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Preparing New Teachers for Common Core
Introduction
Acknowledgments

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Preparing New Teachers for Common Core
Introduction
The Partnership

Ayers Institute for Teacher Learning and Innovation

Established in 2012 as a partnership between the Ayers Foundation and Lipscomb University's College of Education, the Institute was initiated as a result of Dean Candice McQueen's vision for creating a high-quality clearinghouse for best practices coupled with exceptional learning opportunities and professional training to support and develop our best teachers and leaders across the state, especially in more challenged areas. The institute was made possible by the generous $1 million initial gift from Jim and Janet Ayers.

Tennessee Higher Education Commission

"The Tennessee Higher Education Commission is excited to partner with the Ayers Institute for Teacher Learning and Innovation at Lipscomb University on this important endeavor. This program will ensure that future teachers are prepared to help students learn on the first day in the classroom." --Dr. Richard G. Rhoda, Executive Director of the Tennessee Higher Education Commission.

Institute of Higher Education Common Core Advisory Board

The IHE Common Core Advisory Board is the governing board of this particular project. The board itself has worked diligently in the first year of this grant and we look forward to Year Two. This network of people, in conjunction with the Tennessee Higher Education Commission and other state department officials, have made state-wide collaboration not only a reality but an expectation.

IHE Advisory Board Members:
Pamela Browning, Lee University
Kim Finch, Cumberland University
Susan Groenke, UTK
Carlette Hardin, APSU
Dovie Kimmins, MTSU
Hal Knight, ETSU
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Katrina Miller, TN Higher Ed. Commission
Kathryn Meyer, TN Higher Ed. Commission
Allison Woods, Ayers Institute
Amy Wooten, TN Dept. of Education

Preparing New Teachers for Common Core
Introduction
History of Common Core

For years, each state has had a plan for K-12 educational content standards and also a plan for assessing the proficiency of its students against those standards. The states have been independent operators of their standards and assessment systems with students facing national assessments only when they took a college entrance exam near the end of their K-12 education. Even though these state standards and assessment systems require federal approval, that approval has centered on whether a state was testing its students' proficiency against its own content. This standards leaves plenty of room for differences between and among states, differences in what students learned, when they learned it, and what level of proficiency was expected. A student might perform at the advanced level on one state's assessment system, but could have been at the basic level in another.

The National Assessment of Educational Progress (NAEP) has also been assessing samples of students in each state and telling the nation that proficiency for a 5th grader in one state wasn't the same as for other states. While some individual states fared well on NAEP assessments, the Programme for International Student Assessment (PISA), an international study that evaluates educational systems in 70 countries, ranks U.S. student proficiency barely in the top third of participating nations, with particular weakness in mathematics.

In an effort to create a common set of educational standards for students across the nation, the Common Core State Standards were developed through efforts spearheaded by the National Governor's Association (NGA) and the Council of Chief State School Officers (CCSSO) in collaboration with teachers, school administrators, and experts. Tennessee's State Board of Education adopted the Common Core State Standards in Mathematics and English Language Arts in July 2010. As of the start of 2013, forty-five states, the District of Columbia, four territories, and the Department of Defense Education Activity have adopted the Common Core State Standards.

This is an initiative led by the states designed to create a common core of state standards that is relevant and reflects the knowledge and skills young people need for success in college and the workforce. The Common Core State Standards reflect the knowledge and skills that young people need for success in college and careers. Being College and Career Ready means that an individual has the knowledge, skills, and experiences necessary to be successful in postsecondary education without remediation and at the entry level of a career pathway that would support a small family in a 21st century economy.

According to the Tennessee State Department of Education, the Common Core State Standards will strengthen teaching and learning with standards that are

- Focused, coherent, clear, and rigorous
- Internationally benchmarked
- Anchored in college and career readiness
- Evidence- and research-based

One critical strategy in the effort to improve college and career readiness is the proposed assessments for the Common Core State Standards. Race to the Top grants have provided funding to two consortia of states, Partnership for Assessment for Readiness for College and Careers (PARCC) and Smarter Balance, to develop a new generation of assessments intended to provide timely data to improve instruction, accelerate learning, and provide accurate information on how students and schools are performing. Each consortium was awarded more than $175 million to develop assessments that push the frontiers of the assessment field through building next generation assessment results.

Tennessee is part of the PARCC alliance of 24 states working together to develop common assessments based on the Common Core State Standards. PARCC is state-led and a subset of PARCC states, including Tennessee, make up its governing board. PARCC assessments will begin in 2014-15 for grades 3-11 in ELA and Math.

Preparing New Teachers for Common Core
Introduction
How to Navigate the Video Resources

Access:
To access the video resources, go to the website for the Ayers Institute for Teacher Learning and Innovation at: www.lipscomb.edu/ayers

Once on the website, click on the tab that says INVEST.

When you click there, you will be taken to the page that displays all video options. The videos will be organized by grade level and subject area. Click on the video that you want to view.

User account:
The first time you select a video, you will need to create an account by supplying an email address and assigning yourself a password. Creating an account will allow you to comment on the resources and bookmark the videos, meaning your pause or stop will be held and you can begin in the same spot at any later time.

On subsequent visits to the video resources, you will only need to supply your username and password to gain access.

Viewer options:
Once you select the grade level and subject area, the video will play from the beginning. If you would rather jump to a certain chapter, you may choose the chapter you wish to view and click on it. The chapter titles refer to the parts of the lesson.

Underneath the video window are pop-up options, such as planning, differentiation, instructional shifts, etc. These refer to short interview clips with the teachers that focus on the topic identified. These interviews are also referenced during the lesson at various times. You may choose to view it during the lesson or you may choose it anytime from this menu. If you are watching in full screen, you will have to exit the window to view the pop-up clips from the menu under the main player. In full screen, clicking will cause the video will pause so you can access the additional clips.

If needed, you have the option for subtitles or closed captioning

During viewing:
While you are viewing the videos, you will see various pop-ups which will identify Common Core State Standards, Mathematical Practice Standards, and classroom-specific vocabulary.

Preparing New Teachers for Common Core
Introduction
How to Use the Facilitator's Guide

This guide is divided by bold headings on the **Table of Contents.** Each section contains resources specific to the heading.

For each section devoted to **Common Core Instruction**—either Math or ELA—you will find information on the Instructional Shifts Charts specific to each discipline and journal resources you may use for your own information or share with your students.

For each **teacher section**, you will find all elements of the lesson plan, such as student handouts and student work. Additionally, each teacher section includes a **Viewing Guide** which can be used in a number of ways. You may wish to print the discussion and activities pages for your students to use while viewing the segments of the lesson, or you may wish to simply talk through the discussion points and assign the activities as time permits. Be sure to review the discussion points and activities before you assign them as classwork or homework as some of them require handouts for your students that can be found in Appendix A: Student Handouts. You will notice that the discussion points and activities are aligned to a focus area, such as planning, strategies, assessment, and special education.

At the end of each teacher section, you will see **4 activities** that could be used to guide students in the process of analyzing the lesson as a whole, synthesizing important elements, and creating products of their own. These overarching activities have been structured similarly. For example, the first activity deals with a Common Core element, the second focuses on a general practice of teaching and how that practice is supported through Common Core instruction, the third activity asks the student to consider a content-specific issue, and the fourth question is an overall reflection of the lesson, specific to elements we have identified as worthy of reflection. The use of these activities is also left to your discretion. You may use them all or choose the topic or topics you would like your students to focus on.

You will also see a **Mathematical Practices Highlights** section that further explains each Mathematical Practice Standard by identifying student behaviors that indicate students are mastering or moving toward mastery of each standard, and pulls out excerpts from the video lessons that are examples of those student behaviors. There is one activity that corresponds to this video.

The **Appendices** include **Student Handouts** that correspond to the activities for each lesson, answers to math content activities, Shifts for Teacher Prep Practices, Example Lesson following the TTLP, and a **glossary** of terms.

Preparing New Teachers for Common Core
CCSS Math Resources
Mathematical Practice Standards

Mathematical Practice 1: Make sense of problems and persevere in solving them.
Students make sense of problems and persevere in solving them when they:

- Explain the meaning of the problem
- Look for multiple entry points to a solution
- Plan a solution pathway rather than jump to a solution attempt
- Monitor progress and change course if necessary
- Check answers to problems using a different method
- Constantly ask, "Does this make sense?"

Mathematical Practice 2: Reason abstractly and quantitatively.
Students reason abstractly and quantitatively when they:

- Make sense of quantities and their relationships
- Decontextualize using symbolic representations
- Contextualize by pausing to analyze the referents for symbols
- Create a coherent representation of the problem
- Consider all elements of a problem, not just how to compute it
- Know and flexibly use different properties of operations and objects

Mathematical Practice 3: Construct viable arguments and critique the reasoning of others.
Students construct viable arguments and critique reasoning when they:

- Communicate conclusions to others
- Justify conclusions
- Respond to the arguments of others
- Analyze situations by breaking them into cases
- Recognize and use counterexamples
- Distinguish correct logic or reasoning from flawed logic or reasoning
- Ask useful questions to clarify or improve the arguments of others

Mathematical Practice 4: Model with mathematics.
Students model with mathematics when they:

- Solve problems that arise in everyday life, society, and the workplace
- Map the relationship of important quantities in a practical way, using tools such as a diagram, table, graph, flowchart, or formula
- Analyze selected tools to draw conclusions
- Interpret results in context and refine if needed

Mathematical Practice 5: Use appropriate tools strategically.
Students use appropriate tools strategically when they:

- Consider available tools and resources when solving a mathematical problem
- Use tools and resources, including pencil and paper, concrete models, a ruler, a protractor, a calculator, spreadsheet, or digital content
- Make sound decisions regarding the most effective tool to use
- Use technology to visualize results, explore consequences, and compare data
- Use tools to explore and deepen understanding of concepts

Mathematical Practice 6: Attend to precision.
Students attend to precision when they:

- Communicate precisely
- Use clear definitions in discussion
- State the meaning of symbols consistently and appropriately
- Calculate accurately and efficiently
- Express answers with a degree of precision appropriate to the grade level or task

Mathematical Practice 7: Look for and make use of structure.
Students look for and make use of structure when they:

- Look closely to discern a pattern or structure, such as the distributive property
- Use strategic thinking, such as adding an auxiliary line to an existing line in a geometric figure
- Shift perspective based on a broader view of the problem
- See complicated things as single objects or as being composed of several objects

Mathematical Practice 8: Look for and express regularity in repeated reasoning.
Students look for and express regularity in repeated reasoning when they:

- Notice if calculations are repeated
- Look for general methods and shortcuts
- Oversee the process of a mathematical problem while attending to details
- Evaluate the reasonableness of results

Adapted from: http://www.corestandards.org/Math/Practice

Preparing New Teachers for Common Core
CCSS Math Resources
Math Instructional Shifts Chart

Shift #1--Focus strongly where the Standards focus	
Shift from:	**To:**
• Cover topics in mile-wide, inch-deep fashion • Skills repeated in Standards from grade-to-grade	• Narrow and deepen the way time and energy is spent in the math classroom • Major work of each grade: K-2: Addition and subtraction; concepts, skills, and problem solving 3-5: Multiplication and division of whole numbers and fractions; concepts, skills, and problem solving 6: Ratios and proportional relationships; early expression and equations 7: Ratios and proportional relationships; arithmetic of rational numbers 8: Linear algebra 9-12: Number and quantity; algebra, functions, modeling, geometry, statistics, and probability
• Progression through Standards, often neglecting foundational skills • Math skills in isolation	• Strong foundations, solid conceptual understanding, and a high degree of procedural skill and fluency • Apply math skills to solve problems inside and outside the math classroom
Shift #2--Coherence: think across grades, and link to major topics within grades	
Shift from:	**To:**
• Standards not coherently linked from grade to grade • Cycle of review of basic skills/presentation of new skill/practice of new skill • Each standard a new event	• Coherent progression from grade to grade • Carefully connected learning across grades so that students can build new understanding onto foundations built in previous years • Extension of previous learning

• Major topics detract from focus of grade level work	• Major topics support grade level work

Shift #3--Rigor: in major topics pursue: **conceptual understanding,** procedural skill and **fluency**, and **application** with equal intensity	
Shift from:	**To:**
• Math as a set of mnemonics or discrete procedures	• Ability to access concepts from a number of perspectives
• Drill and kill practices	• Structure class time and/or homework time for practice on core functions; students have access to more complex concepts and procedures
• Math problems often out of context	• Apply math in context
• Math is only taught in Math class	• Teachers in other content areas ensure that students are using math to make meaning of and access content.

Emphasis on Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Preparing New Teachers for Common Core
CCSS Math Resources
Suggested Articles and Texts

Hiebert, J. et al. (1997). Making sense: Teaching and learning mathematics with understanding. Portsmouth, NH: Heinemann.

Rothman, R. (2012). Nine ways the common core will change classroom practice. *Harvard Education Letter*, *28*(4), Retrieved from http://www.hepg.org/hel/article/543.

Smith, M. S., Bill, V., & Hughes, E. K. (October 2008). Thinking through a lesson: successfully implementing high-level tasks. *Mathematics Teaching in the Middle School*, *14*(3), 132-138.

Smih, M. S., & Stein, M. K. (2011). *5 practices for orchestrating productive mathematics discussions*. Thousand Oaks, CA: Corwin Press.

Stein, M. A., Smith, M. S., Henningsen, M. A., & Silver, E. (2009). *Implementing standards-based mathematics instruction*. (2nd ed.). New York: Teachers College Press.

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Teacher Profile

4th grade Math: Comparing unlike fractions using the benchmark ½

Stacey Harp, Ed.S
Rutherford County Schools: Cedar Grove Elementary School
Economically disadvantaged: 63.1%

About Ms. Harp, Teacher of the Year, Cedar Grove Elementary School, 2012
Ms. Harp has been a classroom teacher for six years. Prior to becoming a general education teacher, Ms. Harp worked in business and then spent a year as a special education assistant. Ms. Harp has a Master's degree in Curriculum and Instruction and an Educational Specialist Degree in Administration and Supervision. This is her third year to teach fourth grade. All of Ms. Harp's teaching experience has been in a Title I school.

About Mrs. Harp's classroom
There are 23 students in Ms. Harp's class. Their proficiency levels range from "below basic" to "advanced" on their third grade TCAP scores. In terms of mathematical abilities, students struggle with multiplying, but are growing in academic levels.

The Lesson
In the lesson, students will be asked to compare unlike fractions to the benchmark fraction ½ (4.NF.2).

The video is divided into five sections:

Framing the lesson (5 minutes)
The Task (12 minutes)
Small Group Student Dialogue (8 minutes)
The Solutions (30 minutes)
Lesson Closure (12 minutes)

Multiple Mathematical Practice Standards are present in the lesson. Examples of small group dialogue and whole group facilitation are strengths of this lesson.

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Planning for CCSS Math Lesson

Lesson: Fractions	**CCSS Domain:** 4.NF Number and Operations - Fractions	**Date:**

Standard(s) the lesson is building toward	
Math Content Standard	**Assessment**
4.NF.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	Students will analyze and compare four fractions to the benchmark ½.
Mathematical Practice Standards	**Assessments**
MP1: Make sense of problems and persevere in solving them.	MP1 will be assessed be through the work process students take to develop their solution.
MP2: Reason abstractly and quantitatively.	MP2 will be assessed by how students decontextualize numbers to represent a quantity and expression, and then re-contextualize to explain process.
MP4: Model with mathematics.	MP4 will be assessed by the way students solve the task using a number line and visual representations of their work.
MP7: Look for and make use of structure.	MP7 will be assessed by seeing if students can use ½ to compare other fractions.
Clear Learning Targets	I can accurately represent fractions with models. I can compare fractions with different denominators. I can recognize how to use the benchmark ½ to compare fractions.
New Learning	• Vocabulary: benchmark fraction • Concepts: The numerator and denominator are equally important in order to compare fractions • Skills: Use benchmark ½ to compare fractions.
Instructional Strategies	• Private think time, small group discussion, and whole group

	discussion
Materials and Resources	• Thanksgiving Pie task for each student • Index cards

Framing the Lesson for Students (5 minutes)
• Teacher asks a series of questions while letting students respond: "What are some things you do on Thanksgiving Day? Who likes to eat pie at their Thanksgiving lunch or dinner? What are your favorite types of pies to eat? Does anyone get upset when their favorite pie gets eaten quickly?" • Teacher tells a personal story: "My uncle and I both really like to eat pumpkin pie. He always eats a really large piece or a lot of small pieces. Sometimes he comes back for seconds when I am still working on my first. This really irritates me." • Teacher asks: "Do you have anyone in your family that eats something you really like in this way?" • Teacher ties to task by saying: "My uncle and I are both eating portions or fractions of pie. Today, you will be an outsider watching four families celebrating Thanksgiving Day together. Your job is to decide which family is like my uncle and possibly one of your family members that we were just discussing." • Teacher reads the task with the students which requires students to determine who ate the most amount of pie and who ate the least amount of pie by comparing fractions with unlike denominators. • Teacher will enter into task by stating, "You have about 5 minutes of private think time. After private think time, you will spend about 15 minutes sharing with your small group."

The Task (Private and Small Group 20 minutes)	**Anticipated learning difficulties**
Objectives during the task: • Students show effort and persistence in problem solving. • Students dialogue with each other regarding the task by asking each group member to explain their solution or ask clarifying questions. • Teacher circulates room clarifying learning difficulties, asking assessing and advancing questions, and noting student progress on explanations by use of words, diagrams, and equations. • Teacher circulates during small group time listening and responding to student dialogue. General setup of the class: • Small groups are heterogeneous in both gender and mathematical ability. Students are sitting in groups of 3 or 4, depending on the class size. Groups of four are preferable. • Private think time ranges between 5 to 7 minutes, depending on student's involvement. • Small group time ranges between 10 to 15 minutes, depending on student involvement and discussion. • Transition into group time is to be distinguished by each individual teacher. During this lesson, the transition will be a verbal cue, "Okay guys, please start your small group time." •	• Recognizing 3/6 is equivalent to ½. • Recognizing amount left over verses amount eaten. • Comparing fractions with unlike denominators • Using ½ as a benchmark fraction • Combining fractions on one or numerous number lines. **Student prompting** Student prompting will be vague and independently directed to students thinking about the task at hand. Student prompting is similar to assessing questions, in the fact that the goal is to help the student clarify their thinking and obtain an entry point into the task. Sample prompting: • What is the task asking you? • What do you know about fractions? • What does the number on the bottom and top of a fraction tell you? • Can you think of another task or activity that we have done this year to help you?

The Solutions (Whole group discussion, 20 minutes)
During the whole group discussion, the teacher facilitates whole group conversation by having different students share their solutions by use of the ELMO. The teacher will ask students to share based on teacher notes taken during private and small group time. The teacher will call students to explain their work based on their diagramming, equations, and explanations by use of words. Students will be encouraged to ask their classmates questions to make their work better (i.e. Could you label your diagram?, What made you decide to divide the fraction in that way?) This will allow the teacher to address any misconceptions noted during his/her observations as well as show multiple solution paths. At this time, any advancing or assessing questions will be discussed by the whole group. During this discussion, students and teachers will tie back to previously learned material; this can only be addressed by the feedback of the students.

Questioning: Illuminating Student Thinking	
Assessing questions *(potential)*	***Advancing questions***
Assessing questions are solely based on student work. These are questions that I anticipate asking based onthe anticipated learning difficulties. More assessing questions will arise as I see the work and thought process of the students. • How do you find 1/2 of a number? • How do you compare 3/4 and 3/6? • What is another fraction equal to 3/6? • Tell me what you know about a number line.	• How might you use a number line to explain your answer? • How can you use subtraction to find out how much is left? • Is it possible to think about how much is left to find out who ate more? How? • How might you make a rule about the numerator and denominator? • How might you find a common denominator to combine the fractions together?
Lesson Closure (15 minutes)	
• Teacher will review the meaning of the numerator and denominator by writing a fraction down and asking students to respond on an index card: "Let's pretend that my uncle ate 3/5 of my pumpkin pie. Let's see if we can answer some questions." • Teacher asks for verbal response to questions: "What digit is the numerator? What does this number mean? How about the denominator?" • Teacher directs: "First, let's fold your index card in half. On one side of your index card, please draw a model of 3/5. Can you now represent 3/5 on a number line below your model?" • Teacher continues: "Lastly, I want you to think back to that person in your family who eats your favorite pie (like my uncle). Let's pretend you have a pie cut into 4 equal pieces. You choose how many pieces that person will eat. Now, write a fraction that tells how many pieces your family member ate." • Teacher instructs: "Before you line up, explain who ate more of the pie, my uncle or the person you choose. Use words, diagrams, or equations to explain who ate more to me. Hand your cards to me as you exit. This is your ticket out the door."	
Homework	
• To be determined by teacher based on performance of task. If students prove they can independently model and compare fractions, send home a fraction worksheet "More or Less Than ½" for more practice. If many students still appear to be below independent level, only assign a set of fractions to practice modeling. If students have mastered the skill of modeling and comparing, assign students a set of fractions to model on a number line. Challenge them to model the fraction on one number line, as opposed to different ones. • These observations will be the guide for tomorrow's follow up lesson.	

Teacher Reflection
This is a Title I school. There are 23 students ranging from “below basic” to “advanced” on the 2011-2012 TCAP testing in mathematics in this classroom. Students have been exposed to representing fractions extensively in the upcoming grades; however, they have not been formally exposed to comparing fractions. The students have had minimal work placing fractions on a number line at this point in the year. Also, after lesson, reflect on planning and delivery as well as what would be done differently when lesson is taught again.

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Lesson Task

Thanksgiving Pie

On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces.
The Love's chocolate pie was cut into 5 equal pieces. They ate 4 pieces.
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece.
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces.

A) Use the number line below and include diagrams to illustrate:
   1. Which family ate the most pie?
   2. Which family ate the least amount of pie?

B) How much more pie would the Cosby family need to eat in order to have eaten the same amount of pie as the Ray family?

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Student Work—Lesson Task

After the task has been provided to students, Ms. Harp provides "private think time" for students to independently work on the task to the best of their ability. While "private think time" is occurring, Ms. Harp circulates around the room and conferences with students. This section contains student work samples of the task.

Unique to this lesson alone, the student work that is provided here corresponds to the students that Ms. Harp interacts with during the lesson.

The student work in the *Lesson Task* section includes:

Alyssia
Meadow
Kyla
Jorge
Angeleeza
Triston

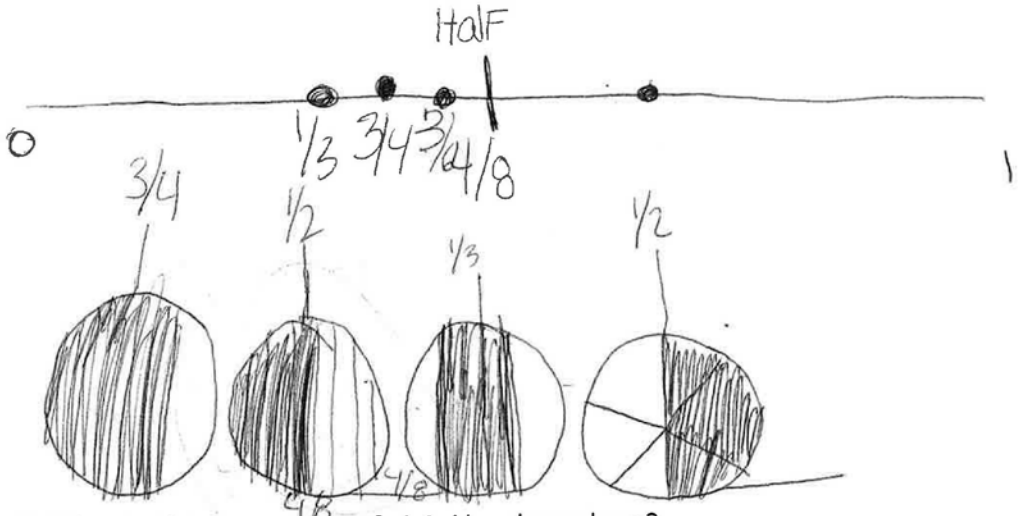
Allyssia

Thanksgiving Pie

On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces. 3/4
The Love's chocolate pie was cut into 8 equal pieces. They ate 4 pieces. 4/8
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece. 1/3
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces. 3/6 1/2

A) Use a number line ~~below~~ and include diagrams to illustrate:
1. Which family ate the most pie?
2. Which family ate the least amount of pie?

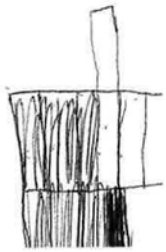


B) Who ate the same amount of pie? How do you know?

Loves and Cosbys Were the same I knew tha because I drew a picture and found out the answer.

C) How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family?

They would need 3/8.



Meadow mcdonald Mapp

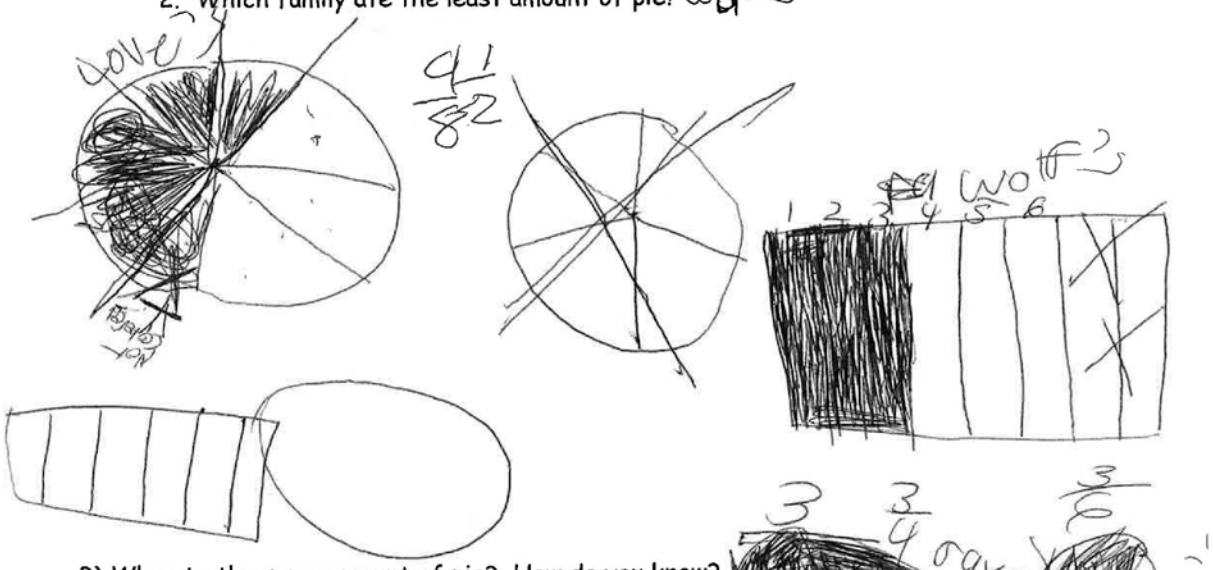
Thanksgiving Pie (23)

On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces.
The Love's chocolate pie was cut into 8 equal pieces. They ate 4 pieces.
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece.
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces.

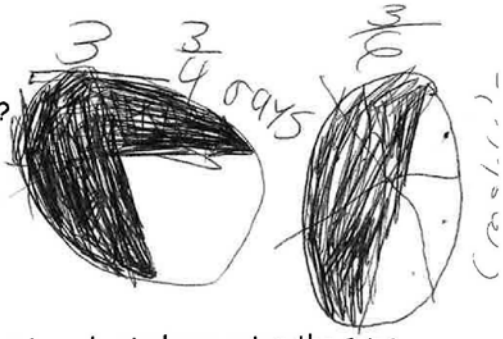
A) Use the number line below and include diagrams to illustrate:

1. Which family ate the most pie? Love's
2. Which family ate the least amount of pie? wolf's



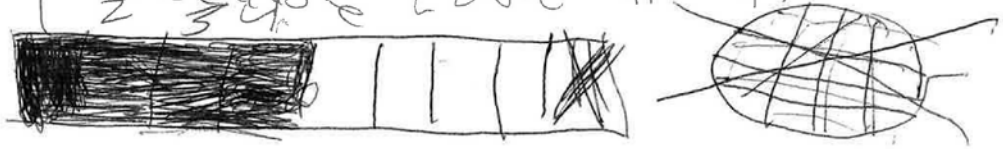
B) Who ate the same amount of pie? How do you know?

Ray's and coby's because they both ate three pieces 3



C) How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family?

They would have not eaten that 4th piece because Love ate 4 ray's ate 3



KY 14 ##

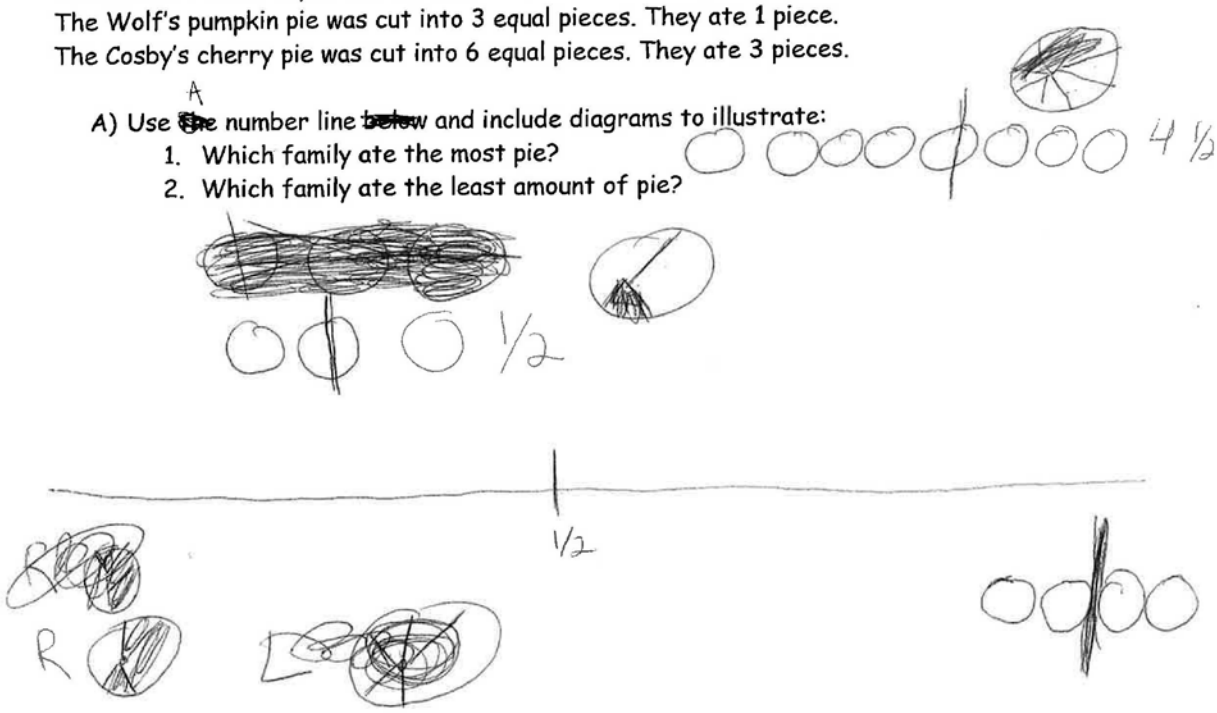
Thanksgiving Pie

On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces. 3/4
The Love's chocolate pie was cut into 8 equal pieces. They ate 4 pieces.
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece.
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces.

A) Use ~~the~~ A number line ~~below~~ and include diagrams to illustrate:

1. Which family ate the most pie? 4 1/2
2. Which family ate the least amount of pie?



B) Who ate the same amount of pie? How do you know?

1 have 1/2 shaded in and the another one have 3/5

C) How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family?

you have to subtract.

4/8 4/3 = 3

Jorge #1

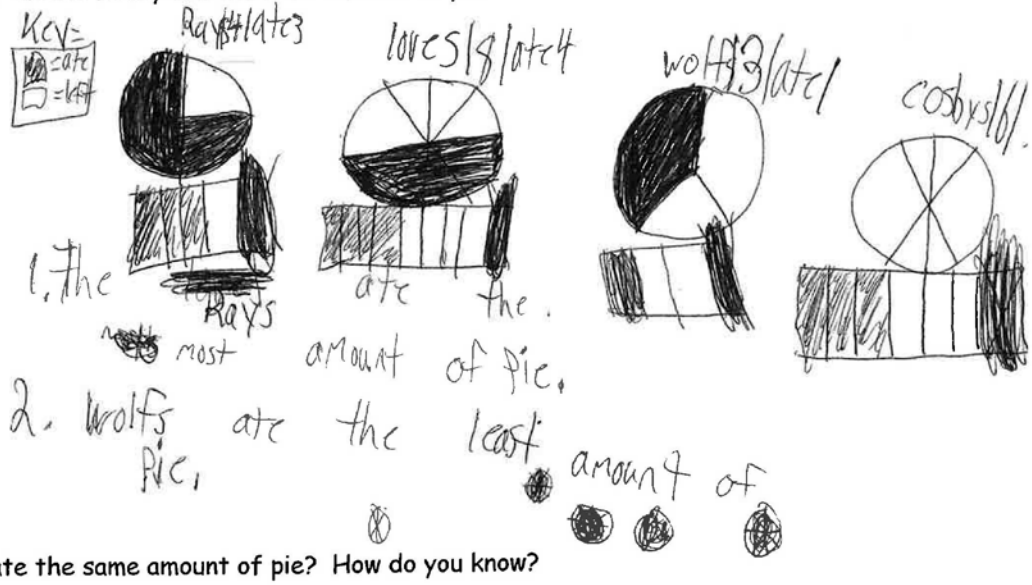
Thanksgiving Pie

On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces.
The Love's chocolate pie was cut into 8 equal pieces. They ate 4 pieces.
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece.
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces.

A) Use a number line and include diagrams to illustrate:

1. Which family ate the most pie?
2. Which family ate the least amount of pie?

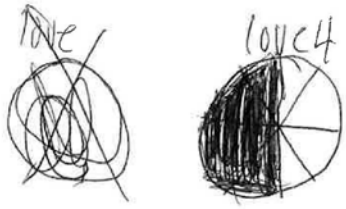


B) Who ate the same amount of pie? How do you know?

the cosby's and the Ray's ate the same amount of pie.

I figerd it out by where I was reading it so thats how I

C) How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family?



Angelica

Thanksgiving Pie

On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces.
The Love's chocolate pie was cut into 8 equal pieces. They ate 4 pieces.
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece.
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces.

A) Use ~~the~~ a number line ~~below~~ and include diagrams to illustrate:

1. Which family ate the most pie?
2. Which family ate the least amount of pie?

R = 3/4
L = 4/8
W = 1/3
C = 3/6

the Love family ate the most because the have more equal pieces than the other families, the wolf family ate the least, how I know is because they only have 1/3.

B) Who ate the same amount of pie? How do you know?

C) How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family?

Triston

Thanksgiving Pie

On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces. = 4-3=1 $\frac{3}{4}$
The Love's chocolate pie was cut into 8 equal pieces. They ate 4 pieces. =8-4=4 $\frac{8}{24}$
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece. = 3-1=
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces. =6-3=3

A) Use ~~the~~ A number line ~~below~~ and include diagrams to illustrate:

1. Which family ate the most pie?
2. Which family ate the least amount of pie?

1. The Love's chocolate had 8 equal pieces, and they ate 4 pieces of there pie. The love's ate the most.

2. The Ray's strawberry ate the least becuse they cut the pie into 4 equal pieces and ate 3 slises now they only have 1 piece of pie.

B) Who ate the same amount of pie? How do you know?

C) How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family?

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Student Work—The Solutions

After students have had the opportunity to discuss their work in small groups, Ms. Harp uses a facilitated conversation to move her students through the task. Using her students as the primary sources of information, Ms. Harp begins with the most basic part of the task and builds the complexity by inviting a variety of students to the document camera to share their work. You may observe the facilitated conversation in video segment four "The Solutions" of Ms. Harp's video. The following includes the student work discussed in the group discussion.

The student work in The Solution section includes:

Randy
Collin
Allison
Mackenzie
DJ

Randy

Thanksgiving Pie

On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

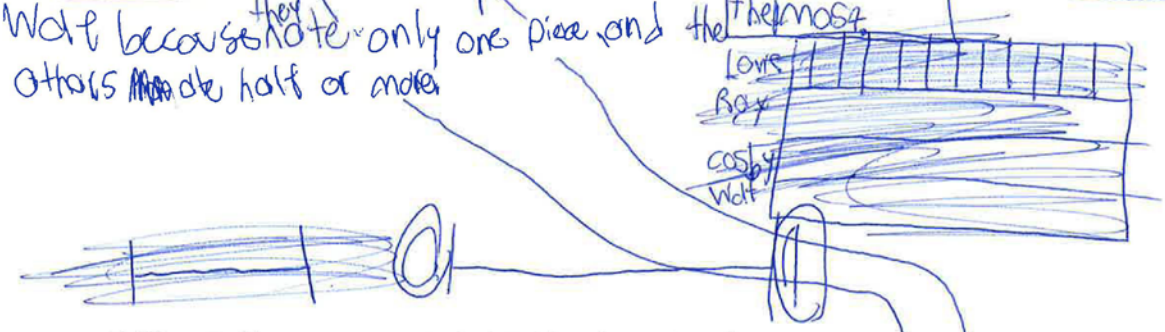
The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces.
The Love's chocolate pie was cut into 8 equal pieces. They ate 4 pieces.
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece.
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces.

