

Fall 2009

PRE TEST

Designing and Testing Model Kayaks: Data Collection and Analysis

A 6th grade module

in

Math in a Cultural Context*

UNIVERSITY OF ALASKA FAIRBANKS

| |
|----------------------------|
| Student Name: |
| Grade: |
| Teacher: |
| School: |
| Location of School: |
| Date: |

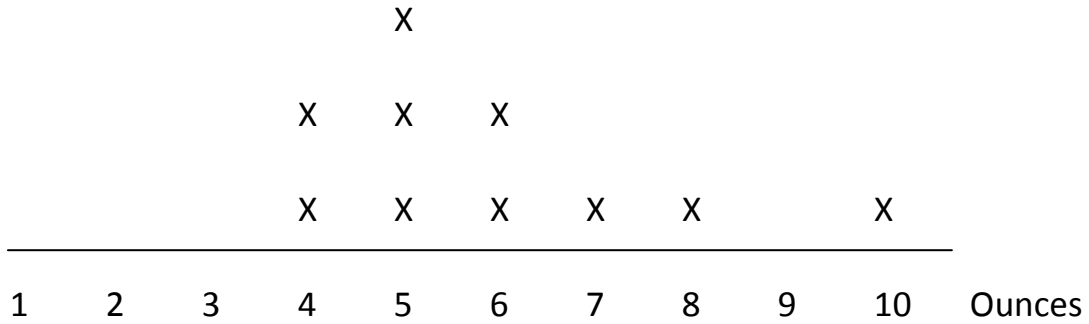
*This project has been funded by the U.S. Department of Education, *Determining the Potential Efficacy of 6th grade Math in a Cultural Context Project*, Jerry Lipka, P.I.

Note: Students may use a calculator for this test

Total Score:

1. Below is a line plot of the weight of students' toy cars, in ounces.

Weight of Student Cars



a. What is the **mode** weight of the cars? _____ ounces

b. What is the **range** of weights? _____ ounces

c. What is the **mean**? _____ ounces

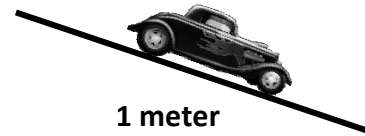
d. What is the **median** weight? _____ ounces

2. Look at the fishing sinkers shown below. Each side weighs the same. Use the picture to answer the following questions.



- a. If the two unmarked weights on the right are the same, how much does one of them weigh?
- b. Explain how you found your answer:

3. Sixth graders recorded the times that their toy cars took going down a 1 meter long ramp. The table below shows their results.



| Car | Trial 1 | Trial 2 | Trial 3 | Mean Time |
|-------------|---------|---------|---------|-----------|
| Kathy's car | 3.8 sec | 3.9 sec | 4.0 sec | |
| Sue's car | 5.1 sec | 5.5 sec | 4.5 sec | |
| Bill's car | 4.5 sec | 4.2 sec | 4.1 sec | |

- a) What is the range of the data?
- b) Find the **mean times** for the 3 students and enter them into the table. Round the answers to one decimal place. Be sure to include units.
- c) Draw a bar graph showing the students' mean times below. Include a title and labels.
- d) Whose car was the fastest?

4. Looking at the data sets below, circle which central tendency (mean, median or mode) best represents the data and find that value.

