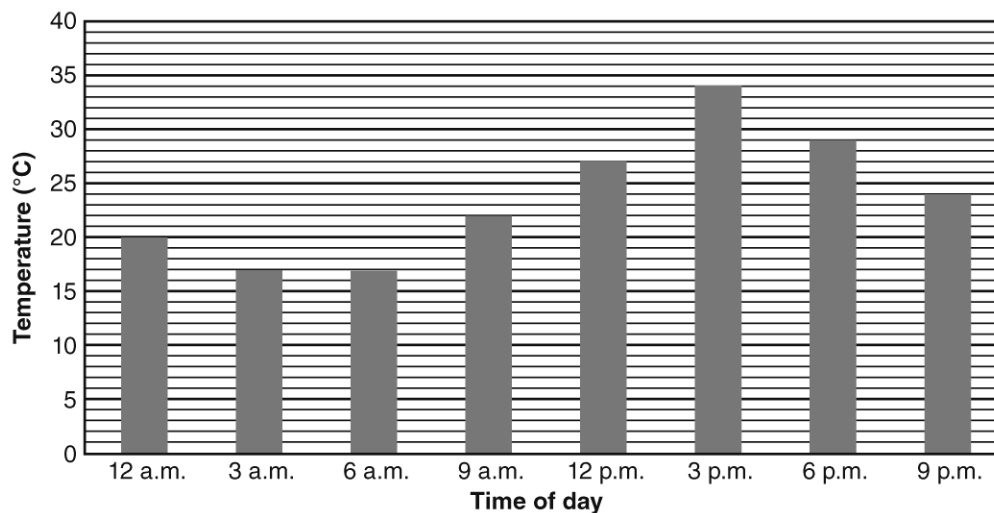


Measurement and Data

Key Concepts

Choose the letter of the best answer.

1. Earth has a mass of 5,973,600,000,000,000,000,000 kilograms. How is this written in scientific notation?
A. 5.9736×10^{24} kg
B. 597.36×10^{22} kg
C. $59,736 \times 10^{25}$ kg
D. 5,973,600,000,000,000,000,000 kg
2. What scientific tool would best be used to compare the masses of two rocks?
A. a hot plate
B. a test tube
C. an electronic balance
D. an electron microscope
3. Wilson measured the air temperature at a particular location every three hours for one day. He organized his findings using a bar graph.

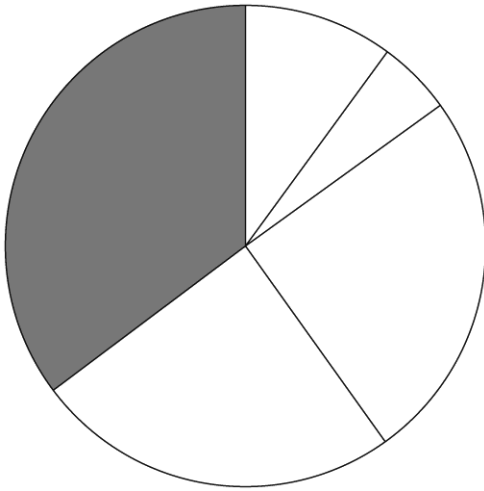


What is the difference between the coldest and the warmest temperatures on this day?

- A. 7 °C
- B. 11 °C
- C. 13 °C
- D. 17 °C

Name _____ Date _____

4. The students in Mrs. Dhaibar's science class take a test. She uses a circle graph to show the results of the test. Each wedge shows a grade range. For example, one wedge shows how many students earned an A.



Which percentage of students got the grade shown in the shaded wedge?