A) Use the number line below and include diagrams to illustrate:

1. Which family ate the most pie?
2. Which family ate the least amount of pie?

Ray family ate more becouse the distance from it is farther and if you do the fractions, and draw you will now that he at the most

Wolf because they ate only one piece and the others made half or more



B) Who ate the same amount of pie? How do you know?

Cosby and Love becouse there both are half.

C) How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family? Eat two more from there pie, and that makes $\frac{6}{8}$ and its the same as $\frac{3}{4}$.

Collin

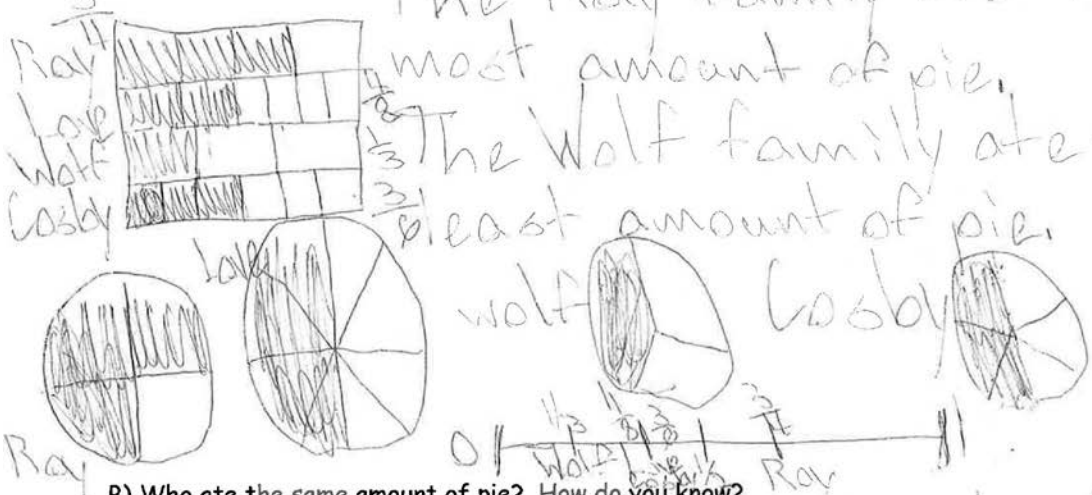
Thanksgiving Pie

On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces.
The Love's chocolate pie was cut into 8 equal pieces. They ate 4 pieces.
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece.
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces.

A) Use the number line below and include diagrams to illustrate:
1. Which family ate the most pie?
2. Which family ate the least amount of pie?

The Ray family ate the most amount of pie. The Wolf family ate the least amount of pie.



B) Who ate the same amount of pie? How do you know?

The Cosby and Love family ate the same amount of pie. I used diagrams and pictures to help me.

C) How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family?

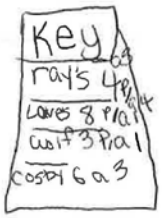
They would of had to eat $\frac{6}{8}$ instead of $\frac{4}{8}$.

Alison Wright

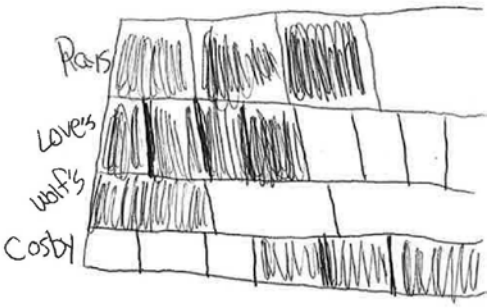
Thanksgiving Pie

On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces.
The Love's chocolate pie was cut into 8 equal pieces. They ate 4 pieces.
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece.
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces.



A) Use ~~the~~ a number line ~~below~~ and include diagrams to illustrate:
1. Which family ate the most pie?
2. Which family ate the least amount of pie?



B) Who ate the same amount of pie? How do you know?

The famiy that ate the most Pie is the Ray's famiy and the families that ate the Same is the lov famiy & the _____ family. I Know that because is drew a Chart to See who ate the same and who ate the most Pie.

C) How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family?

Mackenzie Ivey

Thanksgiving Pie

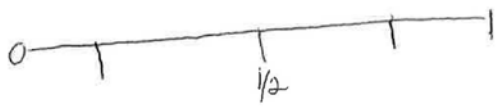
On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces. $\frac{3}{4}$ half of 4 is 2
The Love's chocolate pie was cut into 8 equal pieces. They ate 4 pieces. $\frac{4}{8}$
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece. $\frac{1}{3}$ half of 6 is 4
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces. $\frac{6}{3}$ half of 6 is 3

A) Use ~~the~~ a number line ~~below~~ and include diagrams to illustrate:

1. Which family ate the most pie? Love's
2. Which family ate the least amount of pie? wolf's

The love's ate the most of pie of of the 3 families.
The wolf's ate the least out of the 3 families.



$\frac{3}{4}$ half is 2
$\frac{4}{8}$ half is 4
$\frac{6}{3}$ half is 3
$\frac{3}{1}$ half is 2 1/2

B) Who ate the same amount of pie? How do you know?

C) How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family?

DJ

Thanksgiving Pie

On Thanksgiving Day, four families each ate a part of an equal size pie. Each pie was split into different pieces.

The Ray's strawberry pie was cut into 4 equal pieces. They ate 3 pieces.
The Love's chocolate pie was cut into 8 equal pieces. They ate 4 pieces.
The Wolf's pumpkin pie was cut into 3 equal pieces. They ate 1 piece.
The Cosby's cherry pie was cut into 6 equal pieces. They ate 3 pieces.

A) Use ~~the~~ a number line ~~below~~ and include diagrams to illustrate:

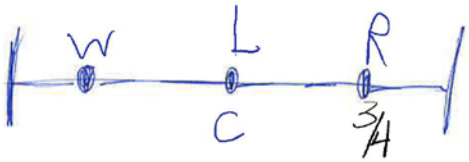
1. Which family ate the most pie? The rays family at more than 1/2
2. Which family ate the least amount of pie? The wolfs ate the less pie because the rays has the most and the others ar halfs thats what my point of ~~view~~ view is.

R 3/4

L 4/8 or 1/2

W 1/3

C 3/6 or 1/2



B) Who ate the same amount of pie? How do you know? The loves and the cosbys because their both halfs even though the loves have more peices

C) How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family? 2 because the rays 1/4 = the loves 2/8.

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Student Work—Lesson Closure

To conclude her lesson, Ms. Harp designed an exit ticket that requires students to create an unlike fraction to compare to a fraction provided by Ms. Harp and then provide an explanation of which fraction is greater. You can view the exit ticket explanation in video segment five "Lesson Closure." This section contains some sample responses to the exit ticket.

FRONT:

Model 3/5.	Pick a fraction with a denominator of 4 and model.

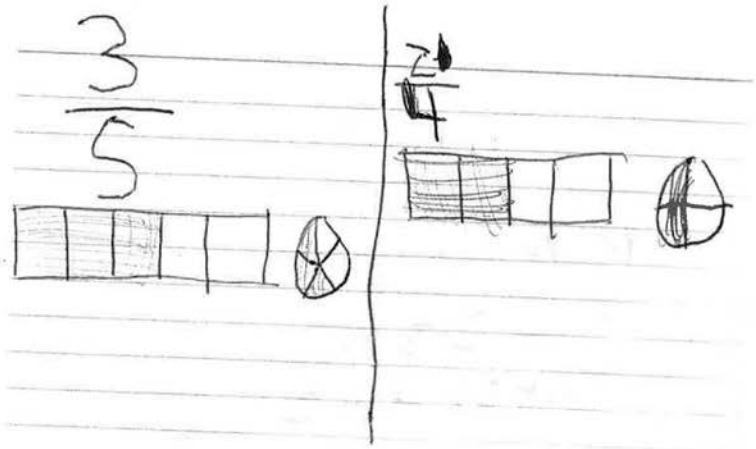
BACK:

Narrative explanation: Who ate more pie?

Owen G. #8

~~Bolt~~

uncle ate
more because half of
5 is 2½ and its 3 but
half of 4 is 2 and it is 2



Cody #9 14/11/12 Harp 4th.

$\frac{3}{5}$

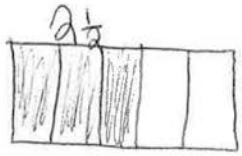
$\frac{3}{4}$

Uncle $\frac{3}{4}$

me $\frac{1}{4}$

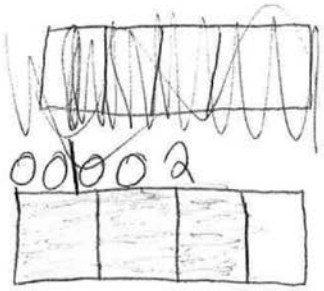
Angeleeza

$\frac{3}{5}$

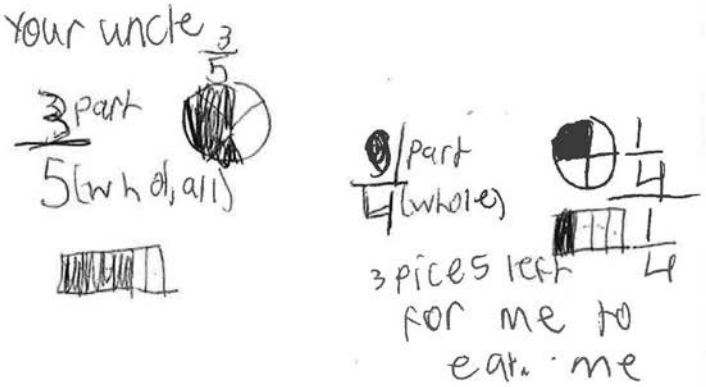


the uncle ate more

$\frac{3}{4}$

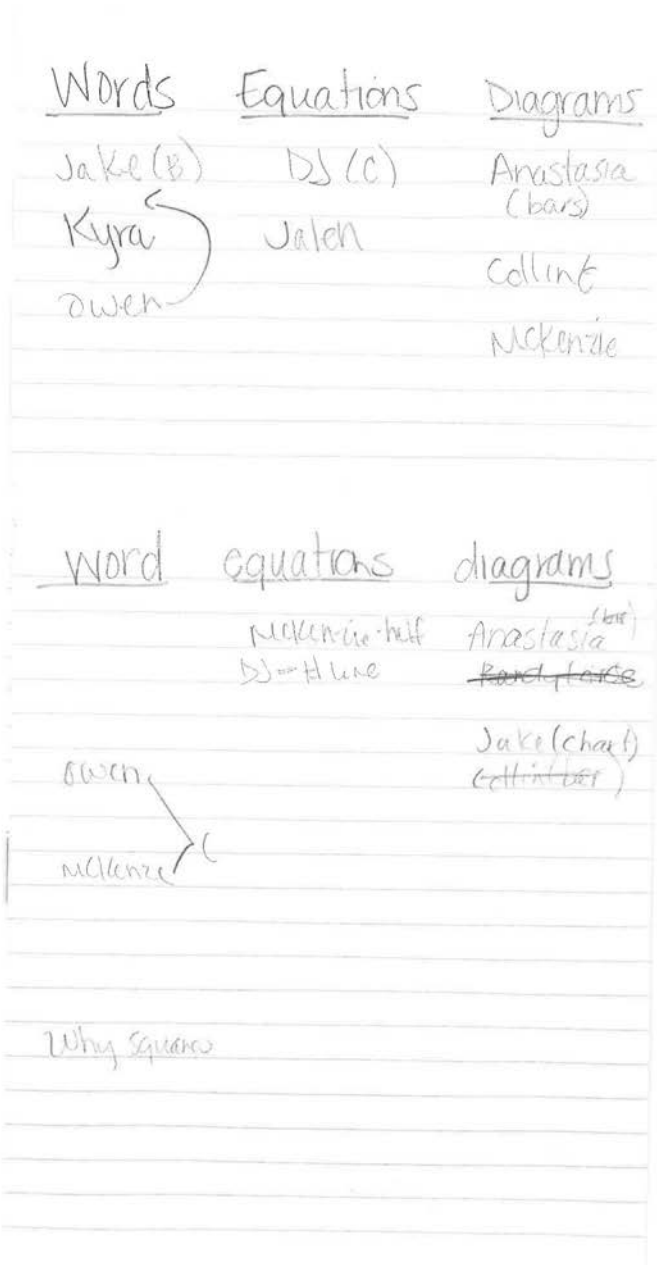


Mackenzie Ivey



Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Student Work—Teacher Notes

Ms. Harp notes in her interview how she groups students. Here is her method for determining the group discussion. She takes notes on student work as she walks around during silent work time.



Words	Equations	Diagrams
Jake (B)	DJ (C)	Anastasia (bars)
Kyra	Jalen	
Owen		Collint
		McKenzie

word	equations	diagrams
	McKenzie-half	Anastasia (bar)
	DJ-#line	~~Rand (arrs)~~
		Jake (chart)
Owen		~~Collin (bar)~~
McKenzie		

Why Squares

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Teacher Reflection

1. What strengths do you see in the lesson?

The strengths of this lesson include the set, discussions, and overall environment of the classroom. The set of the lesson is real world and applicable to my students. The students were able to make connections to their own lives and build up anticipation for the task. I try to be motivating to the students by creating a challenge for them.

Discussions taking place throughout the lesson are also a strength. The student-to-student conversations were relevant and focused. They asked each other questions to push for more in-depth explanations or clarifications of their thinking. Patience is vital when questioning students and waiting for responses during the individual conferencing. These discussions allow students to reflect on their thinking and come up with different solution paths or ideas on their own, without being told.

The most important strength of the lesson is the classroom environment. I strive to be excited and positive with my instruction. I encourage my students to encourage others and give praise when the opportunity arises. We also praise courage, bravery, and risk-taking. Throughout the lesson, we always try to make every discussion a positive experience and tie it back to learning more, even from our mistakes.

2. Can you explain how you developed a culture of sharing and risk-taking in the classroom?

A culture of sharing and risk-taking is vital in any classroom. I ask that my students encourage each other throughout their thinking. We consistently applause each other for our thoughts, correct or incorrect. This teaches perseverance. I try to put myself in their shoes so they can see that everyone gets confused and makes mistakes, even their teacher. I try to set up a helping environment, where each individual's job is to help their partner better understand the task at hand.

Every opportunity and discussion is always connected back to learning: "What did you learn, what can we learn, how does this change your thinking?" I encourage and push my students to talk through their thinking so they come up with their own ideas. By working through their thoughts out loud they begin to realize their mistakes and then create a new potential path. They then feel successful because they came up with the idea, instead of me telling them what to do. This instills ownership and pride in their work.

3. What opportunities do you see to share best practices with pre-service teachers?

Best practices in this lesson include the following:

- Questioning to clarify thinking instead of telling students what to do (Assessing questions).
- Individual conferencing and prompting students who are struggling.
- Anticipating and clearing up misconceptions through discussion, restating, and/or repeating directions and questions.
- Building up anticipation and excitement about the task at hand.
- Encouraging each other to persevere through the thinking process.
- Enabling rich discussion through arguments and supporting with evidence.

4. Do you see any missed opportunities that you would want pre-service teachers of which to be aware?

When you reflect back on a lesson, a teacher will always see missed opportunities. It is this type of thinking that enables a teacher's instruction to grow and develop. During the set and closure, I should have allowed more opportunity for students to reflect and connect back to their own lives. During whole group instruction, I could have allowed more partner discussion to the questions I was asking of the whole group. Lastly, I realize that I can do a better job of spreading my questioning out to a wider variety of students.

5. What data do you use to determine grouping in your classroom?

Initially when grouping students, I use the previous year's TCAP scores and this year's placement scores to group students. As the year progresses, I learn each individual's strengths and weaknesses from observations, various assessments, and class work. In my classroom, I prefer to have heterogeneous groups. I use factors such as ability level, ability to work with others, and problem-solving skills to strategically place students into groups. All of these factors play a vital role in creating productive, collaborative groups.

6. How have you used the TEAM rubrics to improve your practice?

Upon reviewing the TEAM rubric and then using it to evaluate a Common Core lesson, you will find that the Common Core style of instruction easily meets the real-world majority of the aspects of the TEAM rubric. The set of my lesson/task always motivates students by encompassing real world scenarios. Through student small group and whole group instruction, internal summaries of the lesson are consistently being discussed. Higher level questioning is taking place from the teacher during private think time, small group, and whole group discussion. Questioning is also coming from the students to each other. Feedback is another area on the TEAM rubric that is very easily met. Whether the feedback occurs during individual conferencing, small group discussion, from the teacher, or another student, feedback is consistently being given to each student who is sharing their work. The grouping aspect of the rubric is always met by the small group sharing time, which also meets the expectations of a teacher's knowledge of the students. My lessons are structured the same (private think time, small group, and whole group instruction); however, the lesson pacing is difficult to meet on the rubric. Overall, the TEAM rubric and Common Core instructional style goes hand in hand together. Using a math task to structure my lesson enables me to score at expectations or above on the TEAM rubric.

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Viewing Guide—Before Viewing the Lesson

Pre-writing for Activity 1 on pg. 51
Distribute the **Mathematical Practices Chart** found in the **Student Handout Section A.1**. Ask students to fill in the missing information regarding the Math Practice Standards they see in Ms. Harp's lesson.

Discussion Points	Focus
• In the first segment of the video, Ms. Harp explains that she teaches in a Title I School. What is a Title I school? What does this distinction imply?	Professional Knowledge
• Ms. Harp also explains that her students display a wide range of proficiency levels, from "below basic" to "advanced." What does that mean? What is the minimum proficiency level on TCAP testing?	Professional Knowledge
• Based on Ms. Harp's description of the students, how familiar is she with her students' performance data? What conclusions can you draw about the importance of that data?	Planning

Activities	Focus
• Discuss in small groups: Ms. Harp explains that she has students who scored "below basic" and "advanced" on the 3rd grade TCAP in her class. Is it possible to address the learning needs of both groups of students in the same math lesson on modeling and comparing fractions with common denominators? What might be some ways to do so? Where might struggling students need support/additional work? How might you challenge your advanced students in such a lesson?	Professional Knowledge
• The content standard in the lesson is comparing fractions. Brainstorm various ways of knowing a fraction is close to another fraction or larger/smaller than another fraction.	Math Content

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Viewing Guide—During the Lesson

The following discussion questions and activities will guide the viewing of the video lesson.

Video Segment 1—Framing the Lesson

Discussion Points	Focus
• Why might Ms. Harp ask her students to talk to each other about what they do on Thanksgiving, and then share details with the class? What is she trying to do?	Strategies
• What do you think of Ms. Harp's attempt to make a real-world connection for students between Thanksgiving pie and fractions? Do you think it is successful? Why or why not?	Planning

Activities	Focus
• Discuss in small groups: What are some other real-world scenarios you could use with 4th grade students to frame a lesson on modeling and comparing fractions with common denominators?	Planning
• Identify the background knowledge students need prior to this lesson. Consider content, math skills, vocabulary, etc.	Planning

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Viewing Guide—During the Lesson

Video Segment 2—The Task

Discussion Points	Focus
• How does Ms. Harp present the task to her students?	Strategies
• Why start with "private think time"? Which CCSS Mathematical Practice Standard does this support?	Strategies
• What does "real-world" mean? Why is it important to make these connections? In teaching CCSS, how important will these connections be?	Strategies
• What is a "solution path"? Why does Ms. Harp say she tries to build rigorous tasks that have multiple entry points and multiple solution paths? What does this mean? What idea(s) about learning math does this encourage? How does this support CCSS Math shifts?	Math Content
• Ms. Harp doesn't give the individual students she helps the answers. Instead, she helps students solve the task on their own. What are some ways she does this?	Strategies
• Ms. Harp's task consists of three parts. The third part is: How much more pie would the Love family need to eat in order to have eaten the same amount of pie as the Ray family? What operation is required for the third part? What standard does the third part concern? What is the role of this final problem in the task?	Math Content

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Viewing Guide—During the Lesson

Video Segment 2—The Task

Activities	Focus
• Ms. Harp asks the students to read aloud the task directions with her. Can you think of other ways Ms. Harp could have presented the task directions to students to account for diverse learning styles and needs? Do you think all students understand what they are being asked to do? Why or why not?	Strategies
• The real-world application of Thanksgiving pies was relevant to students' lives but seemed to complicate drawing the model for some students. Brainstorm some ways to restructure or restate the task.	Planning
• During independent think time, what are some strategies that you could use to help students clarify their thinking and complete the math task?	Strategies
• Use number lines to compare fractions of pie eaten by each family. You may use a single number line or multiple number lines. When using multiple number lines to compare fractions, what is important to keep the same? (*For answers, see Appendix B.1.)*	Math Content
• Compare the fractions of pie eaten by each family by converting the fractions eaten to common denominators. Do it first for each pair of families and then find a common denominator that works for all 4 families. *(For answers, see Appendix B.2.)*	Math Content

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Viewing Guide—During the Lesson

Video Segment 3—Small Group Student Dialogue

Discussion Points	Focus
• How does Ms. Harp help students know what they're supposed to do in the small group dialogue? How does Ms. Harp structure the dialogue task? What are some things Ms. Harp has probably done prior to this task to prepare students for successful dialogue?	Planning
• Observe students as they work in cooperative learning groups. Look for examples of students who articulate viable arguments supporting their work on the math task. Look for examples or non-examples of appropriate self-assessment and/or peer-assessment.	Planning

Activities	Focus
• As you facilitate cooperative groups, what are some strategies that you could use to help students communicate effectively with group members and help clarify their thinking?	Strategies
• Identify specific things students say to each other about their work, both encouraging and corrective. In CCSS instruction, student-to-student feedback is critical. Brainstorm some concrete ways teachers get their students to feel comfortable giving each other feedback.	Planning
• In small groups, develop 2-3 questions/sentences that students could pose to each other to challenge each other's thinking and request clarification and/or elaboration.	Planning

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Viewing Guide—During the Lesson

Video Segment 4—The Solutions

Discussion Points	Focus
• During whole-class time, Ms. Harp has students share their strategies to solve the task. Why might this be beneficial for the whole class? For the person who is sharing?	Strategies
• During whole-class share time, Ms. Harp asks students to make arguments for and against students' solution paths. What is Ms. Harp trying to get students to do? What makes this effective or ineffective?	Strategies
• How does Ms. Harp help students practice clarifying, elaborating, and arguing their ideas and the ideas of others?	Strategies

Activity	Focus
• In small groups, draw on Howard Gardner's Theory of Multiple Intelligences to create some bodily-kinesthetic, visual-spatial, and/or musical activities that you could use to help students grasp the concept of the function of the numerator and denominator.	Strategies
• Use diagrams to illustrate the fraction equivalences and comparisons from the task. *(For answers, see Appendix B.3.)*	Math Content

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Viewing Guide—During the Lesson

Video Segment 5—Lesson Closure

Discussion Points	Focus
• What is Ms. Harp using the end of the lesson to do? How does she connect the end of the lesson back to the beginning of the lesson? Why might this be helpful for students? What major concepts is she reinforcing and giving students time to practice/show what they know?	Planning
• How will the notecards be helpful to Ms. Harp? How do you think she will use this information in future planning?	Assessment
• Why does Ms. Harp think it's a good idea to challenge her students? In what way is this idea reflected in the CCSS Math Practice Standards? What does she learn from observing her students try to tackle the challenge?	Assessment

Activity	Focus
• In small groups, discuss: Ms. Harp explains that the challenging math lesson was "for learning, not for assessment." What do you think she means by this? What is the difference? When would assessment be appropriate?	Assessment

Preparing New Teachers for Common Core
4th grade Math: Ms. Harp
Viewing Guide—After Viewing the Lesson

These activities are designed to guide students in the process of analyzing the lesson as a whole, synthesizing important elements, and creating products of their own.

Activity I (Practice Standards)

Using the chart you completed while viewing the lesson segments, comment on how Ms. Harp incorporates Math Practice Standards seamlessly in her instruction. How do these standards drive her classroom practice? Comment on how you intend to incorporate the standards into your daily routine.

Activity II (Classroom Management)

The video shows several instances of students critiquing the reasoning of others, both in small group discussion and large group discussion. The students show great respect for each other. A great example is the conversation between DJ and McKenzie (43:20 – 46:33). Developing a classroom culture in which students feel comfortable explaining their thinking and being critiqued by others is an essential element of Common Core instruction, and it does not happen automatically.

Consider the examples of respectful culture that you see throughout this lesson, and comment on what Ms. Harp might have done to lay the groundwork for this environment. Using examples from Ms. Harp's lesson and from your practicum experience, map out a plan for the first week of school that will lay the groundwork necessary for a collaborative, respectful classroom.

Activity III (Math Content)

Consider this CCSS 4th Grade Math Standard: CCSS.Math.Content.4.NBT.A.3. Use place value understanding to round multi-digit whole numbers to any place. Craft an objective and related rigorous real-world task with multiple solution paths and entry points.

Activity IV (Reflection)

If you were going to teach this lesson to your own class tomorrow, what changes could you make to improve the overall outcome of this lesson? Do you see any missed opportunities, any confusion on the faces of the students, or any chance for refinement? Are you convinced that each student understood and mastered the task? What could you do to clear up that confusion or improve student mastery?

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Teacher Profile

5th grade Math: Add and Subtract fractions with unlike denominators

Philip Eller
Rutherford County Schools: Cedar Grove Elementary School
Economically disadvantaged: 63.1%

About Mr. Eller

Philip Eller has been teaching for nine years. In this time, he taught sixth and seventh grade for three years and he has been teaching fifth grade at Cedar Grove Elementary School for the last 6 years. He was recently selected to be a Common Core Math Coach for the Tennessee Department of Education. To fulfill that responsibility, Mr. Eller received intense Common Core training, and then trained teachers across Middle Tennessee in the planning and execution of Common Core Instruction. Mr. Eller has plans to pursue a Master's degree.

About Mr. Eller's classroom

Mr. Eller teaches in an inclusion classroom in a Title I school. He has 4 students with IEP's and 3 three ESL students. The range of ability within his classroom is varied, with performance scores from highly "advanced" to well "below basic." He describes his classroom in this way: "We have kids all over the place."

The Lesson

In this lesson, students will be asked to add or subtract mixed numbers with unlike denominators (5.NF.1).

The lesson is divided into five segments:

Framing the Lesson (6 minutes)
The Task (25 minutes)
Small Group Student Dialogue (13 minutes)
The Solutions (14 minutes)
Lesson Closure (5 minutes)

Multiple Mathematical Practice Standards are seen throughout this lesson. Strengths of this lesson include task differentiation and assessment strategies.

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Planning for CCSS Math Lesson

Lesson: Adding Fractions	**CCSS Domain:** Numbers and Operations - Fractions	**Date:**

Standard(s) the lesson is building toward 5 NF.1 5 NF.2	
Math Content Standard(s)	**Assessment(s)**
• 5.NF.1: Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.	Students will create an addition fractions equation with unlike denominators that equal a certain sum. Students will need to prove that they can add these fractions by finding like denominators first and come up with that sum. *They may choose to use the inverse operation and start with the sum and then subtract a number to find a second addend.
• 5.NF.2: Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g. by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and the reasonableness of answers.	Students will consider the reasonableness by choosing two fractions that are less than the whole and may draw a fraction model that shows how the two addends equal the sum (the new whole).
Mathematical Practice Standard(s)	**Assessment(s)**
• MP1: Make sense of problems and persevere in solving them	MP1 will be assessed through the work process students take to develop their solution.
• MP3: Construct viable arguments and critique the reasoning of others	MP3 will be assessed based on the reasonableness of their arguments and by critiquing others during the table and whole group time.
• MP 4: Model with mathematics	MP4 will be assessed by the way students write their equation and draw a visual representation of their work.
• MP7: Look for and make use of structure	MP7 will be assessed by the presence of the addition and subtraction equation. Students may show addition and subtraction as inverse of each other. This may look like a fact

	family on the students' sheets.
Clear Learning Targets	The students will create fractional addition equations that meet a particular sum and explain the strategy used in doing so.
New Learning	While this is designed to be a culminating activity, borrowing and regrouping with fractions may hold an opportunity for new learning.
Prior Knowledge Needed	Adding and subtracting fractions with like denominators, finding like denominators by LCM or equivalent fractions, borrowing and regrouping of fractions.
Instructional Strategies	• Independent work, partner/group discussion, student led examples, whole group discussion
Materials and Resources	• Teacher resources - Interwrite Board • Student resources - Interwrite Board • Task • Post-it notes • Advancing questions • Homework activity • Poster materials

Framing the Lesson for Students (5 Minutes)
I will say, "I have a problem. Mr. G has asked me to work on two projects for him this weekend. I have to create a new bulletin board for the hallway and he wants me to write and give a speech at a meeting. I will have exactly 7 1/2 hours this weekend to work on both. I am trying to figure out how to divide my time between the two projects. Today, you will give me some advice on how to split that time. To get ready for that I'd like for you to write on the back of your task sheet any ideas you have or rules you know about adding fractions." After a minute I will then have them share what they have written for about one minute with their shoulder partner. This gets them thinking in terms of math and hopefully provides an entry point into the task. I will finish by saying, "Now, I'll give you about ten minutes on your own, followed by five to ten minutes working with your table, and then we will come together to see what everyone thinks. You may turn over your task and begin."

<table>
<tr><th>The Task (20 Minutes)</th><th>Anticipated Learning Difficulties</th></tr>
<tr><td rowspan="3">• Students show effort and persistence in problem-solving.
• Time on task is defined.
• Teacher circulates around the room asking assessing and advancing questions.
• Teacher observes and notes student understanding with a content tracker.
• Students share solutions with each other and act as teachers as they provide backing for their ideas and critique the solutions of others.
• Teacher indicates transition from individual to table work.</td><td>Students may be intimidated by the idea of creating expressions with mixed numbers with unlike denominators. Borrowing and regrouping with fractions may be difficult for some.</td></tr>
<tr><td>Student Prompting</td></tr>
<tr><td>The task should be designed to be real-world. Prompting students will be related to practical application and real-world examples and instances. For example, I might say "Our end of the nine weeks party is coming up. I recently came across a recipe for a drink that I'd like to make and bring to the party. It calls for a mixture of a total of 12 cups of orange and cranberry juices. How much of each juice would you suggest I mix to make the drink?" At this time, I expect an answer where the sum would be 12. The answers will vary. The numbers chosen do not matter as long as they meet the requirement of having a sum of 12. I would then say, "Think about what strategy you used to come up with both numbers. If you suggested 8 cups of orange, how did you come up with the number of cups of cranberry? If you chose 5 cranberry, how did you come up the number of orange? Can you use that same strategy to solve this task?"</td></tr>
<tr><td colspan="2">The Solutions (20 Minutes)</td></tr>
<tr><td colspan="2">• Students dialogue with each other regarding the task and may create posters or explain and defend their solutions to each other.
• Students can share created posters, share and explain solutions on chart paper, on the white board, or on the Interwrite Board. Today we will ask that students create posters in table groups. We will then hang the posters and have the students walk around on a "gallery walk". They will work out other's solutions to check for accuracy and see other solutions they had not thought about.
• Teacher facilitates whole group conversation.</td></tr>
<tr><td colspan="2">Questioning: Illuminating Student Thinking</td></tr>
<tr><td>Assessing questions - Based on student work</td><td>Advancing questions - Based on student work</td></tr>
<tr><td>• What is the task asking you?
• How did you come up with those numbers?
• Did you or could you use a strategy from another task or situation we've seen in Math this year?</td><td>• Can you draw a picture that proves your ideas?
• Can you use 3 fractions or mixed numbers to find the sum?
• Can you use only improper fractions and find the same sum?</td></tr>
</table>

Lesson Closure (5 minutes)
Students will write on a sticky note the answer to a question I have written on the board. The question difficulty will vary based on student work from the day. On their way out the door they will place the sticky note on one of three posters set at the front of the room. There is one to show a high level of confidence in understanding (play), one for an average amount of confidence (pause), and one for a low level of confidence (rewind). The content on the note will provide another check for who has the ideas and the poster on which they put their note lets me know who to come back to and encourage or motivate. They will also pick up their homework on the way out the door.
Homework
After we have shown different solutions and students have explained their thoughts and had a chance to critique each other, I will give the advancing questions to all students for an extension activity for homework.

Teacher Reflection
Class profile: This is a Title I school. There are 19 students ranging from "below basic" to "advanced" on the 2011-2012 TCAP testing in mathematics in this classroom. This is also an inclusion classroom with at least 4 students with varying levels of learning disabilities and at least 3 students who are served by our ESL department.

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Lesson Task

Mixed Numbers with a Sum of 7 6/10

Mr. Gullion has asked me to work on two projects this weekend.

- Create the new bulletin board for the 5th grade
- Plan our next Fun Friday

I will only have $7\frac{6}{10}$ hours to work on both projects. Your job is to help me figure a way to divide my time.

Create an addition equation with two mixed numbers that have unlike denominators whose sum is $7\frac{6}{10}$. Show as many different solutions as you can. **Explain the strategy** for creating your equation.

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Student Work—Framing the Lesson

This section includes student work samples of the Framing the Lesson activity. Before working on the task, Mr. Eller asks the students to write down everything they could remember about adding and subtracting fractions. He then moves onto the task.

The student work in the *Framing the Lesson* section includes:

Cassidy
Dillon
Shelby
Mallory
Xavier
Angel

Cassidy Repoza

If you have unlike denominators you have to make the denominators the same by using Least Common Multiple (LCM). If there are whole #'s add fractions first, then fractions.

Dillon

Change the denominaters to like denomonaters

$$\frac{4}{12} + \frac{1}{6}$$

Least Common Multiple

12 = 12, 24, 36
6 = 6, 12

$$\frac{4}{12} + \frac{2}{12} = \frac{6}{12} = \frac{1}{2}$$

Shelby

adding fractions you have to Have the same demoten to add.

Mallory WEID

① You Must find common denominator's

② What Ever you do to the Bottom you Must do to the top

Example- $\frac{1\times4}{2\times4} + \frac{1\times2}{4\times2} =$ —

(Yavier mcellen)

if you have different denomenator you have to make them the same and you can use LCM to see what numbers that the two match

WELD, to add fractions you must make like denomonaters, same as subtracting, multiplying doesn't count because you just multiply stright across. Words, Equations, Label, Diagram

Angel#2 Brown

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Student Work—Lesson Task

The following section includes student work samples of the 5th Grade Math Task. These samples include the front and back of the task sheet and extra student notes if the student attached an extra page to their task assignment. This task corresponds to video segments 2 "The Task" and 3 "Small Group Student Dialogue".

The student work in the *Lesson Task* section includes:

Angel
Dillon
Shelby
Cassidy
Josh
Xavier
Mallory

Student 1: Front

WELD Angel

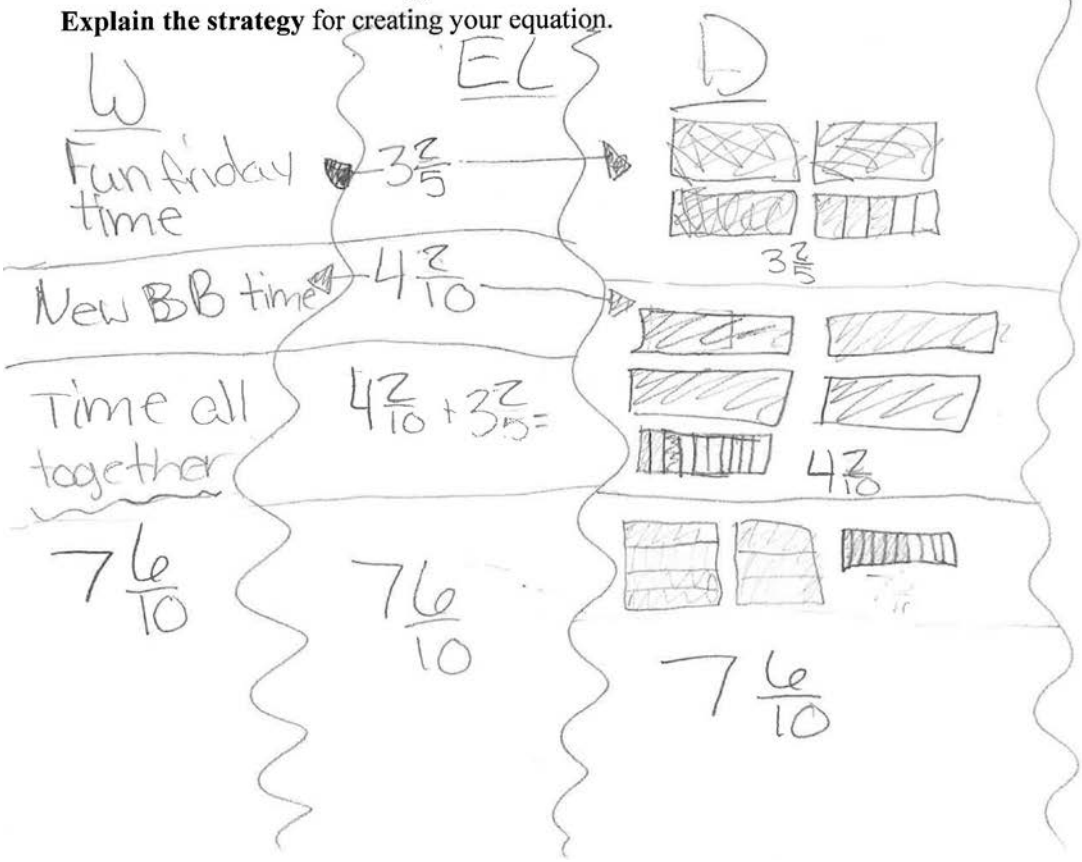
Mixed Numbers with a Sum of 7 6/10

Mr. Gullion has asked me to work on two projects this weekend.

- Create the new bulletin board for the 5th grade
- Plan our next Fun Friday

I will only have 7 $\frac{6}{10}$ hours to work on both projects. Your job is to help me figure a way to divide my time.

