Key

Experimental Design Test Review

1. Write the steps of the scientific method in order below.

① observation
② gather info
③ hypothesis
④ test hypothesis
⑤ analyze data
⑥ conclusion

2. Jamie and JOsie bought a new video game and decided to keep track of their scores. Create a graph of Jamie and Josie's progress.

Jamie	Josie
Try 1- 150 pts	Try 1 - 100 pts
Try 2 - 190 pts	Try 2 - 500 pts
Try 3 - 500 pts	Try 3 - 900 pts
Try 4 - 900 pts	Try 4 - 1100 pts
Try 5 - 1100 pts	Try 5- 1400 pts
Try 6 - 1500 pts	Try 6 - 1500 pts

see last page for graph

Based on your graph, who is a better player?

varying answers w/ support from graph.

How many points would you predict for Jamie on try 7? ~1700 For Josie ~1900

3. A shopping mall wanted to determine whether the more expensive "Tough Stuff" floor wax was better than the cheaper "Steel Seal" floor wax at protecting its floor tiles against scratches. One liter of each brand of floor wax was applied to each of 5 test sections of the main hall of the mall. The test sections were all the same size and were covered with the same kind of tiles. Five (5) other test sections received no wax. After 3 weeks, the number of scratches in each of the test sections was counted. The "Tough Stuff" floor had 45 scratches while the "Steel Seal" floor had 18. The section with no treatment had 72 scratches.

a. Write a hypothesis for this experiment.

If two waxes are tested then the "Tough Stuff" will protect better b/c its more expensiv

b. What is the independent variable? The dependent variable?

I: types of wax D: # scratches

c. List three controlled variables.

same size sections 5 test sections 3 weeks
same tiles main floor

d. Write an appropriate conclusion for this study.

The steel seal is best b/c less expensive & less scratches.

4. What is the difference between scientific theory and scientific law? Provide examples.

scientific theory: explanation of things in nature based on tested hypotheses. ex: Big Bang Theory

scientific law: statement of what happens under certain circumstances seems to be true always ex: law of gravity

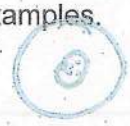
5. What are the three types of graphs? When do you use each?

Circle - breaking whole into parts line: relationship blw indep. & dep. variables

bar - compare/contrast

6. What is the difference between accuracy and precision. Provide examples.

accuracy: close to target/goal



precision: close to other values

7. What is a hypothesis? What is the form we write hypotheses in?

tentative explanation to be tested, prediction, educated guess

if independent then dependent because explain

8. What is slope? What is the equation for slope?

rate of change $\frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x}$

9. Calculate the slope of the line that goes through the points (3, 2) and (8, 11).

$x_1, y_1 \quad x_2 y_2$

$\frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{11 - 2}{8 - 3} = \frac{9}{}$

10. What is the difference between quantitative and qualitative observations. Give examples of both.

qualitative: descriptions ex: that plane flies fast

quantitative: numbers ex: 5cm

11. What is bias? How does bias affect science? How can we reduce science?

slanted view, opinion

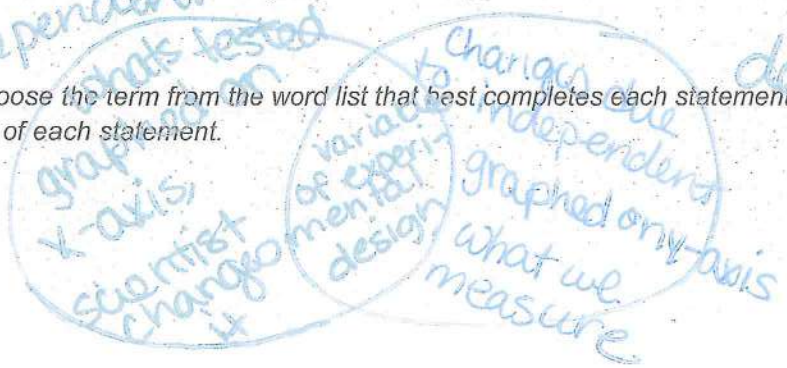
changes how we analyze results

many trials, good observatio peer review

12. What is the purpose of peer review?

validate scientific explanation before publishing in scientific journal

13. Compare and contrast the Independent and dependent variables and how they are graphed.



Directions: *Choose the term from the word list that best completes each statement. Write the term in the blank at the left of each statement.*

graph **y-axis** **percentages** **vertical** **line** **independent**

graph 1. A visual display of data or information is a _____.

vertical 2. In a line graph, the _____ axis is called the *y*-axis.

y-axis 3. In a line graph, the dependent variable is plotted on the _____.

line 4. The type of graph that is useful for showing trends or continuous change is a _____.

percentages 5. Information in a circle graph is often shown as _____.

independent 6. A variable that changes and affects the measure of another variable is called the _____