Name _____ Class _____ Date _____

Skills Worksheet

Directed Reading B

Section: Organizing Your Data (pp. 50–55)

CREATING A DATA TABLE

A. **1.** Which of the following can be the first step to take in organizing data?
- **a.** Choose a topic.
- **b.** Gather information.
- **c.** Create a data table.
- **d.** Analyze data.

A. **2.** Which of the following should you do before an experiment starts?
- **a.** Determine what information is going to be gathered.
- **b.** Draw conclusions about the information before it is gathered.
- **c.** Miss information that might be important.
- **d.** Analyze the information after it is gathered.

3. A factor that is deliberately changed in an experiment is called a(n) independent variable.

4. Where do you find the independent variable in a data table?

in the first column

5. The factor that changes as a result of manipulation and is measured is called a(n) dependent variable.

6. Where do you find the dependent variable in a data table?

in the second column

Variable and Controlled Parameters

7. What is the difference between controlled parameters and variable parameters?

Controlled parameters are factors that stay constant throughout the experiment. Variable parameters are factors that change or vary, throughout the experiment.

CREATING A GRAPH

8. Graphs make it easy to do what two things?

Identify trends and make predictions

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Directed Reading B *continued*

Match the correct description with the correct term. Write the letter in the space provided.

c. axis **9.** is one of two or more reference lines that mark the borders of a graph

d. independent variable **10.** usually represented by the x-axis in a data table

b. dependent variable **11.** usually represented by the y-axis in a data table

a. range **12.** found by subtracting the smallest value of a variable from the largest value of the same variable

e. scale **13.** is the size used for each box or grid mark on a graph

g. data point **14.** plotted by putting a dot on the graph for a pair of data in the table

f. line of best fit **15.** shows how data differ from the pattern; a smooth line drawn to include some but not all of the data points

a. range
b. dependent variable
c. axis
d. independent variable
e. scale
f. line of best fit
g. data point

16. The last step when creating a graph is giving the graph a(n) title.

17. What two things do scientists often include in the titles of their graphs?

a legend showing the independent variable description and dependent variable description.

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PATTERNS SHOWN BY GRAPHS

Match the correct description with the correct term. Write the letter in the space provided.

e. trend **18.** the pattern of data on a graph

b. linear graph **19.** a graph in which the relationship between the independent variable and dependent variable can be shown with a straight line

a. nonlinear **20.** a graph in which the relationship between variables cannot be shown with a straight line

d. direct **21.** a relationship in which the dependent variable increases as the independent variable increases

c. inverse **22.** a relationship in which one variable increases while the other variable decreases

a. nonlinear graph
b. linear graph
c. inverse
d. direct
e. trend

23. How are computers helpful to scientists?

Excel - (spreadsheet software) makes organizing data easy with rows and columns and cells to hold the data.
Also , it can plot the data automatically into graphs.
The internet allows scientists to communicate data and graphs.

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Skills Worksheet

Directed Reading B

Section: Analyzing Your Data (pp. 56–61)

WHY MATHEMATICS?

A.

1. Which of the following is NOT something that scientists use mathematics for?
- **a.** learning how to speak a foreign language
- **b.** seeing patterns in data to make predictions
- **c.** answering questions
- **d.** understanding and summarizing large amounts of data

2. How does a meteorologist use mathematics?

To predict weather and possibly hurricane movement.

3. Why is mathematics often called the "language of science"?

It allows scientists to easily share their findings with each other in a language that everyone understands: numbers!

ACCURACY OF DATA

4. Name three reasons why scientists might get an inaccurate reading when conducting an experiment.

Using broken equipment, using the wrong tool, or using a tool incorrectly.

REPRODUCIBILITY OF DATA

B.

5. Results of an experiment can be supported or accepted by other scientists if the data
- **a.** are not reproducible.
- **b.** are reproducible.
- **c.** cannot be converted into SI units.
- **d.** are supported only by the French Academy of Sciences.

DESCRIBING THE ENTIRE SET OF DATA

Match the correct definition with the correct term. Write the letter in the space provided.

a. mode
b. mean
c. median

b. mean aka average **6.** the number obtained by adding up the data for a given characteristic and dividing this sum by the number of individuals

c. median **7.** the value of the middle item when data are arranged in order by size

a. mode **8.** the most frequently occurring value in a data set

9. When is using the median especially useful?

When there is a renegade, way off the mark, data point that is skewing the mean, then it is useful to use the median to get a more reasonable understanding of the data's true range.

SLOPE OF A LINE

10. A measure of the slant of a line is called the slope.

11. What does the rise represent?

the vertical change in the y-value

12. What does the run represent?

the horizontal change in the x-value

13. How is the slope of a straight line calculated?

slope = the rise / (divided by) the run

14. The value of the slope between any two points on that line will be a(n) constant k number.

15. In the equation $y = kx$, which letter represents the slope of the line, also known as the constant term?

k (in math it is also called m, for example y =mx + b

Match the correct description with the correct term. Write the letter in the space provided.

a. nonlinear graph
b. linear graph

b. linear graph **16.** displays a straight line

a. nonlinear graph **17.** displays a curved line