a) 1, 53, 62, 49, 57 mean median mode

What is its value(s)? _____

b) 23, 24, 27, 30 mean median mode

What is its value(s)? _____

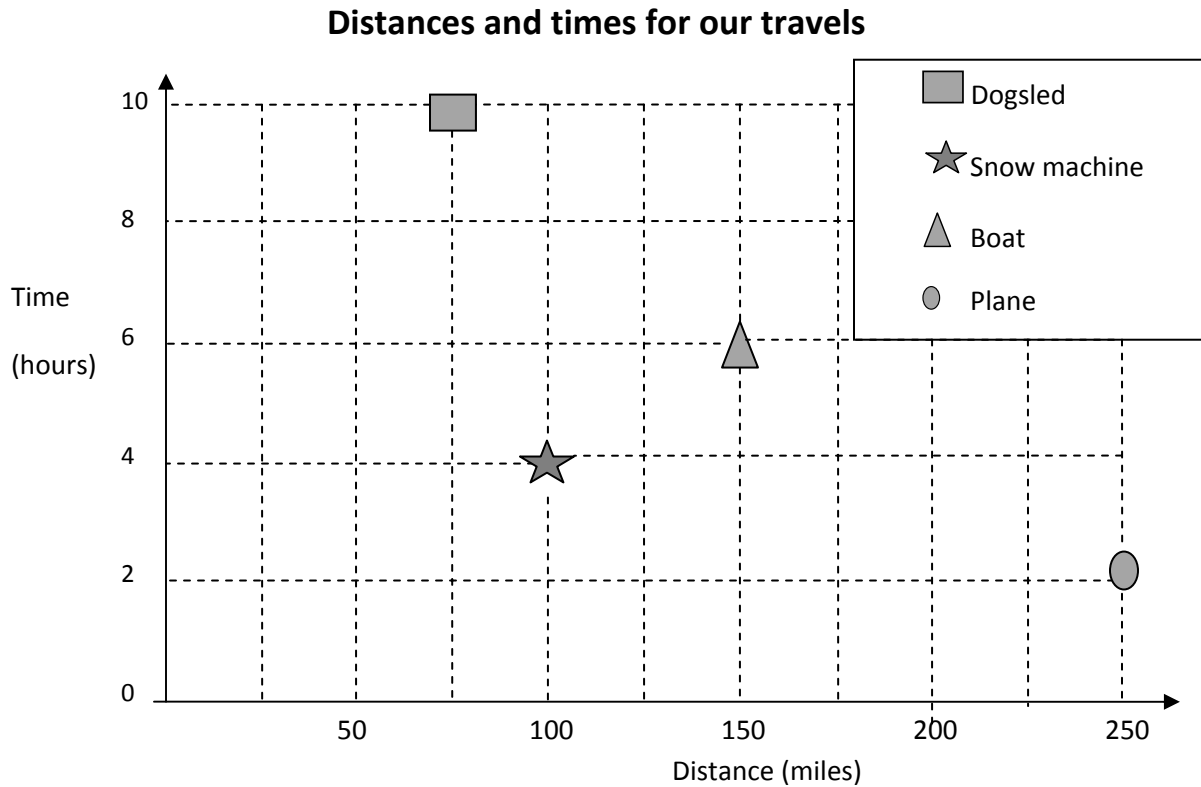
c) 23, 34, 27, 100, 31 mean median mode

What is its value(s)? _____

d) 1, 2, 2, 2, 7, 11, 11, 11 mean median mode

What is its value(s)? _____

5. Nora's family travels by many different methods. Below is a scatter plot showing some distances and times from trips they've taken.



- a. Use the plot to finish filling in the table.

| Travel Method | Distance (miles) | Time (hours) |
|---------------|------------------|--------------|
| Boat | | |
| Snow machine | | |
| Airplane | | |
| Dogsled | | |

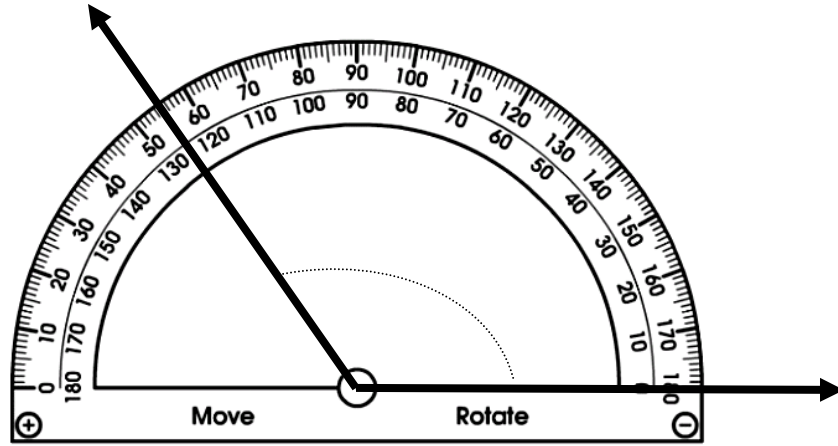
- b. Circle the explanation below that gives the best reason why the dog sled is the slowest method of travel.

