

Fall 2009

**PRE TEST KEY**

Designing and Testing Model Kayaks: Data Collection and Analysis

A 6<sup>th</sup> grade module

in

**Math in a Cultural Context\***

UNIVERSITY OF ALASKA FAIRBANKS

<b>Student Name:</b>	<b>PRE Test KEY</b>
<b>Grade:</b>	
<b>Teacher:</b>	
<b>School:</b>	
<b>Location of School:</b>	
<b>Date:</b>	

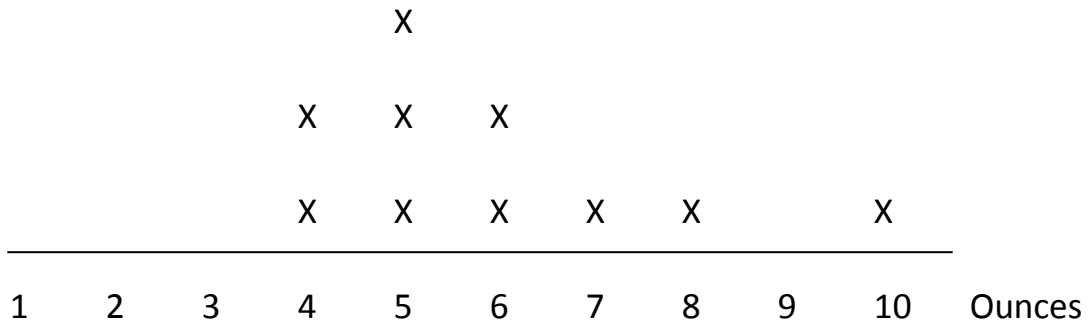
\*This project has been funded by the U.S. Department of Education, *Determining the Potential Efficacy of 6th grade Math in a Cultural Context Project*, Jerry Lipka, P.I.

**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? 5 ounces

(1 point)

b. What is the **range** of weights? 6 ounces

(1 point)

c. What is the **mean weight**? 6 ounces

(1 point)

d. What is the **median** weight? 5.5 ounces

(1 point)

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 identical, how much does one of them weigh?

**1 point**

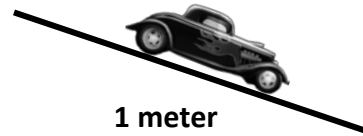
***9 grams***

- b. Explain how you found your answer:

**1 point**

Add the weights on the left to get 18 and divide by the number of weights on the right (2) to get  $18 \text{ grams} / 2 = 9 \text{ grams}$

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	<b>3.9 sec</b>
Sue's car	5.1 sec	5.5 sec	4.5 sec	<b>5.0 sec</b>
Bill's car	4.5 sec	4.2 sec	4.1sec	<b>4.3 sec</b>

- a) What is the range of the data?

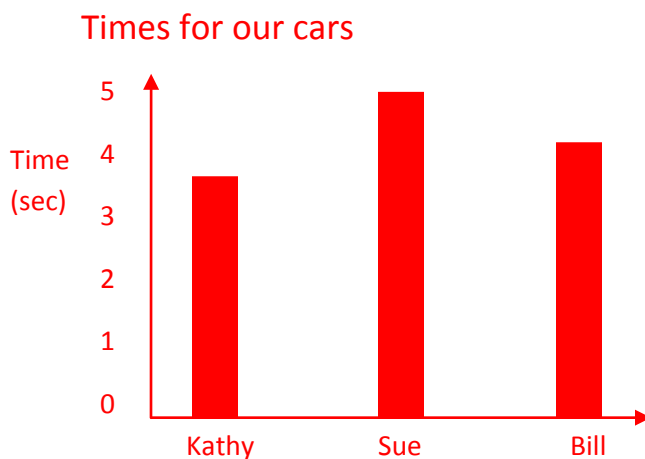
**1 point**

$$5.5 \text{ seconds} - 3.8 \text{ seconds} = 1.7 \text{ seconds}$$

- 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.

