

Physical; Ch. 1 Test; Introduction to Physical Science

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. Which branch of physical science studies the properties of matter and changes in matter?
 - a. photography
 - b. chemistry
 - c. physics
 - d. engineering
- _____ 2. The variable that is expected to change because of another variable is known as the
 - a. manipulated variable.
 - b. responding variable.
 - c. controlled variable.
 - d. independent variable.
- _____ 3. Which of the following are NOT examples of data?
 - a. quantitative observations
 - b. qualitative observations
 - c. theories
 - d. measurements
- _____ 4. A physical representation of an atom is an example of a scientific
 - a. law.
 - b. model.
 - c. observation.
 - d. theory.
- _____ 5. If new evidence does not support a scientific theory, scientists will most likely
 - a. ignore the new evidence in order to continue supporting the theory.
 - b. modify the theory or discard it altogether.
 - c. make the theory into scientific law.
 - d. take no action in the matter.
- _____ 6. The metric system of measurement is based on the number
 - a. 1.
 - b. 10.
 - c. 12.
 - d. 100.
- _____ 7. The basic unit of length in the metric system is the
 - a. foot.
 - b. meter.
 - c. mile.
 - d. kilometer.
- _____ 8. How many meters are there in a kilometer?
 - a. 10
 - b. 100
 - c. 1,000

d. 10,000

- _____ 9. The kilogram is the basic metric unit of
- a. length.
 - b. mass.
 - c. weight.
 - d. volume.
- _____ 10. The amount of space an object takes up is its
- a. volume.
 - b. density.
 - c. mass.
 - d. length.
- _____ 11. If a shoe box measures 6 cm high, 7 cm wide, and 20 cm long, what is its volume?
- a. 420 cm
 - b. 420 cm^3
 - c. 840 cm^3
 - d. 840 cm
- _____ 12. The SI unit of time is the
- a. second.
 - b. minute.
 - c. hour.
 - d. day.
- _____ 13. The SI unit of temperature is the
- a. metric degree.
 - b. degree Fahrenheit.
 - c. degree Celsius.
 - d. Kelvin.
- _____ 14. A metal washer has a mass of 0.27 g and a volume of 0.1 cm^3 . What is its density?
- a. 0.027 g/cm^3
 - b. 0.37 g/cm^3
 - c. 2.7 g/cm^3
 - d. 2.7 g/cm^2
- _____ 15. If scientists cannot obtain exact numbers, they may rely on a(n)
- a. calculation.
 - b. estimate.
 - c. guess.
 - d. assumption.
- _____ 16. The closeness of a measurement to its true value is its
- a. significant figures.
 - b. estimate.
 - c. accuracy.
 - d. precision.
- _____ 17. You measure the length of a string three times and get values of 34.0 cm, 34.1 cm, and 34.2 cm. The actual length is 39.0 cm. What can you say about your measurements?
- a. They are accurate but not precise.
 - b. They are precise but not accurate.

- c. They are both accurate and precise.
 - d. They are neither accurate nor precise.
- _____ 18. The significant figures in a measurement include
- a. only the digits that have been measured exactly.
 - b. the digits that have been measured exactly, plus one digit whose value has been estimated.
 - c. only the digit whose value has been estimated.
 - d. only the last digit in a measurement.
- _____ 19. If you add a mass of 3.7 g to a mass of 9.495 g, the sum with the correct number of significant digits is
- a. 13.2 g
 - b. 13.20 g
 - c. 13.19 g
 - d. 13.195 g.
- _____ 20. A line graph shows
- a. changes in the responding variable only.
 - b. changes in the manipulated variable only.
 - c. how the responding variable changes in response to the manipulated variable.
 - d. how the manipulated variable changes on its own.
- _____ 21. What is the slope of the line connecting the points (10, 5) and (20, 25)?
- a. 0.5
 - b. 1
 - c. 2
 - d. 4
- _____ 22. The slope of a graph tells you
- a. how much x changes for every change in y .
 - b. how much y changes for every change in x .
 - c. the ratio of the run to the rise.
 - d. the ratio of the horizontal change to the vertical change.
- _____ 23. A line graph in which the data points do not fall along a straight line is called a
- a. linear graph.
 - b. nonlinear graph.
 - c. circle graph.
 - d. bar graph.
- _____ 24. All of the following are examples of good laboratory preparation EXCEPT
- a. knowing the safety and first-aid procedures.
 - b. reading through the entire lab before starting it.
 - c. always following your teacher's instruction.
 - d. rushing through the steps in the laboratory.
- _____ 25. Which is not a safe procedure to follow when doing science activities in the lab?
- a. notifying the teacher that there has been an accident
 - b. wearing closed-toe shoes in the laboratory
 - c. wearing goggles in the laboratory
 - d. pouring all used chemicals down the drain
- _____ 26. The measure of the force of gravity on you is your

