ORGANIZING GIVEN INFORMATION: MINDMAPS, TIMELINES, INFOGRAPHICS

Information literacy curricula
Workshop number 3

Name of the institution: Privatna gimnazija i ekonomsko-informatička škola Futura s pravom javnosti

Date: October 2016

Goal of the workshop: The primary objective or purpose of the workshop is familiarizing with the ability to use information and ICT in learning, and the importance of information literacy for lifelong learning. The importance of using the visual information representation tools in everyday life and business will be presented through activities.

The specific objective of the workshop is helping students to realise the importance of evaluating and organizing information as steps prior to understanding and explaining reality, two necessary elements for rebuilding and modelling information and developing ideas. The workshop participants will get familiar with organizing data with visual data representation tools such as infographics, timelines and mind maps and realize their potential and influence and ways of implementation in everyday life, learning or business.

Learning outcomes: At the end of the lesson the student will be able to:

1. **The cognitive domain (knowledge-based):**
   - define mental maps, infographics and timelines
   - recognise the best type of visual representation tool for a specific topic
   - read and produce a mind map, timeline and infographics
   - understand the possible usage of visual representing tools in studying, lifelong learning and business

2. **The affective domain (emotive-based):**
   - reflect on the way they learn and how to improve it
   - devise a process of communication through collaborating on data visualisation projects
   - manage their own ways to effective creative information expressing and organizing and rise up self-esteem

3. **The psychomotor domain (action-based):**
   - organizing their thoughts in a way it best suits them, therefore get better learning results
   - read and create a mind map, timeline and infographics based on logically organised information
   - brainstorm new ideas using mind maps, infographics
   - make decisions, organise thoughts, take notes in meetings, or from printed material, present information

Teacher qualifications:

- general professional knowledge and skills (teaching, psychological development, sociological, legislative-legal).
- knowledge and use of the learning and teaching processes (cross-curricular and subject-planning, programming, learning and teaching focused on learning and student achievement).
- knowledge and application of new methods of learning and teaching (ICT), knowledge and application of methods of evaluation and self-evaluation.
- knowledge and application of organising and visual information representation methods and tools
- knowledge and application of mindmaping techniques and theory

Anticipated age of participants: Students approximately between the ages of 14 and 18.

Class methodology:

**Didactic type of class:** A class has the following structure:

- The students are asked about their own ideas about visualisation of information.
- The teacher explains the theory for all three topics of the workshop.
- The students work in a group. They first create a mind-map in the first part of the workshop, then a timeline in the second and in the third part of the workshop they create an infographic.
- Later, they present their work and analyse others, and a discussion is run with all the students about how it helped them to organise data and understand the connection between them. All creations will be critically reviewed.
- The students think of the lesson they participated in and how to use gained knowledge in their day-to-day life.
- The teacher summarises the content of the workshop.
- The workshop is evaluated using a Kahoot poll and by reviewing the created team products (mind maps, timelines and infographics).

Sociological form of class:

The teacher switches between explaining the content and giving examples and allowing the students to interact. Last activities are done in groups of five students and the teacher keeps track of the student's work. At the end students will show their results to the rest of the group and discuss.

Working methods:
- working in teams/groups
- debate and self-criticism,
- creative work,
- self-evaluation,
- peer-evaluation,
- use of ICT for demonstration and practice.

Class resources and supplies:

- Teacher's computer with Internet access and projector
- PowerPoint presentation
- Computers for students with Internet access to be able to use mind-map, timeline and infographic web based tools
- Paper, colouring pencils

Estimated cost: paper, colouring pencils

Time schedule: The estimated time for this workshop is 315 minutes and it is divided in three main workshop activities which can be conducted in three different lessons.

Courses: Due to the general nature of this workshop, it is useful for all subjects because they all deal with data that can be visualized thus helping students to learn.

Evaluation: During the workshop the teacher will see if the students reached learning outcomes in this workshop through the work they do in class, especially during practical activities. At the end students will take a Kahoot poll and evaluate the workshop. Also, there is attached rubric at the end of this file to help teacher evaluate general participation of students.

Literature:

For the students: None.

For the teachers:

- http://eprints.rclis.org/6717/3/EMPEUIcap2.pdf
- http://www.raco.cat/index.php/RevistaPedagogia/article/viewFile/252223/338592
- https://blocs.xtec.cat/estudivallbona/
- http://www.xtec.cat/iesbanus/Doss_Tecn_Estud2_ESO2011-12.doc

WORKSHOP ARTICULATION

INTRODUCTION:

Time: 15 min

Content: Introduction to data organizing and visual information representation

Goal: Students will discuss the importance of organizing given or found information in order to maintain their knowledge and learn more efficiently and get motivated to improve their data organising and maintaining skills.

