AFTERSCHOOL TRAINING TOOLKIT

Tutoring to Enhance Science Skills

Tutoring Three: Learning to Make Bar Graphs

Sample Data for a Bar Graph

Example 1: Pet Survey (GR 2–3)
Ms. Hubert's afterschool students took a survey of the 600 students at Morales Elementary School. Students were asked to select their favorite pet from a list of eight animal. Here are the results.

> Lizard 25, Dog 250, Cat 115, Bird 50, Guinea pig 30,
> Hamster 45, Fish 75, Ferret 10

Example 2: Bubble Sizes (GR 3–5)
One of Mr. Tongy's teams of students in an afterschool science class had the following bubble-sizes data in the Festival of Bubbles' activity, "Which Liquid Detergent Makes the Biggest Bubbles?"

> Brand A: 44.0 cm, 38.9 cm, 30.8 cm, 29.4 cm
> Brand B: 25.6 cm, 30.2 cm, 23.3 cm, 20.1 cm
> Brand C: 10.0 cm, 15.4 cm, 21.6 cm, 12.9 cm

Example 3: pH of Substances (GR 5–10)
The following are pH values of common household substances taken by three different teams using pH probes. *Safety precautions in repeating this experiment include hooded ventilation, chemical-splash safety goggles, gloves, and apron. Do not use bleach, ammonia, or strong acids with children.*

> Lemon juice 2.4, 2.0, 2.2; Baking soda (1 Tbsp) in Water (1 cup) 8.4, 8.3, 8.7; Orange juice 3.5, 4.0, 3.4; Battery acid 1.0, 0.7, 0.5; Apples 3.0, 3.2, 3.5; Tomatoes 4.5, 4.2, 4.0; Bottled water 6.7, 7.0, 7.2; Milk of magnesia 10.5, 10.3, 10.6; Liquid hand soap 9.0, 10.0, 9.5; Vinegar 2.2, 2.9, 3.0; Household bleach 12.5, 12.5, 12.7; Milk 6.6, 6.5, 6.4; Household ammonia 11.5, 11.0, 11.5; Lye 13.0, 13.5, 13.4; and Sodium hydroxide 14.0, 14.0, 13.9; Anti-freeze 10.1, 10.9, 9.7; Windex 9.9. 10.2, 9.5; Liquid detergent 10.5, 10.0, 10.3; and Cola 3.0, 2.5, 3.2

Teaching tip: *The pH scale is from 0 to 14. Have students make two data tables, one with the data as given and one with the pH scale 0 to 14 with the substances' average pH in rank order on the scale (Battery acid at the lower end and Sodium hydroxide at the upper end) or create a pH graphic organizer.*

Example 4: Automobile Land Speed Records (GR 5-10)
In the first recorded automobile race in 1898, Count Gaston de Chasseloup-Laubat of Paris, France, drove 1 kilometer in 57 seconds for an average speed of 39.2 miles per hour (mph) or 63.1 kilometers per hour (kph). In 1904, Henry Ford drove his Ford Arrow across frozen Lake St. Clair, MI, at an average speed of 91.4 mph. Now, the North American Eagle is trying to break a land speed record of 800 mph. The Federation International de L'Automobile (FIA), the world's governing body for motor sport and land speed records, recorded the following land speed records. (Retrieved on February 5, 2006, from http://www.landspeed.com/lsrinfo.asp.)

Speed (mph)	Driver	Car	Engine	Date
407.447	Craig Breedlove	Spirit of America	GE J47	8/5/63
413.199	Tom Green	Wingfoot Express	WE J46	10/2/64
434.22	Art Arfons	Green Monster	GE J79	10/5/64
468.719	Craig Breedlove	Spirit of America	GE J79	10/13/64
526.277	Craig Breedlove	Spirit of America	GE J79	10/15/65
536.712	Art Arfons	Green Monster	GE J79	10/27/65
555.127	Craig Breedlove	Spirit of America, Sonic 1	GE J79	11/2/65
576.553	Art Arfons	Green Monster	GE J79	11/7/65
600.601	Craig Breedlove	Spirit of America, Sonic 1	GE J79	11/15/65
622.407	Gary Gabelich	Blue Flame	Rocket	10/23/70
633.468	Richard Noble	Thrust 2	RR RG 146	10/4/83
763.035	Andy Green	Thrust SSC	RR Spey	10/15/97