- a. mass.
 - b. weight.
 - c. volume.
 - d. density.
- _____ 27. On a linear graph, the slope of the line
- a. changes with the x -coordinate.
 - b. changes with the y -coordinate.
 - c. equals the sum of the x - and y -coordinates.
 - d. is constant.
- _____ 28. During an experiment, you drop a glass test tube and it shatters on the floor. What should you do first?
- a. Pick it up and hope no one notices.
 - b. Notify your principal.
 - c. Notify your teacher.
 - d. Ask your lab partner to help you clean it up.
- _____ 29. Which of the following is a true statement about line graphs with no identifiable trends?
- a. They can be useful.
 - b. They show that the two variables are related.
 - c. All data points fall along a smooth curve.
 - d. The slope is constant.
- _____ 30. In a well-designed experiment, the one variable that is purposely changed is known as the
- a. manipulated variable.
 - b. responding variable.
 - c. controlled variable.
 - d. independent variable.

Modified True/False

Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

- _____ 31. Engineering is a way of learning about the natural world by gathering information.

- _____ 32. A knowledge of physical science is essential in many different careers, such as those of a firefighter, photographer, or sound technician. _____
- _____ 33. Inferences are the facts, figures, and other evidence gathered through observation.

- _____ 34. A scientific law is a well-tested explanation for a wide range of observations or experimental results. _____
- _____ 35. SI is a version of the metric system. _____
- _____ 36. To measure objects smaller than a meter but still visible to the unaided eye, scientists would use the centimeter or kilometer. _____
- _____ 37. A(n) millisecond is one-thousandth of a second. _____

- ____ 38. A scientist would most likely use the Kelvin scale to measure daily temperature.

- ____ 39. When multiplying or dividing measurements, the answer has the same number of significant figures as the measurement with the most significant figures. _____
- ____ 40. Slope is the ratio of vertical change to horizontal change. _____

Completion

Complete each statement.