**3 points** (1 for each answer)

- c) Draw a bar graph showing the students' mean times below. Include a title and labels.



**2 points**

1 for correct data + 1 for correct labeling

- d) Whose car was the fastest?

**1 point**

**Kathy's**

4. Looking at the data sets below, determine which central tendency (the mean the median or the mode) best represents the data. Circle the word and then find the value.

**8 points** (1 point for each correct circle and one for each correct answer in each section)

a) 1, 53, 62, 49, 57

mean

median

mode

What is its value(s)? 53

b) 23, 24, 27, 30

mean

median

mode

What is its value(s)? 26

c) 23, 34, 27, 100, 31

mean

median

mode

What is its value(s)? 31

d) 1, 2, 2, 2, 7, 11, 11, 11

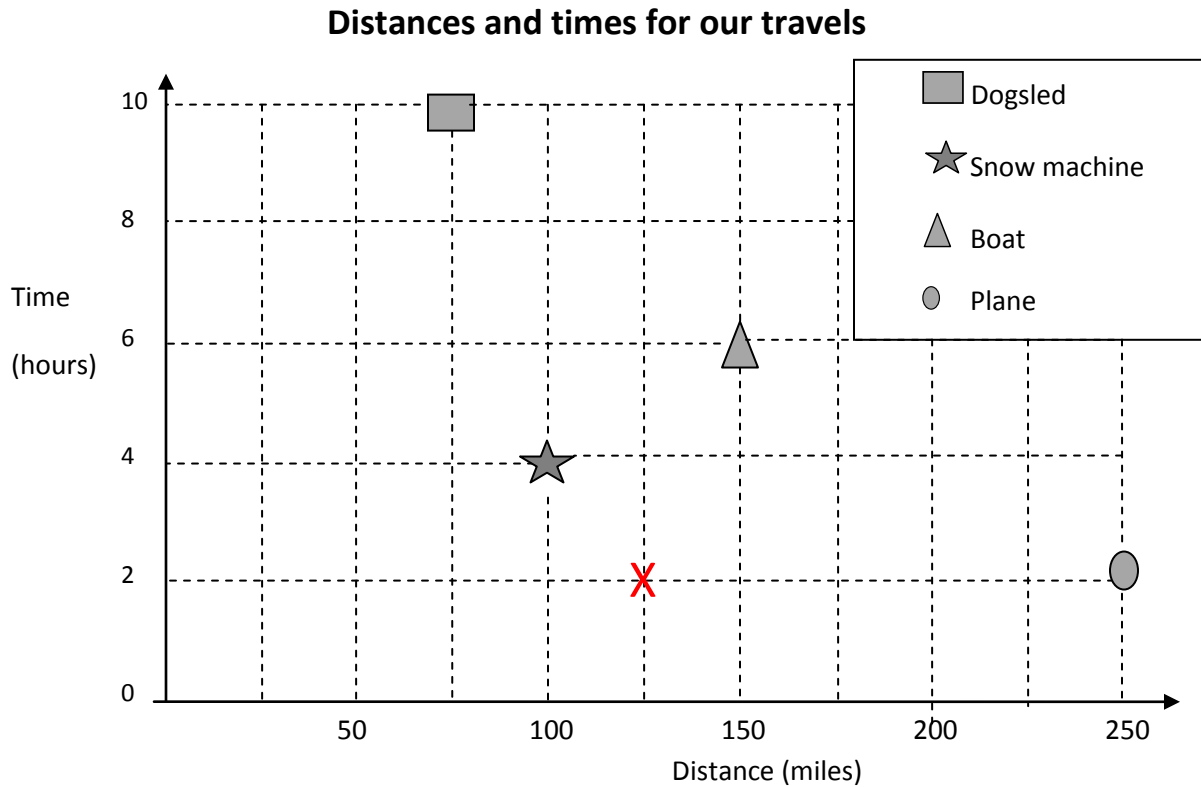
mean

median

mode

What is its value(s)? 2 and 11

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.