Material: paper, pencil, colouring pencils, computer, LCD projector

Development: Students are divided into 3 groups. Challenge students to express their problems that occur when trying to memorize and connect data and information in a reasonable way while learning. For example, when they try to remember important dates for some historical events to see the connection or causes and consequences, or structuring a complex science class topic by describing and capturing their thoughts to simplify and easily remember the "big picture", or describe the difference and compare two or more things (planets and stars, different technologies, IOS and Android, etc.). Students will see what they have in common with others and it can be great conversation starter. It should create a need to find out the solution for their common problems and motivate them to watch the video and take notes.

DEVELOPMENT:

Time: 15 min

Content: Brainstorming – ask student to remain in same groups as in previous exercises and to talk about how they learn and organize the information given via a new learning material and write down the key activities during data organizing and learning. After a few minutes ask them to represent their examples and discuss the pros and cons of the most often methods they use.

The students should be asked about their opinion about the importance of proper data organization and communication of ideas with others. Ask them what kind of teaching materials they like the most and why. Why is visualisation of content useful and important?

Comment each answer.

Show the students the video explaining the learning process and usage of visuals in getting their full potential by using learning methods that use both sides of their brain in order to make connections and organise their thoughts, facts and knowledge.

https://www.youtube.com/watch?v=qIqkjH3iSQo (or use any that you find useful for this purpose)

Ask students if they already used any visual representation of organized information. Do they think they can be useful in learning or organizing given information? Now is the time to find out how.

Content:

Time: 270 min

VISUAL ORGANISING AND REPRESENTING INFORMATION

We all know the say "*A picture is worth a thousand words*". If we think of how we learn the fastest we remember that we are much more efficient when we replace a lot of text with notes, sketches, images, drawings and all kind of graphically represented and connected information. If you're looking for creative ways to visualize and represent them in paper and online, check out the following tools. Most have a digital version of creation tools that are free, web based, and relatively easy to use. Today we will focus on mindmaps, timelines and infographics. We will do it for several reasons. Along with them we can enlighten the mystery on how to

- organize given information and our thoughts
- discover cause-effect relations
- be able to remember and process data instead of only memorize them
- transmit/communicate a message or information
- present large amounts of information in a easy to understand way

1. MIND MAPS

"Mind Maps are the meta-language of the human race."

– Tony Buzan

A mind map is a diagram used to visually organize information. The technique of Mind Mapping was created by Tony Buzan and is one of the most widely used thinking tools around the world.

A Mind Map® is a visual thinking tool which maps out your thoughts and ideas in a brain-friendly way using the technique of radiant thinking. It combines colour, visual-spatial skills and imagination to trigger your brain to think more creatively, learn faster, remember more and communicate better.

Mind maps can be hand-drawn on paper or produced using mind mapping software applications.

You can benefit from Mind Maps to

- brainstorm ideas quickly and easily
- take fast and effective notes during classes or meetings
- make concise notes from printed material
- study better and remember more
- prepare and present information or ideas
- memorize facts more effectively and meaningfully

Mind Maps can be used for

- *thinking* (brainstorming, decision-making and project planning)
- learning (note-taking, note-making, studying)
- communication (presentations, meetings, speeches)

The best way to learn why and how to make a mind map is to hear it from his inventor, mr. Tony Buzan. Now we will learn the technique to build a map from start to finish and explore how to enhance our map for memorizing and learning. Watch the video that provides the explanation of the mind mapping process and the advices and take some notes.

How to mind map:

https://www.youtube.com/watch?v=wLWV0XN7K1g
https://www.youtube.com/watch?v=Ztjf8ksehvI

Rules for mind mapping:

https://www.youtube.com/watch?v=76Roy4E4ZbE

EXERCISE 1:

Students should now organize themselves in 3 teams and make a mind map on the content for a topic that will be provided to them in form of a printed text (teacher can choose a topic depending on his/her needs in class – for example: computer parts, classification of animal kingdom, blood types, global warming, human rights etc.). They will also get a printed guide *How to make a mind map*, a big piece of paper and some colouring pens. After making the mind maps, a team representative will hang it on the wall and explain the map. Then they will be given a mind map of the other team and using the guide *How to read Mind maps* try to read and explain it.
Finally, they will discuss the benefits of mind mapping in their tasks.