Create an addition equation with two mixed numbers that have unlike denominators whose sum is 7 $\frac{6}{10}$. Show as many different solutions as you can. **Explain the strategy** for creating your equation.



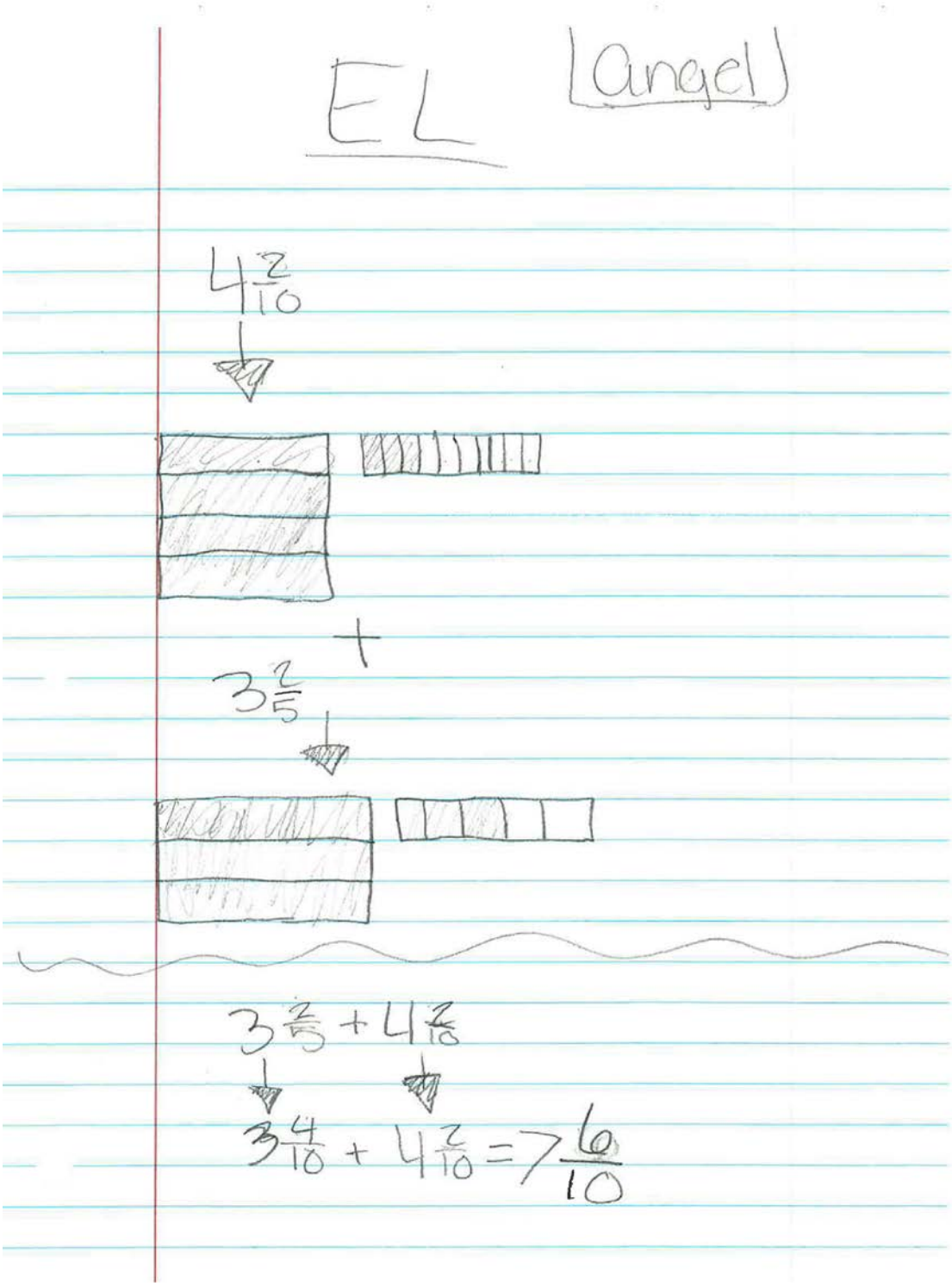
Student 1: Back

Make denomonaters like, or simalar

$$2\frac{6}{8} + 1\frac{3}{16} = 3\frac{15}{16}$$

$$2\frac{12}{16} + 1\frac{3}{16} = 3\frac{15}{16}$$

Student 1: Additional Work



Student 2: Front

Gillom

Mixed Numbers with a Sum of 7 6/10

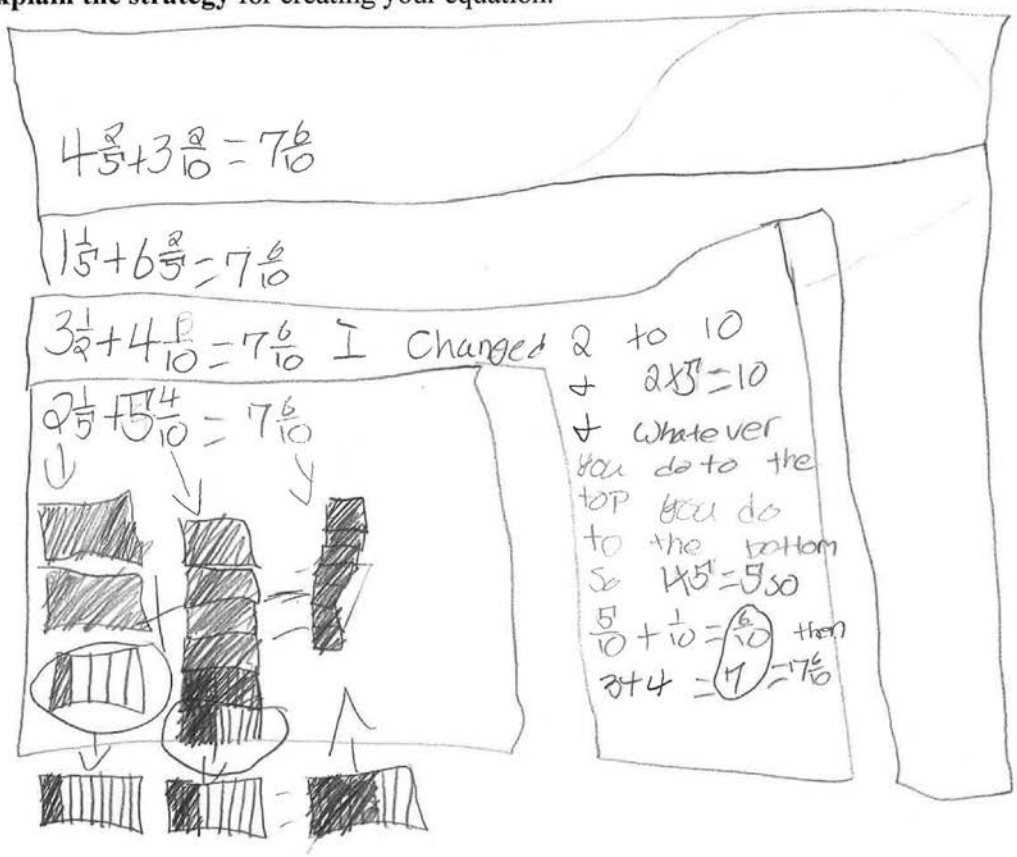
Mr. Gullion has asked me to work on two projects this weekend.

- Create the new bulletin board for the 5th grade
- Plan our next Fun Friday

I will only have $7\frac{6}{10}$ hours to work on both projects. Your job is to help me figure a way to divide my time.

Create an addition equation with two mixed numbers that have unlike denominators whose sum is $7\frac{6}{10}$. Show as many different solutions as you can.

Explain the strategy for creating your equation.



Student 2: Back

you have to change the denominators to like.

$5\frac{3}{4} + 6\frac{1}{4}$

$5\frac{3}{4} + 6\frac{2}{4} = 11 + \frac{5}{4} = 11\frac{5}{4} = 12\frac{1}{4}$

Student 3: Front

Weld Shelby

Mixed Numbers with a Sum of 7 6/10

Mr. Gullion has asked me to work on two projects this weekend.

- Create the new bulletin board for the 5th grade
- Plan our next Fun Friday

I will only have 7 $\frac{6}{10}$ hours to work on both projects. Your job is to help me figure a way to divide my time.

Create an addition equation with two mixed numbers that have unlike denominators whose sum is 7 $\frac{6}{10}$. Show as many different solutions as you can.

Explain the strategy for creating your equation.

Mr. Eller Has $7\frac{6}{10}$ of the Bulletin Board for 5th grade and fun Friday.

$5\frac{4}{10} = 5\frac{4}{10}$

$2\frac{2}{10} = 2\frac{1}{5}$

$3\frac{1}{10} = 3\frac{1}{10}$

$4\frac{5}{10} = 4\frac{1}{2}$

FF. $6\frac{1}{10} = 6\frac{1}{10}$

BB. $1\frac{5}{10} = 1\frac{1}{2}$

$7\frac{6}{10} - 7\frac{6}{10} = 1$ Hole so Mr. Eller pretty may have 1 Hour to do the the Bulletin Bordare $1\frac{1}{2}$ of the Bulletin Bord and $1\frac{1}{2}$ of the fun Friday.

~~He Heth~~ Has 1 Hole or $\frac{1}{4}$

$1\frac{1}{2} + 1\frac{1}{2} = 1$ hole

$1\frac{1}{2} \times 1\frac{1}{2} = \frac{1}{4}$

Student 3: Back

How you add is you Have to have the same danter Like ex if you don't Have the same danter then you can't add the fractions

$\frac{1}{8} \times \frac{2}{8} = \frac{1}{32}$

$\frac{2}{4} + \frac{8}{4} = 2\frac{1}{2}$

qutions

1.

Student 4: Front

Cassidy

Mixed Numbers with a Sum of 7 6/10

Mr. Gullion has asked me to work on two projects this weekend.

- Create the new bulletin board for the 5th grade
- Plan our next Fun Friday

I will only have 7 $\frac{6}{10}$ hours to work on both projects. Your job is to help me figure a way to divide my time.

Create an addition equation with two mixed numbers that have unlike denominators whose sum is 7 $\frac{6}{10}$. Show as many different solutions as you can.

Explain the strategy for creating your equation.

#1

$3\frac{4}{10} + 4\frac{1}{5} = 7\frac{6}{10}$ hours

$3 + 4 = 7$

$\frac{4}{10} + \frac{1 \times 2}{5 \times 2} = \frac{6}{10}$

$\frac{4}{10} + \frac{2}{10} = \frac{6}{10}$

First add 3 and 4 wich = 7. Then add $\frac{4}{10} + \frac{1}{5} = \frac{6}{10}$ because $\frac{1}{5} = \frac{2}{10}$. You get that by doing 1x2 wich is 2 the 5x2 wich is 10. $\frac{2}{10}$. Finally, change $\frac{1}{5}$ to $\frac{2}{10}$ then add 4 and 2 = 6 then put 10 below it, and put

#2

$5 + 2 = 7$

$\frac{8 \div 4}{20 \div 4} \quad \frac{2}{10}$

$\frac{4}{10} + \frac{2}{10} = \frac{6}{10}$

$5\frac{8}{20} + 2\frac{2}{10} = 7\frac{6}{10}$ hours

WELD

or 3 equations

a bless

a a r a m

$6 + 1 = 7$

Student 4: Back

If no like denominators make denominators equal. What you do to the D you must do tho the N. Then +/- the numerators. Keep D same if same D's. Then add/sub. N.

$$\frac{1\times2}{2\times2}+\frac{2}{4}=\frac{4}{4}=1 \qquad \frac{1\times2}{2\times2}+\frac{1}{4}=\frac{3}{4}$$

$$\frac{2}{4}+\frac{2}{4}=\frac{4}{4} \qquad \frac{2}{4}+\frac{1}{4}=\frac{3}{4}$$

Student 4: Additional Work

Cassidy

#1 7 next to $\frac{6}{10}$ and you get $7\frac{6}{10}$.

#2 First add 5 and 2 wich equals 7. Then add $\frac{8}{20}$ and $\frac{2}{10}$ wich $= \frac{6}{10}$ because $\frac{8}{20} = \frac{4}{10}$. You get that by doing $8 \div 2$ wich $= 4$, then $20 \div 2$ wich $= 10$ then put 4 on top of ten. $\frac{4}{10}$. Finally change $\frac{8}{20}$ into $\frac{4}{10}$, then add 5 and 2 wich equals 7, the next add $\frac{4}{10}$ and $\frac{2}{10}$ wich equals $\frac{6}{10}$ and put 7 and $\frac{6}{10}$ next to each other and you get $7\frac{6}{10}$.

Student 5: Front

WELD
Orabia
Rabia
Diego
Sorn
Sam

Sobh 12-17-12 #6
MR. ELIER grade 5

Mixed Numbers with a Sum of 7 6/10

Mr. Gullion has asked me to work on two projects this weekend.

- Create the new bulletin board for the 5th grade
- Plan our next Fun Friday

I will only have 7 $\frac{6}{10}$ hours to work on both projects. Your job is to help me figure a way to divide my time.

Create an addition equation with two mixed numbers that have unlike denominators whose sum is 7 $\frac{6}{10}$. Show as many different solutions as you can. **Explain the strategy** for creating your equation.

FF BB

$4\frac{3}{10} + 3\frac{6}{20} = 7\frac{6}{10}$

FF	$4\frac{3}{10}$
BB	$3\frac{6}{20}$

$= 7\frac{6}{10}$

$4+3=7$

$\frac{3}{10} + \frac{6}{20} = \frac{6}{10}$

I know 4+3= 7=whole then I said $\frac{3}{10}$ is half of $\frac{6}{10}$ insted of $\frac{3}{10}+\frac{3}{10}$ I mutiplied $\frac{3}{10}$ dy 2 = $\frac{6}{20}$

FF BB

$5\frac{66}{220} + 2\frac{6}{20} = 7\frac{6}{10}$

FF	$5\frac{66}{220}$
BB	$2\frac{6}{20}$

$= 7\frac{6}{10}$

$\frac{3}{10} + \frac{3}{10} = 6/10$ $\frac{3}{10} \times 11 = \frac{66}{220}$

I know 5+2=7 and $\frac{3}{10}$ is half of $\frac{6}{10}$ so I Mitiplied $\frac{3}{10}$ dy 2 & 11 wich now makes $\frac{6}{20}$ & $\frac{66}{220}$

$5+2=7$ $\frac{3}{10} \times 2 = \frac{6}{20}$

Student 5: Back

to add unlike denom. you have to make denom. the same

$$\frac{1}{4} + \frac{3}{12}$$

$\times 3$

$$\frac{3}{12} \quad \frac{3}{12} = \frac{1}{2} = \frac{6}{12}$$

Student 5: Additional Work

$4\frac{3}{10} + 3\frac{6}{20} = 7\frac{12}{20} = 7\frac{6}{10}$

$2\frac{6}{20} + 5\frac{66}{220}$

Student 6: Front

Xavier

Mixed Numbers with a Sum of 7 6/10

Mr. Gullion has asked me to work on two projects this weekend.

- Create the new bulletin board for the 5th grade
- Plan our next Fun Friday

I will only have 7 $\frac{6}{10}$ hours to work on both projects. Your job is to help me figure a way to divide my time.

Create an addition equation with two mixed numbers that have unlike denominators whose sum is 7 $\frac{6}{10}$. Show as many different solutions as you can. **Explain the strategy** for creating your equation.

7

Weld

$3\frac{4}{5}$ x2 $4\frac{2}{10}$

$3\frac{2}{5}$ $4\frac{2}{10}$

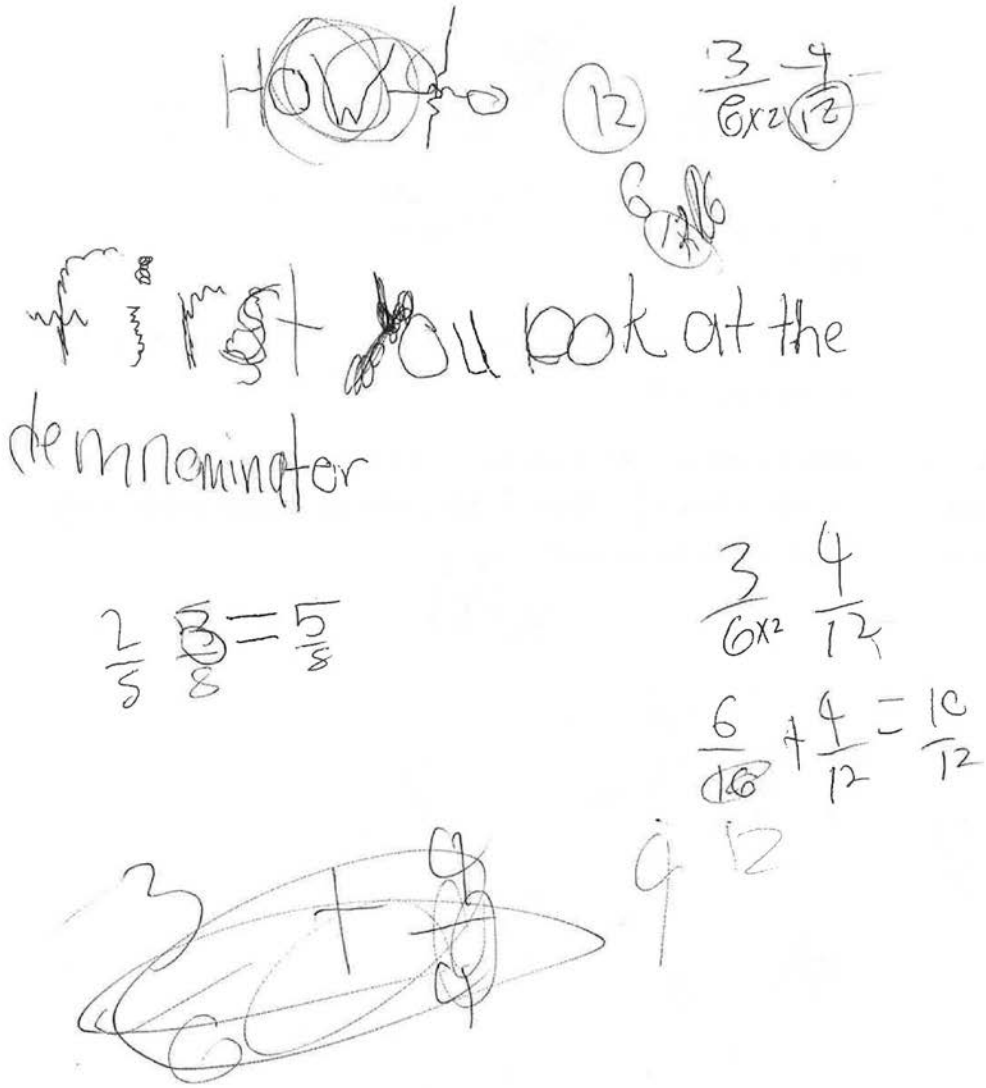
$3\frac{2}{5}$ x2 $4\frac{2}{10}$

$7\frac{6}{10}$

$3\frac{2}{5}$ x2 $4\frac{2}{10}$

$3\frac{2}{5} + 4\frac{2}{10} = 7\frac{6}{10}$ You have to to make d same to the bottom you do and what ever you do to the top

Student 6: Back



Student 7: Front

Mallory

Mixed Numbers with a Sum of 7 6/10

Mr. Gullion has asked me to work on two projects this weekend.

- Create the new bulletin board for the 5th grade
- Plan our next Fun Friday

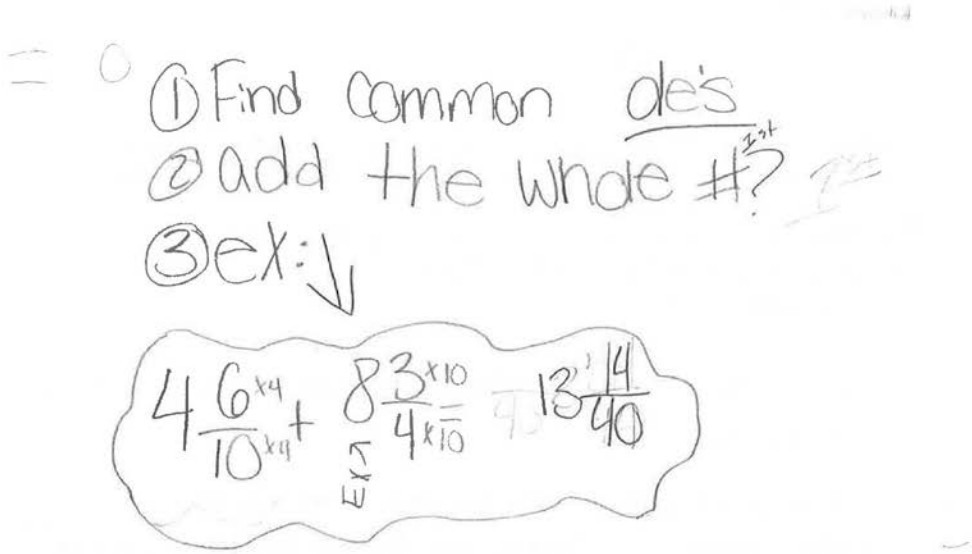
I will only have 7 $\frac{6}{10}$ hours to work on both projects. Your job is to help me figure a way to divide my time.

Create an addition equation with two mixed numbers that have unlike denominators whose sum is 7 $\frac{6}{10}$. Show as many different solutions as you can. **Explain the strategy** for creating your equation.

$4\frac{2^{\times 2}}{5^{\times 2}} + 3\frac{2^{\times 1}}{10^{\times 1}} = 7\frac{6}{10}$

$\frac{32}{10}$

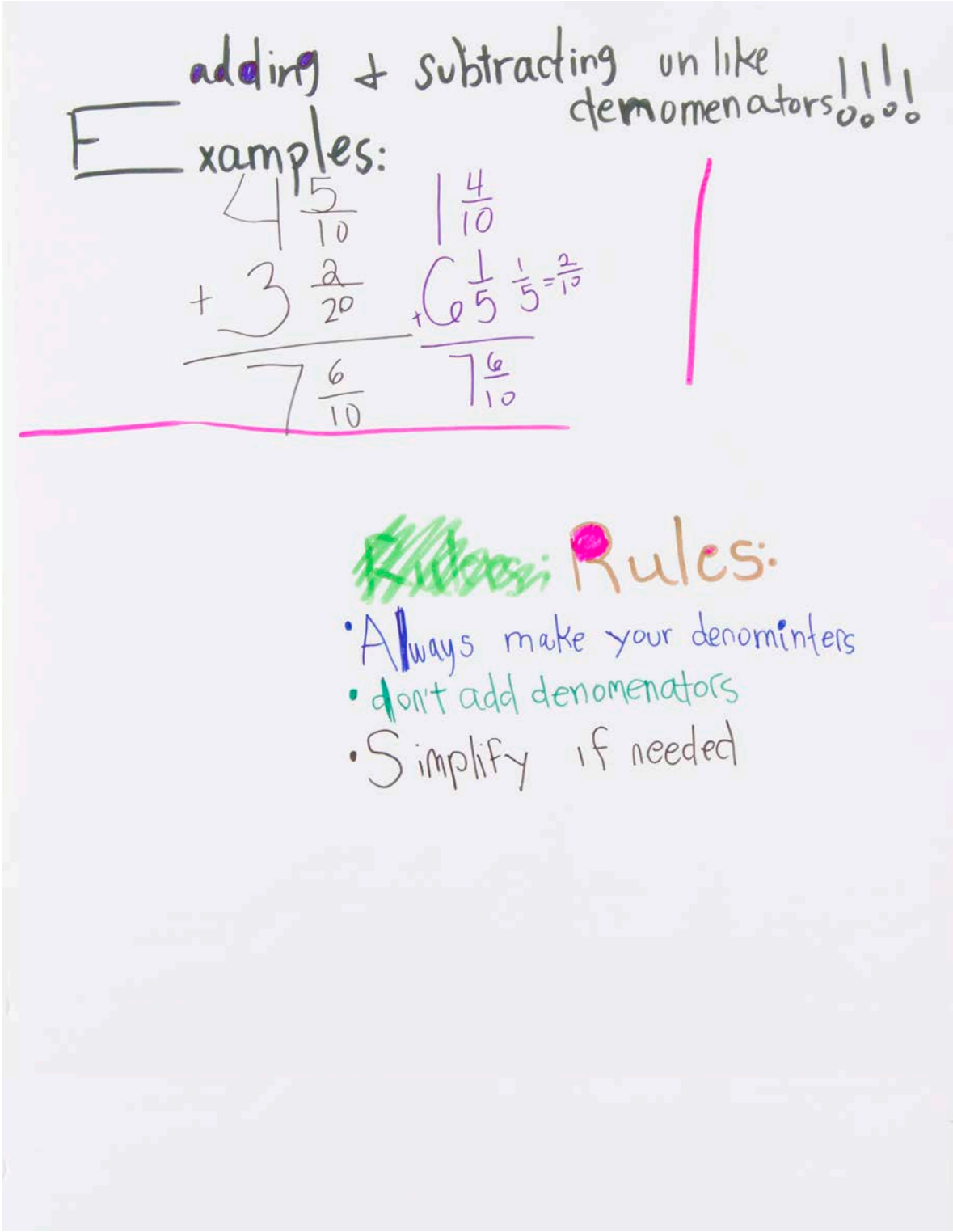
Student 7: Back



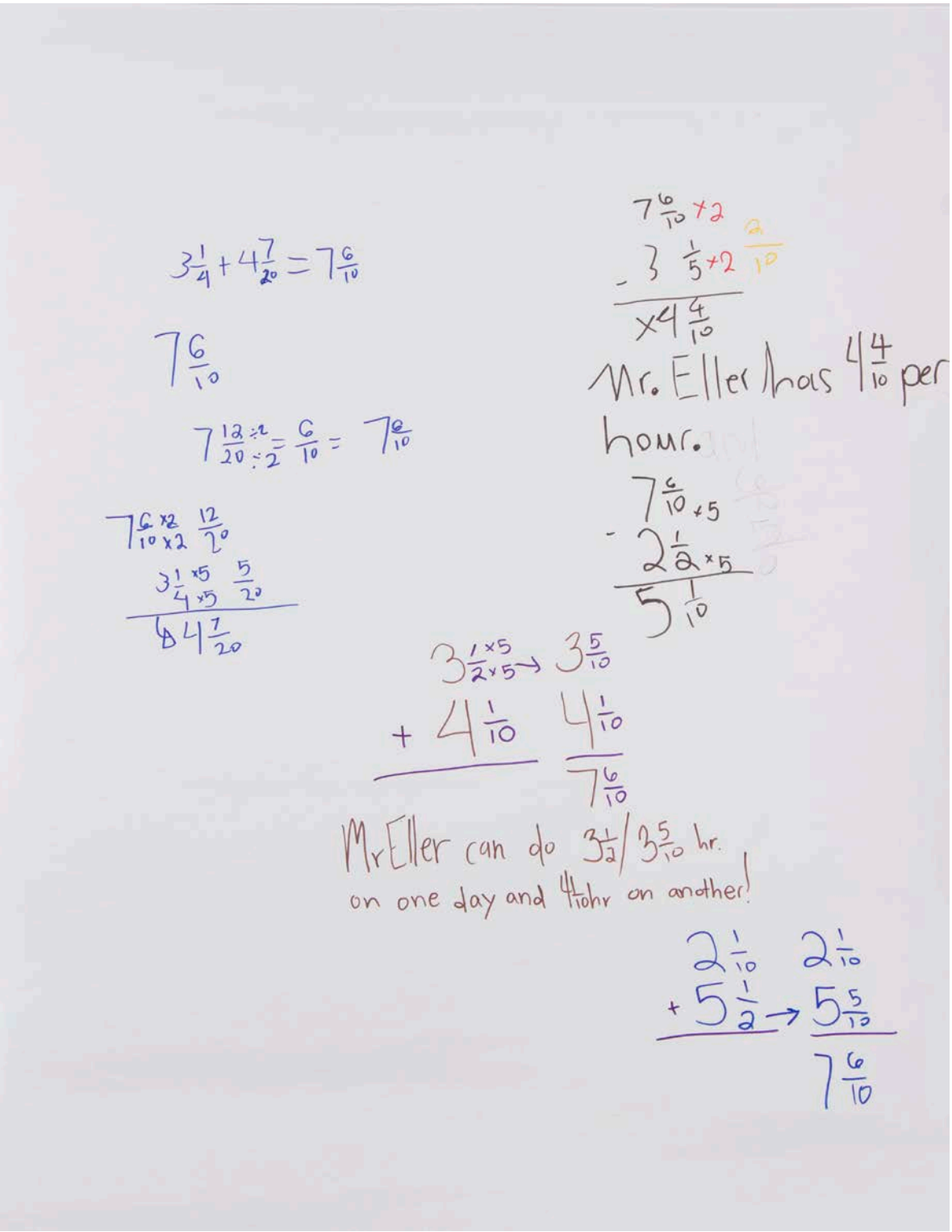
Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Student Work—The Solutions

The following section includes the student charts which resulted from the Gallery Walk activity. There is one chart for each team of students. All 5 charts from the Gallery Walk are represented here. This student work corresponds to video segment 4 "The Solutions."

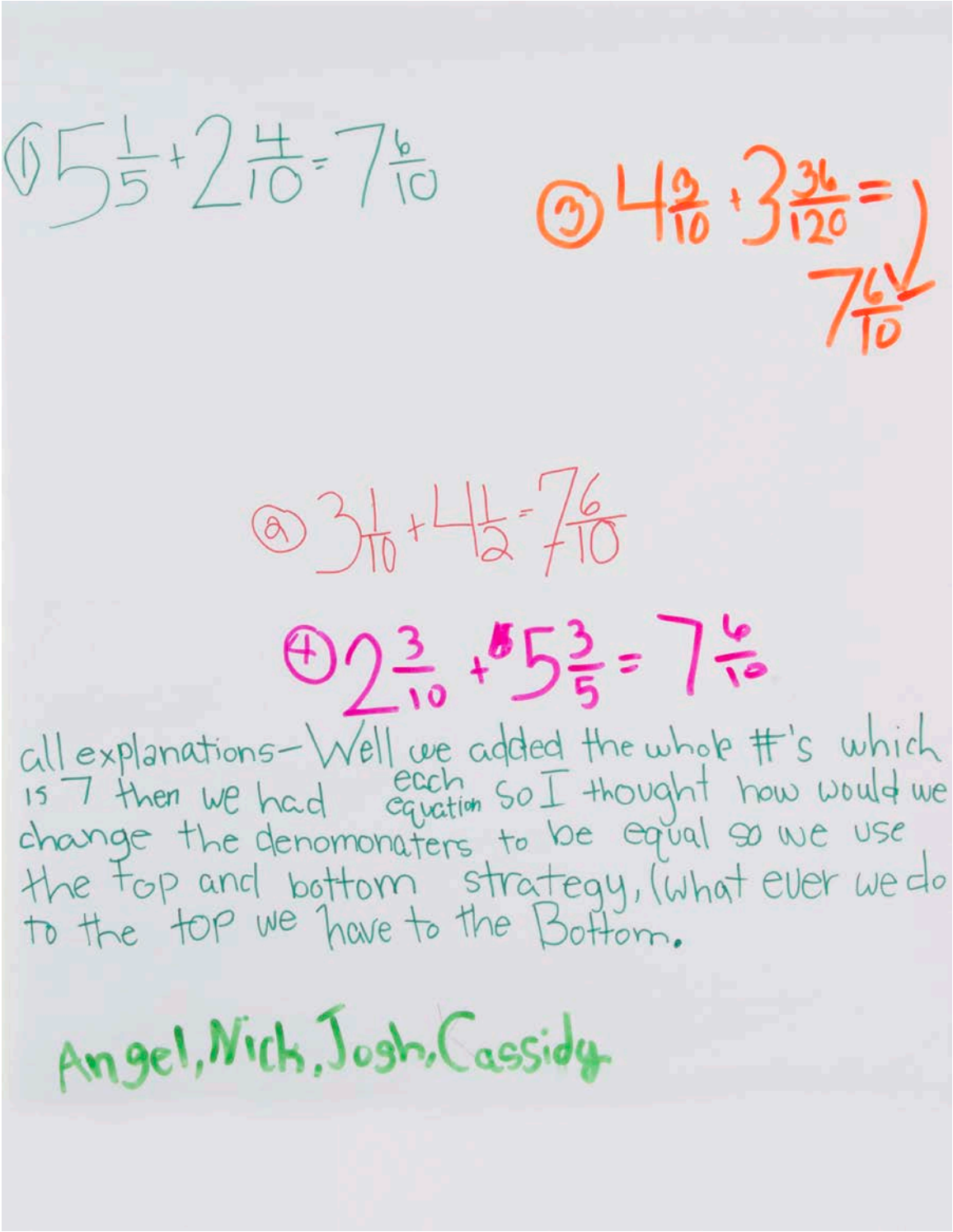
Team 1


adding + subtracting un like demomenators!!!!
Examples:
4 5/10
+ 3 2/20
7 6/10
1 4/10
+ 6 1/5 1/5 = 2/10
7 6/10
Rules:
• Always make your denominters
• don't add denomenators
• Simplify if needed

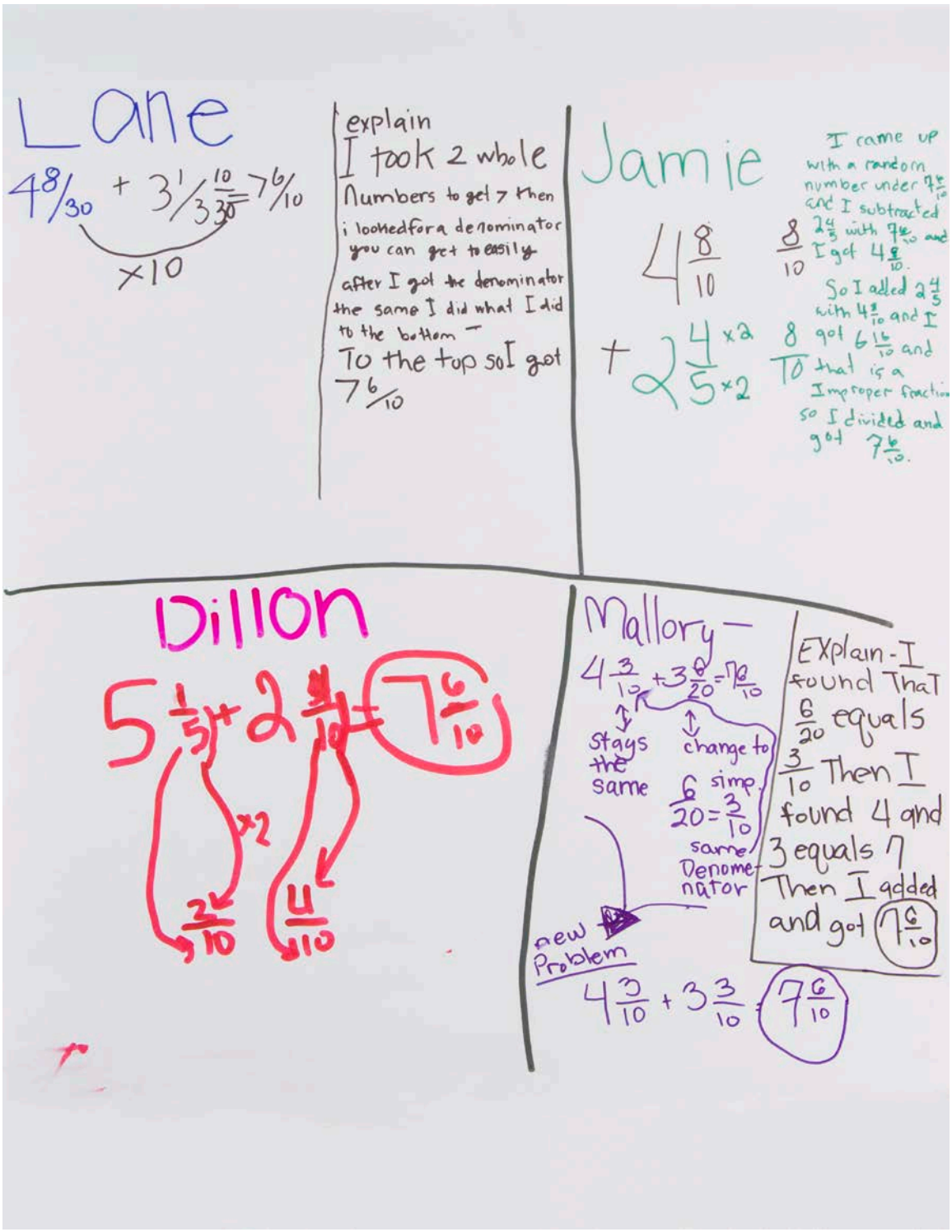
Team 2


3 1/4 + 4 7/20 = 7 6/10
7 6/10
7 12/20 ÷2 = 6/10 = 7 6/10
7 6/10 ×2 12/20
3 1/4 ×5 5/20
4 7/20
7 6/10 ×2
- 3 1/5 ×2 2/10
4 4/10
Mr. Eller has 4 4/10 per hour.
7 6/10 ×5
- 2 1/2 ×5
5 1/10
3 1/2 ×5 → 3 5/10
+ 4 1/10 4 1/10
7 6/10
Mr Eller can do 3 1/2 / 3 5/10 hr. on one day and 4 1/10 hr on another!
2 1/10 2 1/10
+ 5 1/2 → 5 5/10
7 6/10