41. Developing a hypothesis and designing an experiment to test it is part of the process of scientific _____.

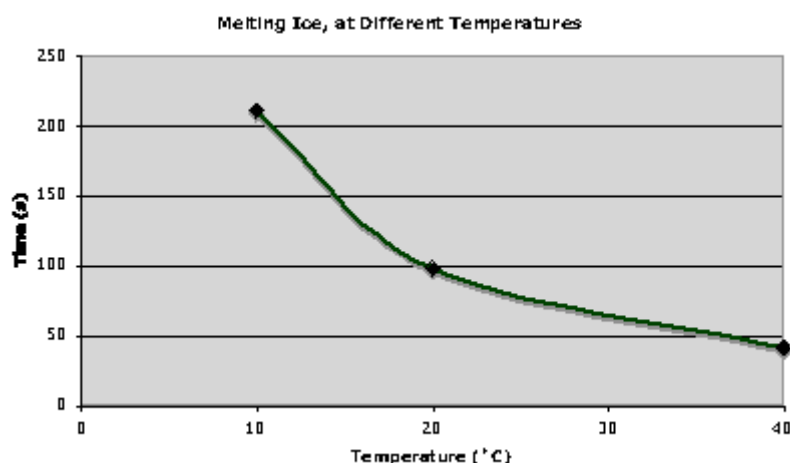
42. Publishing an article in a scientific journal is one way that scientists _____ their conclusions.
43. Each unit in the SI system is _____ times larger than the next smallest unit.
44. The curve on the surface of water in a graduated cylinder is called a(n) _____.
45. Density is a measure of how much mass is contained in a given _____.
46. An estimate is not a guess because an estimate is based on _____.
47. If you add 4.667 g and 3.2 g, the answer has _____ significant figures.
48. Data points may not fall along a straight line because of small measurement _____.
49. A repeating pattern in a graph is a(n) _____ trend.
50. The most important lab safety rule is to always follow your teacher's _____ and the textbook directions exactly.
51. _____ means using one or more senses to gather information.
52. The study of matter, energy, motion, and forces, and how they interact, is called _____.
53. All objects in the universe attract each other. This observed pattern is an example of a scientific _____.
54. A line graph in which the data points yield a straight line is called a _____ graph.
55. The point where the x -axis and y -axis cross is called the _____ of a graph.
56. A _____ is a smooth line that reflects the general pattern of a graph.
57. The measure of the exactness of a measurement is called _____.
58. _____ refers to how close a group of measurements are to each other.

59. A student measures the length, height, and width of a box to be 10.5 cm, 9.2 cm, and 15.3 cm. In calculating the volume of the box, the answer should have _____ significant figures.
60. A student increases the volume of a water sample five times to determine if the volume has an effect on the freezing point. In this experiment, the volume of water is the _____ variable.

Short Answer

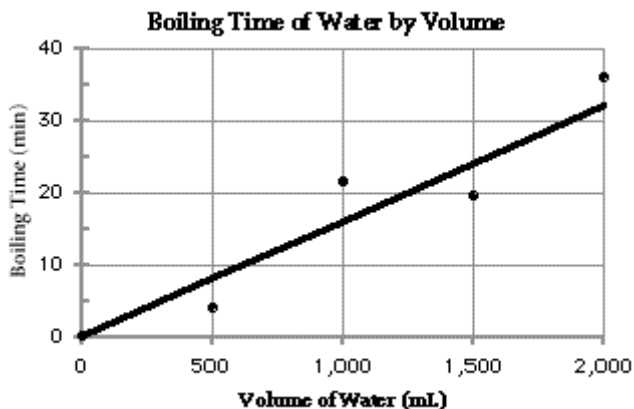
The graph below shows the amount of time an ice cube took to melt at three different water temperatures. Distilled water was chilled or heated to three specific temperatures. 300 mL of chilled or heated water was then added to three separate 400 mL beakers. A 4 cm-by-2 cm ice cube was placed into each of the three beakers.

Use the graph to answer the following questions.



61. Which variable is the manipulated variable? On which axis is it plotted?
62. Which variable is the responding variable? On which axis is it plotted?
63. What parameters were controlled in this experiment? Why are controlled parameters important for a scientific experiment?
64. What conclusion can you draw from this graph?
65. Would you predict that an ice cube added to 300 mL of water at 5°C would take more or less than 225 seconds to melt? What evidence supports your prediction?
66. Why would a scientist decide to display data on a graph like this?

Use the graph to answer each question.



67. On which axis is volume shown?
68. On which axis is time shown?
69. What type of line is shown?
70. Why is it preferable to draw a line of best fit rather than to connect the dots?
71. What is each individual point called?
72. What conclusion can you draw from this graph?

Essay

73. Give an example of observing, inferring, and predicting and explain how these skills are important to scientists.
74. What is SI? Why do scientists use SI?
75. What is the difference between mass and weight? Which one would change if you were on the moon, and why?
76. What is the difference between accuracy and precision? Is one more important than the other?
77. Describe precautions you can take before starting a lab, while performing the lab, and at the end of a lab to make the lab safe. What should you do in case an accident occurs?
78. Design an experiment to determine how temperature affects the rate of sugar dissolving in water. Be sure to identify the proper manipulated, controlled, and responding variables.
79. Why should you draw a line of best fit when creating a line graph?
80. Suppose you find a small sample of an unknown liquid. Plan a series of measurements and calculations you could make to predict the mass of a much larger sample of the same liquid.