For this exercise attachment named "Exercise 1 materials" is prepared.

How to Make a Mind Map:

1. Take a blank piece of plain paper A4 size or bigger
2. Turn the paper landscape i.e., the long side of the paper at the top
3. Draw a coloured image in the centre of the paper. This central image represents the topic of the Mind Map®
   – use at least 3 colours in the image
4. Draw the main themes of the Mind Map® on thick branches radiating out from the central image
   – print the word in CAPITAL LETTERS
   – place the word on a line of the same length
   – make the central lines thick, curved and organic (like the branch of a tree attached to the trunk)
   – connected directly to the central image
5. Add other main theme branches around the map
6. Start to add a second level of thought. These words and/or images are linked to the main branch that triggered them – connecting lines are now thinner and words may be in lower case
7. Add a third or fourth level of thought as those thoughts come to you
8. Use images throughout your Mind Map®. Add an image to all the main branches to represent each key theme and also use images to visualise every important key word on your map. You can use:
   – pictures
   – line drawings
   – patterns
   – shapes
   – symbols
   – stick figures etc.
9. Add dimension to your Mind Map® by adding boxes and adding depth around the words and images
10. Use colours throughout the Mind Map®. Be as big, bold and imaginative as possible

(Mind Maps® is a registered trademark of The Buzan Organisation)

How to Read Mind Maps

On Mind Maps, ideas and thoughts are shown as coloured images and key words branching out from a central theme. One of the key benefits of Mind Maps® is that they help you to see how ideas link to each other as well as how they relate to the central theme. Have a look at the mind map provided.

1. Start in the centre – the image represents the theme/topic of the Mind Map®.

2. Select one of the main branches (thick curved line connected to the central image). This has a key word printed on it and represents an idea/thought that is linked to the main theme. Think of it as being like a chapter heading in a book.

3. Read out from the centre along the branch. These are second and third levels of thought with words and images that are associated with the main branch.

4. Continue reading around the Mind Map® until you have read and understand the whole map.

Digital mind-maping tools

The teacher should inform the students about various digital tools for creating effective mind maps and pick one of his/her own choice to demonstrate the easy procedure of digital mind-map creation.

EXERCISE 2:

After the demonstration students can try the below listed tools by transferring the mind-map they created on paper into a digital form and share it with classmates.

Here is a list of some most effective digital mind-maping tools used for education:

- **Mindmeister:** easy to use mind-mapping tool that lets you collaborate on creating and developing mind maps in real time. The "basic" version is free and just requires registration. (https://www.mindmeister.com)
- **Mindomo:** a very versatile tool that can be used to create a great variety of conceptual maps. Users need to register to save the results on a computer (https://www.mindomo.com)
- **Popplet**: a free online application that can be used to create mental maps and interactive diagrams, which may include images, text and videos, that can then be printed or inserted in a web page. Users need to register. (https://popplet.com)
- **Bubbl.us**: another free online application for creating mental maps that can then be printed or inserted in a web page. (https://bubbl.us)
- **Wikimindmap:** a very simple tool for creating conceptual maps based on words or expressions. Once we have entered a word or expression and chosen which engine will be used to establish the relationships (for example, Wikipedia in your own language), a map is generated with various terms related with the word or expression chosen. Clicking on any of them opens Wikipedia with information on the terms generated. (http://www.wikimindmap.org)
- **SpicyNodes:** a tool that enables creating interactive conceptual maps and diagrams with multimedia elements and links to external sites. (http://www.spicynodes.org)
- **WiseMapping:** a free online tool for creating mental maps. Registration is free and allows creating customised maps, collaboration, sharing, printing or exporting the maps. (http://www.wisemapping.com)
- **Mind42:** a quick and easy way of creating mental maps. This is a tool with a lot of advantages such as collaboration with other colleagues, as well as inserting text, links and images in the nodes. It requires registration. (https://mind42.com)

2. TIMELINES

EXERCISE 3:

On the main table there is one box/envelope for each group of students (5 per group). In the box they will find some pictures with date and info (Coca Cola bottles through history, cell-phones development, most important historic human inventions). The teacher could stretch a string between walls (or use a table or wall for hanging the photos) for each group and ask them to hang the pictures in date order from the oldest to the youngest. Ask them if they know why they are doing it? That is the result? A timeline!

For this exercise attachment named "Exercise 3 materials" is prepared.

Ask the students when have they mostly used them in school? Can they read them? Do they know what the acronyms mean? Wait for students to answer, comment each answer and give an example.