- i. Because it goes a short distance over a long time.
- ii. Because it goes a short distance in a short time.
- iii. Because it goes a long distance in a short time.
- iv. Because it goes a long distance over a long time.

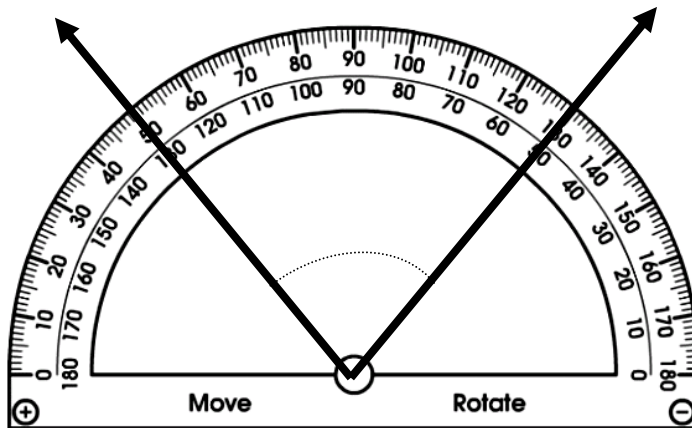
- c. Nora's Family took a trip in a car that took 2 hours and drove 125 miles.
Place an X on the scatter plot to represent on this trip.

6. Measure the angles.

a. How many degrees is the angle below? _____ degrees

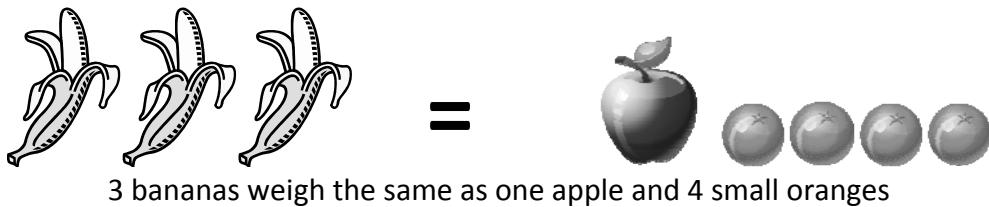


b. How many degrees is the angle below? _____ degrees

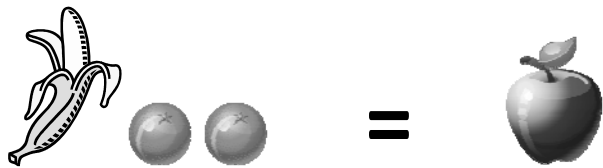


7. Mrs. Smith is going shopping to buy school clothes for her three children, Sue, Bob and Tom. She gets confused because they each wear a different size and have a different favorite color. Sue wears size M and likes red, Bob wears size L and likes blue, and Tom wears size XL and likes green. Make a table of the data so that Mrs. Smith can buy her children the sizes that fit and colors they like.

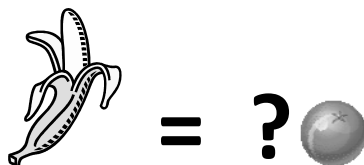
8. June works in a grocery store weighing fruit for customers. She notices the following:



and



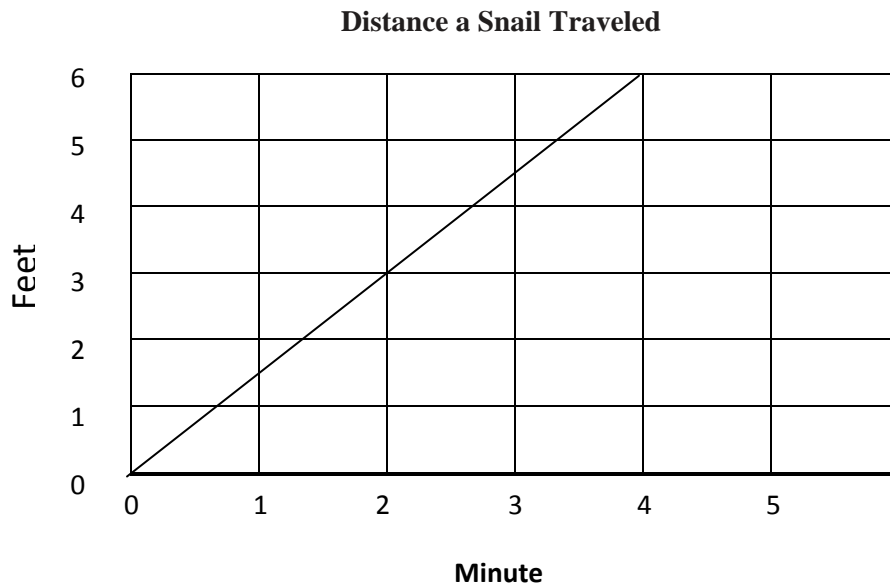
So, how many small oranges weigh the same as a banana? _____



9. A basketball team has \$150.00 to buy basketballs. If one basketball costs \$25.60, what is the greatest number of basketballs the team can buy?

- a. 4
- b. 5
- c. 6
- d. 7

10. A snail is trying to get to the other side of a road. Here is a graph showing how far he traveled in minutes.



At what rate is the snail traveling?

- a. $\frac{1}{2}$ foot per minute
- b. 1 foot per minute
- c. $1\frac{1}{2}$ feet per minute
- d. 2 feet per minute

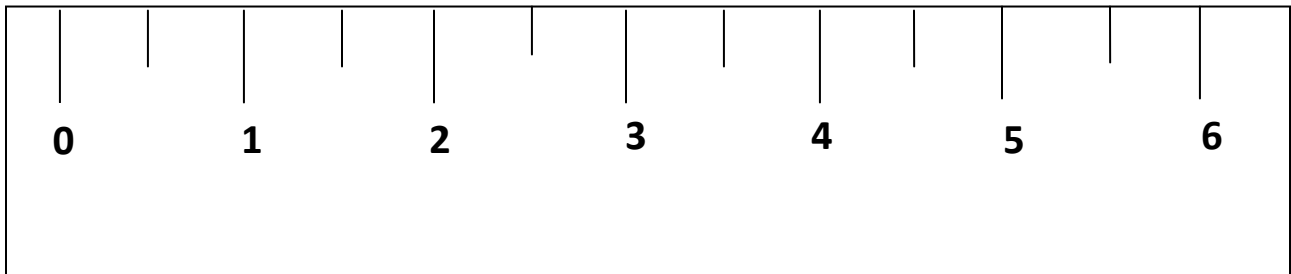
11. A school snack bar sells 5 items as shown below.

Snack Menu

| | |
|--------|--------|
| Chips | \$1.25 |
| Juice | \$2.00 |
| Orange | \$0.75 |
| Candy | \$0.50 |
| Gum | \$0.50 |

- a. What is the mean cost? _____
- b. Which pair of items could be added to the menu without changing the mean cost?
- a. Banana (\$0.75) and hot chocolate (\$1.00)
 - b. Banana (\$0.75) and peanuts (\$1.25)
 - c. Energy Bar (\$1.50) and peanuts (\$1.25)
 - d. Energy Bar (\$1.50) and hot chocolate (\$1.00)

12. Below is a model car whose length is being measured in inches.



a. How many inches long is the model car? _____ inches

b. The ratio of inches to centimeters is 1 to 2.54.

How many centimeters long is the car? _____ cm