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Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1 DIF: L2
OBJ: CaPS.1.1.2 Identify skills that scientists use to learn about the natural world.
STA: S 8.9 BLM: comprehension
2. ANS: B PTS: 1 DIF: L2
OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world.
STA: S 8.9.c BLM: comprehension
3. ANS: C PTS: 1 DIF: L2
OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world.
STA: S 8.9.b BLM: comprehension
4. ANS: B PTS: 1 DIF: L2
OBJ: CaPS.1.2.2 Explain the roles of models, laws, and theories in science.
STA: S 8.9.a BLM: application
5. ANS: B PTS: 1 DIF: L2
OBJ: CaPS.1.2.2 Explain the roles of models, laws, and theories in science.
STA: S 8.9.a BLM: comprehension
6. ANS: B PTS: 1 DIF: L1
OBJ: CaPS.1.3.1 Explain why scientists use a standard measurement system.
STA: S 8.9.a BLM: knowledge
7. ANS: B PTS: 1 DIF: L1
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.9.a BLM: knowledge
8. ANS: C PTS: 1 DIF: L2
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.9.a BLM: application
9. ANS: B PTS: 1 DIF: L2
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.8.a | S 8.8.b BLM: comprehension
10. ANS: A PTS: 1 DIF: L1
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.8.a | S 8.8.b BLM: knowledge
11. ANS: C PTS: 1 DIF: L2
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.8.b BLM: application
12. ANS: A PTS: 1 DIF: L1
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.9.a BLM: knowledge
13. ANS: D PTS: 1 DIF: L2
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.9.a BLM: comprehension

14. ANS: C PTS: 1 DIF: L2
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.8.b BLM: application
15. ANS: B PTS: 1 DIF: L1
OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9.b BLM: knowledge
16. ANS: C PTS: 1 DIF: L1
OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9.b BLM: knowledge
17. ANS: B PTS: 1 DIF: L3
OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9.b BLM: synthesis
18. ANS: B PTS: 1 DIF: L1
OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9.b BLM: knowledge
19. ANS: A PTS: 1 DIF: L2
OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9.b BLM: application
20. ANS: C PTS: 1 DIF: L2
OBJ: CaPS.1.5.1 Explain what types of data line graphs can display. STA: S 8.9.g BLM: comprehension
21. ANS: C PTS: 1 DIF: L2
OBJ: CaPS.1.5.2 Describe how you determine a line of best fit or the slope of a graph. STA: S 8.9.d BLM: application
22. ANS: B PTS: 1 DIF: L1
OBJ: CaPS.1.5.2 Describe how you determine a line of best fit or the slope of a graph. STA: S 8.9.d BLM: knowledge
23. ANS: B PTS: 1 DIF: L1
OBJ: CaPS.1.5.3 Explain why line graphs are powerful tools in science. STA: S 8.9.g BLM: knowledge
24. ANS: D PTS: 1 DIF: L2
OBJ: CaPS.1.6.2 Describe what you should do if an accident occurs. STA: S 8.9 BLM: application
25. ANS: D PTS: 1 DIF: L3
OBJ: CaPS.1.6.1 Explain why preparation is important when carrying out scientific investigations in the lab and in the field. STA: S 8.9 BLM: evaluation
26. ANS: B PTS: 1 DIF: L1
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.9.a BLM: knowledge
27. ANS: D PTS: 1 DIF: L3
OBJ: CaPS.1.5.1 Explain what types of data line graphs can display. STA: S 8.9.d BLM: application
28. ANS: C PTS: 1 DIF: L2
OBJ: CaPS.1.6.2 Describe what you should do if an accident occurs. STA: S 8.9 BLM: comprehension