PRESENTATION:

A timeline is an actual picture of events that happened in history. The main function of a timeline is to visualize data over time. Whether you use them for educational purposes or business or to visualize historic events, time-related information can be presented as a list of data points with the distance between those points giving a visual hint on the time interval between events. Timelines actually are a way of displaying a list of events in chronological order. It is typically a graphic design showing a long bar labelled with dates alongside and (usually) events labelled on points where they would have happened. They are very often part of an infographic which we will discuss later.

Timelines can be linear or parallel (comparative). A linear timeline shows a picture of events as they occurred in a certain period of time. Use a linear timeline for one subject and time frame. A linear timeline can be written horizontally, vertically or curved. A parallel (comparative) timeline shows two or more subject areas which occurred at the same time and compares them so we can see the main difference. A comparative timeline might compare historical events in two or more countries or compare two or more subjects like software development, car releases or people's lives.
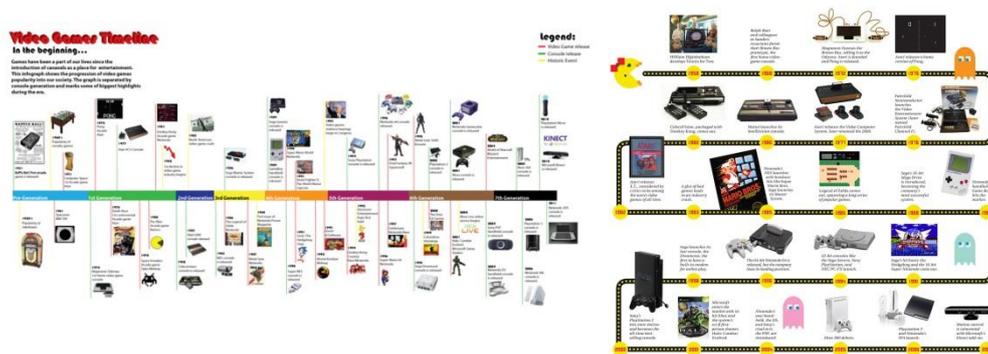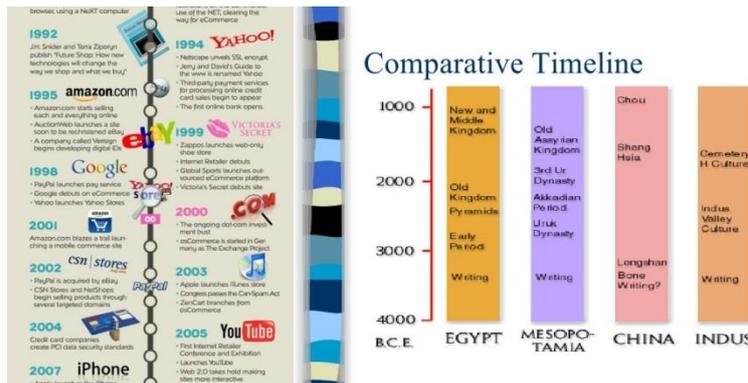
Timelines can be hand drawn or made by digital tools. There are many web based digital timeline creating tools available for teachers and students. Some of the most popular are:

- **Tiki-Toki**: a web-based software that allows creating a fully-functional interactive timelines and sharing them on the web. (http://www.tiki-toki.com/)
- **Timeglider**: a free web-based timeline software that enables creating, collaborating, and publishing zooming interactive timelines. (http://timeglider.com/)
- **Timetoast** : easy to use tool to create great interactive timelines . The website offers examples of popular timelines grouped into different categories. (http://www.timetoast.com/)
- **Timeline Js**: free web-based timeline tool that allows creating interactive timelines and sharing them on the web (http://timeline.knightlab.com/)
- **Capzles**: a nice web-based tool for creating rich multimedia timelines with photos, music, videos, documents and blogs (http://www.capzles.com/)
- **Ourstory**: allows writing stories, taging friends, and adding media to collaborative timelines privately or in public. (http://www.ourstory.com/)
- **Myhistro**: helps watching and reading historical timelines and creating dynamic timelines embedded with texts, videos and pictures. (http://www.myhistro.com/)

EXERCISE 4:

After the demonstration the students can try out the tools by transferring the timeline they created on a string, wall or table into a digital form and share it with classmates (photos and data should be delivered by the teacher in a digital form on a shared folder).

3. INFOGRAPHICS

Almost 10000 infographics are released daily online. Why? What are they? Although the number is huge, not all of them are designed as they should be.