**2 points (1 for the correct distances, 1 for the correct times)**

Travel Method	Distance (miles)	Time (hours)
Boat	150	6
Snow machine	100	4
Airplane	250	2
Dogsled	75	10

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

**1 point**

**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.

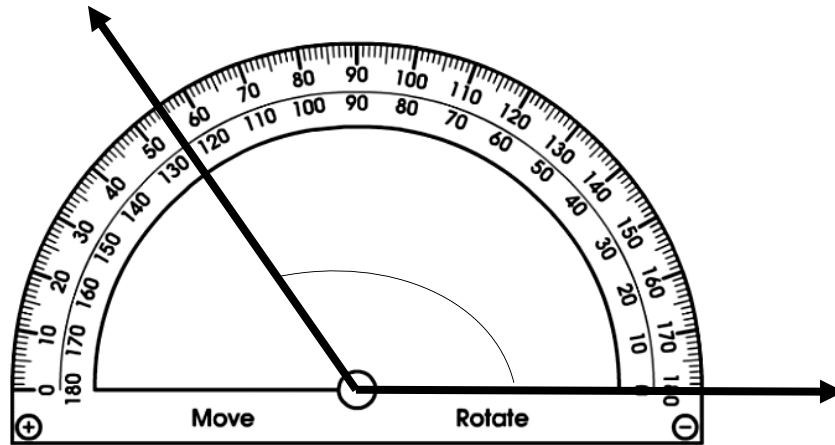
**1 point**

Place an X on the scatter plot to represent on this trip.

6. Read the angles.

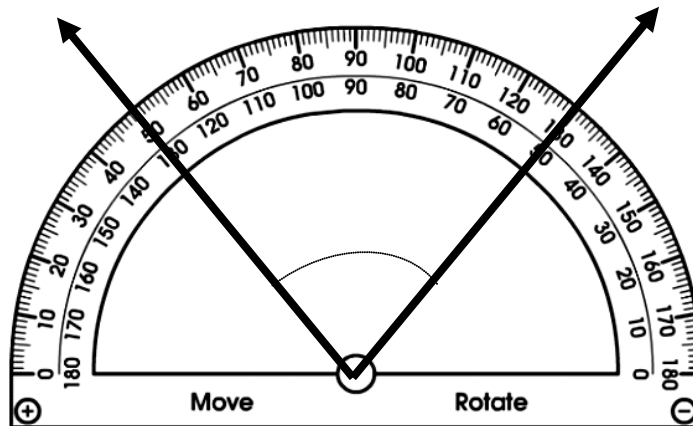
a. How many degrees is the angle below? 125 +/- 2 degrees

1 point



b. How many degrees is the angle below? 80 +/- 2 degrees

1 point



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. Organize the data and put it into a table so that Mrs. Smith can buy her children the sizes that fit and colors they like.

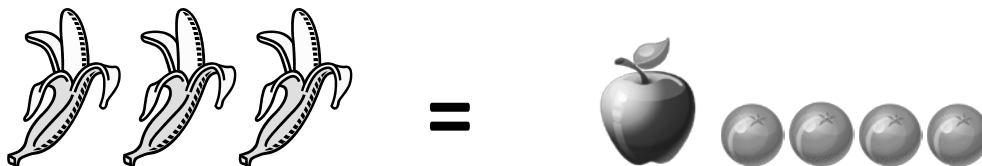
**2 points** (1 point for drawing a table and 1 point for getting the data in correctly)

(Any table that correctly displays the data is acceptable. Here is a sample.)