29. ANS: A PTS: 1 DIF: L2
OBJ: CaPS.1.5.3 Explain why line graphs are powerful tools in science.
STA: S 8.9.g BLM: comprehension
30. ANS: A PTS: 1 DIF: L2
OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world.
STA: S 8.9.c BLM: comprehension

MODIFIED TRUE/FALSE

31. ANS: F, Science

PTS: 1 DIF: L1
OBJ: CaPS.1.1.1 Explain what physical science involves. STA: S 8.9
BLM: knowledge
32. ANS: T PTS: 1 DIF: L2
OBJ: CaPS.1.1.2 Identify skills that scientists use to learn about the natural world.
STA: S 8.9 BLM: application
33. ANS: F, Data

PTS: 1 DIF: L1
OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world.
STA: S 8.9.a | S 8.9.b BLM: knowledge
34. ANS: F, theory

PTS: 1 DIF: L1
OBJ: CaPS.1.2.2 Explain the roles of models, laws, and theories in science.
STA: S 8.9.a BLM: knowledge
35. ANS: T PTS: 1 DIF: L2
OBJ: CaPS.1.3.1 Explain why scientists use a standard measurement system.
STA: S 8.9.a BLM: knowledge
36. ANS: F, millimeter

PTS: 1 DIF: L1
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.9.a BLM: knowledge
37. ANS: T PTS: 1 DIF: L2
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.9.a BLM: comprehension
38. ANS: F, Celsius

PTS: 1 DIF: L2
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.9.a BLM: comprehension
39. ANS: F, fewest

- PTS: 1 DIF: L2
OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9.b BLM: comprehension
40. ANS: T PTS: 1 DIF: L2
OBJ: CaPS.1.5.2 Describe how you determine a line of best fit or the slope of a graph. STA: S 8.9.d BLM: comprehension

COMPLETION

41. ANS: inquiry.
PTS: 1 DIF: L2
OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world. STA: S 8.9.a BLM: comprehension
42. ANS: communicate
PTS: 1 DIF: L2
OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world. STA: S 8.9.a BLM: comprehension
43. ANS: 10
PTS: 1 DIF: L2
OBJ: CaPS.1.3.1 Explain why scientists use a standard measurement system. STA: S 8.9.a BLM: comprehension
44. ANS: meniscus
PTS: 1 DIF: L2
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.9.a BLM: comprehension
45. ANS: volume
PTS: 1 DIF: L1
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature. STA: S 8.8.a | S 8.8.b BLM: knowledge
46. ANS: known information
PTS: 1 DIF: L2
OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9.b BLM: comprehension
47. ANS: two
PTS: 1 DIF: L2
OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9.b BLM: comprehension
48. ANS: errors

PTS: 1 DIF: L2
OBJ: CaPS.1.5.2 Describe how you determine a line of best fit or the slope of a graph.
STA: S 8.9.b BLM: comprehension

49. ANS:
nonlinear
cyclical

PTS: 1 DIF: L2
OBJ: CaPS.1.5.3 Explain why line graphs are powerful tools in science.
STA: S 8.9.g BLM: comprehension

50. ANS:
instructions
directions

PTS: 1 DIF: L2
OBJ: CaPS.1.6.1 Explain why preparation is important when carrying out scientific investigations in the lab and in the field. STA: S 8.9 BLM: comprehension

51. ANS: Observing

PTS: 1 DIF: L1
OBJ: CaPS.1.1.1 Explain what physical science involves. STA: S 8.9
BLM: knowledge

52. ANS: physics

PTS: 1 DIF: L1
OBJ: CaPS.1.1.2 Identify skills that scientists use to learn about the natural world.
STA: S 8.2 BLM: knowledge

53. ANS: law

PTS: 1 DIF: L2
OBJ: CaPS.1.2.2 Explain the roles of models, laws, and theories in science.
STA: S 8.9.a BLM: comprehension