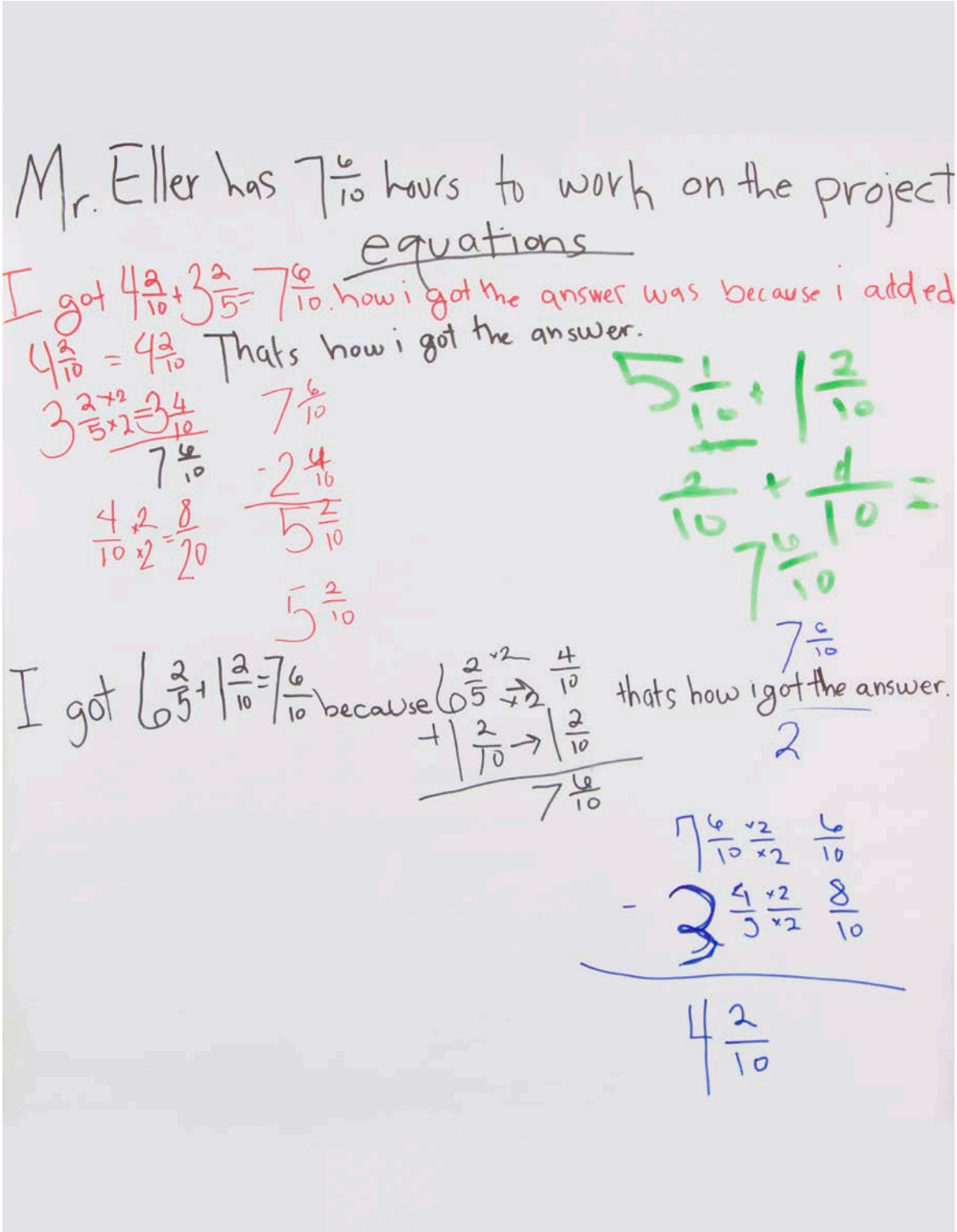
Team 3


① $5\frac{1}{5}+2\frac{4}{10}=7\frac{6}{10}$
③ $4\frac{3}{10}+3\frac{36}{120}=$
$7\frac{6}{10}$
② $3\frac{1}{10}+4\frac{1}{2}=7\frac{6}{10}$
④ $2\frac{3}{10}+5\frac{3}{5}=7\frac{6}{10}$
all explanations- Well we added the whole #'s which is 7 then we had each equation so I thought how would we change the denomonaters to be equal so we use the top and bottom strategy, (what ever we do to the top we have to the Bottom.
Angel, Nick, Josh, Cassidy

Team 4


Lane
4 8/30 + 3 1/3 10/30 = 7 6/10
×10
explain
I took 2 whole numbers to get 7 then i looked for a denominator you can get to easily after I got the denominator the same I did what I did to the bottom — To the top so I got 7 6/10
Jamie
4 8/10
+ 2 4/5 ×2
8/10
I came up with a random number under 7 6/10 and I subtracted 2 4/5 with 7 6/10 and I get 4 8/10.
So I added 2 4/5 with 4 8/10 and I got 6 16/10 and To that is a Improper fraction so I divided and got 7 6/10.
Dillon
5 1/5 + 2 4/10 = 7 6/10
×2
2/10
4/10
Mallory —
4 3/10 + 3 6/20 = 7 6/10
stays the same
change to
6/20 = 3/10 simp.
same Denomenator
new Problem
4 3/10 + 3 3/10 = 7 6/10
Explain - I found That 6/20 equals 3/10 Then I found 4 and 3 equals 7 Then I added and got 7 6/10

Team 5


Mr. Eller has 7 6/10 hours to work on the project
equations
I got 4 2/10 + 3 2/5 = 7 6/10. how i got the answer was because i added
4 2/10 = 4 2/10 Thats how i got the answer.
3 2/5 ×2 = 3 4/10
7 6/10
4/10 ×2 = 8/20
7 6/10
- 2 4/10
5 2/10
5 1/10 + 1 2/10
2/10 + 1/10 =
7 6/10
7 6/10
I got 6 2/5 + 1 2/10 = 7 6/10 because 6 2/5 ×2 → 4/10
+ 1 2/10 → 1 2/10
7 6/10
thats how i got the answer.
2
7 6/10 ×2 6/10
- 3 4/5 ×2 8/10
4 2/10

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Student Work—Lesson Closure

These are the directions to Mr. Eller's reflection activity.

Solve this problem on your sticky note:

Add 10 3/5 + 4 7/15

Mr. Eller then instructs students to place their sticky notes on pause, play, or rewind. To do this, students must self-assess and determine if they are ready to move on (play), they need a little more practice (pause), or they need significant re-teaching to master this skill (rewind).

The student work included here:

Mallory
Cassidy
Shelby
Dillon
Xavier
Angel

Mallory

$10\frac{3 \times 3}{5 \times 3} + 4\frac{7}{15}$

$10\frac{9}{15} + 4\frac{7}{15} = 15\frac{1}{15}$

Cassidy

LCM

5, 10, 15

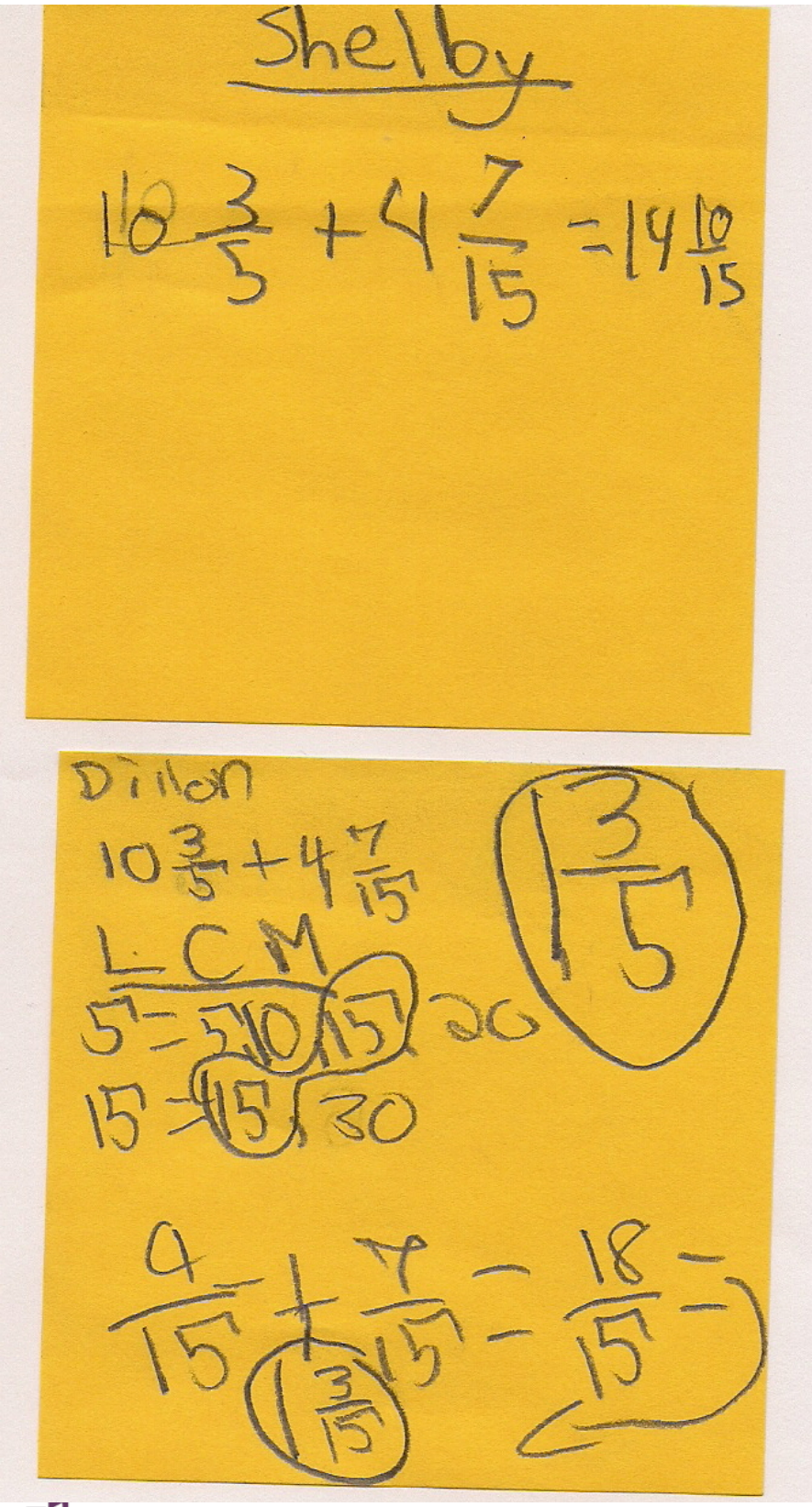
15

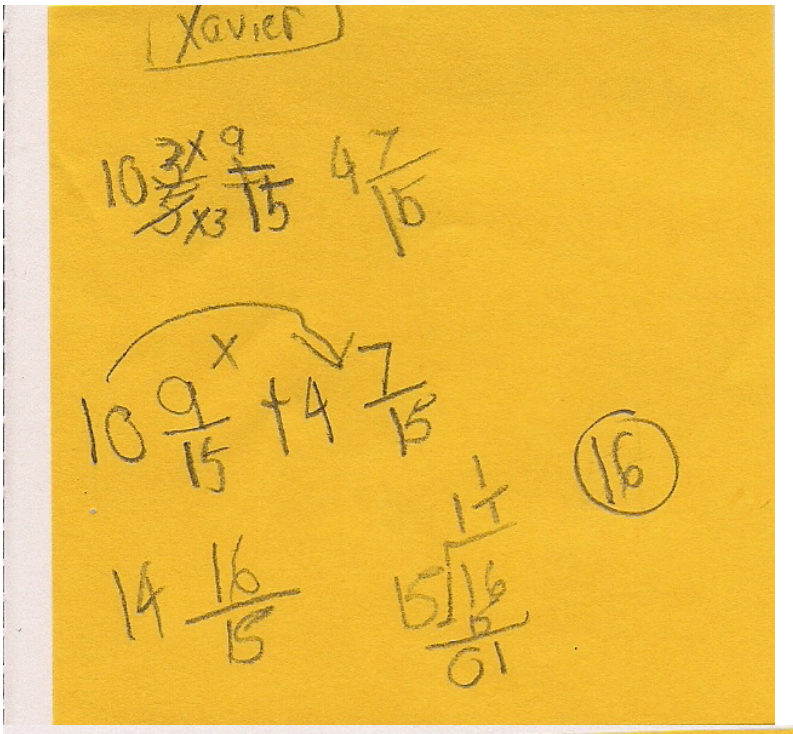
$10\frac{3}{5} + 4\frac{7}{15}$

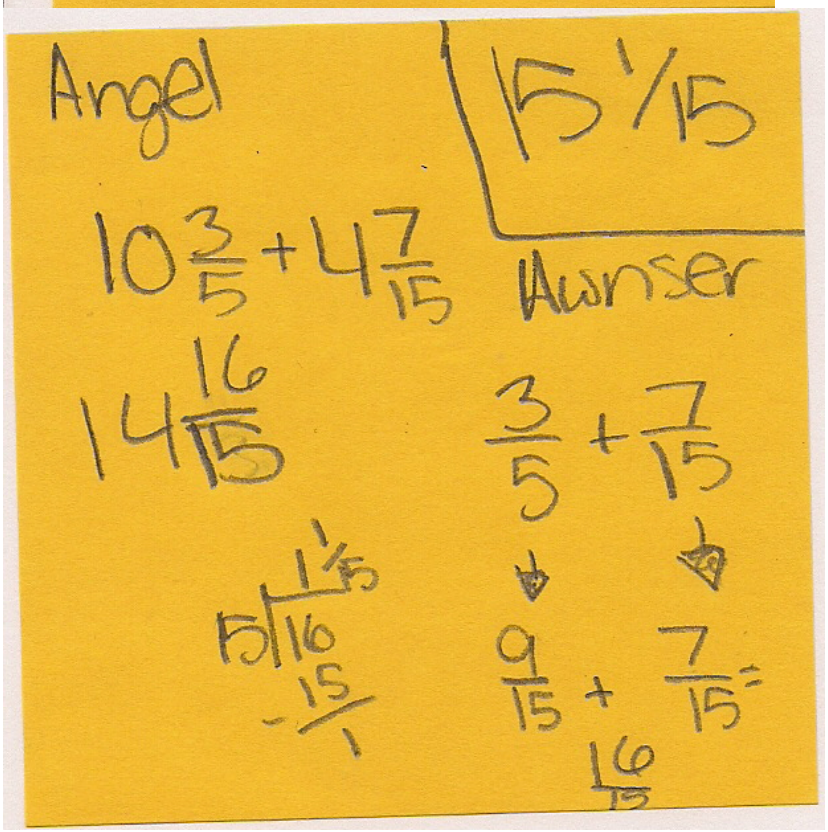
$\downarrow$

$10\frac{9}{15} + 4\frac{7}{15} = 14\frac{16}{15} =$

$15\frac{1}{15}$


Shelby
10 3/5 + 4 7/15 = 14 10/15
Dillon
10 3/5 + 4 7/15
LCM
5 = 5 10 15 20
15 = 15 30
9/15 + 7/15 = 18/15
1 3/15
1 3/5


Xavier
10 3/5 x 9/15 4 7/15
10 9/15 + 4 7/15
14 16/15
16


Angel
15 1/15
10 3/5 + 4 7/15
Awnser
14 16/15
3/5 + 7/15
9/15 + 7/15 =
16/15

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Teacher Reflection

1. What strengths do you see in the lesson?

One of the strengths of the lesson is that it provided time for the student to think, work, and struggle on their own before confirming their thoughts or filling in the holes that might be present. The idea that the students could discover the learning on their own, instead of me just telling them, is powerful. Another strength is the fact that the students had a chance to become the teachers and help each other where there might be some misconceptions. Finally, the opportunity for me to challenge the thinking of the advanced students through the advancing questions is an area that is often left out or difficult to accomplish.

2. Can you explain how you developed a culture of sharing and risk-taking in the classroom?

It can be difficult to develop a culture of sharing and risk-taking. It is definitely a taught skill and rarely happens immediately. There will always be some students who naturally feel more comfortable sharing and conversely some who will be more reluctant. The key is to try and close the gap.

3. What opportunities do you see to share best practices with pre-service teachers?

I began by demonstrating that we have different strengths and weaknesses. While some enjoy and excel at math, others prefer reading, some science or social studies. As a result, we can find others in the room with complimentary skills and abilities. The classroom is filled with 25 teachers, not just one. It is also important to explain that, oftentimes, the wrong answer can be more helpful that the right one. The wrong answer can lead us down a path that reveals misconceptions, provides time to critique and correct others' thinking, and confirm one's own thinking. The understanding that wrong isn't bad helps to eliminate the fear of answering even when they are not positive they have it all figured out. Lastly, demonstrating that a problem may have more than one solution path is helpful. Just because they didn't see it the same way as the "smart kid" doesn't mean that their thinking is wrong.

4. Do you see any missed opportunities that you would want pre-service teachers of which to be aware?

One opportunity is revealed early in the video. I spent a lot of time with one student in particular. I tried to help him get down the path as much as he could on his own without just giving him the answers. This is sometimes difficult. You should try and provide strategies, refer to anchors, and show similar problems that require the same math but with easier numbers, but fight the temptation to give answers. Another good practice is to somehow provide an outlet for those who will finish quickly or master the skill before the others. This takes preplanning. You should try and advance, extend, or enrich the activities by building in extra levels of complexity. Let them go as far as they can. Challenge those who usually find school easy.

During the video, Mr. Batts and I wanted to draw attention to the fact that there was only one student that we saw who actually answered the question from the task. Although many had the right equation, most did not re-contextualize the numbers. I failed to bring that to the attention of the class.

5. What data do you use to determine grouping in your classroom?

When grouping in class, I pull together different pieces of information. I will start a new idea by activating prior knowledge. Based on where the students start in relation to the particular skill is one way to group. I might use data from last year if we are re-teaching a skill. I might also just use good ole teacher judgment based on how they have been performing. I sometimes group students with similar ability together. I find that the advanced group has the ability to push and challenge each other. It also provides time for me to work with a group who might all need some extra time. Sometimes I use groups that mix in different abilities. This gives the students more of an opportunity to fill the teacher role in a group.

6. How have you used the TEAM rubrics to improve your practice?

The TEAM model reads more like a list of best practices than a checklist of must-do's. When planning a lesson, I try to include some of the higher-level problem solving and thinking skills without trying to accomplish every item on the list. These kinds of activities and practices fall in line with what we are trying to accomplish with Common Core. I think the two work hand in hand.

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Viewing Guide—Before Viewing the Lesson

Pre-writing for Activity 1 on pg. 103	
Distribute the handout entitled **5th Grade Math: Instructional Shifts** in the **Student Handout section A.2**. **Watch the video pop-up entitled "Instructional Shifts."** As students listen to Mr. Eller describe the instructional shifts that are necessary for Common Core instruction to lead to student achievement, ask students to paraphrase his description and write their own words in the appropriate place on the handout. Then, as they are viewing the lesson, ask them to look for evidence of those shifts in Mr. Eller's instruction.	
Discussion Points	**Focus**
• At the beginning of the video, Mr. Eller will be describing the variety of students in his inclusion class. What does "inclusion" mean? What does it mean to "include" rather than "exclude"?	Professional Knowledge
• How might the variety that Mr. Eller describes (4 students with learning disabilities, 3 ESL students, students that range from "basic" to "highly advanced" on the 4th grade TCAP) influence his teaching?	Planning
• Why is it important for teachers to pay attention to the different ways students think and process various types of information in the classroom?	Strategies
Activities	**Focus**
• Discuss in small groups: Mr. Eller is about to tell us that he has 4 students with learning disabilities and we will see an inclusion teacher working with a small group of students. In what way can working with another teacher be seen as an opportunity? What problems do you think it may pose? What steps could you take to make the classroom teacher/inclusion teacher relationship work?	Special Education
• Imagine you are teaching an inclusion Math class similar to Mr. Eller's. In your class, you have 3 ESL students and students who tested at "basic" and "highly advanced" levels on the 4th grade TCAP. You are planning to teach a lesson on adding or subtracting fractions with unlike denominators. Brainstorm some ways you might help your ESL students, in particular, access the content.	Planning

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Viewing Guide—During the Lesson

The following discussion questions and activities will guide the viewing of the video lesson.

Video Segment 1—Framing the Lesson

Discussion Points	Focus
• Why does Mr. Eller use "Fun Friday" and the 5th grade bulletin board design as his focus for the math instruction?	Strategies
• Why do you think Mr. Eller begins his instruction with having students write everything they remember about adding and subtracting fractions? Why might this be helpful for students? How could Mr. Eller use this information?	Strategies
• Why does Mr. Eller have students share what they wrote with someone at their table? Why might this be helpful to students? How might this be helpful to Mr. Eller?	Strategies
Activities	**Focus**
• Discuss in small groups: How is the problem introduced in a way that has meaning and interest for the students? Interest and meaning impact motivation. Classroom activities can be high or low in interest and high or low in meaning. Brainstorm examples of an activity in math that is: high interest/low meaning, high meaning/low interest, low meaning/low interest, and high meaning/high interest? Discuss how application of a mathematical concept is a higher level thinking skill as compared to solving problems on a worksheet page.	Math Content
• Discuss in small groups, what leads to transfer of knowledge? • In video segment one, what does Mr. Eller ask the students to do <u>after</u> he presents the problem, but <u>before</u> he asks them to begin solving the problem? • How else is "think time" encouraged throughout the lesson? What is the relationship between information processing and meta-cognition? How can words (oral, written) be used to help process information across the curriculum, including Math class? Describe the progression from working independently to working with a peer or peers.	Professional Knowledge

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Viewing Guide—During the Lesson

Video Segment 2—The Task

Discussion Points	Focus
• What are "advancing" questions? What are "assessing" questions? What drives Mr. Eller's "advancing" questions? How can teachers be prepared to ask good "advancing" questions? How are students' answers to these questions helpful to teachers?	Planning
• How does Mr. Eller differentiate the lesson? How does he keep his advanced students challenged? What are the advanced tasks he gives individual students? Are these appropriate tasks? What does this afford him time to do?	Strategies
• How does Mr. Eller help students know what his expectations are? How does Mr. Eller structure his lesson? What do you think of his "Effort + Dialogue" formula?	Planning
• Mr. Eller proposes that students approach the problem by first splitting the whole number into two pieces and then splitting the fraction into two pieces. Does this work? Could it promote any misconceptions?	Math Content
• Mr. Eller suggests splitting up the fraction $\frac{6}{10}$ by splitting it up as a sum of fractions with denominator 10. Does this work? Could it promote any misconceptions?	Math Content

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Viewing Guide—During the Lesson

Video Segment 2—The Task

Activities	Focus
• View the dialogue between the student and the teacher at time stamps 9:56 – 14:25 and 26:37 – 30:40. Brainstorm some ways the teacher could have aided the student's understanding. Do you think the student mastered or even understood the skill that the task requires? What would you do to ensure mastery with this student?	Math Content
• In small groups, discuss the difference between procedural fluency and conceptual understanding. Procedural fluency seemed to be the focus of the lesson, but procedural fluency and conceptual understanding go hand in hand, and the student's lack of conceptual understanding of equivalent fractions may have been an obstacle to becoming procedurally fluent. Common Core instruction focuses heavily on conceptual understanding, but procedural fluency is obviously essential. Map out some steps you could take to ensure procedural fluency while focusing on conceptual fluency.	Math Content
• Illustrate graphically the subtraction 7 3/4 - 4 5/6 *(For answer, see Appendix B.4.)*	Math Content
• Describe two different algorithms for subtracting mixed numbers. *(For answer, see Appendix B.5.)*	Math Content
• Tyler, a baker has 27 ½ lbs. of flour. It takes 2 1/3 lbs. of flour to bake a batch of bread rolls. 1. How much flour would Tyler have after baking one batch of bread rolls? 2. How much flour would Tyler have after baking two batches of bread rolls? 3. How many full batches of rolls could Tyler make with his flour? *(For answers, see Appendix B.6.)*	Math Content

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Viewing Guide—During the Lesson

Video Segment 3—Student Dialogue

Discussion Points	Focus
• Why is it important for students to talk with others about the work they are doing? How do we learn through our own talk and listening to the talk of others?	Strategies
• What are some ways Mr. Eller could have provided more structure for the small group table activity?	Planning
• How does Mr. Eller group his students? What do you think of this strategy?	Strategies
• Observe students as they work in cooperative learning groups. Look for examples of students who articulate viable arguments supporting their work on the math task. Look for examples or non-examples of appropriate self-assessment and/or peer-assessment.	Planning

Activities	Focus
• As you facilitate cooperative groups, what are some strategies that you could use to help students communicate effectively with group members and help clarify their thinking?	Strategies
• Identify specific things students say to each other about their work, both encouraging and corrective. In CCSS instruction, student-to-student feedback is critical. Map out a plan you would use to get your students comfortable giving each other quality, evaluative feedback.	Planning
• In small groups, develop 2 assessing questions and 2 advancing questions that you could use with this lesson.	Planning

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Viewing Guide—During the Lesson

Video Segment 4—The Solutions

Discussion Points	Focus
• What is a "gallery walk"? What is the purpose of this?	Strategies
• What are students doing as they visit each poster during the gallery walk?	Strategies
• Once the whole class convenes (after the gallery walk), what does Mr. Eller have students do?	Strategies

Activities	Focus
• Analyze how effectively students worked with their groups to critique the work of other students. Find specific examples of constructive/non-constructive feedback. Math Practice Standard 3 states, "Construct viable arguments and critique the reasoning of others." Does this gallery walk activity provide evidence of this skill? Why or why not? Give some specific examples.	Strategies
• Discuss in small groups: Mr. Eller explains that the "gallery walk" provided an opportunity for students to see examples of correct work, as well as examples of misconceptions, and that it gave students an opportunity to discuss and "fill in the gaps" with the misconceptions. Mr. Eller said this was beneficial to students who had the misconceptions, as well as to students who got to critique others' work. Do you agree with this? Do you think the gallery walk and follow-up discussion was beneficial to all students? Why or why not?	Assessment

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Viewing Guide—During the Lesson

Video Segment 5—Lesson Closure

Discussion Points	Focus
• How does the teacher ask the students to reflect on their learning at the conclusion of the lesson?	Strategies
• What is Mr. Eller doing as the students complete the closure task? What is on his chart? What kind(s) of information does this give Mr. Eller? How might he use this information?	Assessment
• What is the "Play, Pause, or Rewind" strategy? How is this information helpful to Mr. Eller? What might be problematic about this activity?	Assessment

Activity	Focus
• In small groups, brainstorm other ways Mr. Eller could have had his students reflect on the task of the lesson.	Planning

Preparing New Teachers for Common Core
5th grade Math: Mr. Eller
Viewing Guide—After Viewing the Lesson

These activities are designed to guide students in the process of analyzing the lesson as a whole, synthesizing important elements, and creating products of their own.

Activity I (Instructional Shifts)

Using the chart on instructional shifts you completed while viewing the lesson, comment on Mr. Eller's implementation of instructional shifts. How do these shifts serve as anchors to his lesson planning? Does the incorporation of these shifts seem natural or forced? Why or why not? What obstacles do you see in planning instruction in this way? What opportunities does this type of instruction provide? What do you think Mr. Eller has done to make these shifts a part of his everyday instruction? What do you intend to do to incorporate these shifts?

Activity II (Differentiation)

Mr. Eller mentions differentiation in several places in his interview footage. Analyze his instruction for specific opportunities for differentiation. How does Mr. Eller customize learning for his students? Why is it important to do this? Identify strategies that Mr. Eller employs to ensure that he is meeting the needs of all students. Since an important shift in Common Core instruction is appropriate rigor, how does differentiation support this shift? How do you intend to ensure rigor while meeting the needs of all students in your class?

Activity III (Math Content)

What is the role of the problem context in the Common Core? Does the context for this task seem appropriate? Are the questions reasonable within this context? Can you find places where Mr. Eller uses the context to help students illustrate the mathematics? Can you produce a problem that would use the same skills and place it within a reasonable context?

Activity IV (Reflection)

If you were going to teach this lesson to your own class tomorrow, what changes could you make to improve the overall outcome of this lesson? Do you see any missed opportunities to incorporate other strategies that would lead to better student understanding? How would you refine this lesson to ensure a higher degree of student understanding and mastery? Consider the quality of the feedback students gave to each other. Given the importance of student feedback in Common Core instruction, what steps could you take in your own classroom to improve that student-to-student feedback?

Preparing New Teachers for Common Core
4th & 5th Grade Math
Data Analysis

Activities	Focus
• Review the TVAAS school summary for Cedar Grove Elementary math TCAP scores. You should notice that Cedar Grove has usually been successful in meeting the expected gains for math as a school. In what grade for which year does the greatest negative gap occur between the Cedar Grove growth measure and the state growth standard? Is it more or less than one standard deviation (standard error)?	Data analysis
• Now, look at the chart at the bottom of the page. Given your answer to the first question, consider the cohort of students with negative growth you identified and see if the achievement scores for that cohort align with the growth scores. What is the pattern of achievement for that cohort of students in the 3rd, 4th, and 5th grades? What conclusions can you draw from this pattern?	Data analysis
• For more detail on the disaggregated scores for these students, examine the other chart, the accountability report, paying particular attention to Cedar Grove's 2012 results. On the blank chart, record the percentages of all students in each of the bands (Below Basic, Basic, Proficient, and Advanced), and then chart the results for all White students, African American students, Hispanic students, and economically disadvantaged students. How do the results differ for the NCLB subgroups versus all students or White students?	Data analysis
• If you are a teacher in this school, what would you consider when planning for these students? What else would you need to know to make decisions about your students?	Data-driven planning

Preparing New Teachers for Common Core
4th & 5th Grade Math
Data Analysis

Accountability Report Chart

Subgroup	Below Basic	Basic	Proficient	Advanced
All students				
White				
African American				
Hispanic				
Economically disadvantaged				

Preparing New Teachers for Common Core
4th & 5th Grade Math
Data Analysis

TVAAS

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Report: School Value Added
School: Cedar Grove Elementary School
District: Rutherford County
Year: 2012
Test: TCAP
Subject: Math

LEARN HOW TO USE THIS REPORT *(Flash required)*
TCAP | High School Tests

Estimated School Growth Measure					
Grade	3	4	5	Growth Measure over Grades Relative to	
Growth Standard		0.0	0.0		
State 3-Yr-Avg		3.0	0.0	Growth Standard	State
2010 Growth Measure		-2.1 R	9.0 G*	3.4	1.9
Standard Error		1.2	1.0	0.8	0.8
2011 Growth Measure		8.8 G*	10.9 G*	9.8	8.3
Standard Error		1.1	1.1	0.8	0.8
2012 Growth Measure		7.8 G*	-1.4 R	3.2	1.7
Standard Error		1.1	1.1	0.8	0.8
3-Yr-Avg Growth Measure		4.8 G*	6.1 G*	5.5	4.0
Standard Error		0.7	0.6	0.4	0.4

Estimated School Avg Achievement			
Grade	3	4	5
State Base Year (2009)	50.0	50.0	50.0
State 3-Yr-Avg	49.9	51.9	50.0
2009 Avg Achievement	51.8	50.1	53.3
2010 Avg Achievement	56.3	49.6	59.1
2011 Avg Achievement	51.5	64.6	60.5
2012 Avg Achievement	56.5	59.3	63.2

G*	The school made substantially more progress than the standard for Academic Growth
G	The school made more progress than the standard for Academic Growth
Y	The school met the standard for Academic Growth
R	The school made less progress than the standard for Academic Growth
R*	The school made substantially less progress than standard for Academic Growth

Achievement results and growth results must be used together to get a complete picture of student learning.
The standard for Academic Growth is met when the student group makes one year's growth/maintains their relative achievement level from one year to the next in relation to the statewide distribution (2009 baseline).

Preparing New Teachers for Common Core
4th & 5th Grade Math
Data Analysis

Department of Education
Kevin Huffman, Commissioner

GOVERNOR Bill Haslam
Visit Bill's Web Site

Report Card Explained | Report Card Terms | Benchmarks & Documents | NAEP data | Family and Community Survey | Data Explanation | Print Version | Grade Scale | Value Added | Download Report Card Archives

Report Card
TENNESSEE DEPARTMENT OF EDUCATION
Director: Mr. Harry Gill
2012

RUTHERFORD COUNTY SCHOOLS

CEDAR GROVE ELEMENTARY
Principal: Mr. Mark Gullion

Please click here for all downloadable Report Card data

Report Card for 2012

State | System | School **Select a School** Cedar Grove Elementary

Profile | Accountability | Achievement | Value-Added | Attendance and Graduation | Discipline | Teacher

Accountability Data – Tennessee uses accountability data to track growth and improvement year-over-year. Accountability data include gains on student assessments, gap closure between groups of students and graduation rate. These measures meet certain federal requirements and are used to determine a school or district's accountability status under the state's waiver from the Elementary and Secondary Education Act. The overall percentage of students scoring proficient and advanced on accountability data may differ from achievement data because of the federal accountability requirements related to students with disabilities and English Learners.

Achievement Data: Math , Grades 3-8

	2011						2012						2012 District						2012 State					
							All Students Target 72.3%Proficient & Advanced						All Students Target 53.9%Proficient & Advanced						All Students Target 44.5%Proficient & Advanced					
							All Students Target 3.5% Growth						All Students Target 3.5% Growth						All Students Target 3.5% Growth					
Subgroup	% Tested	% Below Basic	% Basic	% Prof	% Adv	% Prof & Adv	% Tested	% Below Basic	% Basic	% Prof	% Adv	% Prof & Adv	% Tested	% Below Basic	% Basic	% Prof	% Adv	% Prof & Adv	% Tested	% Below Basic	% Basic	% Prof	% Adv	% Prof & Adv
All Students	100.00	4.60	26.60	44.10	24.70	68.80	100.00	6.30	26.70	42.30	24.70	67.00	100.00	10.00	31.90	34.80	23.30	58.10	100.00	16.80	36.00	28.70	18.50	47.20
African American	100.00	5.60	28.90	44.40	21.10	65.60	100.00	6.00	39.00	38.00	17.00	55.00	100.00	16.10	40.50	30.50	12.90	43.40	100.00	28.50	42.60	21.00	7.90	28.90
Asian	100.00	0.00	5.30	63.20	31.60	94.70	100.00	0.00	23.00	30.80	46.20	77.00	99.00	8.40	26.60	37.00	28.00	65.00	100.00	6.40	20.50	30.60	42.50	73.10
Hawaiian/Pacific Islander	*	*	*	*	*	*	*	*	*	*	*	*	100.00	12.40	31.30	43.80	12.50	56.30	100.00	8.80	31.90	32.80	26.50	59.30
Hispanic	100.00	1.60	37.50	48.40	12.50	60.90	100.00	2.70	27.60	52.60	17.10	69.70	100.00	12.90	39.20	33.10	14.80	47.90	99.00	18.00	42.50	27.40	12.10	39.50
Native American	*	*	*	*	*	*	-	-	-	-	-	-	100.00	17.50	30.40	30.40	21.70	52.10	100.00	17.50	36.60	28.20	17.70	45.90
White	100.00	5.30	24.60	41.40	28.70	70.10	100.00	7.80	21.70	41.30	29.20	70.50	100.00	8.10	29.00	36.00	26.90	62.90	100.00	12.70	33.60	31.60	22.10	53.70
Hispanic,Black or Native American	100.00	3.90	32.50	46.10	17.50	63.60	100.00	4.60	34.10	44.30	17.00	61.30	100.00	14.90	40.00	31.40	13.70	45.10	100.00	26.20	42.50	22.40	8.90	31.30
Economically Disadvantaged	100.00	4.10	30.60	47.10	18.20	65.30	100.00	6.20	31.40	41.20	21.20	62.40	100.00	14.50	38.60	32.20	14.70	46.90	100.00	22.70	41.40	25.10	10.80	35.90
Non-Economically Disadvantaged	100.00	5.10	21.10	40.00	33.70	73.70	100.00	6.30	20.00	44.00	29.70	73.70	100.00	6.40	26.50	36.90	30.20	67.10	100.00	8.40	28.70	33.80	29.10	62.90
Students with Disabilities	100.00	21.60	16.20	35.10	27.00	62.20	98.00	30.00	28.00	16.00	26.00	42.00	99.00	27.90	36.20	22.60	13.30	35.90	99.00	29.70	38.90	18.50	12.90	31.40
Non-Students with Disabilities	100.00	2.90	27.60	45.00	24.50	69.50	100.00	3.10	26.60	45.80	24.50	70.30	100.00	7.70	31.30	36.40	24.60	61.00	100.00	14.80	35.60	30.30	19.30	49.60
Limited English Proficient	100.00	0.00	69.20	30.80	0.00	30.80	100.00	8.30	54.20	29.20	8.30	37.50	100.00	19.00	43.40	28.00	9.60	37.60	100.00	23.90	45.60	22.80	7.70	30.50
Non-Limited English Proficient	100.00	4.70	25.20	44.60	25.50	70.00	100.00	6.20	25.10	43.10	25.60	68.70	100.00	9.40	31.30	35.20	24.10	59.30	100.00	16.40	35.70	29.00	18.90	47.90

Data Analysis Answers

a.) The greatest negative gap between the Cedar Grove growth measure and the state growth standard is in 4th grade in 2010. The growth measure in 2010 in 4th grade was -2.1, more than the standard deviation (standard error) of 1.2.

b.) The group of students identified as low achieving was in the 4th grade in 2010. The state base score for the estimated school average achievement is 50.0. In the 3rd grade in 2009, that cohort of students had an estimated school average achievement of 51.8; in 2010, they had an average achievement of 49.6 when they were in the 4th grade; and they had 60.5 in 2011 when they were in 5th grade. The pattern for their achievement indicates that they had better than the state estimated school average achievement for their 3rd grade and 5th grade years, but less than the state estimated school average for their 4th grade year. *Answers will vary, but should mention a necessary focus on the 4th grade, either in terms of teacher quality or student remediation.*

c.) For All students tested, 6.30% scored Below Basic, 26.70% Basic, 42.30% Proficient, and 24.70% Advanced.

   a. For White students, the scores were 7.80% Below Basic, 21.70% Basic, 41.30% Proficient, and 29.20% Advanced. While a larger percent of White students scored Below Basic than All students, a smaller percent scored Basic, and a larger percent scored Advanced.
   b. For African American students, the scores were 6.00% Below Basic, 39.00% Basic, 38.00% Proficient, and 17.00% Advanced. A much larger percent of African American students scored Basic (39.00%) than either All students (26.70%) or White students (21.70%). Also, small percentages of African American students scored Proficient and Advanced than All students or White students.
   c. For Hispanic students, the scores were 2.7% Below Basic, 27.60% Basic, 52.6% Proficient, and 17.10% Advanced. A smaller percent of Hispanic students scored Below Basic than All, White or African American students, and a larger percent scored Proficient than students in the other three groups. The percent of Hispanic students scoring Advanced is almost the same as that of African American students, but significantly less than All students or White students.
   d. Students listed as Non-Economically Disadvantaged scored 6.30% Below Basic, 20.00% Basic, 44.00% Proficient, and 29.70% Advanced.
   e. Student listed as Economically Disadvantaged scored 6.20% Below Basic, 31.40% Basic, 41.20% Proficient, and 21.20% Advanced. The major contrasts between the two are in the Basic category where 31.20% of Economically Disadvantaged students scored, but only 20.00% of Non-Economically Disadvantaged students and in the Advanced category where 29.70% of Non-

Economically Disadvantaged students, but only 21.20% of Economically Disadvantaged students scored.

d.) While a teacher in this school should consider all available data when planning for these students, the teacher could examine the scores for individual students to determine which to target for acceleration. Achievement patterns indicate that scores for students in three sub-groups (African American, Hispanic, and Economically Disadvantaged) should be examined for possible remediation, but also for enrichment that would help them move from Proficient to Advanced. In addition to these summative test scores, the teacher could examine students' achievement patterns and predictions, student records, and his or her own assessment of student readiness for the year's content.