Infographics are visual representations of information, data or knowledge. They are used where complex information needs to be explained simply, quickly and clearly. Human brain is able to consume visual content 60000 times faster than text! Photos are just not enough because they can't express statistical facts or numerical data or a concept. They use graphics such as in signs, maps, journals. Infographics are often used in ICT, mathematics, and statistics to ease the process of creating and communicating conceptual information.

An infographic is made of **universal** symbols, pictures, and data visualizations with short-form texts with a purpose to tell a story. They actually use visual elements such as signs, charts, maps, or diagrams to help us better understand a given text-based content. But if the main importance for understanding is based on the text besides graphics, we miss the key point.

The infographics can also be interactive meaning there is a possibility to click on some elements to gain additional information.

So what **should** be an infographics and how is it structured? It should tell the story and get the message, theme and point across even if we take away the textual data. As a matter of fact, not all infographics rely the data to tell the story. The main point and purpose of an infographics is to use symbols, illustrations and clean data visualisations to tell „a story". Also, infographics are not made to be just good looking. They need to deliver a clear message of the data in a concise way.

What makes the **bad infographics**? First of all, too much data because it draws away the focus from what is important and the key point. Graphs are usually created wrong specially when they are combined. They are often to complex and that lack of simplicity makes them hard to read.

A **good infographic** uses pictures, graphics, symbols and icons without overloading it with text or details. They are simple and easy readable. It should focus on the main message. It should be quickly readable to meet the possible average attention ratio. They use clean design with enough space between data. Colour scheme is also important and it should be simple. Saturation should be reduced on less important data and increased on most important ones. Typography is also important, as much as the font size (it represents the importance). The design should be consistent and in the relation with the subject. If the infographics is interactive the additional article should not repeat the information already given but serve supplemental ones.

EXERCISE 5:

The teacher should show the students some examples of infographics. Some of them are good and some badly designed. Student must judge them based on the previously defined criteria. The decisions must be argumented and discussed.

Here are some examples of bad and good designed infographics:
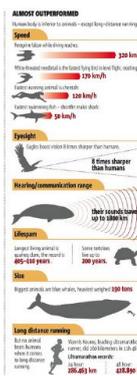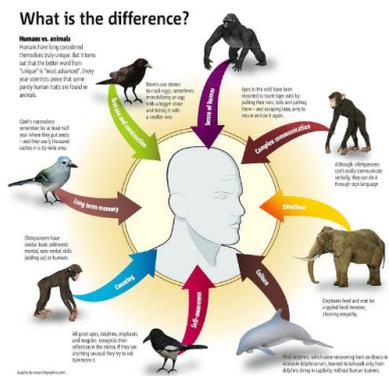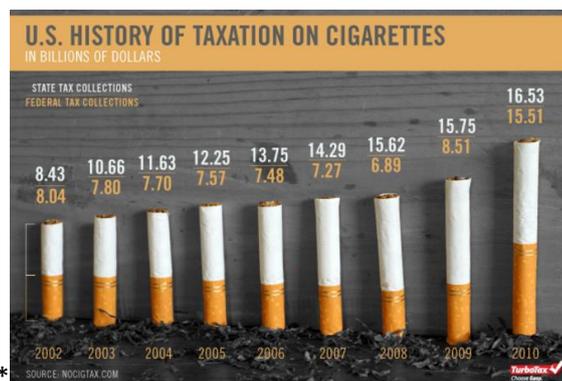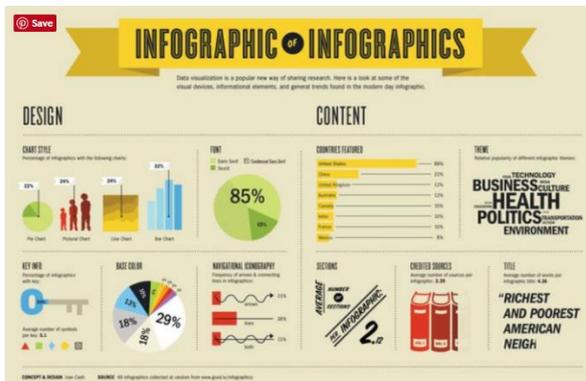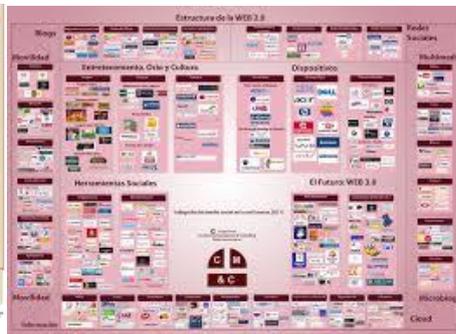
There are various types of infographics: statistically based, timeline based, process based, map or geography based.