54. ANS: linear

PTS: 1 DIF: L1
OBJ: CaPS.1.5.3 Explain why line graphs are powerful tools in science.
STA: S 8.9.g BLM: knowledge

55. ANS: origin

PTS: 1 DIF: L1
OBJ: CaPS.1.5.1 Explain what types of data line graphs can display.
STA: S 8.9.d BLM: knowledge

56. ANS: line of best fit

PTS: 1 DIF: L1

- OBJ: CaPS.1.5.2 Describe how you determine a line of best fit or the slope of a graph.
STA: S 8.9.d BLM: knowledge
57. ANS: precision
- PTS: 1 DIF: L1
OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9 BLM: knowledge
58. ANS: Reproducibility
- PTS: 1 DIF: L1
OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9 BLM: knowledge
59. ANS: two
- PTS: 1 DIF: L3
OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9.b BLM: application
60. ANS: manipulated
- PTS: 1 DIF: L2
OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world.
STA: S 8.9.c BLM: application

SHORT ANSWER

61. ANS:
Temperature; the horizontal axis (x -axis)
- PTS: 1 DIF: L2
OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world. | CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements.
STA: S 8.9.c BLM: analysis
62. ANS:
time; the vertical axis (y -axis)
- PTS: 1 DIF: L2
OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world. | CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements.
STA: S 8.9.c BLM: analysis
63. ANS:
The size of the ice cube, the amount of water, the type of water, and the type of container were controlled parameters. Scientists use controlled parameters to be sure that the changes to the manipulated variable are causing the changes to the responding variable.
- PTS: 1 DIF: L2

OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world.

STA: S 8.9.c BLM: analysis

64. ANS:

The temperature of water will affect the amount of time it takes an ice cube to melt. The warmer the water, the faster the ice cube will melt.

PTS: 1 DIF: L3

OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world.

STA: S 8.9.c BLM: synthesis

65. ANS:

The ice cube would take more than 225 seconds to melt. The ice cube at 10°C took approximately 210 seconds to melt, which was more than double the time the ice cube at 20°C took. Similarly, the ice cube at 20°C took more than twice the amount of time that the ice cube at 40°C took. Therefore, an ice cube at 5°C would probably take longer than 225 seconds, which is only 15 seconds longer than it took the ice cube at 10°C to melt.

PTS: 1 DIF: L3

OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world.

STA: S 8.9.c BLM: synthesis

66. ANS:

An important part of the process of scientific inquiry is communication. Scientists use graphs to help communicate the results of their experiments and identify trends.

PTS: 1 DIF: L2

OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world.

STA: S 8.9.a BLM: application

67. ANS:

Volume is shown on the horizontal axis (x -axis).

PTS: 1 DIF: L2

OBJ: CaPS.1.5.1 Explain what types of data line graphs can display.

STA: S 8.9.d BLM: analysis

68. ANS:

Time is shown on the vertical axis (y -axis).

PTS: 1 DIF: L2

OBJ: CaPS.1.5.1 Explain what types of data line graphs can display.

STA: S 8.9.d BLM: analysis

69. ANS:

It is a line of best fit.

PTS: 1 DIF: L2

OBJ: CaPS.1.5.1 Explain what types of data line graphs can display.

STA: S 8.9.d BLM: analysis

70. ANS:

A line of best fit emphasizes the overall trend of the data.

PTS: 1 DIF: L2
OBJ: CaPS.1.5.2 Describe how you determine a line of best fit or the slope of a graph.
STA: S 8.9.d BLM: comprehension

71. ANS:

Each point is a data point.

PTS: 1 DIF: L2
OBJ: CaPS.1.5.2 Describe how you determine a line of best fit or the slope of a graph.
STA: S 8.9.e BLM: comprehension

72. ANS:

The volume of water will affect the amount of time it takes the water to boil. The greater the volume of water, the more time it takes to boil.