<i>Kid</i>	<i>Size</i>	<i>Color</i>
<i>Sue</i>	<i>M</i>	<i>Red</i>
<i>Bob</i>	<i>L</i>	<i>Blue</i>
<i>Tom</i>	<i>XL</i>	<i>green</i>

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

**2 points** (One point if they have done the substitution, but got the wrong answer)



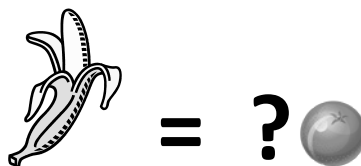
3 bananas weigh the same as one apple and 4 small oranges

and



1 banana and 2 small oranges weigh the same as an apple

So, how many small oranges weigh the same as a banana? 3



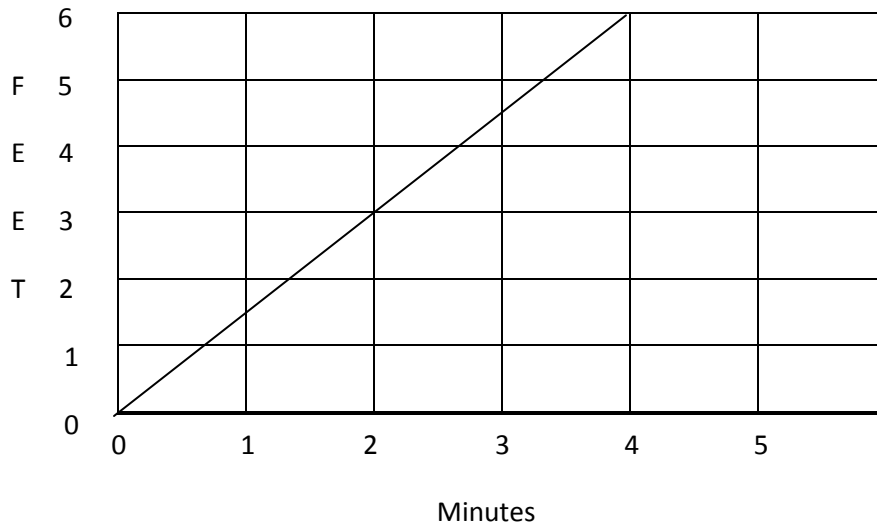
9. A basketball team has \$150.00 to buy basketballs. If one basketball costs \$25.60, what is the greatest number of basketballs the team can buy?

**1 point**

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

10. A snail is trying to get to the other side of a park.

**1 point**



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

**1 Point**

a. What is the mean? \_\_\$1.00\_\_

**1 Point**

b. Which pair of items could be added to the menu without changing the mean?

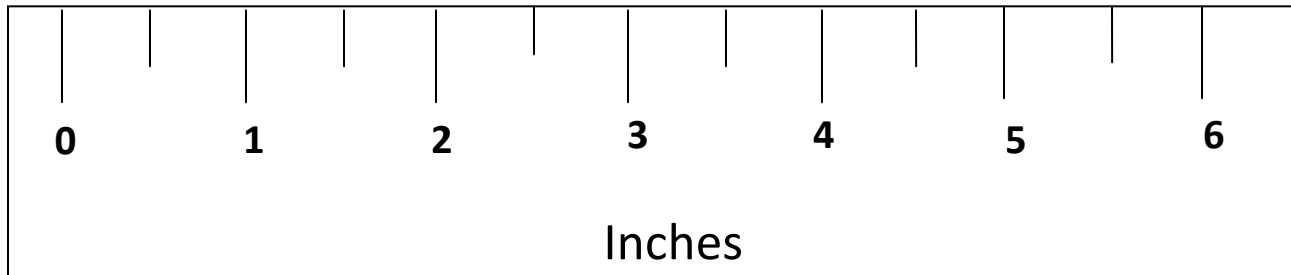
i. Banana (\$0.75) and hot chocolate (\$1.00)

**ii. *Banana (\$0.75) and peanuts (\$1.25)***

iii. Energy Bar (\$1.50) and peanuts (\$1.25)

iv. Energy Bar (\$1.50) and hot chocolate (\$1.00)

12. Below is a model car whose length is being measured in inches.  
The ratio of inches to centimeters is 1 to 2.54.



**1 point**

- a. How many inches is the model car? 4 inches

**1 point**

- b. How many centimeters long is the car? 10.16 cm

***Car is 4 inches long.  $4 * 2.54 = 10.16$***