There are a lot of web based free and commercial infographics creation tools, and a quite satisfying infographic templates you can use in PowerPoint. Here is a list of the most popular free web based tools used in education and business:

- **Piktochart**: an infographic and presentation tool enabling creating engaging infographics with just a few clicks. Its customizable editor lets us modify colour schemes and fonts, insert pre-loaded graphics and upload basic shapes and images. Its grid lined templates also make it easy to align graphical elements and resize images proportionally. There's a free version offering three basic themes, while a pro account costs $29 per month or $169 for a year. (https://piktochart.com/)
- **Canva Infographic Maker**: a powerful and easy-to-use online tool that's suitable for all manner of design tasks, from brochures to presentations and much more besides, with a vast library of images, icons, fonts and features to choose from. (https://www.canva.com/create/infographics/)
- **Vizualize**: a simple yet compelling personal visualisation tool with lot of possibilities (http://vizualize.me/)
- **Google Developers**: is the perfect infographic generator for websites, chart tools are powerful, simple to use, and free that has a variety of charts and configure an extensive set of options. (https://developers.google.com/chart/)
- **Easel.ly:** free web-based infographic tool offers a dozen free templates which are easily customisable.(https://www.easel.ly/)
- **Infogr.am:** a great free tool which offers access to a wide variety of graphs, charts and maps as well as the ability to upload pictures and videos to create cool infographics. (https://infogr.am/)
- **Venngage**: simple and easy to use. You can choose from templates, themes, and hundreds of charts and icons as well as uploading images and backgrounds, or customize a theme to suit the brand. You can animate them too! (https://venngage.com/)

EXERCISE 6:

After the presentation part, the workshop continues on computers. Teacher demonstrates one of the infographic creation tool, students register and prepare materials given by the teacher. The teachers should prepare materials or use the example material (for example, the difference between an African and Asian elephant, the left/right brain functions, evolution of Coca Cola bottle) or the students can choose their own topic they are interested in. Students will divide into teams. While creating the infographic they should take care of the main point and design rules. The infographics should be presented to others and best one can be chosen.

For this exercise attachment named "Exercise 6 materials" is prepared.

CONCLUSION:

Time: 15 min

Content:

The student reflect on the knowledge and skills they have gained. They analyse the benefits of tried visualisation tools may have in their learning and impact on their grades, skills, learning styles and work. They might write down the most important one and compare to others.

As final evaluation of the workshop students take **EVALUATION POLL** made in Kahoot online tool:

https://play.kahoot.it/#/k/e6c7f4c5-7add-46f8-babc-42506eb119ed

HOMEWORK ASSIGNMENT:

Students can make a small mind map on benefits of visualization tools.

The attitude and participation of the students can be evaluated with the following rubric:

EVALUATION WORKSHOP				
Level – Cycle:–	GROUP:		Age:	
EVALUATOR:			Date:	
ELEMENTS	NEEDS TO IMPROVE 1	SATISFACTORY 2	GOOD 3	EXCELLENT 4
ATTITUDE (25%)	Often has a negative attitude about the task.	Usually has a negative attitude about the task.	Often has a positive attitude about the task.	Always has a negative attitude about the task.
PARTICIPATION (25%)	Not engaged. Needs frequent reminders to stay on task, often not prepared.	Peripherally engaged and usually cooperative, respectful and prepared.	Actively engaged in partner and group work.\n\nGenerally cooperative, respectful and prepared.	Actively engaged and may take a leadership role.\n\nAlways cooperative, respectful and well prepared.
GIVING INSTRUCTIONS (25%)	Students give incorrect instructions	Some instructions are confusing	Instructions are quite clear	Instructions are very clear. There are extra clarification
RESPECT OTHER MEMBERS' IDEAS / DECISIONS (25%)	Verbally disparages ideas of other classmates, wants things his way.	Usually sides with a member who has ideas similar to his own.	Usually withholds disparaging remarks about the ideas of others; supports others' ideas.	Respects opinions of classmates, supports group decisions.

ATTACHMENTS:

- PowerPoint presentation "Organizing given information"
- attachment "Exercise 1 materials"
- attachment "Exercise 3 materials"
- attachment "Exercise 6 materials"