PTS: 1 DIF: L3
OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world.
STA: S 8.9.c BLM: synthesis

ESSAY

73. ANS:

Observing is using one or more senses to gather information. Smelling that milk is sour is an observation. Inferring is trying to explain observations based on what you know from past experiences. For example, saying that the milk was sour because it was left out of the refrigerator too long could be an inference. Predicting is making a forecast of what will happen in the future based on past experiences or evidence. Saying that the milk will go bad if left out too long is a prediction. Scientists use these skills to learn more about the natural world.

PTS: 1 DIF: L2
OBJ: CaPS.1.1.1 Explain what physical science involves. STA: S 8.9
BLM: application

74. ANS:

SI the International System of Units. Using SI as a standard system allows scientists to compare data and communicate with each other about their results.

PTS: 1 DIF: L2
OBJ: CaPS.1.3.1 Explain why scientists use a standard measurement system.
STA: S 8.9.a BLM: comprehension

75. ANS:

Mass is a measure of the amount of matter an object contains. Weight is a measure of the force of gravity acting on an object. Your weight would change on the moon because the force of gravity is weaker on the moon.

PTS: 1 DIF: L2
OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and

temperature. STA: S 8.9.f BLM: analysis

76. ANS:

Accuracy is how close a measurement is to the true value. Precision is how close a group of measurements are to each other. No, both are important.

PTS: 1 DIF: L3

OBJ: CaPS.1.4.1 Describe what math skills scientists use in collecting data and making measurements. STA: S 8.9 BLM: synthesis

77. ANS:

Before starting any lab, you should learn the location and the proper use of emergency equipment in the lab room. Also, knowing safety and first-aid procedures will help prepare you to properly handle an accident, should one occur. The day before the lab read the lab procedure carefully to making sure that you understand all of the directions. The most important safety rule when performing a lab is to follow your teacher's instructions and the textbook's direction exactly. At the end of the lab, clean up the work area. Turn off, unplug, and return any equipment to its proper place. Dispose of waste materials properly, following your teacher's instruction. Wash your hands thoroughly. Finally, should an accident occur, immediately notify your teacher and follow any directions and carry them out quickly. By doing the above you minimize lab dangers.

PTS: 1 DIF: L3

OBJ: CaPS.1.6.1 Explain why preparation is important when carrying out scientific investigations in the lab and in the field. | CaPS.1.6.2 Describe what you should do if an accident occurs.

STA: S 8.9 BLM: synthesis

78. ANS:

Sample answer: To determine how temperature affects the rate of sugar dissolving in water, the manipulated variable must be the temperature and the responding variable must be the rate. Equal amounts of water at different temperatures should be placed in identical containers. Then equal amounts of sugar should be added to the various containers. The sugar should not be stirred in the containers. The time it takes the sugar to dissolve should be recorded at regular intervals.

PTS: 1 DIF: L3

OBJ: CaPS.1.2.1 Describe how scientists investigate the natural world.

STA: S 8.9.c BLM: synthesis

79. ANS:

When creating a line graph, you should not simply connect all your data points with a line. By simply connecting the dots, you may place too much importance on each individual data point in determining the overall shape of the line. For instance, connected data points may appear to be a zigzag when a straight line might reflect the data more accurately. Instead of connecting the dots, you should draw a line of best fit to emphasize the overall trend shown by all the data taken as a whole.

PTS: 1 DIF: L3

OBJ: CaPS.1.5.2 Describe how you determine a line of best fit or the slope of a graph.

STA: S 8.9.d BLM: evaluation

80. ANS:

The mass of a much larger sample of the liquid can be predicted by determining the density of the smaller sample. To determine the density of the smaller sample, you must first measure the liquid's mass and volume. The mass can be measured with a balance and the volume can be measured with a graduated cylinder. Once the mass and volume are known, the density can be calculated by dividing the mass by the volume. Once the density is known, it can be multiplied by any volume, no matter how large, to predict the mass that volume of liquid would have.

PTS: 1

DIF: L3

OBJ: CaPS.1.3.2 Identify the SI units of measure for length, mass, volume, density, time, and temperature.

STA: S 8.9.a

BLM: synthesis