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Teacher Profile

7th grade Math: Solve Word Problems with Inequalities

Neily Boyd
KIPP Academy Nashville

About Ms. Boyd

Neily Boyd has been teaching for four years, all in the Nashville area. She began her teaching career at Stratford High School in Nashville where she taught for two years through the Teach for America program. During that time, she received an M.Ed. from Lipscomb University. For the past two years, she has been teaching 7th grade Math at KIPP Academy Nashville, a charter school organization.

About Ms. Boyd's classroom

KIPP Academy Nashville is a Title I school, so most of Ms. Boyd's students are on "Free and Reduced Lunch." In her particular classroom, 2/3 of her students scored "proficient" or "advanced" on their 6th grade TCAP Math Assessment. The other 1/3 scored "basic" or "below basic."

The Lesson

In this lesson, students are asked to solve contextual problems involving unequal components by setting up inequalities, graphing the solution, and testing the reasonableness of possible solutions. (M.7.EE.4b)

The video is divided into four segments:

Framing the Lesson (18 minutes)
The Task (24 minutes)
Partner Work (14 minutes)
Lesson Closure (6 minutes)

Multiple Mathematical Practice Standards are evident in this lesson. Strengths of this lesson include questioning techniques and scaffolding the task.

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Planning for CCSS Math Lesson

Lesson: Solve contextual problems involving unequal components by setting up inequalities, graphing the solution, and testing possible solutions	**CCSS Domain:** 7.EE (Expressions and Equations)	**Date:**

Standard(s) the lesson is building toward	
Math Content Standard(s)	**Assessment(s)**
• 7.EE.4b: Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*	• Students will complete an exit slip in which they will write an inequality to solve a word problem and graph their solution on a number line
Mathematical Practice Standard(s)	**Assessment(s)**
• MP1: Make sense of problems and persevere in solving them	• On the exit slip, MP1 will be assessed through the work process students take to develop their solution
• MP2: Reason abstractly and quantitatively	• On the exit slip, MP2 will be assessed through the work process students take to develop their solution
• MP3: Construct viable arguments and critique the reading of others	• On the exit slip, MP3 will be assessed through testing the reasonableness of a proposed solution

Clear Learning Targets	I can determine if a word problem is reasonable by setting up an inequality and testing possible solutions.
New Learning	• Recognizing the differences between a relationship that is equal (equation) and a relationship that is unequal (inequality) • Writing an inequality • Understanding the meaning of “at least” and “at most” in context in order to be able to understand why “at least” means a greater than or equal to sign and “at most” means a less than or

	equal to sign • Testing and defending the possible solutions of an inequality by using the graph of the solutions
Instructional Strategies	• Guided notes • "Everybody Writes" (from *Teach Like a Champion)* • Think-Pair-Share • Scaffolding problems from easy to hard • Using sentence starters such as "I agree with _____ because_____" or "I disagree with _____ because I think _____" in order to explain and defend their reasoning
Materials and Resources	• Guided Notes sheet which includes the Framing the Lesson component, the two problems we will do as a class, and the 5 practice problems they will do with their partners • Exit slip for each student

Framing the Lesson for Students (5 minutes)

• Students will have already learned to construct equations in the form px + q = r to find the solution to a word problem
• Students will be given a word problem that leads to an equation and asked to solve.
• Students will then be given the same word problem but which requires an inequality to solve, not an equation.
• Students will be asked to write their thoughts about how the two problems differ and why those differences matter.
• As a class, we will generate the answers to the following questions about the two problems:
  o What is the difference between these two problems?
  o What effect does this difference have on our possible solutions?
• Once we have answered these two questions we will generate the following rule:
  o When the ***parts equal the total*** we can use an equation to solve but when the ***parts do not equal the total*** we need to solve by using an inequality.

The Task (15 minutes)	Anticipated learning difficulties
• PART 1: Students are given word problems that lead to inequalities in the following forms: 1) the equation px + q < r 2) the equation px + q > r 3) the equation px + q ≥ r 4) the equation px + q ≤ r • In the first part of the question, students will learn generate the inequalities and graph their solutions. • PART 2: Once students generate the inequality, they will then answer constructed response questions that require them to analyze the possible solutions to the problem and discuss with their partners. • We will do two problems together and then I will release them to work with their partners.	Some students who are low readers will struggle to successfully identify the relationship between the parts and the whole and therefore struggle to decide which inequality sign to choose. **Student prompting** • Always connect their thinking back to practical application (i.e.—"visualize this situation") • For example: If it says "make at least $20," and the student thinks it should be written ≤ 20, I would ask them, "If you want at least $20, let's name some amounts of money you'd be ok with having." Then we would test out certain amounts like "would $30 be ok?," "would $25 be ok?," "would $15 be ok?." This allows the student to discover that we actually want amounts greater than 20, not less than 20. My final question would be "would 20 be ok?" and the student would say yes because we want "at least" 20. From this the student discovers that we need not just a greater than sign but a greater than or equal to sign

The Solutions (40 minutes)

- Students will have 5 problems to work out on their own. They will be given 8 minutes for each problem.*
- PART 1: Students will spend the first few minutes of this time simply generating inequalities and graphing their solution (2 minutes).
- PART 2: Students will answer constructed response questions and discuss their thinking with their partners (3 minutes).
- PART 3: Students will discuss and defend their answers with each other at the end of class (3 minutes to discuss as a class).

*We may not get to all 5 problems because of time, but some students will finish all 5

Questioning: Illuminating Student Thinking	
Assessing questions	***Advancing questions***

• What key words can we use tell that this problem requires an inequality not an equation?
• Why would we use that specific inequality in this problem?
• What is the solution to this problem?
• What other values could be possible solutions?
• In reference to the graph:
  o Why did you shade that direction?
  o Why did you shade in (or not shade in) the circle at your solution?
	• Could x be a solution to this problem? Why?
	• Student A says x can be a solution this problem but Student B disagrees and says it cannot be. Which student do you agree with? Why?
	• What would happen if we had used ___ sign instead of ___ sign?
	• How would the meaning of the solution change if we added the "or equal to" bar underneath the inequality sign?

Lesson Closure (10 minutes)	
• Students will complete an exit slip that assess all parts of the content and practice standards. • Exit slips will be returned the following day with my comments. • Students will then work a similar problem on their "Do Now" the next morning and I will use the data from this exit slip to guide my questioning as we go over their work for tomorrow.	
Homework	
• Students will do 2 problems (2 parts to each problem) that are aligned to today's lesson and 4 problems that are review problems aligned to the "Do Now" problems from the start of today's lesson. We will review and discuss their answers on their homework after the do now in tomorrow's class.	

Teacher Reflection
• Class Makeup: This is a Title I school. There are 27 students ranging from "below basic" to "advanced" on the 2011-2012 TCAP test in mathematics in this classroom. Students have learned how to write expressions from verbal expressions as well as how to write equations to solve word problems. Students also already know how to solve inequalities and graph the solution of an inequality on a number line. This will be the first time that the students are exposed to writing inequalities to solve word problems as well as to analyzing and describing the possible solutions of the inequalities that they write.

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Lesson Task

Writing Inequalities to Solve Word Problems

Example 1: An employee at an electronics store gets paid $20 a day plus an additional $4 per sale. If the employee made $52, how many sales did he make?	*Example 2:* An employee at an electronics store gets paid $20 a day plus an additional $4 per sale. If the employee wants to make more than $52, how many sales does he need to make?

What is the difference between these two problems? _____

_____

What affect does this have on our possible solutions? _____

_____

_____

When the _____ we can use an equation to solve but when

the _____ _____w

e need to solve by using an inequality.

1a) A runner is training for a marathon and needs to run more than 40 miles during his training this week. He has already run 16 miles this week and runs 6 miles each day. How many more days does the runner need to run this week?

Parts ◯ Total

_____

Solve:

Graph:

1b) The runner's neighbor is cheering him on and says he will meet his goal if he runs for 4 more days. Is he correct? Why or why not?

2a) In order to stay within her monthly budget, Ms. Miguez needs to spend less than $200 on groceries. Last week she spent $44 on groceries and needs to shop for 3 more weeks. How much money can she spend each week and still be within her budget?

Parts ◯ Total

_____

Solve:

Graph:

2b) Ms. Miguez plans to spend $47 on groceries each week for the next 3 weeks. Will she stay within her budget? Explain your thinking.

3a) A KIPP student needs to have at least $450 in their bank account to earn the 3rd quarter field trip. The student already has $205 in their account and has 7 weeks to earn the rest. How much money will the student have to earn each week to get to go on the field trip?

Parts ◯ Total

_____

Solve:

Graph:

3b) Sanielle sees this student's paycheck and concludes that the student will have to earn $35 each week to earn the field trip. Jalen says the student will only have to earn $34 each week to earn the field trip. Which student is correct? Why?

4a) Mr. Dixon is on a road trip to North Carolina. He has already driven 70 miles and is driving 50 miles per hour. If he started off the trip with enough gas to drive at most 320 miles, how many more hours can he keep driving?

Parts ◯ Total

_____

Solve:

Graph:

4b) Mr. Dixon is 3 and half hours away from a gas station. Will he be able to make it? Explain your thinking.

5a) A parking lot at the Opry Mills mall can hold at most 98 cars before it closes. There are already 26 cars in the lot and 12 more cars arrive each hour. For how many hours will the lot stay open before it closes?

Part Total

Solve:

Graph:

5b) Maiya and Kiria are going to the mall in 7 hours and want to park in this parking lot. Kiria says they will still be able to find a parking spot in the lot, but Maiya disagrees. Which student do you agree with? Explain and prove your answer.

6) Brian received an iTunes gift card for his birthday with $20 on it. He has already purchased an iMovie for $8. He now wants to spend the rest on songs that cost $2 each. How many songs will he be able to buy?

Parts ◯ Total

_____

Solve:

Graph:

6b) Brian purchased 4 songs with his leftover money, so all together he has purchased one iMovie and 4 songs. He found an iBook that costs $3.50 that he would also like to buy. Will he have enough money to buy this book? Explain your thinking.

7) A student wants to get more points on her math quiz this week than she did last week. Last week she got a 74. This week she has already gotten 26 points and will get 4 points for each question she gets correct. How many more questions does she need to get correct?

Parts ◯ Total

_____

Solve:

Graph:

7a) The student says that if she gets 12 more questions correct on her test she will have met her goal. Is this true? Explain your thinking.

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Lesson Task—Exit Slip

Writing Inequalities to Solve Word Problems

1a) As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make to reach this goal.

Inequality: _____

Solve:

Graph:

1b) How many sales would you need to make to meet this goal?

_____

1c) This week you end up making 16 sales and your coworker congratulates you for meeting your goal! Is your coworker correct to congratulate you? Did you meet your goal? Explain your thinking.

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Lesson Task—Homework

Homework: Due Wednesday
YOU MUST SHOW ALL WORK TO RECEIVE ANY CREDIT!

1a) Dondre is saving up to buy an X-Box. He will need at least $250 to buy the X-Box has already saved $100. He can earn extra money by cutting his neighbors' yards. If he earns $12 per yard, how many more yards will he need to cut to be able to buy the X-Box?

Parts ◯ Total

_____

Solve:

Graph:

1b) Dondre's friend Savion tells Dondre that he will need to mow the yards of 12 more neighbors before he can afford the X-Box. Dondre disagrees and says he needs to mow the yards of 13 more neighbors. Explain to Dondre and Savion which one is correct and why.

2a) Myka wants to lose fewer dollars on her paycheck than she did last week. She has already lost $6 on her paycheck this week and looses an additional $2 for every deduction. If she lost $30 on her paycheck last week, how many more deductions can she get this week?

Parts ◯ Total

_____

Solve:

Graph:

2b) Myka calculates that she can get 12 more deductions this week and still meet her goal. Do you agree with her? Explain your thinking.

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Student Work--The Task

The following section includes three student examples of the multi-page 7th Grade Task packet. These activities correspond to video segment 2 (The Task) and video segment 3 (Partner Work) in which students had independent think time and then partner share time to complete these tasks.

The student work included in The Task section is from the following students.

Kameeilah

Kameelah

KIPP/2018/ Belmont

02 – 21 – Math Notes

Writing Inequalities to Solve Word Problems

Example 1: An employee at an electronics store gets paid $20 a day plus an additional $4 per sale. If the employee made $52, how many sales did he make?	*Example 2:* An employee at an electronics store gets paid $20 a day plus an additional $4 per sale. If the employee wants to make more than $52, how many sales does he need to make?
$4s + 20 = 52$ $-20 \quad -20$ $\frac{4s}{4} \quad \frac{32}{4}$ $s = 8$ sales	$4s + 20 > 52$ $-20 \quad -20$ $\frac{4s}{4} > \frac{32}{4}$ $s > 8$ sales

BRAINSTORM BOX! *What do you think are the differences between these two problems?*

Example 2 says he wants to make than 52 sales. Example 1 is just asking how many sales did he make.

1) What is the difference between these two problems? In example 1 the parts and the whole are equal but in example 2 the parts and the whole are not equal.

2) What do we use to solve a problem when:

a) The parts are equal to the total → Equation

b) The parts are not equal to the total → Inequality

3) What effect does this have on the number of possible solutions?

In example 1 we only have 1 solution, but in example 2 we have many solutions.

STOP

KIPP/2018/_____ 02 – 21 – Math Notes

1a) A runner is training for a marathon and needs to run more than 40 miles during his training this week. He has already run 16 miles this week and runs 6 miles each day. How many more days does the runner need to run this week?

Parts (?) Total

Solve:

$6d + 16 > 40$

$-16 \quad -16$

$\frac{6d}{6} > \frac{24}{6}$

$6\overline{)24}$ = 4

Graph: $d > 4$ days

1b) The runner's neighbor is cheering him on and says he will meet his goal if he runs for 4 more days. Is he correct? Why or why not?

no, He has not right because he is suppose to run more than 4 days to meet his goal.

STOP

KIPP/2018/_____ 02 – 21 – Math Notes

2a) In order to stay within her monthly budget, Ms. Miguez needs to spend less than $200 on groceries. Last week she spent $44 on groceries and needs to shop for 3 more weeks. How much money can she spend each week and still be within her budget?

Parts (?) Total

Solve:

$44 + 3w < \cancel{200}^{\,1\,9\,10}$

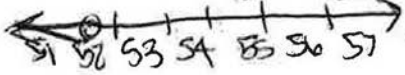
$-44 \qquad -44$

$\frac{3w}{3} < \frac{156}{3}$

$3\overline{)156}$ = 52; 15; 06; −6; 0

Graph:

$w < \$52$



2b) Ms. Miguez plans to spend $47 on groceries each week for the next 3 weeks. Will she stay within her budget? Explain your thinking.

Yes; Because if you spend less than $52 each week, you would still be in your budget.

STOP

KIPP/2018/_____ 02 – 21 – Math Notes

3a) A KIPP student needs to have at least $450 in their bank account to earn the 3rd quarter field trip. The student already has $205 in their account and has 7 weeks to earn the rest. How much money will the student have to earn each week to get to go on the field trip?

Parts (?) Total

Solve:

$205 + 7x \geq 450$

$-205 \qquad -205$

$\frac{7x}{7} \geq \frac{245}{7}$

$7\overline{)245}$ = 35

Graph:

$x \geq \$35$

3b) Sanielle sees this student's paycheck and concludes that the student will have to earn $35 each week to earn the field trip. Jalen disagrees and says the student will have to earn $36 each week to earn the field trip. Which student is correct? Why?

Sanielle is right because it has to be greater than or equal to 35 is equal to + you can still get $36 to meet your goal.

STOP

KIPP/2018/ Bel... J

02 – 21 – Math Notes

4a) Mr. Dixon is on a road trip to North Carolina. He has already driven 70 miles and is driving 50 miles per hour. If he started off the trip with enough gas to drive at most 320 miles, how many more hours can he keep driving?

Parts (?) Total

Solve:

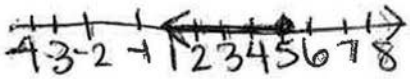
$70 + 50h \leq 320$

$-70 \quad -70$

$\frac{50h}{50} \leq \frac{250}{50}$

$h \leq 5$

Graph:



4b) Mr. Dixon is 3 and half hours away from a gas station. Will he be able to make it? Explain your thinking.

Yes because he has enough gas to go 5 hours or less than 5 hours And 3 + a hall is less than 5. So he will meet his destination..

KIPP/2018/ Reina

02 – 21 – Math Notes

5a) A parking lot at the Opry Mills mall can hold at most 98 cars before it closes. There are already 26 cars in the lot and 12 more cars arrive each hour. For how many hours will the lot stay open before it closes?

Parts (>) Total

Solve:

$26 + 12h \leq 98$

$-26 \quad -26$

$\frac{12h}{12} < \frac{12}{12}$

$12 \overline{)72}$ = 6

-72

00

$h \leq 6$ hours

Graph: -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8

5b) Maiya and Kiria are going to the mall in 7 hours and want to park in this parking lot. Kiria says they will still be able to find a parking spot in the lot, but Maiya disagrees. Which student do you agree with? Explain and prove your answer.

I agree with Mary ; Because you can only park there for 6 hours or less than 6 hours So you can't stay for 7 hours.

KIPP/2018/_____ 02 – 21 – Math Notes

6a) Brian received an iTunes gift card for his birthday with $20 on it. He has already purchased an iMovie for $8. He now wants to spend the rest on songs that cost $2 each. How many songs will he be able to buy if he wants to spend at most $20?

Parts (?) Total

Solve:

$8 + 2x \le \cancel{20}^{10}$

$-8 \qquad -8$

$\frac{2x}{2} \le \frac{12}{2}$

$x \le \$6$

Graph:

6b) Brian purchased 4 songs with his leftover money, so all together he has purchased one iMovie and 4 songs. He found an iBook that costs $3.50 that he would also like to buy. Will he have enough money to buy this book? Explain your thinking.

Yes, Because he bought an iMovie for $8 + 2$ for each song. And that equals $16 So that means he has $4 left over And it still lets him buy an ibook for $3.50.

KIPP/2018/_____ 02 – 21 – Math Notes

7a) A student wants to get more points on her math quiz this week than she did last week. Last week she got a 74. This week she has already gotten 26 points and will get 4 points for each question she gets correct. How many more questions does she need to get correct?

Parts (?) Total

Solve:

$\cancel{26} + 4x > \cancel{74}$ (6, 14)

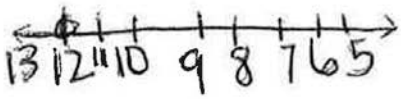
$-\cancel{26} \quad -26$

$\frac{4x}{4} > \frac{48}{4}$

$4\overline{)48}$ = 12

$x > 12$

Graph:



7b) The students says that if she gets 12 more questions correct on her test she will have met her goal. Is this true? Explain your thinking.

No, Because you can't get exactly 12 questions & you suppose to have more than 12 questions to meet your goal.

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Student Work—Lesson Closure—Exit Slips

This section includes solutions to the exit slip activity completed during video segment 4 (Lesson Closure).

The student work in the *Exit Slip* section includes:

Eric
Fartun
Sherrikah
Julia

Eric Powell 11-13-12

KIPP / 2018 / Belmont 02 – 21– *Exit Slip*

Writing Inequalities to Solve Word Problems

1a) As a salesperson, you are paid $37 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make to reach this goal.

Parts ? Total 9

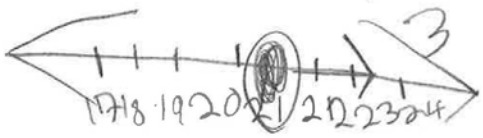
Inequality: $37 + 3s \geq 100$

Solve: $-37 \quad -37$

$\frac{3s}{3} \geq \frac{63}{3}$

$s \geq 21$

Graph:



1b) How many sales would you need to make to meet this goal? 21

1c) This week you end up making 20 sales and your coworker congratulates you for meeting your goal! Is your coworker correct to congratulate you? Did you meet your goal? Explain your thinking.

no because it would have to be 21 or greater. the sign is greater than or equal to.

Jahun Nassan

KIPP / 2018 / Delmont

November 13, 2018

02 – 21– *Exit Slip*

Writing Inequalities to Solve Word Problems

1a) As a salesperson, you are paid $37 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make to reach this goal.

Parts (?) Total

Inequality: 37 + 3s ≥ 100

Solve:

-37 -37

3s ≥ 63

s ≥ 21

3)63

6

3

3

Graph:

21

1b) How many sales would you need to make to meet this goal? 21 or higher

1c) This week you end up making 20 sales and your coworker congratulates you for meeting your goal! Is your coworker correct to congratulate you? Did you meet your goal? Explain your thinking. No because I have to make at least 21 sales or higher.

Sherrifan Taylor

KIPP / 2018 / Belmont

Tues. Nov. 13. 12

02 – 21– *Exit Slip*

Writing Inequalities to Solve Word Problems

1a) As a salesperson, you are paid $28 per week plus $4 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make to reach this goal.

9 Parts (?) Total

Inequality: $28+4x \geq 100$

Solve: -28 $\quad -28$

$4x = 72$

$\frac{4x}{4} = \frac{72}{4}$

$4\overline{)72}$ = 18

-4

32

$x \geq 18$

Graph:

1b) How many sales would you need to make to meet this goal? 18

1c) This week you end up making 18 sales and your coworker congratulates you for meeting your goal! Is your coworker correct to congratulate you? Did you meet your goal? Explain your thinking.

Yes, b/c you needed 18 sales b/c you multiply 4 and 72 and you get 18.

Julia 11-13-18

KIPP / 2018 / Belmont 02 – 21– *Exit Slip*

Writing Inequalities to Solve Word Problems

1a) As a salesperson, you are paid $28 per week plus $4 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make to reach this goal.

Parts (?) Total

Inequality: $28 + 4p \geq 100$

Solve: $-28 \quad -28$

$\frac{4p}{4} \geq \frac{72}{4}$

$4\overline{)72}$ = 18

Graph: $p \geq 18$

1b) How many sales would you need to make to meet this goal? 18

1c) This week you end up making 18 sales and your coworker congratulates you for meeting your goal! Is your coworker correct to congratulate you? Did you meet your goal? Explain your thinking.

yes, Because you need more or right at it.

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Student Work-- Lesson Closure—Homework

The following section includes student responses to the 7th Grade Math homework assignment that Ms. Boyd gives as an extension to the lesson task.

The student work included in the *Lesson Closure—Homework* section is from the following students:

Willilam
Quana
Janelle
Timia

William Herrera November 13, 2018

KIPP/2018/ Belmont

02 – 21 – Math Homework

Questions?
Call Mrs. Boyd!
615-347-8867

Homework 02 – 21: Due Wednesday, November 13

YOU MUST SHOW ALL WORK TO RECEIVE ANY CREDIT!

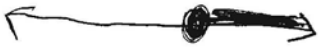
1a) Dondre is saving up to buy an X-Box. He will need at least $250 to buy the X-Box has already saved $118. He can earn extra money by cutting his neighbors' yards. If he earns $12 per yard, how many more yards will he need to cut to be able to buy the X-Box?

Parts ? Total

Solve:

$12y + 118 \geq 250$
$-118 \quad -118$
$12y \geq 132$
$\div 12 \quad \div 12$
$y \geq 11$

Graph:



1b) Dondre's friend Savion tells Dondre that he will need to mow the yards of 11 more neighbors before he can afford the X-Box. Dondre disagrees and says he needs to mow the yards of 12 more neighbors. Explain to Dondre and Savion which one is correct and why.

Savion, because Dondre says it is 12.

2a) Myka wants to lose fewer dollars on her paycheck than she did last week. She has already lost $6 on her paycheck this week and looses an additional $2 for every deduction. If she lost $30 on her paycheck last week, how many more deductions can she get this week?

Parts ? Total

Solve:

$2d + 6 < 30$
$-6 \quad -6$
$2d < 24$
$\div 2 \quad \div 2$
$d < 12$

Graph:

KIPP/2018/_____ 02 – 21 – Math Homework

2b) Myka calculates that she can get 12 more deductions this week and still meet her goal. Do you agree with her? Explain your thinking.

No, because she has to get less than 30.

3) *(SPI 3.8)* Students in an art class are drawing pictures of what they are doing during the holiday season. The art teacher has 37 markers to give out to students to use on their pictures. The teacher gives 8 students an equal number of markers and has 5 left over. Write an equation to determine how many markers each student receives.

Parts that make up total = Total

Solve:

$8m + 5 = 37$
$-5 \quad -5$
$8m = 32$
$\div 8 \quad \div 8$
$m = 4$

4) *(EE.4) Write an inequality to solve:* 9 plus 2 times x is at least 31.

Inequality: $9 + 2x \geq 31$

Solve:

$-9 \quad -9$
$2x \geq 22$
$\div 2 \quad \div 2$
$x \geq 11$

Graph:

5) *(SPI 1.1)* A 10 ounce pitcher of orange juice contains 2 ounces of orange flavoring and 8 ounces of water. A 30 ounce pitcher of orange juices contains the same ratio of flavoring to water. How much flavoring does a 30 ounce pitcher of orange juice contain?

$\frac{2}{10} = \frac{x}{30}$ $x = 6$

$\frac{10x}{1} = \frac{60}{6}$

Quana Underwood November 13, 2012

KIPP/2018/ Belmont

02 – 21 – Math Homework

Questions? Call Mrs. Boyd! 615-347-8867

Homework 02 – 21: Due Wednesday, November 13

YOU MUST SHOW ALL WORK TO RECEIVE ANY CREDIT!

1a) Dondre is saving up to buy an X-Box. He will need at least $250 to buy the X-Box has already saved $118. He can earn extra money by cutting his neighbors' yards. If he earns $12 per yard, how many more yards will he need to cut to be able to buy the X-Box?

Parts ? Total 4

Solve:

$118 + 12y \geq 250$

$-118 \quad -118$

$\frac{12y}{12} \geq \frac{132}{12}$

$y \geq 11$

Graph:

1b) Dondre's friend Savion tells Dondre that he will need to mow the yards of 11 more neighbors before he can afford the X-Box. Dondre disagrees and says he needs to mow the yards of 12 more neighbors. Explain to Dondre and Savion which one is correct and why.

Savion is correct because we are finding out any number that is equal to or greater than 11.

2a) Myka wants to lose fewer dollars on her paycheck than she did last week. She has already lost $6 on her paycheck this week and looses an additional $2 for every deduction. If she lost $30 on her paycheck last week, how many more deductions can she get this week?

Parts ? Total

Solve:

$2d + 6 < 30$

$-6 \quad -6$

$\frac{2d}{2} < \frac{24}{2}$

$d < 12$

Graph:

KIPP/2018/_____ 02 – 21 – Math Homework

2b) Myka calculates that she can get 12 more deductions this week and still meet her goal. Do you agree with her? Explain your thinking.

No because she is trying to get less than 12.

3) *(SPI 3.8)* Students in an art class are drawing pictures of what they are doing during the holiday season. The art teacher has 37 markers to give out to students to use on their pictures. The teacher gives 8 students an equal number of markers and has 5 left over. Write an equation to determine how many markers each student receives.

Parts that make up total = Total

Solve:

$8m + 5 = 37$

$-5 \quad -5$

$\frac{8m}{8} = \frac{32}{8}$

$m = 4$ markers

4) *(EE.4) Write an inequality to solve:* 9 plus 2 times x is at least 31.

Inequality: $9 + 2x \geq 31$

Solve:

$-9 \quad -9$

$\frac{2x}{2} \geq \frac{22}{2}$

$x \geq 11$

Graph:

5) *(SPI 1.1)* A 10 ounce pitcher of orange juice contains 2 ounces of orange flavoring and 8 ounces of water. A 30 ounce pitcher of orange juices contains the same ratio of flavoring to water. How much flavoring does a 30 ounce pitcher of orange juice contain?

$\frac{10}{2} = \frac{30}{x}$ $\quad \frac{10x}{10} = \frac{60}{10}$ $\quad x =$ of flavoring

Janelle Johnson November 13, 2018

KIPP/2018/ Belmont

02 – 21 – Math Homework

Questions? Call Mrs. Boyd! 615-347-8867

Homework 02 – 21: Due Wednesday, November 13

YOU MUST SHOW ALL WORK TO RECEIVE ANY CREDIT!

1a) Dondre is saving up to buy an X-Box. He will need at least $250 to buy the X-Box has already saved $118. He can earn extra money by cutting his neighbors' yards. If he earns $12 per yard, how many more yards will he need to cut to be able to buy the X-Box?

Parts ? Total

$12y + 118 \geq 250$

Solve:

$12y + 118 \geq 250$

$-118 \quad -118$

$\frac{12y}{12} = \frac{132}{12}$

$y \geq 11$

$12 \overline{)132}$ = 11

Graph:

1b) Dondre's friend Savion tells Dondre that he will need to mow the yards of 11 more neighbors before he can afford the X-Box. Dondre disagrees and says he needs to mow the yards of 12 more neighbors. Explain to Dondre and Savion which one is correct and why.

Dondre, b/c it needs to be more than 11

2a) Myka wants to lose fewer dollars on her paycheck than she did last week. She has already lost $6 on her paycheck this week and looses an additional $2 for every deduction. If she lost $30 on her paycheck last week, how many more deductions can she get this week?

Parts ? Total

$2p + 6 < 30$

Solve:

$-6 \quad -6$

$\frac{2p}{2} < \frac{24}{2}$

$p < 12$

Graph:

KIPP/2018/_____ 02 – 21 – Math Homework

2b) Myka calculates that she can get 12 more deductions this week and still meet her goal. Do you agree with her? Explain your thinking.

No,bic it needs to be less than 12 not equal to.

3) *(SPI 3.8)* Students in an art class are drawing pictures of what they are doing during the holiday season. The art teacher has 37 markers to give out to students to use on their pictures. The teacher gives 8 students an equal number of markers and has 5 left over. Write an equation to determine how many markers each student receives.

Parts that make up total = Total

Solve: $5 + 8m = 37$

$-5 \quad -5$

$\frac{8m}{8} = \frac{32}{8}$

$m = 4$

4) *(EE.4) Write an inequality to solve:* 9 plus 2 times x is at least 31.

Inequality: $9 + 2x \geq 31$

Solve: $9 - \quad -9$

$\frac{2x}{2} = \frac{22}{2}$

Graph: $x \geq 11$

5) *(SPI 1.1)* A 10 ounce pitcher of orange juice contains 2 ounces of orange flavoring and 8 ounces of water. A 30 ounce pitcher of orange juices contains the same ratio of flavoring to water. How much flavoring does a 30 ounce pitcher of orange juice contain?

300
600

$\frac{10oj}{2of} = \frac{300j}{xof}$ $\quad \frac{10x}{10} = \frac{600}{10}$ $\quad x = 60oz$

Timia Kennerly November 13, 2018

KIPP/2018/ Belmont

02 – 21 – Math Homework

Questions? Call Mrs. Boyd! 615-347-8867

Homework 02 – 21: Due Wednesday, November 13

YOU MUST SHOW ALL WORK TO RECEIVE ANY CREDIT!

1a) Dondre is saving up to buy an X-Box. He will need at least $250 to buy the X-Box has already saved $118. He can earn extra money by cutting his neighbors' yards. If he earns $12 per yard, how many more yards will he need to cut to be able to buy the X-Box?

Parts ? Total

Solve: $118 + 12y \geq 250$

$-118 \quad -118$

$\frac{12y}{12} = \frac{132}{12}$

$y \geq 11$

$132 \div 12 = 11$

-12

12

-12

0

Graph: 11

1b) Dondre's friend Savion tells Dondre that he will need to mow the yards of 11 more neighbors before he can afford the X-Box. Dondre disagrees and says he needs to mow the yards of 12 more neighbors. Explain to Dondre and Savion which one is correct and why.

Savion, is right because it can that no# and greater than or equal to

2a) Myka wants to lose fewer dollars on her paycheck than she did last week. She has already lost $6 on her paycheck this week and looses an additional $2 for every deduction. If she lost $30 on her paycheck last week, how many more deductions can she get this week?

Parts ? Total

Solve: $6 + 2d \leq 30$

-6

$\frac{2d}{2} = \frac{24}{2}$

$d \leq 12$

Graph: 12

KIPP/2018/_____ 02 – 21 – Math Homework

2b) Myka calculates that she can get 12 more deductions this week and still meet her goal. Do you agree with her? Explain your thinking.

Yes, it can be that no# and lower

3) *(SPI 3.8)* Students in an art class are drawing pictures of what they are doing during the holiday season. The art teacher has 37 markers to give out to students to use on their pictures. The teacher gives 8 students an equal number of markers and has 5 left over. Write an equation to determine how many markers each student receives.

Parts that make up total = Total

$8m+5=37$

Solve:

-5

$\frac{8m}{8} \mid \frac{32}{8}$

$m=4$

4) *(EE.4) Write an inequality to solve:* 9 plus 2 times x is at least 31.

Inequality: $9+2x \geq 31$

Solve:

-9

$\frac{2x}{2} \mid \frac{22}{2}$

$x \geq 11$

Graph:

5) *(SPI 1.1)* A 10 ounce pitcher of orange juice contains 2 ounces of orange flavoring and 8 ounces of water. A 30 ounce pitcher of orange juices contains the same ratio of flavoring to water. How much flavoring does a 30 ounce pitcher of orange juice contain?

$\frac{10}{2}$ $\frac{30}{6}$

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Teacher Reflection

1. What strengths do you see in the lesson?

The students are engaged in the lesson and are enjoying the problem-solving aspect of it. They are also engaged in working with their partners and helping each other get to the correct solutions and conclusions. I also see that this lesson is the appropriate next step in rigor from the previous day's lesson. It isn't too easy for them, but they also definitely don't feel overwhelmed or lost. It is just enough to keep them challenged while also empowering them to think critically.

2. Can you explain how you developed a culture of sharing and risk-tasking in the classroom?

At the beginning of the year, students are always very afraid to admit mistakes or try something new because they are afraid of being wrong. I message constantly that making mistakes is important because it is how we learn and remember what we've learned. I take time in every class to let students point out their own missed problems and where they made the mistake. I say things like, "It's only a mistake if you can't find where you went wrong," and "You will remember it for so much longer if you find your mistake."

Finally, it is incredibly important to remain patient and encouraging when students make mistakes. Often when students struggle, we feel frustrated because we interpret a student's mistake to mean we are not teaching it well. However, the students don't read it that way. When they see us get frustrated, they feel bad about themselves and stop trying. The key to developing a culture of risk-taking is by building an environment where wrong answers aren't bad; they're part of the learning process.

3. What opportunities do you see to share best practices with pre-service teachers?

Math is a subject that is easy to teach in a strictly procedural way: do this, then this, then this. Students will be able to get the questions correct if you just teach a series of steps, but they won't be able to apply the knowledge later on because they won't understand why they are doing those steps. Clear steps are important, but only after students understand the concept.

Teaching things in a conceptual way is often scary for new teachers because you worry that you aren't making it clear enough. However, this is the only way that students will actually learn to think critically about what they are doing. Students should feel a healthy

amount of struggle in every lesson. You don't want them to struggle so much that they don't learn anything and just give up, but you also don't want to make it so easy that they are just repeating steps and not processing the knowledge.

Allowing them to analyze the work they have done, find mistakes, correct others' thinking, and explain their logic pushes them to think critically. While they won't always get the correct answer at first, once they do, they've got it for good.

4. Do you see any missed opportunities that you would want pre-service teachers of which to be aware?

Watching this video allowed me to see an aspect of partner work that I don't normally get to see—what they say when I'm not around. I typically partner my lowest students with higher students to help them. Watching it, however, I realize how many times the higher-performing student tries to explain it, is unsuccessful, and ends up simply telling the other student what to write. It makes me that much more aware of how carefully I need to continue to check for understanding with my lower-performing students after partner work and not just assume that they understand now because they are getting the process correct. Many of them still miss pieces of the conceptual understanding.

5. What data do you use to determine grouping in your classroom?

I use data from students' quizzes to determine who should be partnered with whom, but I also pay close attention to personalities. For example, a student who makes good grades but isn't very patient wouldn't be the best choice as a partner for your lowest-performing student. In that case, it's better to partner them with a "C" student who loves to help other students and can explain things multiple times without losing patience. It is critical to make sure that you do not put two low-performing students together because if they do not understand and get stuck, it will simply lead to increased frustration with the topic.

6. How have you used the TEAM rubrics to improve your practice?

My school does not use the TEAM rubrics. We use the KIPP Foundation evaluations.

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Viewing Guide—Before Viewing the Lesson

Pre-writing for Activity 1 on pg. 153
Distribute the chart entitled **Advancing and Assessing Questions** included in **Student Handout Section A.3**. Instruct students to record as many of Ms. Boyd's questions as possible, and then label the questions assessing or advancing. This chart will be used to guide viewing, but also to complete a culminating activity at the end of the lesson.

Discussion Points	Focus
• Ms. Boyd teaches at a charter school in the Nashville area. What is a charter school?	Professional Knowledge
• What instructional opportunities do mixed-level classrooms provide? What obstacles might they pose? What impact does this have on a teacher's instructional planning?	Planning

Activities	Focus
• Discuss in small groups: Ms. Boyd explains that she has students who scored "advanced" and "proficient" on the 6th grade TCAP, and students who scored "basic" or "below basic," all in her class together. Is it possible to address the learning needs of all performance levels in the same math lesson? What might be some ways to do so? Where might struggling students need support/additional work? How might you challenge your advanced students in such a lesson?	Planning

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Viewing Guide—During the Lesson

The following discussion questions and activities will guide the viewing of the video lesson.

Video Segment 1—Framing the Lesson

Discussion Points	Focus
• Ms. Boyd begins the lesson by asking a student to read the learning target for the day. Why would she begin her lesson this way? What evidence can you provide to show the effectiveness of this practice?	Planning
• Ms. Boyd asks for volunteers to read the first two problems; then she gives the students two minutes for independent work time. What Common Core Mathematical Practice does this support? Why? What evidence do you see that demonstrates students are used to independent work time?	Strategies
• The first two word problems pose real-world questions in easily accessible language. What CCSS does this support? Do you think the students understand what they are being asked to do? Why or why not?	Planning

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Viewing Guide—During the Lesson

Video Segment 1—Framing the Lesson

Activities	Focus
• In the interview with Ms. Boyd, she articulates the goal of the lesson today. Which is more understandable—the way she explains it or the version on the board that the student reads at the beginning of the lesson? Why? Brainstorm some ways that Ms. Boyd could have communicated this goal in more student-friendly language. Also identify some ways she could engage the students in understanding or articulating the goal for the day.	Planning
• In small groups, brainstorm some ways to assess mastery of this lesson's learning target.	Planning
• What is the common core standard addressed by this lesson? What are the restrictions on the inequalities in this standard? How many different types of inequalities fit into this standard? *(For answers, see Appendix B.7.)*	Math Content
• For more information and practice with creating challenging problems to advance student thinking, see Appendix B.8.	Math Content

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Viewing Guide—During the Lesson

Video Segment 2—The Task

Discussion Points	Focus
• There are several ways that teachers can scaffold instruction for students, such as modeling, offering support through teacher interaction, asking effective questions, and engaging students in providing feedback. How does Ms. Boyd scaffold the task for her students?	Strategies
• Common Core tasks expect academic rigor from the students, and the quantity of scaffolding will determine, in part, what the students learn from the task. How could Ms. Boyd determine if a student has been successful in solving these word problems? What could she do with this knowledge?	Assessment
• What value would there be in encouraging students to display their graphing solution under the document camera vs. the teacher sharing her solution under the document camera? How could this be done? How should it be structured?	Strategies
• Are there any features of the inequalities from Mrs. Boyd's tasks that make them special?	Math Content

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Viewing Guide—During the Lesson

Video Segment 2—The Task

Activities	Focus
• Review the video from time stamp 21:00 to 23:00. Note the ways that Ms. Boyd differentiates instruction during this time. Note especially her use of assessing and advancing questions. How do you think Ms. Boyd prepares herself for this series of questions? In small groups, brainstorm some ways that you could prepare for these exchanges.	Strategies
• Review the tasks included with the lesson. Determine the inequalities associated with each of Mrs. Boyd's tasks and the type of model. Are all the types of inequalities represented? *(For answers, see Appendix B.9.)*	Math Content
• Rewrite Task 4 in a way that leads to a rational inequality exactly as above. What is your interpretation of the inequality in this case? *(For answers, see Appendix B.10.)*	Math Content

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Viewing Guide—During the Lesson

Video Segment 3—Partner Work

Discussion Points	Focus
• How does the teacher and student behavior during this portion of the lesson differ from Math classes you have been a part of and what impact will those differences have on student learning? What mathematical shifts do you see represented?	Planning
• How does Ms. Boyd allow students time to persevere through these problems but still support their learning? What evidence do you see in this video segment that Ms. Boyd is removing scaffolding but providing clarification as needed?	Strategies
• What is Ms. Boyd doing as the students are working with their partners? Considering the overall effectiveness of this portion of the lesson, how does Ms. Boyd's behavior add to or detract from this effectiveness?	Planning
• How does Ms. Boyd set her students up for *Mathematical Practice Standard 3: Construct viable arguments and critique the reasoning of others*?	Math Content
• Another Mathematical Practice Standard that is evident in this portion of the lesson is *Mathematical Practice Standard 2: Reason abstractly and quantitatively*. How does Ms. Boyd help individual students clarify their understanding of the math task? What evidence do you observe from the students that they are using abstract or quantitative thinking?	Math Content
Activity	**Focus**
• In this video segment, the focus is on student interaction. What groundwork do you think Ms. Boyd has laid to make partner work effective in her classroom? What steps could you take to make sure that partner work time is used effectively?	Planning

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Viewing Guide—During the Lesson

Video Segment 4—Lesson Closure

Discussion Points	Focus
• In this final task, Ms. Boyd removes the scaffolding while continuing to encourage. In what ways does she signal that the students now must perform without her help?	Strategies
• Do you think Ms. Boyd uses the exit slip as a formative or summative assessment? Why or why not? What would be the benefit of using this assessment as formative or summative?	Assessment

Activities	Focus
• The Lesson Closure activity is a way for students to reflect on the skills they learned and perform tasks that will show the depth to which they learned the skill. Considering the student response to the learning goal at the beginning of class, brainstorm some ways that Ms. Boyd could improve the quality of this closure activity.	Planning
• In small groups, craft a closure activity that could be used to assess student mastery of the standard of this lesson or the learning goal for the day.	Assessment

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Viewing Guide—After Viewing the Lesson

These activities are designed to guide students in the process of analyzing the lesson as a whole, synthesizing important elements, and creating products of their own.

Activity I (Questioning)

Using the chart you completed while viewing Ms. Boyd's 7th grade lesson, comment on her questioning techniques. Consider the variety and the quality of the questions Ms. Boyd asks. Does she use mostly advancing or assessing questions? How could each type of questioning be helpful to Ms. Boyd? Since rigor is such an important element in Common Core instruction, how could you ensure that your questioning leads to rigorous instruction? What steps will you take to incorporate both kinds of questions in your daily instruction? Include examples of at least two questions of each type.

Activity II (Planning for a Common Core Math Lesson)

Choose a CCSS other than the ones used by Ms. Boyd, Mr. Eller, or Ms. Harp and craft a Lesson Plan that would result in instruction similar to the examples you have viewed during this video series.

Include the following:

- Framing the Lesson
  - Include lesson objectives in student-friendly language based on a CCSS.
  - Identify prior knowledge and key vocabulary necessary.
- The Task
  - Craft a real-world task with multiple solution paths and entry points.
- Partner/Group Time
  - Devise an opportunity for students to work with partners or groups.
- The Solutions
  - Write some guiding questions based on anticipated student solutions.
  - Craft assessing questions.
  - Craft advancing questions.
- Closure
  - Craft a reflection activity that points to the learning goal and assesses the depth of student mastery of the skill.

Preparing New Teachers for Common Core
7th grade Math: Ms. Boyd
Viewing Guide—After Viewing the Lesson

Activity III (Math Content)

Consider the way Ms. Boyd structures the problems she asks her students to solve. Of particular interest are the letters she uses to represent variables within the tasks, such as:

Task	Letter	Variable
Example 1 and 2	s	Number of sales
Task 1	d	Number of days
Task 2	m	Money spent on groceries per week
Task 3	m	Money saved per week
Task 4	h	Hours of driving

Why are all these variables used in these tasks? Why not just use x like the inequalities in the standards? What opportunity do these variables present that using x might not?

Also, craft a task that would incorporate a variable you could represent with a letter other than x and explain your choice of variable.

Activity IV (Reflection)

If you were going to teach this lesson to your own class tomorrow, what changes could you make to improve the overall outcome of this lesson? Do you see any missed opportunities to incorporate other strategies that would lead to better student understanding? How would you refine this lesson to ensure a higher degree of student understanding and mastery? Consider the student-friendliness of the learning goal, the frequency and quality of Ms. Boyd's questions, and the opportunities for student input. You could also consider math-specific strategies that could be incorporated to improve student outcomes.

Preparing New Teachers for Common Core Mathematical Practices Highlight Video Viewing Guide

The Mathematical Practices Highlight Video is a way to emphasize the practice standards so that pre-service teachers will have some concrete examples of the student behaviors that are associated with each practice standard.

Since these practice standards should be incorporated into everyday instruction, it is important for pre-service teachers to have these examples. Pre-service teachers not only need to see them in action, but they also need to consider how Ms. Harp, Mr. Eller, and Ms. Boyd lay the groundwork for these practices to be seamlessly integrated into the planning and execution of a successful CCSS Math lesson.

The following activity corresponds to the Mathematical Practice Highlight Video.

Preparing New Teachers for Common Core
Mathematical Practices Highlight Video
Viewing Activity

As you view the Mathematical Practices video, use the chart below and highlight or underline the student behaviors that you see. The video will provide the information that you see in the chart and then include some clips from classroom footage. As you see student behavior that corresponds to the description, highlight or underline that description.

Mathematical Practice 1: Make sense of problems and persevere in solving them.
Students make sense of problems and persevere in solving them when they: • Explain the meaning of the problem • Look for multiple entry points to a solution • Plan a solution pathway rather than jump to a solution attempt • Monitor progress and change course if necessary • Check answers to problems using a different method • Constantly ask, "Does this make sense?"
Mathematical Practice 2: Reason abstractly and quantitatively.
Students reason abstractly and quantitatively when they: • Make sense of quantities and their relationships • Decontextualize using symbolic representations • Contextualize by pausing to analyze the referents for symbols • Create a coherent representation of the problem • Consider all elements of a problem, not just how to compute it • Know and flexibly use different properties of operations and objects
Mathematical Practice 3: Construct viable arguments and critique the reasoning of others.
Students construct viable arguments and critique reasoning when they: • Communicate conclusions to others • Justify conclusions • Respond to the arguments of others • Analyze situations by breaking them into cases • Recognize and use counterexamples • Distinguish correct logic or reasoning from flawed logic or reasoning • Ask useful questions to clarify or improve the arguments of others

Mathematical Practice 4: Model with mathematics.

Students model with mathematics when they:

- Solve problems that arise in everyday life, society, and the workplace
- Map the relationship of important quantities in a practical way, using tools such as a diagram, table, graph, flowchart or formula
- Analyze selected tools to draw conclusions
- Interpret results in context and refine if needed

Mathematical Practice 5: Use appropriate tools strategically.

Students use appropriate tools strategically when they:

- Consider available tools and resources when solving a mathematical problem
- Use tools and resources, including pencil and paper, concrete models, a ruler, a protractor, a calculator, spreadsheet, or digital content
- Make sound decisions regarding the most effective tool to use
- Use technology to visualize results, explore consequences, and compare data
- Use tools to explore and deepen understanding of concepts

Mathematical Practice 6: Attend to precision.

Students attend to precision when they:

- Communicate precisely
- Use clear definitions in discussion
- State the meaning of symbols consistently and appropriately
- Calculate accurately and efficiently
- Express answers with a degree of precision appropriate to the grade level or task

Mathematical Practice 7: Look for and make use of structure.

Students look for and make use of structure when they:

- Look closely to discern a pattern or structure, such as the distributive property
- Use strategic thinking, such as adding an auxiliary line to an existing line in a geometric figure
- Shift perspective based on a broader view of the problem
- See complicated things as single objects or as being composed of several objects

Mathematical Practice 8: Look for and express regularity in repeated reasoning.

Students look for and express regularity in repeated reasoning when they:

- Notice if calculations are repeated
- Look for general methods and shortcuts
- Oversee the process of a mathematical problem while attending to details
- Evaluate the reasonableness of results

Preparing New Teachers for Common Core
CCSS English Language Arts Resources
ELA Anchor Standards for Reading

Key Ideas and Details

1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
3. Analyze how and why individuals, events, or ideas develop and interact over the course of a text.

Craft and Structure

4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.
5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.
6. Assess how point of view or purpose shapes the content and style of a text.

Integration of Knowledge and Ideas

7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of Reading and Level of Text Complexity

10. Read and comprehend complex literary and informational texts independently and proficiently.

Preparing New Teachers for Common Core
CCSS English Language Arts Resources
ELA Anchor Standards for Writing

Text Types and Purposes

1. Write arguments to support claims in an analysis of substantive topics or texts using valid reasoning and relevant and sufficient evidence.

2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

3. Write narratives to develop real or imagined experiences or events using effective techniques, well-chosen details, and well-structured event sequences.

Production and Distribution of Writing

4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build and Present Knowledge

7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

9. Draw evidence from literary or informational texts to support analysis, reflection, and research.

Range of Writing

10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

Preparing New Teachers for Common Core
CCSS English Language Arts Resources
ELA Anchor Standards for Speaking and Listening

Comprehension and Collaboration

1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

Presentation of Knowledge and Ideas

4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

5. Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

Preparing New Teachers for Common Core
CCSS English Language Arts Resources
ELA Anchor Standards for Language

Conventions of Standard English

1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Knowledge of Language

3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

Vocabulary Acquisition and Use

4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

6. Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

Preparing New Teachers for Common Core
CCSS English Language Arts Resources
ELA Instructional Shifts Chart

1. Building knowledge through content rich non-fiction.	
Shift from:	**To:**
• Imbalance with focus on literary texts	• Balance of fiction and non-fiction texts K-5: 50% Fiction, 50% Non-fiction 6-8: 45% Fiction, 55% Non-fiction 9-12: 30% Fiction, 70% Non-fiction
• Analysis of conventions such as plot, character, conflict, setting, and theme	• Content rich non-fiction to build coherent general knowledge
• Literacy and writing in isolation	• Embedded literacy in history/social studies, science, and technical subjects to build knowledge through reading and writing
2. Reading, writing and speaking grounded in evidence from text both literary and informational.	
Shift from:	**To:**
• Questions that could be answered without close reading or that do not require inference	• Questions that require inferential thinking supported by text evidence
• No requirement to defend answer with text-based evidence, either verbally or in written form	• Requiring students to articulate evidence-based answers verbally and in writing
• Formulaic writing, summaries, paragraph responses, 5-Paragraph essay format, overuse of graphic organizers	• Intentional cultivation of narrative writing then scaffolding sequencing and details which will build capacity for argumentative and informational writing
3. Regular practice with complex text and its academic language	
Shift from:	**To:**
• Focus on basic skills of reading, writing, and vocabulary in isolation	• Scaffolded complexity of texts
• Assessment readiness	• College, career-readiness
• Mechanical language	• Metaphorical language

Preparing New Teachers for Common Core
CCSS English Language Arts Resources
Suggested Articles and Texts

Boyles, N. (December 2012/January 2013). Closing in on close reading. *Educational Leadership*, *70*(4), 36-41.

Davis, L. (2012). 5 things every teacher should be doing to meet the common core state standards. *Eye On Education*, Retrieved from www.eyeoneducation.com.

Rothman, R. (2012). Nine ways the common core will change classroom practice. *Harvard Education Letter*, *28*(4), Retrieved from http://www.hepg.org/hel/article/543.

Sandler, S., & Hammond, Z. (December 2012/January 2013). Text and truth: Reading, student experience, and the common core. *Kappan*, *94*(4), 58-61.

Shanahan, T. (December 2012/January 2013). The common core ate my baby and other urban legends. *Educational Leadership*, *70*(4), 10-16.

Shanahan, T., Fisher, D., & Frey, N. (2012). The challenge of challenging text. *Educational Leadership*, *69*(6), 58-62.

Thiebes, K. (2010). Comparing economic systems: Anatonomy of an LDC module. *Literacy Design Collaboration, The Bill & Melinda Gates Foundation*.

Preparing New Teachers for Common Core
5th grade ELA: Ms. Schrimsher
Teacher Profile

5th grade ELA: Compare and contrast texts

Beth Schrimsher
Cameron College Prep

About Ms. Schrimsher

After earning a Bachelor's degree in Elementary Education at Tennessee Technological University and a Master's in Reading Education from Vanderbilt University, Ms. Schrimsher began her career teaching 5th grade in the Atlanta, GA area. After four years, Ms. Schrimsher moved to Nashville and began teaching 7th grade at Cameron Middle School. She taught at Cameron Middle School for two years, and then joined Cameron College Prep as a 5th grade English/Language Arts teacher.

About Ms. Schrimsher's classroom

In this 5th grade class, Ms. Schrimsher has students whose reading abilities range from 1st grade to upper middle school. There are no students who receive Special Education services, but there are several students who have recently exited an English Language Learner program. The student population in this classroom is culturally diverse and represents the diversity within the school.

The Lesson

In the lesson, students are asked to compare and contrast two different events in history using two different texts. (RI 5.3)

The video is divided into five segments:

Framing the Lesson (12 minutes)
The Task (20 minutes)
Guided Practice (9 minutes)
Independent Practice (8 minutes)
Lesson Closure (5 minutes)

Multiple anchor standards for ELA are present in this lesson. Strength of this lesson include text selection and academic vocabulary.

Preparing New Teachers for Common Core
5th grade English Language Arts: Ms. Schrimsher
Planning for a CCSS ELA Lesson

Lesson: Comparing and Contrasting Text	**CCSS Domain:** Reading Informational Texts	**Date:**

Standard(s) the lesson is building toward	
ELA Standard(s)	**Assessment(s)**
• Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (RI 5.1) • Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text. (RI 5.2) • Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information from the text. (RI 5.3)	• Using a completed pre-writing organizer, students will write a compare/contrast paragraph using quotes from two different texts.

Clear Learning Targets	• I can compare and contrast two different events from history, using two different texts.
New Learning	• Quoting from a text to justify a comparison of two texts. • Using multiple texts on similar but different topics as opposed to multiple texts on the same topic. • Comparing and contrasting similar historical events (focusing on the problem and solution of both) • Vocabulary: pilgrim, tremendous, investor, persecution
Instructional Strategies	• Whole class discussion, Small group discussion, Partner writing
Materials and Resources	• Table talk/silent discussion guides • *Eating the Plates* (pg 1-5) • *A Picture Book of Anne Frank* • Prewriting organizer • Chart paper • Writing journals

Framing the Lesson (15 min)

- Whole class – Brainstorm the possible decisions that Jews could have made to escape the persecution from the Nazis. Focus on the decision to leave for a safer country.
- Table groups – Silent discussion, using guiding questions and quotes from *The Diary of Anne Frank*. Each student will respond on the page, then pass to the next person. Oral discussion will follow.

The Task (20 min)	**Anticipated learning difficulties**
• Read aloud excerpt from *Eating the Plates* (pg 1-5), annotating text as we read. • At the end of each page, we will stop and find sentences that show comparisons and contrasts to what we know about the Jews emigrating from Europe. The sentences will be coded with highlighter in one color for comparisons and another for contrasts. • We will return to the excerpt from *A Picture Book of Ann Frank* to locate and highlight coordinating sentences that match the highlighted sentences on the pilgrim text.	• Some students may find the highlighting codes confusing. • Transitioning between texts will need to be monitored to make sure everyone is looking at the correct text. **Student prompting** • Provide a highlighter color key on the board. • Use the ELMO to help with transition between texts

Guided practice (20-30 min)

- I do – Begin completing the pre-writing organizer.
- We discuss – Talk about why I added those details. Have students critique ("I like that she added _____, but I would have.") my pre-writing organizer.
- We do – With a writing partner, complete the pre-writing organizer, adding main idea sentence, supporting details, and quotes from both texts.

Questioning: Illuminating Student Thinking

Assessing Questions	***Advancing Questions***
• Why did you choose those details? • Why did you choose those quotes? • How does this detail support the main idea? • How are you going to show the differences in these two texts? • How are you going to show the similarities in these two texts? • Does your main idea sentence tell me what the details are going to be about?	• Compare and contrast the arrival experiences of the pilgrims and the Jews based on evidence in the text. • Compare and contrast the hardships immigrants faced once they arrived based on text evidence. • Using text evidence, which of these texts offers a better description of the immigration experience.

• **Independent practice (30 min)**
• Students will use the pre-writing organizer to draft a paragraph that compares/contrasts the immigration to America of the Pilgrims (1600s) and the Jews (1900s), using two texts for evidence. • Students will individually confer with their teacher as they write.
• **Lesson Closure (Time required)**
• *How can I assess student learning and lesson effectiveness?* Paragraphs will be scored on a rubric, looking effectiveness of the main idea sentence, importance of details, and accurate use of text quotes. • *How will I facilitate reflection for students?* Students will complete an exit ticket with reflections statements (with a scale) about the lesson's skills and the texts' topics. • *How willI set-up for tomorrow's goals?* Read aloud *How Many Days to America?* to preview the following day's assignment of creating a fictional story that is based in factual events/evidence.

Homework
• Interview questions with someone who immigrated to America; study for vocab quiz.

Reflection
• The activating activity of responding to quotes was difficult, as it was our first time trying it. I will offer more direct instruction on how to respond to a quote before we try it again. • Students were very engaged in the topic. I will plan to connect more historical events through common themes. • The writing piece was difficult because the only text experience the students had with the Jews were through pieces about the Frank family. They were unable to make generalizations about European Jews by studying just that family. Next time, I will use a larger variety of texts and teach a lesson on generalizations before this lesson.

Preparing New Teachers for Common Core
5th grade English Language Arts-Mrs. Schrimsher
Lesson Task—Framing the Lesson

"Because we are Jewish, we moved to Holland in 1933."

~Anne Frank

Why did Anne's family need to leave their home land just because they were Jewish?

"The rest of our family stayed in Germany and has really suffered."

~ Anne Frank

Before she went into hiding, Anne wrote lots of letters to her friends and family. What do you think she would say in a letter to family in Germany?

"To think that I was once a German, too! Now I have no country. Hitler took that away from us long ago."

~Anne Frank

How did Hitler take away Anne's country?

"I want to go on living after my death."

~Anne Frank

How did Anne's diary allow her to fulfill this dream?

Preparing New Teachers for Common Core
5th grade English Language Arts: Ms. Schrimsher
Lesson Task

Introduction:

Good-bye Forever

My country, 'tis of thee
Sweet land of liberty,
Of thee I sing:
Land where my fathers died,
Land of the pilgrim's pride,
From every mountain side
Let freedom ring.

—Samuel Francis Smith,
"America"

This book is about the eating habits, customs, and manners of real people who lived a long time ago.

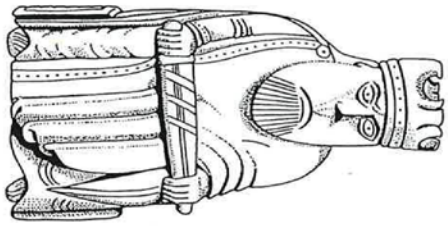
We call them the Pilgrims. Pilgrims are people who travel to a faraway place in order to pray there.

The Pilgrims were born in England close to four hundred years ago. Back then, English people had to

pray the way the king said they should. If they didn't, they could be put in prison or even killed.

The Pilgrims wanted to pray in their own way. So they decided to leave England and find a new home.

First they went to Holland. The people of Holland, called the Dutch, were nice to the Pilgrims. They gave them homes and jobs. Some Pilgrims became weavers, tailors, and button makers. Others became masons and bricklayers.



The King of England was angry at the Pilgrims. He wanted to put them in jail.

Same
different

The Pilgrims were safe in Holland. But they were not happy living among the Dutch. They thought the Dutch were more interested in money and fun than they were in religion. And the Pilgrims were afraid that their children would grow up to be just like the Dutch.

So they decided to take a big chance—to sail across the ocean to America.

It was a very dangerous and very scary thing to do. Only a few English people had been to America. Many still believed that the earth was flat. They thought that if you sailed too far you would fall off the edge.

Even people who knew that the earth was round were worried. What was America like? Was it safe there? The Pilgrims were afraid. But they made up their minds to go.

First they needed supplies—a *lot* of supplies. There wouldn't be any stores in America! They had to bring with them everything they would need when they got there: clothes and shoes and dishes and furniture, food and drink and weapons and tools, farming equipment, cloth, and beads to trade to the Indians.

To buy all of these supplies, and to hire a ship for the long voyage, would cost a tremendous amount of

money. In fact, the trip would cost more money than the Pilgrims had.

So they made a deal with a group of English investors. These investors were called the Merchant Adventurers.

The Merchant Adventurers hired a ship, named the *Mayflower*, to take the Pilgrims to America. And they gave the Pilgrims food and supplies.

In return, the Pilgrims agreed to work for the Merchant Adventurers for seven years. Everything valuable that the Pilgrims found in America—such as animal furs, beautiful bird feathers, oil, and whale ivory—would belong to the investors. The Pilgrims would keep for themselves only things that they needed to stay alive.

The Merchant Adventurers made the same deal with other settlers who were traveling on the *Mayflower*. The Pilgrims called these other settlers "Strangers." The Pilgrims called themselves "Saints."

After the agreement with the Merchant Adventurers was signed, some of the Pilgrims almost changed their minds. They thought their children were too young for such a dangerous trip to an unknown place.

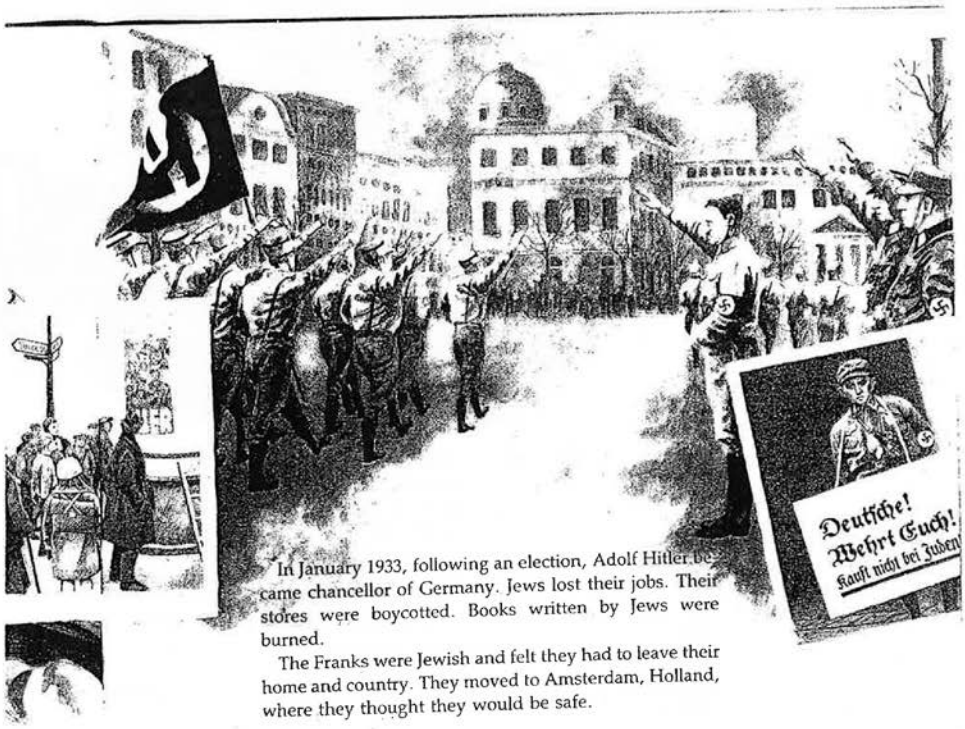
Finally they decided to leave little children and old people behind with friends. They would send for them after they were settled.

It was sad to say good-bye.

But on September 6, 1620, the time finally came to raise the anchor. Wind was filling the sails. The narrow deck of the *Mayflower* was crowded with crying, waving, shouting Saints and Strangers.

Slowly the *Mayflower* swung about and pointed her prow toward America.

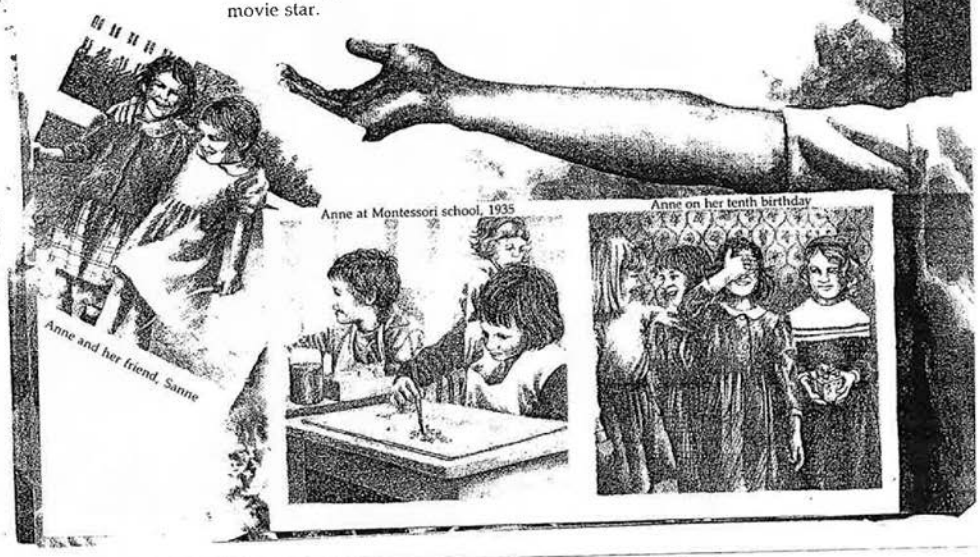
Anne was born during very difficult times. Millions of Germans were out of work. As people became more troubled, they listened to the hate-filled speeches of Adolf Hitler, the Nazi party leader. Hitler blamed Germany's problems on various groups of innocent people, but mostly on the Jews.



In January 1933, following an election, Adolf Hitler became chancellor of Germany. Jews lost their jobs. Their stores were boycotted. Books written by Jews were burned.

The Franks were Jewish and felt they had to leave their home and country. They moved to Amsterdam, Holland, where they thought they would be safe.

Anne's first years in Amsterdam were peaceful. At the Montessori School, her class was asked to write plays. Anne was full of story ideas. When the plays were put on, Anne was given the best parts because she was lively and outgoing. Anne dreamed of becoming a writer or a movie star.



Anne and her friend, Sanne

Anne at Montessori school, 1935

Anne on her tenth birthday

The yellow star

But the hatred the Franks had escaped in Germany followed them. In 1939 the Second World War began. The German army conquered one European country after another. In May 1940 Holland was invaded.

Now there was no escape. Nazi soldiers guarded the train stations and the borders. If somehow a Jew did get out, there was almost no place to go. Country after country declared itself closed to Jewish refugees.

The Immigration of Pilgrims and Jews

Main Idea Sentence: _____

_____

Why did they leave?	Where did they go?	How are they alike?	How are they different?

Name _____ Date _____ Cohort _____

Comparison Paragraph Rubric

Main Idea Sentence
- ☐ The main idea sentence clearly states the topic of the paragraph (3)
- ☐ The main idea sentence states the topic of the paragraph (2)
- ☐ The main idea sentence partially states the topic of the paragraph (1)

Supporting Details
- ☐ At least three relevant supporting details; no irrelevant details (3)
- ☐ At least two relevant supporting details; only one irrelevant detail (2)
- ☐ At least one relevant supporting details; two or more irrelevant details (1)

Quotes from the Text
- ☐ Includes two effective quotes from the text (3)
- ☐ Includes one effective quote from the text (2)
- ☐ Includes information from the text (1)

Conclusion Sentence
- ☐ The conclusion sentence restates the main idea using new words/phrases (3)
- ☐ The conclusion sentence restates the main idea (2)
- ☐ No clear concluding sentence (1)

Conventions
- ☐ No patterns of error (3)
- ☐ Patterns of error don't effect meaning (2)
- ☐ Patters of error effect meaning (1)

EXIT TICKET

1. Circle the skill that was easiest for you.

   main idea supporting details quotes from text compare/contrast

2. Circle the skill that was hardest for you.

   main idea supporting details quotes from text compare/contrast

3. How did the prewriting organizer help you write the paragraph?

4. How did the rubric help you write the paragraph?

5. Complete the face to represent how you feel about this lesson.

Preparing New Teachers for Common Core
5th grade ELA: Ms. Schrimsher
Student Work—Framing the Lesson

This section includes student responses for the silent discussion activity that appears in video segment 1 "Framing the Lesson."

For this activity, the students shared written responses as table teams.

"The rest of our family stayed in Germany and has really suffered."

~ Anne Frank

Before she went into hiding, Anne wrote lots of letters to her friends and family. What do you think she would say in a letter to family in Germany?

Paige She will say i am in British and i am hidding from the Nazi's.

Jabari She will say, "I miss ya all and I might see ya soon".

This is very scary to be in hidding I want to be free. I will miss you. It will be helpful to live.

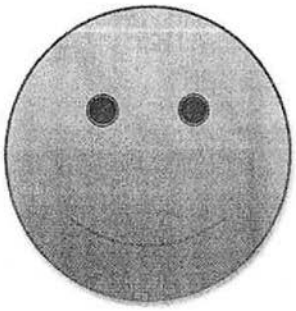
"Because we are Jewish, we moved to Holland in 1933."

~Anne Frank

Why did Anne's family need to leave their home land just because they were Jewish?

The Germans were taking Jewish people to consintration cams.

Just becouse they were Jews dos't mean they could be trated this way.



"I want to go on living after my death."

~Anne Frank

How did Anne's diary allow her to fulfill this dream?

Becuse anne whanted to be a writer or a movie star

Anne wanted to be a writter of a movie star! After her death she got famous because she wrote about parts of her life in her diary.

"To think that I was once a German, too! Now I have no country. Hitler took that away from us long ago."

~Anne Frank

How did Hitler take away Anne's country?

Jesmar— because they were getting poor and didnt have money to eat

Paiget because they were poor and did not have money to buy food and a shelter.

Jakaiah Hew family was gewish and might have been killed so they left.

They

"The rest of our family stayed in Germany and has really suffered."

~ Anne Frank

Before she went into hiding, Anne wrote lots of letters to her friends and family. What do you think she would say in a letter to family in Germany?

She would say she missed them very/much

She would say that she loves them and misses them very much!

Sht might say I miss you and I hope you guys are okay.

They have a secred Annexx. They moved to Holland.

"Because we are Jewish, we moved to Holland in 1933."

~Anne Frank

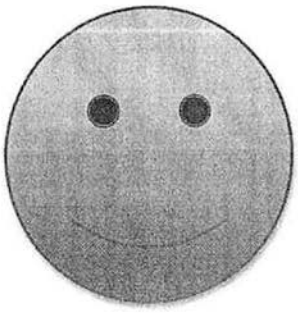
Why did Anne's family need to leave their home land just because they were Jewish?

Because they might get caught and killed by the Nazi's, or taken to concentration camp.

Because they might of got killed by the Germans, or they might of got kidnaped.

Yes but they a secred Anexx. But when they moved to Holland the Nazi's folled them.

Because



"I want to go on living after my death."

~Anne Frank

How did Anne's diary allow her to fulfill this dream?

She wrott in her diary about her lift, and how her lift ended.

She is a Frank family they have a secred Anexx.

By putting every thing she dream of in that Dairy She wanted to be a writer and a movie star

By putting what she did and had and about her life.

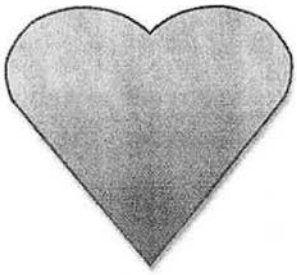
"Because we are Jewish, we moved to Holland in 1933."

~Anne Frank

Why did Anne's family need to leave their home land just because they were Jewish?

One's family had to move because of her race and religon.

Yesmar Because they were going to get killed because they didn't have no money and they were going to get killed and they were getting poor.



"To think that I was once a German, too! Now I have no country. Hitler took that away from us long ago."

~Anne Frank

How did Hitler take away Anne's country?

Nazi's to away Anne family and friend and Killed them. Jews were taken and Killed.

By Commending His Solider's to go Kill some of Jews.

By becoming a King or ruler and the Nazi's came after them.

They took it away by wreching every country till they ruined Holland

Preparing New Teachers for Common Core
5th grade ELA: Ms. Schrimsher
Student Work—The Task

The following section includes the student work on the graphic organizer for the 5th Grade ELA lesson. These graphic organizers were completed in groups of two or three.

The student work included in *The Task* section is from the following students:

Edward
Anna B.
Ferndanda

Deborah Jones

The Immigration of Pilgrims and Jews

Main Idea Sentence: The pilgrims and the Jews are alike and notalike.

Why did they leave? (from my text)	Where did they go?	How are they alike?	How are they different?
- Pilgrims wanted religious freedom and - Jews were persecuted for their religion.	- The pilgrims and the Jews both move to Holland and America.	- They both wanted a freedom and a safe home.	- The Jews have more children being. - The pilgrim left have children behind.
from text The pilgrims wanted to pray in their own way.	First they went to Holland. The Mayflower Adventure had a ship named the mayflower, to take the pilgrims to America.	They decied to leave England and find a new home.	Final the decide to leave little children and old people behind with friends.

Anna B. #3 ELA Nov. 15, 2012

The Immigration of Pilgrims and Jews

Main Idea Sentence: Pilgrims and Jews are alike, because

Why did they leave?	Where did they go?	How are they alike?	How are they different?
- Pilgrims wanted religious freedom - Jews were persecuted for their religion	- Pilgrims went to Holland. - Anne Frank's family went to Holland also	- Pilgrims needed money - Jews needed money	- Pilgrims sailed across ocean. - Jews went into hiding
The pilgrims wanted to pray in their own way.	So they decided to leave England and find a new home. Then they went to Holland.	"To buy all these supplies would cost a tremendous amount of money"	The Merchant Adventurers hired a ship, named the Mayflower to take the Pilgrims to America

My from they

From the text

#3

Fernanda Garcia

The Immigration of Pilgrims and Jews

Main Idea Sentence: How Pilgrims and Jews are alike and different.

	Why did they leave?	Where did they go?	How are they alike?	How are they different?
from my head	-Pilgrims wanted religious freedom. -Jews were persecuted for their religion.	Pilgrims went to Holland. Anne frank family went to Holland also.	Pilgrims needed money Jews needed money	Pilgrims Sail across ocean. Jews went into hiding.
from the text	The pilgrims wanted to pray in their own way.	So they decided to leave England and find a new home.	To buy all of these supplies, and to hire a Ship for the long voyage, would cost a tremendous amount of money.	The Merchant Adventurers hired a ship, named the Mayflower, to take the Pilgrims to America.

Preparing New Teachers for Common Core
5th grade ELA: Ms. Schrimsher
Student Work—Lesson Closure

This section includes student work samples of the 5th Grade ELA lesson closure activity. This activity appears in video segment 5 (Lesson Closure). The students used the information from their graphic organizers to write the paragraphs (also included here).

The student work included in the *Lesson Closure* section is from the following students:

Anna B.
Fernanda
Alvin

The pilgrims and the Jews are alike and different. The difference between Jews and Pilgrims are that Jews were kind of hunted, and pilgrims weren't. The similar thing between pilgrims and Jews are they both became immigrants insearch of better life. The Jews went to America for a better life. The pilgrims discover the world and found America, some wanted a better life. I read that Pilgrims kind was called "Dutch". I also read that Jews kind were called "Jewish people. The Jews and pilgrims lived totally different lifes. Even though Jews and pilgrims live totally different lifes they still are similar and different.

How Pilgrims and Jews are alike and different.

The pilgrims and the Jews wanted to pray in their own way. They both decided to leave England and find a new home. To buy all of these supplies, and to hire a ship for the long voyage, would cost a tremendous amount of money both pilgrims and Jews needed money. Pilgrims sailed across the ocean, but Jews went into hiding. All you need to know about how pilgrims and Jew are alike and different.

Alvin Chapman 11/26/12 #3 ELA

Pilgrime and Jew are similer in some ways cause they both move to Holland. Pilgrim are real people who lived long ago. Some Jew's went to Holland because Nazi's were taking over Germany. Jew's needed money.food. jobs, and supplies. Some Jew's were trying to get gone before the Nazi's got them. The Pilgrim's had a ship named the Mayflower to get them to Holland.

Preparing New Teachers for Common Core
5th grade ELA: Ms. Schrimsher
Teacher Reflection

1. What strengths do you see in the lesson?

This lesson was able to incorporate multiple informational texts to compare and contrast two significant points in world history. Students were asked to interact with texts in different ways (responding to AF's diary quotes, annotate texts, sort main ideas and details from multiple texts).

2. Can you explain how you developed a culture of sharing and risk-taking in the classroom?

The culture of our school (clear expectations around our treatment of peers and the learning environment) naturally allows my classroom to be a "safe zone" for learning. In addition, I protect thinking time by not allowing students to "opt out" of answering a question or contributing to a group/class discussion. I want to provide an atmosphere where everyone's input is valued and where there is a place in the lesson for students to think then share.

3. What opportunities do you see to share best practices with pre-service teachers?

Pre-service teachers will have the opportunity to see a lesson that has so many critical components in action (activation, I do/we do/you do, student reflection, etc).

4. Do you see any missed opportunities that you would want pre-service teachers of which to be aware?

However, I would love for pre-service teachers to see the guided reading teaching that went into place to get these readers to this point. Learning to annotate text and compare/contrast two texts were both taught in small groups with leveled readers. The learners were "set up" to be successful at this task.

5. What data do you use to determine grouping in your classroom?

To group my students, I initially used Reading A to Z fluency assessment (with comprehension checks). Then groups are more solidified as we start to receive more baseline data from our school-wide MAP testing. However, groups remain fluid, and students move between groups as needs change.

6. How have you used the TEAM rubrics to improve your practice?

The TEAM rubric has made me more aware of important components of my teaching. As I have used the rubric for a longer period of time, so many of the expectations have become a part of my "teacher thinking." I'm learning to use them automatically, instead of always having to think, "Oh, I need to add this, this, and this." However, I am very realistic with myself. I will never teach a lesson in which I would be able to tick off every point in all the five boxes. I just use the expectations of the rubric to provide a frame for what I should expect of myself and students during the course of our learning.

Preparing New Teachers for Common Core
5th Grade ELA: Ms. Schrimsher
Viewing Guide—Before Viewing the Lesson

Discussion Points	Focus
• At the beginning of the video, Ms. Schrimsher will describe the range of readers in her class. What implications for planning does this range of readers pose for Ms. Schrimsher?	Planning
• Ms. Schrimsher will also mention the number of students within her class who have recently exited an ELL program. What does that mean? How might this affect Ms. Schrimsher's instruction?	Professional Knowledge
• Ms. Schrimsher will discuss the importance of modeling for the students. What is modeling? How important is it to incorporate modeling into instruction?	Planning

Activity	Focus
• Imagine you are teaching a reading class similar to Ms. Schrimsher's. In your class, you have 3 ESL students and students who range in reading levels from 1st to 7th grade. You are planning to teach a lesson on determining two or more main ideas in a reading passage and how those main ideas are supported by key details. Brainstorm some ways you might help your ESL students and students with lower reading levels access the content. Consider what skills students should demonstrate to show mastery of this standard. What will they already need to know and be able to do in order to be successful in this lesson?	Planning
• Using the same goal of determining two or more main ideas, write out the steps you would take to model this skill to your students.	ELA Content

Preparing New Teachers for Common Core
5th Grade ELA: Ms. Schrimsher
Viewing Guide—During the Lesson

The following discussion questions and activities will guide the viewing of the video lesson.

Video Segment 1—Framing the Lesson

Discussion Points	Focus
• What evidence do you see that students have been trained to do "think time?"	Strategies
• How does Ms. Schrimsher activate prior vocabulary? What Language CCSS does this address?	Planning
• Why does Ms. Schrimsher have students share their ideas with their table groups? Are there Common Core Anchor Standards that support this activity? Who benefits from this share time?	Strategies
• What is silent discussion? Identify the steps involved in this activity. How is it building reading and writing skills for the students?	Strategies

Preparing New Teachers for Common Core
5th Grade ELA: Ms. Schrimsher
Viewing Guide—During the Lesson

Video Segment 1—Framing the Lesson

Activities	Focus
• Discuss in small groups: Ms. Schrimsher uses a strategy she calls silent discussion. How does this strategy activate background knowledge? Brainstorm some other ways you could engage the students in activating background knowledge while answering questions grounded in text.	Strategies
• Consider this Anchor Standard for Speaking and Listening: *Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.* How well are Ms. Schrimsher's students accustomed to doing this? How can you tell? Map out a plan to lay the groundwork for this skill in a classroom.	ELA Content
• What academic vocabulary words will students need to know to be successful in this lesson? (Consider the words Ms. Schrimsher uses as she asks questions, gives directions, etc. These are not the content vocabulary words, such as "persecution," but the academic words, such as "fact.") How could you address the following standard as you prepare students for this lesson? *CCSS.ELA-Literacy.L.5.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).*	Planning

Preparing New Teachers for Common Core
5th Grade ELA: Ms. Schrimsher
Viewing Guide—During the Lesson

Video Segment 2—The Task

Discussion Points	Focus
• How does Ms. Schrimsher establish a purpose for reading? In terms of engagement and comprehension, how important is this step?	Strategies
• How does Ms. Schrimsher explain the difference between CCSS instruction and instruction with the traditional standards? According to Ms. Schrimsher, what opportunities does CCSS instruction provide that the former standards did not?	Planning
• How does Ms. Schrimsher model her expectations when she is at the document camera?	Strategies
• Does Ms. Schrimsher give appropriate time to the modeling portion of this activity? Is it too much or not enough? Why? What student indicators prove that they are ready to do this task on their own?	Strategies

Preparing New Teachers for Common Core
5th Grade ELA: Ms. Schrimsher
Viewing Guide—During the Lesson

Video Segment 2—The Task

Activities	Focus
• Ms. Schrimsher gives all the directions for this task verbally. Review this portion of the lesson again and write out the directions for this task. Why would it be helpful for these directions to be in written form as well? How would the written form of directions meet the needs of more learners? Are there other ways Ms. Schrimsher could have delivered the directions to assure that every student understands them?	Planning
• Discuss in small groups: Ms. Schrimsher speaks of the importance of text selection. Go through the steps of selecting an appropriate informational text within a literature unit. You may incorporate Ms. Schrimsher's suggestions, but add your own. Identify the literature unit's title or focus, and justify your choice of informational text. Why this text? What will this text add to overall understanding of the literature or mastery of content standards?	ELA Content
• Discuss in small groups: Consider the Common Core Reading Anchor standard below: *CCSS.ELA-Literacy.CCRA.R.1 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.* Describe three additional ways that Ms. Schrimsher could address this anchor standard.	ELA Content

Preparing New Teachers for Common Core
5th Grade ELA: Ms. Schrimsher
Viewing Guide—During the Lesson

Video Segment 3—Guided Practice

Discussion Points	Focus
• There are several ways that teachers can scaffold instruction for students, such as modeling, offering support through teacher interaction, asking effective questions, and engaging students in providing feedback. How does Ms. Schrimsher scaffold the paragraph assignment?	Strategies
• Consider this Common Core Writing Anchor Standard: *CCSS.ELA-Literacy.CCRA.W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.* In what specific ways does Ms. Schrimsher address this standard during guided practice?	ELA Content

Activities	Focus
• In CCSS instruction, text evidence is a key instructional shift. How does Ms. Schrimsher incorporate this shift through the use of the graphic organizer? Do you believe this activity is effective? What evidence can you point to that would support your opinion? Brainstorm other ways that you could encourage students to base their answers in the text you are using considering this standard: *CCSS.ELA-Literacy.W.5.2b Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.*	Planning
• Read the text *A Real Education in Money* included in the **Student Handout Section A.4**. On your own, write 3 text-based questions that correspond to that text. Then, trade with a partner and answer each other's questions. After answering, look at the responses your partner gave. Are they what you anticipated them to be? How could you revise the question to get the answers you anticipated?	ELA Content

Preparing New Teachers for Common Core
5th Grade ELA: Ms. Schrimsher
Viewing Guide—During the Lesson

Video Segment 4—Independent Practice

Discussion Points	Focus
• How does Ms. Schrimsher's academic feedback guide the students toward defending their answers with text evidence?	Strategies
• How does Ms. Schrimsher communicate her expectations on the paragraph assignment?	Strategies

Activities	Focus
• In the **Student Handout section A.5-A.6**, there are two examples of graphic organizers and paragraphs from the same students. Analyze the student work from the graphic organizer to the paragraph phase and comment on how well the students incorporate the ideas from the graphic organizers into their paragraphs. Based on what you see in the paragraph, does this graphic organizer aid the student in completing this assignment?	Assessment
• Using the rubric that is included in the **Student Handout section A.7**, assign a grade to the student paragraphs. Assess these paragraphs as if you were the teacher. Mark on the student work, make notes in the margin, circle, or underline the things that you would want your students to pay attention to. Compare your notes and the grade that you assigned with a peer. Discuss any similarities or differences you see.	Assessment
• Most classrooms have students with varying levels of academic achievement, as does Ms. Schrimsher's. Implemented well, CCSS requires that students "read widely and deeply from among a broad range of high-quality, increasingly challenging literary and informational texts." In a small group, suggest ways that Ms. Schrimsher could differentiate the assigned independent practice for students who need academic challenge.	Strategies

Preparing New Teachers for Common Core
5th Grade ELA: Ms. Schrimsher
Viewing Guide—During the Lesson

Video Segment 5—Lesson Closure

Discussion Points	Focus
• What is the value of the exit ticket activity? What does this activity give the students time to do? How could Ms. Schrimsher use the information on the exit ticket?	Strategies
• What Writing CCSS does Ms. Schrimsher incorporate into her homework assignment?	Planning

Activity	Focus
• In her reflection at the end of the lesson, Ms. Schrimsher discusses her opening activity "Responding to Anne's Quotes." She says it "was a bit of a stretch for the students." Brainstorm some ways that she could have scaffolded this activity. Consider Ms. Schrimsher's opinion that the students "rose to the occasion." Do you agree or disagree? Why or why not?	Strategies
• Examine the exit ticket Ms. Schrimsher has her students complete. Evaluate the effectiveness of this particular tool. What revisions would you suggest?	Planning

Preparing New Teachers for Common Core
5th Grade ELA: Ms. Schrimsher
Viewing Guide—After Viewing the Lesson

These activities are designed to guide students in the process of analyzing the lesson as a whole, synthesizing important elements, and creating products of their own.

Activity I (ELA Instructional Shifts)

One of the ELA Common Core shifts involves, "embedded literacy in history/social studies, science, and technical subjects to build knowledge through reading and writing" (ELA Shift Chart). Imagine that you are on a collaborative planning team. You are the ELA teacher working with a Social Studies teacher and a Science teacher. How could your team plan for and integrate these texts into a history or science lesson?

Activity II (Planning)

One of the most important elements of a well-executed lesson is a well-thought out plan. Review Ms. Schrimsher's lesson plan and the video segment entitled "Planning" and comment on the strengths of Ms. Schrimsher's overall plan. Consider her text selection, incorporation of CCSS Anchor Standards, distribution of resources, and classroom management. What steps do you think Ms. Schrimsher has taken to ensure that these elements work throughout her lesson? How do you think these elements work together to ensure student mastery of the skill?

Activity III (ELA Content)

Consider the following CCSS 5th Grade Writing Standard:

> CCSS.ELA-Literacy.W.5.3 Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

Use this standard to craft a learning target for a lesson that will be connected to this lesson on immigration.

Activity IV (Reflection)

If you were going to teach this lesson to your own class tomorrow, what changes could you make to improve the overall outcome of this lesson? Do you see any missed opportunities to incorporate other CCSS Anchor standards, instructional shifts, or strategies that would lead to better student outcomes? How would you refine this lesson to ensure a higher degree of student understanding and mastery?

Preparing New Teachers for Common Core
Implications for Teacher Preparation
What Have We Learned?

The Ayers Institute for Teacher Learning and Innovation has learned a variety of lessons through its engagement with the IHE Common Core Advisory Board and the creation of CCSS training and resources for teacher preparation. We will share four of these lessons as we believe these are ones that need consideration by all who prepare new teachers.

First, CCSS is impacting teacher preparation by bringing about the collaboration between arts and sciences and education faculty. While this may seem insignificant, it is one of the most important outcomes that can be realized through careful integration of the CCSS across teacher preparation programs. As education faculty know and understand the CCSS, they must work with the arts and sciences faculty to teach the components of the new standards within specific disciplines. For example, a typical math class for elementary teachers should now include specific modeling of how to set up a math task around various mathematical standards with attention to the practice standards. This will be most successful when education faculty and math faculty discuss the components of a healthy task and how to create small group instruction and questioning around the task to ensure student engagement from all levels of students. The math faculty can lend their expertise in how to scaffold the math concepts within this framework to maximize student understanding and connections to real life and other mathematical concepts.

Our team has discovered the phenomenal benefits of using video to enhance professional understanding and development. While we knew the benefits of video for modeling, we discovered the value of video for collaborative discussion to enhance group understanding of a CCSS element. For example, as we viewed the videos numerous times, we spent hours discussing how the teachers used the math practice standards within their lessons. We pinpointed exact moments when the teachers used “just right” questions to motivate students as we carefully monitored student non-verbal feedback and student work. We also witnessed both the art and science of teaching in each video and found ourselves able to “chunk” how the teacher set up each teaching moment to help students learn a math concept. Because we experienced, discussed, and even argued about teacher practice and student learning as a team (while focusing on the same video model), we came to better understand all elements of the CCSS along with the good, better, and best teacher practices that help students learn in authentic ways.

Also, the teachers we worked with for this project and the research we have done on CCSS have pushed us to think about “planning” in new ways. Teacher preparation programs are notorious for using and teaching from one lesson plan template. We do this for a variety of reasons, one of which is so we can have common understanding of the elements of a good lesson. While the components of a good lesson are generally the same (standards and objectives, set, presentation, closure, and assessment), we have seen the value of using lesson planning protocols and not

lesson planning templates as we work with the CCSS. Lesson planning, especially using CCSS, will require teachers to plan lessons that may potentially vary from a set template. For example, as a teacher plans a math lesson using a task, she needs to think through potential problems students may encounter as they initiate work on a task, questions that will help move students ahead if they get stuck, questions that will help advance their thinking if they move quickly through a task, and how to integrate the math practices throughout the lesson. These are elements that should be included in a lesson plan with prompts that help a teacher think about them as she plans. One such planning protocol is called *The Thinking through a Lesson Protocol* (TTLP) developed by Smith, Bill, and Hughes (2008). In this protocol, teachers are forced to think about the learner as the lesson is prepared, not just the teacher instruction. To refer an example lesson plan using this protocol, see Appendix D. We believe CCSS will assist us in rethinking how we teach planning and how we discuss planning for student learning, not just planning for teacher instruction.

Finally, we believe IHE's need to discuss CCSS integration within a larger context about teacher preparation reform. While Year One of our project has specifically focused on training and resource creation for teacher preparation around CCSS, we know that multiple aspects of teacher preparation must be addressed to adequately integrate the CCSS. For example, teachers must have significant content knowledge and the content pedagogy to teach the standards. We need to specifically review our teacher preparation programs to see if they adequately address content and content pedagogy to the level expected by CCSS. And, have we assessed our candidates with multiple measures to know whether they can teach CCSS at the various levels represented by their licensure grade span? In addition, while CCSS is addressing what we teach, are we integrating the importance of why we teach? Have we adequately taught and assessed our teacher candidates about their beliefs around children's ability to learn? Even if our teacher candidates know the CCSS extensively, they will only be successful if they believe they can impact student lives for the better through education or if they believe that all students can learn.

Preparing New Teachers for Common Core
Appendices

Appendix A: Student Handouts

Appendix B: Answers to Math Content Discussion Point and Activities

Appendix C: Shifts for Teacher Prep Practice

Appendix D: Example Lesson Plan following The Thinking Through a Lesson Protocol (TTLP)

Appendix E: Glossary

Preparing New Teachers for Common Core
Appendix A
Student Handouts

A.1 4th Grade Math: Mathematical Practices
A.2 5th Grade Math: Instructional Shifts
A.3 7th Grade Math: Assessing and Advancing Questioning
A.4 5th Grade ELA Text: *A Real Education in Money*
A.5 5th Grade ELA: Fernanda Garcia
A.6 5th Grade ELA: Anna B.
A.7 5th Grade ELA: Rubric

Preparing New Teachers for Common Core
Appendix A: Student Handouts
A.1 4th Grade Math: Mathematical Practices

In the chart below, first put the Mathematical Practice Standards into your own words, or give some example student behavior that would indicate incorporation of the standard.

CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them.
In your own words:
Time Stamps from 4th Grade Lesson:
CCSS.Math.Practice.MP2 Reason abstractly and quantitatively.
In your own words:
Time Stamps from 4th Grade Lesson:
CCSS.Math.Practice.MP3 Construct viable arguments and critique the reasoning of others.
In your own words:
Time Stamps from 4th Grade Lesson:
CCSS.Math.Practice.MP4 Model with mathematics.
In your own words:
Time Stamps from 4th Grade Lesson:

CCSS.Math.Practice.MP5 Use appropriate tools strategically.
In your own words:
Time Stamps from 4th Grade Lesson:
CCSS.Math.Practice.MP6 Attend to precision.
In your own words:
Time Stamps from 4th Grade Lesson:
CCSS.Math.Practice.MP7 Look for and make use of structure.
In your own words:
Time Stamps from 4th Grade Lesson:
CCSS.Math.Practice.MP8 Look for and express regularity in repeated reasoning.
In your own words:
Time Stamps from 4th Grade Lesson:

Preparing New Teachers for Common Core
Appendix A: Student Handouts
A.2 5th Grade Math: Instructional Shifts

Use the chart below to identify the instructional shifts that Mr. Eller explains in his opening interview. In the box next to the shift, describe that shift, and then use the next box to record evidence of that shift within Mr. Eller's lesson.

Instructional Shift	Description/Paraphrase	Evidence of shift from lesson
1.		
2.		

Preparing New Teachers for Common Core
Appendix A: Student Handout
A.3 7th Grade Math: Assessing and Advancing Questioning

Use the following chart to record as many questions as possible from Ms. Boyd's lesson. After you record the question, decide whether the question is an assessing question or an advancing question.

To help you categorize the questions, use descriptions:

Assessing questions scaffold instruction for students who are "stuck" during the lesson and give the teacher an indication of student understanding.

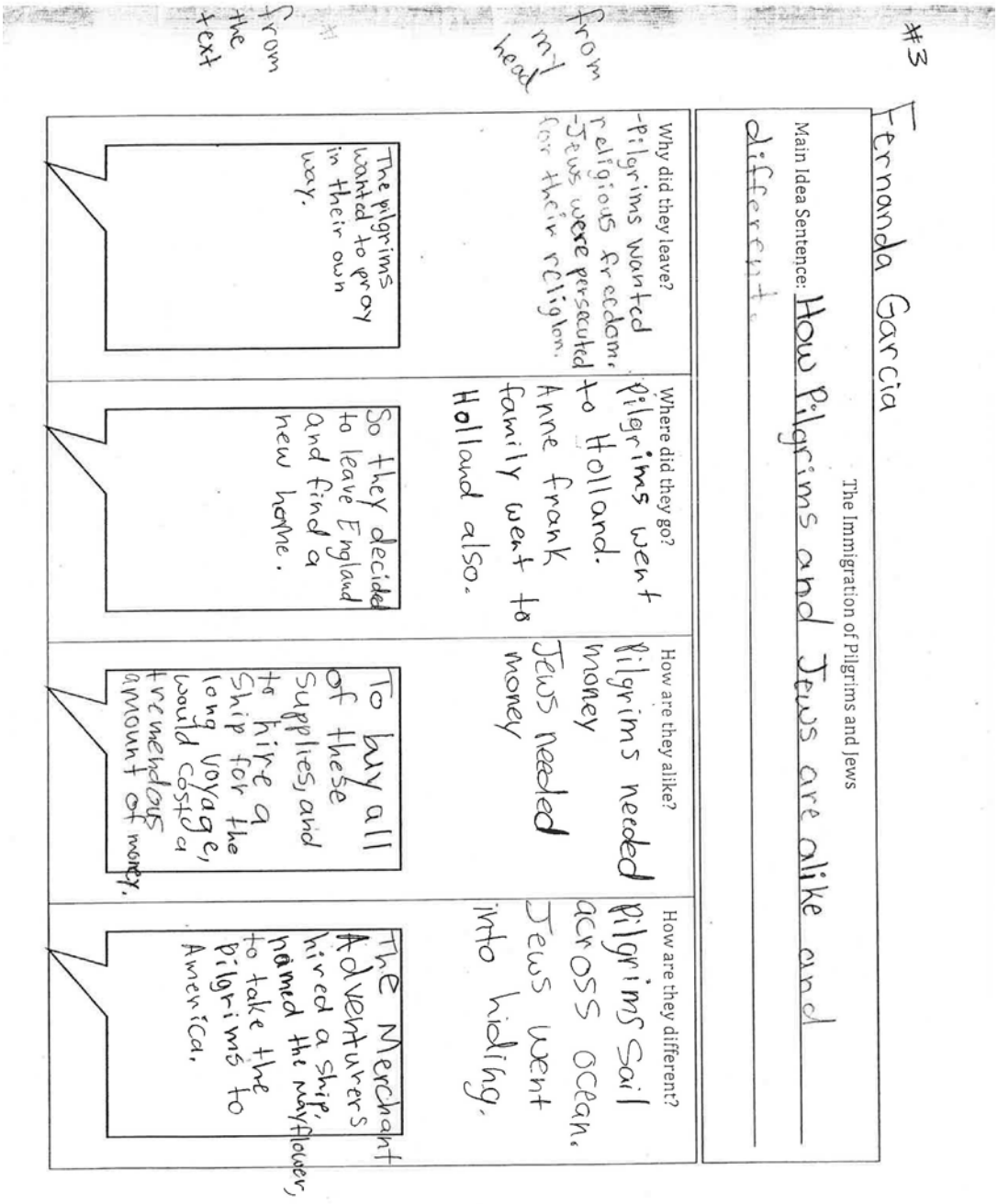
Advancing questions further learning for students who are ready to advance beyond the learning target.

Questions Ms. Boyd asks:	Assessing	Advancing

Preparing New Teachers for Common Core
Appendix A: Student Handouts
A.4 5th Grade ELA Text: *A Real Education in Money*

Boynton, A., & Blevins, W. (2007). *Navigating nonfiction*. (p. 65). New York: Scholastic.

Preparing New Teachers for Common Core
Appendix A: Student Handouts
A.5 5th Grade ELA: Fernanda Garcia



#3

Fernanda Garcia

The Immigration of Pilgrims and Jews

Main Idea Sentence: How Pilgrims and Jews are alike and different

Why did they leave?	Where did they go?	How are they alike?	How are they different?
-Pilgrims wanted religious freedom. -Jews were persecuted for their religion.	Pilgrims went to Holland. Anne frank family went to Holland also.	Pilgrims needed money Jews needed money	Pilgrims Sail across ocean. Jews went into hiding.
The pilgrims wanted to pray in their own way.	So they decided to leave England and find a new home.	To buy all of these supplies and to hire a Ship for the long voyage, would cost a tremendous amount of money.	The Merchant Adventurers hired a ship, named the mayflower, to take the pilgrims to America.

from my head

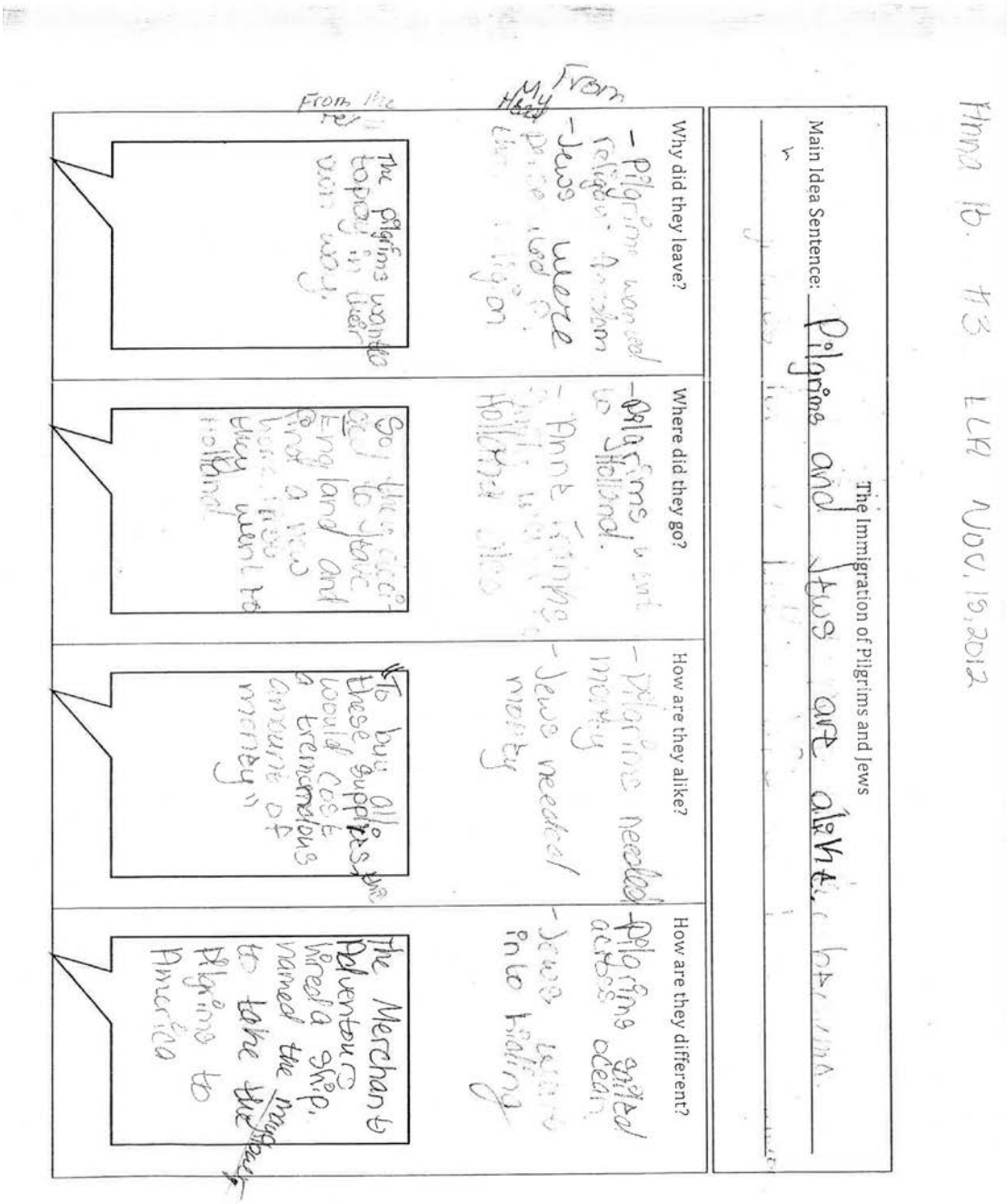
from the text

Preparing New Teachers for Common Core
Appendix A: Student Handouts
A.5 5th Grade ELA: Fernanda Garcia

How Pilgrims and Jews are alike and different.

The pilgrims and the Jews wanted to pray in their own way. They both decided to leave England and find a new home. To buy all of these supplies, and to hire a ship for the long voyage, would cost a tremendous amount of money both pilgrims and Jews needed money. Pilgrims sailed across the ocean, but Jews went into hiding. All you need to know about how pilgrims and Jew are alike and different.

Preparing New Teachers for Common Core
Appendix A: Student Handouts
A.6 5th Grade ELA: Anna B.



Anna B. #3 ELA Nov. 19, 2012

The Immigration of Pilgrims and Jews

Main Idea Sentence: Pilgrims and Jews are alike, but

Why did they leave?	Where did they go?	How are they alike?	How are they different?
- Pilgrims wanted religion freedom - Jews were poor and [illegible] religion From the Pilgrims wanted to topoy in their own way.	-Pilgrims went to Holland. - Anna [illegible] Holland also So they could go to Englan and find a new home they went to Holland	- Pilgrims needed money - Jews needed money To buy all these supplies would cost a tremendous amount of money	- Pilgrims sailed across ocean - Jews walked into Holland The Merchant Adventurers hired a ship, named the Mayflower to take the Pilgrims to America

Preparing New Teachers for Common Core
Appendix A: Student Handouts
A.6 5th Grade ELA: Anna B.

The pilgrims and the Jews are alike and different. The difference between Jews and Pilgrims are that Jews were kind of hunted, and pilgrims weren't. The similar thing between pilgrims and Jews are they both became immigrants insearch of better life. The Jews went to America for a better life. The pilgrims discover the world and found America, some wanted a better life. I read that Pilgrims kind was called "Dutch". I also read that Jews kind were called "Jewish people. The Jews and pilgrims lived totally different lifes. Even though Jews and pilgrims live totally different lifes they still are similar and different.

Preparing New Teachers for Common Core
Appendix A: Student Handouts
A.7 5th Grade ELA: Rubric

Name _____ Date _____ Cohort _____

Comparison Paragraph Rubric

Main Idea Sentence
- ☐ The main idea sentence clearly states the topic of the paragraph (3)
- ☐ The main idea sentence states the topic of the paragraph (2)
- ☐ The main idea sentence partially states the topic of the paragraph (1)

Supporting Details
- ☐ At least three relevant supporting details; no irrelevant details (3)
- ☐ At least two relevant supporting details; only one irrelevant detail (2)
- ☐ At least one relevant supporting details; two or more irrelevant details (1)

Quotes from the Text
- ☐ Includes two effective quotes from the text (3)
- ☐ Includes one effective quote from the text (2)
- ☐ Includes information from the text (1)

Conclusion Sentence
- ☐ The conclusion sentence restates the main idea using new words/phrases (3)
- ☐ The conclusion sentence restates the main idea (2)
- ☐ No clear concluding sentence (1)

Conventions
- ☐ No patterns of error (3)
- ☐ Patterns of error don't effect meaning (2)
- ☐ Patters of error effect meaning (1)

EXIT TICKET

1. Circle the skill that was easiest for you.

   main idea supporting details quotes from text compare/contrast

2. Circle the skill that was hardest for you.

   main idea supporting details quotes from text compare/contrast

3. How did the prewriting organizer help you write the paragraph?

4. How did the rubric help you write the paragraph?

5. Complete the face to represent how you feel about this lesson.

Preparing New Teachers for Common Core
Appendix B
Answers to Math Content Discussion Points and Activities

B.1 4th Grade Math: Content Activities for Video Segment 2—The Task
B.2 4th Grade Math: Math Content Activities for Video Segment 2—The Task
B.3 4th Grade Math: Math Content Activities for Video Segment 4—The Solutions
B.4 5th Grade Math: Mathematical Activities for Video Segment 2—The Task
B.5 5th Grade Math: Mathematical Activities for Video Segment 2—The Task
B.6 5th Grade Math: Mathematical Activities for Video Segment 2—The Task
B.7 7th Grade Math: Restrictions on Inequalities
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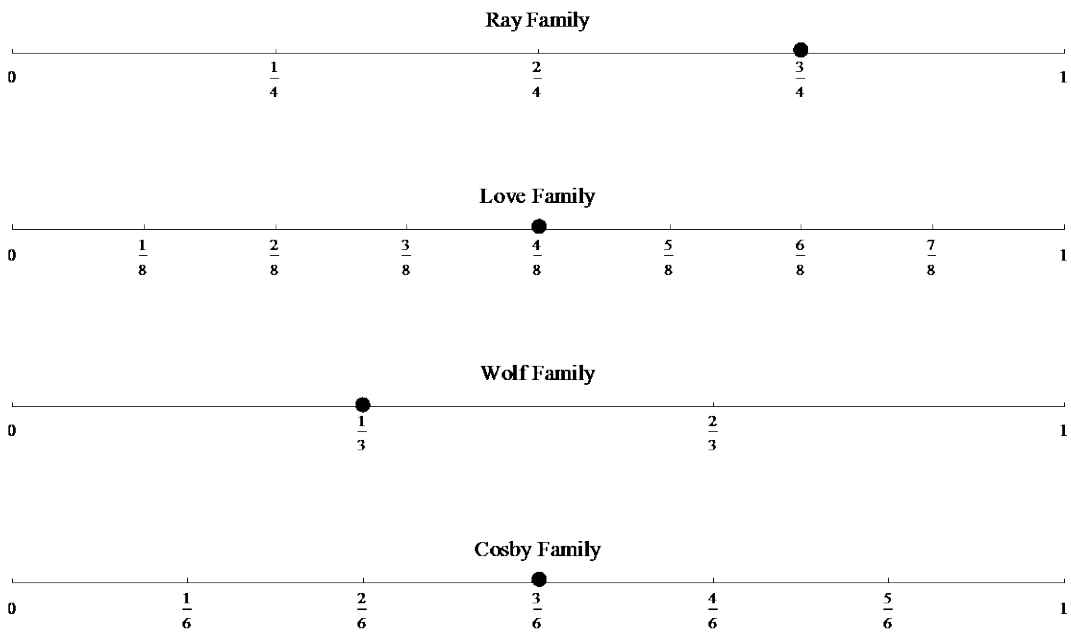
Appendix B: Answers to Math Content Discussion Points and Activities
B.1 4th Grade Math: Content Activities for Video Segment 2—The Task

Use number lines to compare the fractions of pie eaten by each family. You may use a single number line or multiple number lines. When using multiple number lines to compare fractions, what is important to keep the same?

Here we represent the points on multiple number lines. Notice that the 0s and the 1s of all the number lines line up vertically. When comparing fractions on different number lines, you must ensure that the units and the origins match before you can use the location for comparison.



To produce the number line to show the fraction $\frac{3}{6}$, we take the interval of length 1 and divide it into 6 equal length pieces. By definition each of the pieces is $\frac{1}{6}$ long. Starting from 0 we measure using multiples of this length.

Preparing New Teachers for Common Core
Appendix B: Answers to Math Content Discussion Points and Activities
B.2 4th Grade Math: Math Content Activities for Video Segment 2—The Task

Compare the fractions of pie eaten by each family by converting the fractions eaten to common denominators. Do it first for each pair of families and then find a common denominator that works for all 4 families.

Comparing the fraction of pie eaten by the Ray family with the fraction of pie eaten by the Love family we see that $\frac{3}{4} > \frac{4}{8}$. This can be computed either by replacing $\frac{3}{4}$ with the equivalent fraction $\frac{6}{8}$ or by replacing $\frac{4}{8}$ with the equivalent fraction $\frac{2}{4}$. In either case we end up with fractions with equal denominators. When fractions have equal denominators (the same "fractional unit"), and are fractions of the same whole, then the fractions may be compared by examining the numerators, so

$$\frac{6}{8} > \frac{4}{8} \text{ since } 6 > 4, \text{ or}$$
$$\frac{3}{4} > \frac{2}{4} \text{ since } 3 > 2.$$

Comparing the fraction of pie eaten by the Ray family with the fraction of pie eaten by the Wolf family, we see that $\frac{3}{4} > \frac{1}{3}$. This can be computed by replacing each fraction with an equivalent fraction with a denominator of 12. The fraction $\frac{3}{4}$ is equivalent to $\frac{9}{12}$ and the fraction $\frac{1}{3}$ is equivalent to $\frac{4}{12}$. When fractions have equal denominators (the same "fractional unit"), and are fractions of the same whole, then the fractions may be compared by examining the numerators, so

$$\frac{9}{12} > \frac{4}{12} \text{ since } 9 > 4.$$

Comparing the fraction of pie eaten by the Ray family with the fraction of pie eaten by the Colby family we see that $\frac{3}{4} > \frac{3}{6}$. This can be computed by replacing $\frac{3}{6}$ with the equivalent fraction $\frac{2}{4}$, or by replacing each fraction with an equivalent fraction with denominator 12. In either case we end up with fractions having equal denominators. When fractions have equal denominators (the same "fractional unit"), and are fractions of the same whole, then the fractions may be compared by examining the numerators, so

$$\frac{9}{12} > \frac{6}{12} \text{ since } 9 > 2, \text{ or}$$
$$\frac{3}{4} > \frac{2}{4} \text{ since } 3 > 2.$$

Comparing the fraction of pie eaten by the Love family with the fraction of pie eaten by the Wolf family, we see that $\frac{4}{8} > \frac{1}{3}$. This can be computed either by replacing $\frac{4}{8}$ with the equivalent fraction $\frac{3}{6}$ and the fraction $\frac{1}{3}$ with the equivalent fraction $\frac{2}{6}$, or by replacing each fraction with an equivalent fraction with a denominator of 24[1] (though this is not strictly a 4th grade standard given the remark in the Standards limiting the denominators in 4th grade to 1, 2, 3, 4, 5, 6, 8, 10, and 12). In either case, we end up with fractions having equal denominators. When fractions have equal denominators (the same "fractional unit"), and are fractions of the same whole, then the fractions may be compared by examining the numerators, so

$$\frac{12}{24} > \frac{8}{24} \text{ since } 12 > 8, \text{ or}$$
$$\frac{3}{6} > \frac{2}{6} \text{ since } 3 > 2.$$

We know that both the Love family and the Cosby family ate a fraction equivalent to $\frac{1}{2}$ of their pie. Thus, $\frac{4}{8} = \frac{3}{6}$.

Comparing the fraction of pie eaten by the Wolf family with the fraction of pie eaten by the Cosby family, we see that $\frac{3}{6} > \frac{1}{3}$. This can be computed by replacing $\frac{1}{3}$ with the equivalent fraction $\frac{2}{6}$. When fractions have equal denominators (the same "fractional unit"), and are fractions of the same whole, then the fractions may be compared by examining the numerators, so

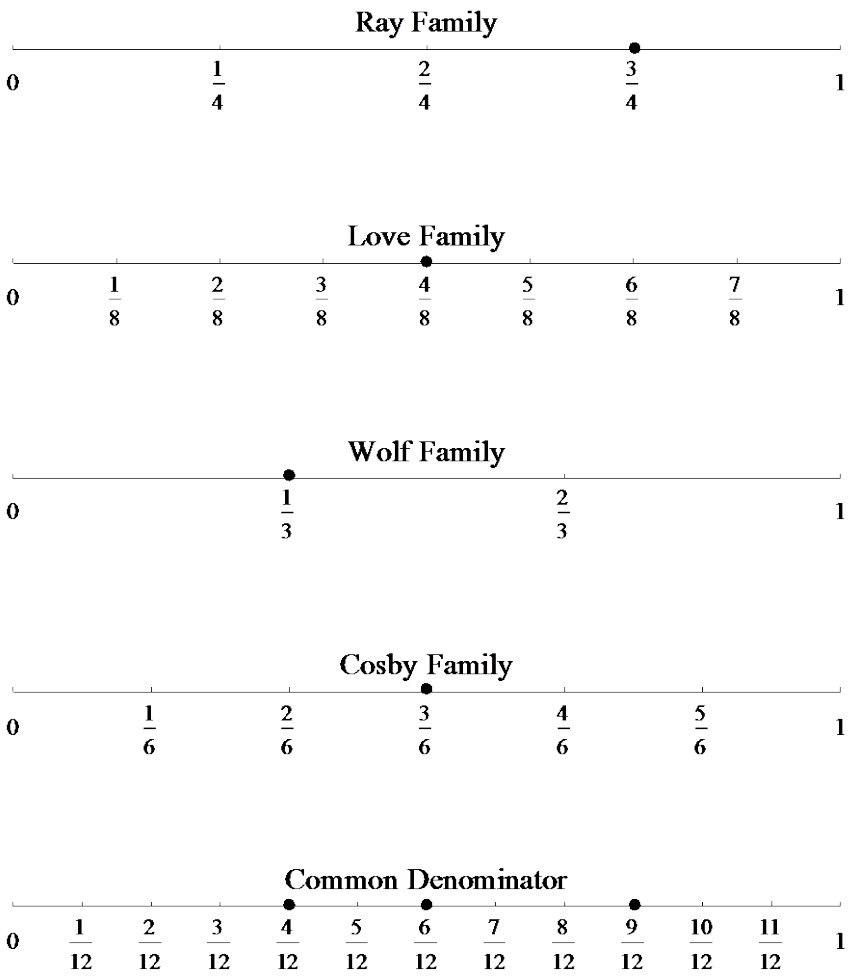
$$\frac{3}{6} > \frac{2}{6} \text{ since } 3 > 2.$$

Finally we may compare all the fractions by using the common denominator of 12

$$\frac{1}{3} = \frac{4}{12} < \frac{3}{6} = \frac{4}{8} = \frac{6}{12} < \frac{3}{4} = \frac{9}{12}.$$

[1] Denominator 12 also works but since it can only be used to represent even numbers of eighths it does not work in general Denominator 24 is the smallest that can be used to represent any number of thirds and eighths.

This is clearly illustrated on number lines below.



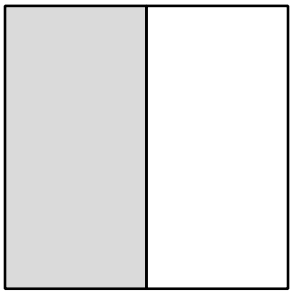
Notice that the fractions $\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, and $\frac{7}{8}$ do not correspond to fractions with a denominator of 12. To represent all the fractions with denominators 3, 4, 6, or 8 we would need to use a denominator of 24 (this may be done as an in-class exercise though the standards limit denominators to 3, 4, 5, 6, 8, 10, 12, and 100 so it is inappropriate for assessment).

Preparing New Teachers for Common Core
Appendix B: Answers to Math Content Discussion Points and Activities
B.3 4th Grade Math: Math Content Activities for Video Segment 4—The Solutions

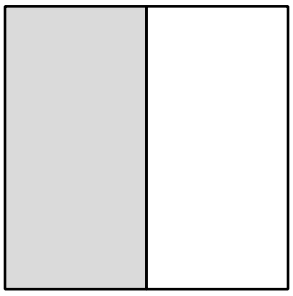
Use diagrams to illustrate the fraction equivalences and comparisons from the task.

We show that $\frac{1}{2} = \frac{3}{6} = \frac{4}{8}$ using both circles and rectangles. Using circles we have essentially one way of doing this

However there are two natural ways of drawing such diagrams using rectangles. One way uses subdivisions that run in the same direction as the subdivisions for the original fraction leading to diagrams that model the number line as follows



Another uses subdivisions that run perpendicular to the subdivisions for the original fraction.



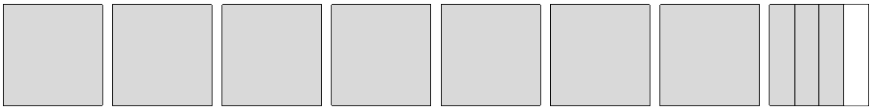
Diagrams of the second type as commonly used when introducing fraction multiplication.

Preparing New Teachers for Common Core
Appendix B: Answers to Math Content Discussion Points and Activities
B.4 5th Grade Math: Mathematical Activities for Video Segment 2—The Task

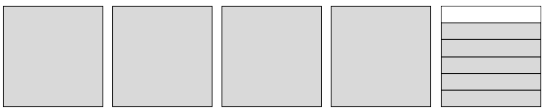
Illustrate graphically the subtraction 7 3/4 - 4 5/6.

First, we show the minuend and subtrahend

$7\frac{3}{4}$



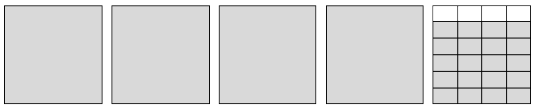
$4\frac{5}{6}$



Next, we use equivalent fractions to rewrite both fractions with a common denominator. We use the product of the denominators 20 rather than the least common denominator 24. It is easier to justify graphically.

$7\frac{18}{24}$

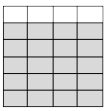
$4\frac{20}{24}$



Now, we subtract the whole number parts. We erase the same number of boxes from both minuend and subtrahend.

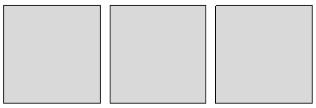
$3\frac{18}{24}$

$\frac{20}{24}$

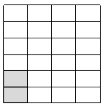


We do not have $\frac{20}{24}$ in the minuend to subtract. We can subtract only $\frac{18}{24}$,which leaves $\frac{2}{24}$ still to be subtracted.

3

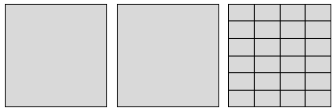


$\frac{2}{24}$

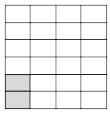


We must decompose one whole into $\frac{24}{24}$.

$2\frac{24}{24}$

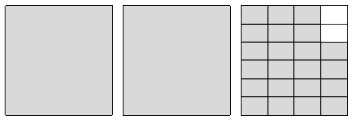


$\frac{2}{24}$



Now, we may complete the subtraction to give the final solution.

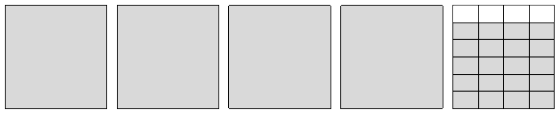
$2\frac{22}{24}$



The approach outlined here does not correspond directly to the algorithm (this approach works left to right while the standard algorithm works right to left). The standard algorithm would begin with the same conversion but looking at

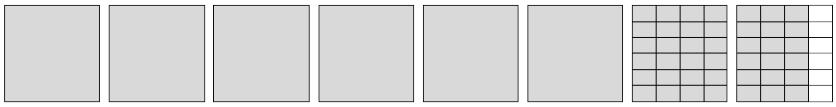
$7\frac{18}{24}$

$4\frac{20}{24}$

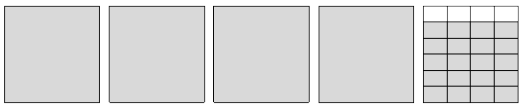


we would see that we do not have enough twenty-fourths in the minuend to subtract and so we would immediately decompose.

$6\frac{42}{24}$

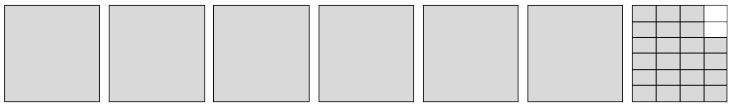


$4\frac{20}{24}$

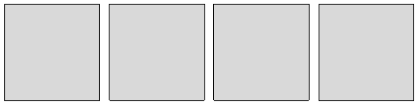


Now, we may subtract the fractional part of the subtrahend to get

$6\frac{22}{24}$

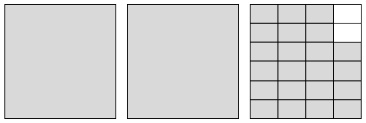


4

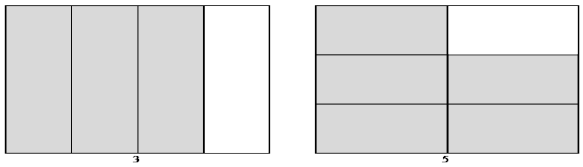


Lastly, we subtract the whole number portion of the minuend to obtain the same final answer.

$$2\frac{22}{24}$$

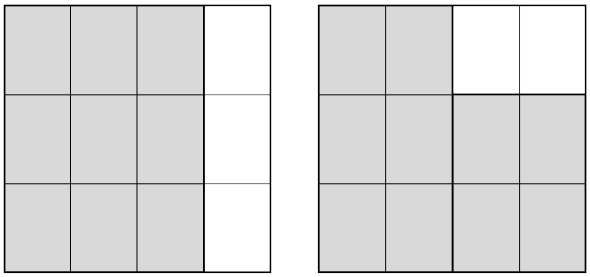


We worked throughout this with the product of the denominators. This naturally arises when you represent the two fractions using perpendicular divisions as above. It is possible, though perhaps not natural, to see that you may represent these fractions using twelfths rather than twenty-fourths. We illustrate that here. We know that the common factor in the two denominators is 2. We represent the fourths exactly as before but represent the sixths using a division into two parts along the same direction as for the fourths i.e.



$\frac{3}{4}$ $\frac{5}{6}$

Now, we need only to add three subdivisions to the fourths picture and two subdivisions to the sixths picture to obtain



$\frac{9}{12}$ $\frac{10}{12}$

Preparing New Teachers for Common Core
Appendix B: Answers to Math Content Discussion Points and Activities
B.5 5th Grade Math: Mathematical Activities for Video Segment 2—The Task

Describe two different algorithms for subtracting mixed numbers.

We consider the subtraction $7\frac{3}{4} - 4\frac{5}{6}$. Regardless of the algorithm that is to be followed we must first put the fractions over a common denominator. We may either use the least common multiple 12 or the product 24. We will choose to use the least common multiple 12 in this activity and rewrite the subtraction as

$$7\frac{9}{12} - 4\frac{10}{12}.$$

One possible algorithm follows the usual subtraction algorithm route with a different decomposing step. Since there is an insufficient number of twelfths in the minuend to allow us to subtract the fractional part of the subtrahend we must decompose a one from the minuend into twelve twelfths. We then have $\frac{12}{12} + \frac{9}{12} = \frac{21}{12}$ in the minuend. Hence we obtain the new subtraction

$$6\frac{21}{12} - 4\frac{10}{12} = 2\frac{11}{12}.$$

An alternative algorithm transforms both fractions into improper fractions.

$$7\frac{9}{12} = 7 \times \frac{12}{12} + \frac{9}{12},$$
$$= \frac{84}{12} + \frac{9}{12} = \frac{93}{12},$$

$$4\frac{10}{12} = 4 \times \frac{12}{12} + \frac{10}{12},$$
$$= \frac{48}{12} + \frac{10}{12} = \frac{58}{12}.$$

Now, we may subtract the numerators directly

$$\frac{93}{12} - \frac{58}{12} = \frac{35}{12} = 2\frac{11}{12}.$$

This algorithm works well for small mixed numbers, but becomes rapidly more inefficient as the size of the whole number part or the denominator increases.

Preparing New Teachers for Common Core
Appendix B: Answers to Math Content Discussion Points and Activities
B.6 5th Grade Math: Mathematical Activities for Video Segment 2—The Task

Tyler a baker, has 27 ½ lbs. of flour. It takes 2 1/3 lbs. of flour to bake a batch of bread rolls.

1. **How much flour would Tyler have after baking one batch of bread rolls?**
2. **How much flour would Tyler have after baking two batches of bread rolls?**
3. **How many full batches of rolls could Tyler make with his flour?**

The first subtraction does not require decomposing, merely passage to a common denominator. Computing

$$27\frac{1}{2} - 2\frac{1}{3} = 27\frac{3}{6} - 2\frac{2}{6} = 25\frac{1}{6}.$$

Tyler will have $25\frac{1}{6}$ lb of flour left after baking one batch of bread rolls.
The second subtraction requires an additional decomposing step. Computing

$$25\frac{1}{6} - 2\frac{1}{3} = 25\frac{1}{6} - 2\frac{2}{6} = 24\frac{7}{6} - 2\frac{2}{6} = 22\frac{5}{6}.$$

Tyler will have $22\frac{5}{6}$ lb of flour left after baking two batches of bread rolls.
The final part of the question is actually a 6th grade fraction division problem. However, division can be thought of as repeated subtraction. This works, but is very tedious. However, the subtraction may be simplified by noticing that it takes 7 lb of flour to bake 3 batches. Thus, we see it takes 21 lbs of flour to bake 9 batches. This reduces the question to how many batches can be baked with $6\frac{1}{2}$ lbs of flour. This can easily be done by repeated subtraction to reach the conclusion, that from $6\frac{1}{2}$ lbs of flour, Tyler can bake two full batches of bread rolls. This means that in total Tyler can bake 11 full batches of bread.
This can be related to division for advanced students.

$$27\frac{1}{2} \div 2\frac{1}{3} = 27\frac{1}{2} \div \frac{7}{3}$$

From this point, we may flip and multiply or write the dividend and divisor with a common denominator.

$$27\frac{1}{2} \div \frac{7}{3} = \frac{55}{2} \div \frac{7}{3} = \frac{165}{6} \div \frac{14}{6} = 165 \div 14 = 11\frac{11}{14}$$

This yields 11 full batches of bread. This division process eliminates fractions before the division step by writing both numbers in the same fractional units.
Preparing New Teachers for Common Core

Appendix B: Answers to Math Content Discussion Points and Activities
B.7 7th Grade Math: Restrictions on Inequalities

Question: What is the common core standard addressed by this lesson? What are the restrictions on the inequalities in this standard? How many different types of inequalities fit into this standard?

The standard is 7.EE.4b

> Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.

While the standard does not explicitly say so we can expect it to deal with 4 types of inequalities $px + q < r$, $px + q \leq r$, $px + q > r$, and $px + q \geq r$. The numbers p, q, and r are restricted to be rational.

When we are reading or writing word problems we need to keep in mind whether we have a *set model* problem, which involve a count of something, or a measurement model problem, which involves an infinitely divisible whole, e.g. heights, weights, times, areas, volumes, capacities etc.

Preparing New Teachers for Common Core
Appendix B: Answers to Math Content Discussion Points and Activities
B.8 7th Grade Math: Creating Challenging Problems to Advance Student Thinking

One of the standard problems with these longer tasks is that some students will finish too quickly. To engage and challenge these students, you need to prepare some higher level problems. There are some techniques that can be used to come up with this type of problem on the fly:

- What if I changed the problem to … ? Hopefully your change adds a wrinkle like a negative coefficient or a rational solution or changes the problem from a measurement model to a set model or vice versa and hence changes how the solution is interpreted.
- Give the student an inequality and ask them to write a word problem that has this as its solution.

However, the best challenge problems are planned in advance and will hopefully push the student just a little beyond the expectation of the standard. Looking at this standard I immediately though about inequalities of the form

$$a + bx > c + dx$$

together with its variants. These do not explicitly appear in the 7th grade standard but can be reduced to the inequalities that do appear in a single step.

Preparing New Teachers for Common Core
Appendix B: Answers to Math Content Discussion Points and Activities
B.9 7th Grade Math: Mathematical Activities for Video Segment 2—The Task

Question: Determine the inequalities associated with each of Mrs. Boyd's tasks and the type of model. Are all the types of inequalities represented?

Task 1: $16 + 6d > 40$ in a set model (if we think of a count of days – time can be measurement).
Task 2: $44 + 3m < 200$ in a measurement model (technically money is a set model, a count of pennies, but it is normally treated as being a measurement model).
Task 3: $205 + 7m \geq 450$ in a measurement model (technically money is a set model, a count of pennies, but it is normally treated as being a measurement model).
Task 4: $70 + 50h \leq 320$ in a measurement model (here it is certainly possible to drive part of an hour).

It would seem that we have represented all possible inequalities that this standard represents.

Preparing New Teachers for Common Core
Appendix B: Answers to Math Content Discussion Points and Activities
B.10 7th Grade Math: Mathematical Activities for Video Segment 2—The Task

Question: Rewrite Task 4 in a way that leads to a rational inequality exactly as above. What is your interpretation of the inequality in this case?

All of the questions are written in a way that leads naturally to a sum of parts being compared to a larger whole. Consider the following task similar to Task 2.

> After paying rent Ms. Miguez has $240 to spend on groceries for 4 weeks. She spends the same amount on groceries each week. She needs to have $64 left at the end of the month to pay her utility bill. How much money can she spend each week and still be within her budget?

What inequality is represented here? Rather than a sum of expenses this problem is phrased as money being spent. One natural way of writing this as an inequality is

$$240 - 4m \geq 64$$

where m is the amount spent on groceries per week. The amount $240 - 4m$ is the amount of money that Ms. Miguez has left at the end of the month. This is compared to the 64 exactly as in the problem. There are two ways of solving this inequality. One is to move the $4m$ to the other side to make it positive as shown here:

$$\begin{aligned} 240 - 4m &\geq 64 \\ 240 &\geq 64 + 4m \\ 176 &\geq 4m \\ 44 &\geq m \end{aligned}$$

Another method is to leave the m on the left-hand side and proceed exactly as for positive coefficients.

$$\begin{aligned} 240 - 4m &\geq 64 \\ -4m &\geq -176 \\ m &\leq 44 \end{aligned}$$

where we use that when we divide by a negative coefficient we must reverse the inequality. This situation is not seen if there are only ever positive coefficients.

Preparing New Teachers for Common Core
Appendix C
Shifts for Teacher Prep Practice

As CCSS instruction will bring shifts in classroom practice for the K-12 teachers we are training, CCSS implementation at the higher education level will necessitate shifts as well. The following descriptions and questions provide a framework for conversation around the requirements and implications of CCSS implementation at the higher education level.

Depth—this shift applies to the level of **content pedagogy** your course or program currently provides; it also applies to the variety of learning strategies, assessment strategies, and student engagement strategies your program currently provides, either in theory or modeled by instructors.

Essential Questions for Depth— Who is teaching content pedagogy? When is content pedagogy addressed through coursework, field experiences, or clinical placements? How do you know that current practices offer the appropriate depth of content pedagogy? How are you using standards to ensure the appropriate depth of content pedagogy?

Rigor—this shift refers to the specificity of **expectations** and the realistic assigning of grades; it could also apply to the **accountability** of instructors to ensure rigor through modeling intentional practices, such as planning and incorporating quality resources into everyday instruction.

Essential Questions for Rigor— How do you know what you are doing is rigorous? What examples can you provide to demonstrate that rigor is maintained from course to course? How do you know that each layer of your program maintains rigor through increasing expectations? What changes need to be made to ensure that all courses are appropriately rigorous?

Coherence—this shift refers to the **purposeful flow** apparent in your program from course to course; it also applies to the **relevance**, **timeliness** and **connection** of the clinical placements within your program.

Essential Questions for Coherence— How do you ensure increasing levels of student competency in the essential skills of teaching and learning? Do these essential skills spiral throughout your program? Consider the following: content pedagogy, content knowledge, professional knowledge, development stages and learning theory, technology, classroom management.

Focus—this shift refers to the need to **recruit** and **select** only those aspiring teachers who possess the talent and tangible characteristics that will lead to a successful teacher career; it also refers to the need to focus on the essential competencies that result in prepared teachers.

Essential Questions for Focus— Have you defined what a 1st year teacher should know and be able to do? How do you know that you are recruiting and accepting the kind of aspiring teachers who fit this profile? How do you know you are offering the courses these aspiring teachers need to be successful? Has your program defined its selection and recruitment criteria?

Preparing New Teachers for Common Core
Appendix D
Example Lesson Plan following TTLP

Lesson Planning: 8th Grade Unit on Functions
Tiling a Patio Task

Part 1: Selecting and Setting Up a Mathematical Task
What are your mathematical goals for the lesson (i.e., what do you want students to know and understand about mathematics as result of the lesson)?

Goals:
Students will demonstrate an understanding of the following three mathematical ideas:

1. That linear functions grow at a constant rate
2. That there are different but equivalent ways of writing an explicit rule that defines the relationship between two variables
3. That the rate of change of a linear function can be highlighted in different representational forms: the successive difference in a table of (x,y) values in which values for x increase by 1, as the m value in the equation $y=mx+b$, and as the slope of the function when graphed

In what ways does the task build on students' previous knowledge, life experiences, and culture? What definitions, concepts, or ideas do students need to know to begin to work on the task? What questions will you ask to help students access their prior knowledge and relevant life and cultural experiences?

Set/Background Knowledge:
Vocabulary:

1. Linear function: f(x)=2x+1
2. Constant rate: change at even intervals
3. Variable: unknown, can change

Will need to:

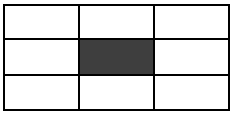
1. Describe what a patio is.
2. Describe tiles and a garden patio layout.
3. Describe the importance of purchasing the right number of tiles before starting the patio job.

Set/Initiating Activity:
Teacher will introduce goals written as student-friendly learning targets and then define some of the vocabulary used in goals. Then, teacher will share that she needs the class to help her friend,

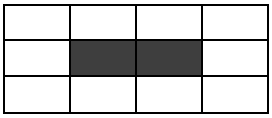
Alfredo Gomez, with a patio project he is doing. Teacher will pass out the patio task and read task aloud with students. Teacher will discuss patio, tiles, garden, etc. before "private think time" begins.

Task: (The Tiling a Patio task, adapted from Cuevas and Yeatts, 2005)

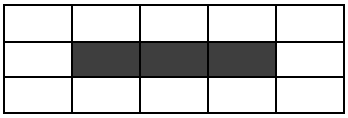
Alfredo Gomez is designing patios. Each patio has a rectangular garden area in the center. Alfredo uses black tiles to represent the soil of the garden. Around each garden, he designs a border of white tiles. The pictures shown below shows the three smallest patios that he can design with black tiles for the garden and white tiles for the border.



Patio 1



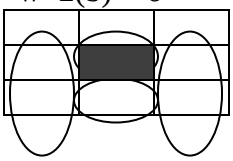
Patio 2



Patio 3

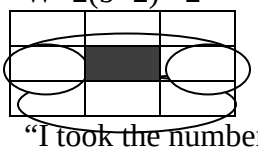
a. Draw patio 4 and 5. How many white tiles are in patio 4? Patio 5?
b. Make some observations about the patios that could help you describe larger patios.
c. Describe a method for finding the total number of white tiles needed for patio 50 (without constructing it).
d. Write a rule that could be used to determine the number of white tiles needed for any patio. Explain how your rule relates to the visual representation of the patio.
e. Write a different rule that could be used to determine the number of white tiles needed for any patio. Explain how your rule relates to the visual representation of the patio.

What are all the ways the task can be solved?
Possible solution #1:
w=2(b) + 6



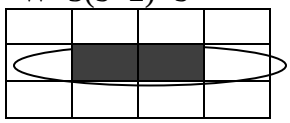
The “2 times the number of black tiles and the “plus 6”

Possible solution #2:
W=2(b+2) +2



“I took the number of black tiles and added 2, then took that times two to get the bottom and top rows. Then, I did plus 2 to get the two ends by the black tile.”

Possible solution #3:
W=3(b+2) -b



“There’s always going to be two more tiles than the black tiles in each row and there is always 3 rows. Then you have to subtract the black tiles to get only the white tiles for the patio.”

What particular challenges might the task present to struggling students or to students who are ELL? How will you address those challenges?

1. All students should have access to task
2. T. should read the task aloud and allow for questions to make sure students understand all parts of the task.
3. T. should allow students (independently) to engage in “private think time” and complete both a and b of the task. Students should be allowed to use any material (grid paper, colored pencils, tiles, calculators).
4. Then, during small group work, they can discuss their ideas and solutions with others.

What are your expectations for students as they work on and complete this task?

1. To use different approaches to complete a-e.
2. Students should be working together, explaining their thought processes, and questioning/critiquing others.

What resources or tools will students use in their work that will give them entry into, and help them reason through, the task?

1. Grid paper, colored pencils, small tiles or manipulatives, calculators

How will the students work? – independently, in small groups, or in pairs – to explore the task? How long will they work in each of these configurations? Will students be partnered in a specific way? If so, in what way?

1. Initially, independent during “private think time.”

2. Then, in small groups to complete a-e.

How will students record and report their work?

1. Record work on the patio task handout.
2. Report work in small group time and then in large group as solutions are discussed (on chart paper/white board).

Part 2: Supporting the Students' Exploration of the Task

Small group questions:

Questions to help a group get started or make progress on the task?
How can you begin converting your pictures in answers *a* and *b* to symbols or variables? Where could you start? What do you know about patios 1-5? Does anything stay the same? If so, what part? How would you represent this? Does anything change? If so, how does it change?

Questions to focus students' thinking on the key mathematical ideas?
What do you notice about the progression from patio 1 to patio 5? How does this "progression" look in patio 50?

Questions to assess students' understanding of key mathematical ideas, problem-solving strategies, or the representations?
How could I use patterns I have noticed to create a representation of how to find the number of white tiles for any patio?

Questions to advance students' understanding of the mathematical ideas?
How many different ways could I represent how to determine the number of white tiles in patio 50 using different equations?

Questions to encourage all students to share their thinking with others or to assess their understanding of their peers' ideas?
Is his/her (peer) thinking accurate? Does her/his explanation make sense with how you were finding the number of white tiles? What is different about his/her explanation? What do you have that is the same?

Student engagement in the task:

What assistance or questions will you ask with an easily frustrated group?
Where can you start? What tool(s) can you use to start? Let's draw patio ___ together? What patterns do you notice when you compare it to the other patio drawings?

What will you do if a group finishes the task immediately? How will you extend the task to provide challenge?

What other representational forms (ie: table, graph, equation) could be used to show rate of change in a linear function? Can you create another "tile" task in which the patio is in a different shape? How does it differ or look the same as the original patio problem?

What will you do with student(s) who spend majority of time on non-mathematical aspect of the task?
Prompt the student to move to symbol representation (not drawings) as quickly as possible.

Part 3: Sharing and Discussing the Task

What solution paths will you share? In what order? Why?
I will share the solution paths in the order as written above since it moves from fewest symbols/variables to most symbols/variables. I also believe students will most likely discover solution 1 before 2 and 3.

How will the order help develop students' understanding of the mathematical ideas that are the focus of the lesson?
The order of solution discovery is not entirely important to this task.

What questions will you ask to:

1. *Expand on, debate, and questions the solutions being shared?*
2. *Make connections among the different strategies being presented?*
3. *Look for patterns?*
4. *Begin to form generalizations?*

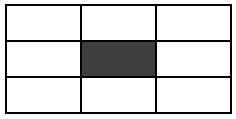
Can all three of the solutions we discovered be correct? How can you justify your answer? How would we graph these solutions? What would they look like in a table?

How will you know that all students in the class understand the mathematical ideas that you intend for them to learn?
Give each student another tile problem (slightly different look) to complete for homework. Or, have each student, write his/her answers or explanations to the tile problem done in class with reasoning (in words) for each solution.

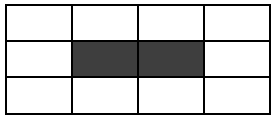
What will you do tomorrow that will build on this lesson?
Show the solutions in graph form and discuss the various representational forms that show rate of change in a linear function.

TASK:

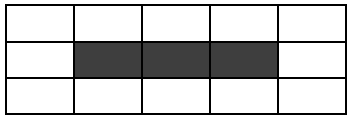
Alfredo Gomez is designing patios. Each patio has a rectangular garden area in the center. Alfredo uses black tiles to represent the soil of the garden. Around each garden, he designs a border of white tiles. The pictures shown below shows the three smallest patios that he can design with black tiles for the garden and white tiles for the border.



Patio 1



Patio 2



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Created by: The Ayers Institute for Teacher Learning & Innovation at Lipscomb University, 2012
Format used: *The Thinking Through a Lesson Protocol* (TTLP). (From Smith, Bill, and Hughes , 2008, p. 134)
Adapted from*: 5 Practices for Orchestrating Productive Mathematical Discussions*. (From NCTM/Smith & Stein, 2011)

Preparing New Teachers for Common Core
Appendix E
Glossary

1. Achievement—measures student performance at one point in time based on a defined level of proficiency using a standardized assessment, such as Tennessee Comprehensive Assessment Program (TCAP), End of Course (EOC) tests, ACT, etc.

2. Advanced—a performance level on the Tennessee Comprehensive Assessment Program (TCAP) test which indicates the student's performance demonstrates superior mastery and that the student is significantly prepared.

3. Advancing question—a question used by a teacher to further learning for students who are ready to advance beyond the learning target.

4. Assessing question—a question used by a teacher to offer support for students who are not mastering the learning goal, or to give the teacher an indication of student understanding.

5. Basic—a performance level on the Tennessee Comprehensive Assessment Program (TCAP) test which indicates the student's performance demonstrates mastery and that the student is well prepared.

6. Below Basic—a performance level on the Tennessee Comprehensive Assessment Program (TCAP) test which indicates the student's performance demonstrates partial mastery and that the student is minimally prepared.

7. Charter school—**a** primary or secondary school that is subject to some of the rules, regulations, and statutes that apply to other public schools, but generally have more flexibility than traditional public schools. A charter school is attended by choice.

8. Cohort—a group of students recorded as a set

9. Common Core State Standards (CCSS)—an initiative of the U.S. Department of Education, sponsored by the National Governors Association and the Council of Chief State School Officers, that seeks to bring diverse state curricula into alignment with each other through the adoption of a national set of college and career ready standards.

10. Conceptual fluency—the comprehension of mathematical concepts, operations, and relations, and skill in applying them flexibly, accurately, and efficiently.

11. Decompose—the process of separating numbers into their components (to divide a number into smaller parts).

12. Differentiation—the customizing of instruction through individualized content, process, or product that meets the individual learning needs of students.

13. Disaggregated—the presentation of data broken into segments of the student population instead of the entire enrollment so that stakeholders can monitor the progress of each student group.

14. ELA Anchor Standards—K–12 standards that define what students should understand and be able to do by the end of each grade in the following areas of literacy: reading, writing, speaking and listening, and language.

15. ELL—an acronym for English Language Learner, which refers to the intervention program available to any student whose native language is any other than English.

16. ESL—an acronym for English as a Second Language, which refers to the intervention program available to any student whose native language is any other than English.

17. Exit ticket—a reflection activity often used by teachers at the end of a lesson.

18. Gallery walk—a cooperative learning opportunity in which groups of students rotate around a classroom, composing answers and reflecting on the answers of other students.

19. Growth—measures student performance at one point in time based on a defined level of proficiency using a standardized assessment such as Tennessee Comprehensive Assessment Program (TCAP), End of Course (EOC) tests, ACT, etc.

20. Howard Gardner's Theory of Multiple Intelligences—a model of intelligence that differentiates intelligence into specific "modalities", rather than seeing it as dominated by a single general ability. These intelligences are arranged into the following eight categories: spatial, linguistic, logical-mathematical, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalistic. He later suggested that existential and moral intelligence may also be worthy of inclusion.

21. INVEST—the overarching label for the projects driven by the Ayers Institute for Teacher Learning and Innovation; these projects include higher education CCSS implementation, instructional coaching, and leadership.

22. Mathematical Practice Standards—practices that mathematics educators at all levels should seek to develop in their students; they represent overarching habits that a productive mathematical thinker should display.

23. Minuend—a quantity or number from which another is to be subtracted

24. Modeling—the act of a teacher or student serving as an example of a behavior that other students can emulate or learn from.

25. No Child Left Behind (NCLB) subgroups—federal legislation that identifies the student populations that are monitored for yearly progress. The subgroups are: students with disabilities, limited English proficient, economically disadvantaged, white, African American, Hispanic, Asian/Pacific Islander, American Indian/Alaskan Native, Multi-Racial/Multi-Ethnic. In order for a subgroup to report data, there must be 45 or more students who identify with the characteristics of that group.

26. Private think time—a specified amount of time during which students are given an opportunity to work on a task individually before student dialogue begins.

27. Procedural fluency—knowledge of procedures, specifically when and how to use procedures appropriately, and skill in performing them flexibly, accurately, and efficiently.

28. Proficient—a performance level on the Tennessee Comprehensive Assessment Program (TCAP) test which indicates the student's performance demonstrates mastery and that the student is well prepared.

29. Real-world task—a task which includes authentic materials and situations in order to build relevance and increase student engagement.

30. Scaffolding—offering instructional support for students through modeling, questioning, providing feedback, or breaking the task into manageable segments.

31. Solution path—a means of solving a problem or task

32. Subtrahend—the number that is to be subtracted from the minuend.

33. Tennessee Value Added Assessment System (TVAAS)—tracks student achievement from year to year on standardized assessments in order to determine the amount of learning growth students experience over time.

34. Title I school—a school that is eligible to receive funding through a federal program that provides financial support to local high-poverty schools to improve teaching and learning for the students in those schools.