- A. 15%
 - B. 25%
 - C. 35%
 - D. 50%
5. For which of the following situations would a circle graph be most effective?
- A. a meteorologist wants to represent the high and low temperature recorded each day during the past month
 - B. a teacher wants to represent the number of questions that each of his students answered correctly on their final exam
 - C. a city council wants to represent the percentage of its budget received by each city department during the past year
 - D. a scientist wants to represent the height reached by each pea plant exposed to different amounts of carbon dioxide in an experiment

Name _____ Date _____

6. Which of the following is not a correct match between a measurement and the tool used to make that measurement?
 - A. length: meter stick
 - B. time: graduated cylinder
 - C. temperature: thermometer
 - D. mass: triple beam balance
7. A scientist is using a model to predict when a volcano might erupt again. What kind of model is the scientist most likely to use?
 - A. scale model
 - B. computer model
 - C. physical model
 - D. diagram
8. Scientists are conducting an experiment in which they give people different amounts of Vitamin C to determine whether Vitamin C intake has an effect on how often a person gets sick. What is the independent variable in this experiment?
 - A. the amount of vitamin C
 - B. how often a person gets sick
 - C. the type of illness a person gets
 - D. the brand of vitamin C being used
9. The executive board of a technological company wants to illustrate the task list for each of the different departments that make up the company. What type of model would best be used in this example?
 - A. a scale model
 - B. a physical model
 - C. a conceptual model
 - D. a mathematical model

Name _____ Date _____

10. Below are the results of a chemistry lab experiment.

Trial #	Measurement (kg)
1	35
2	36
3	34
4	36
5	35

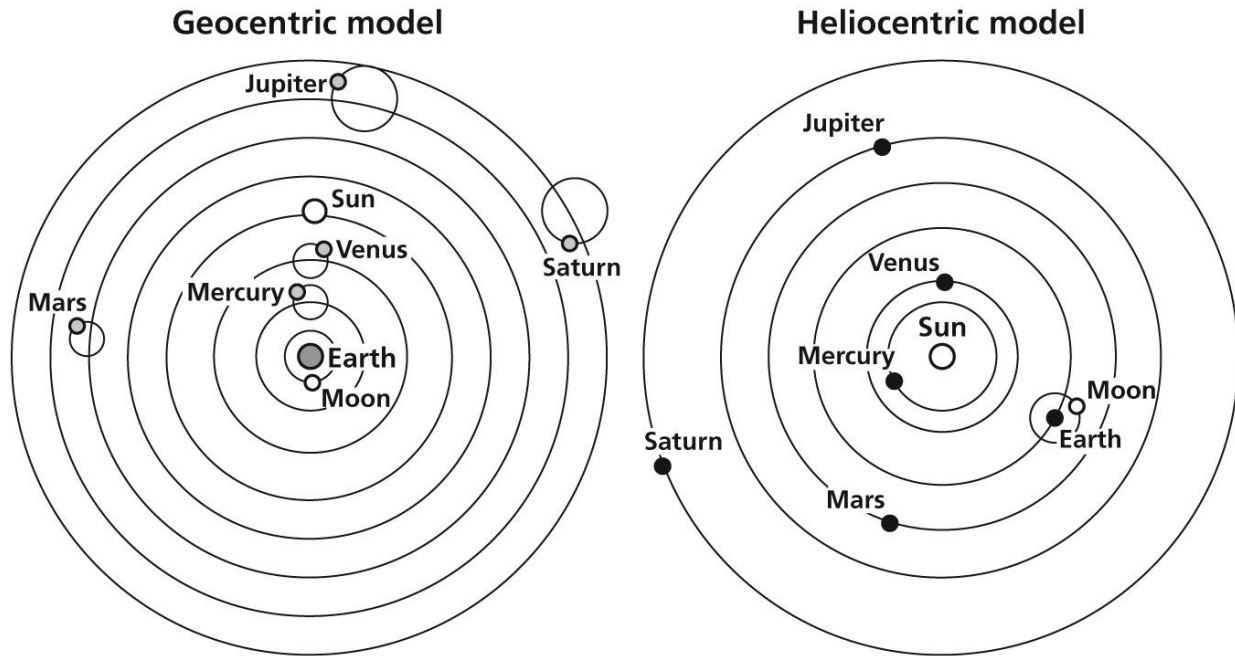
If the actual value was 42 kg, what can be said about the measurements?

- A. The measurements are accurate and precise.
 - B. The measurements are accurate but not precise.
 - C. The measurements are precise but not accurate.
 - D. The measurements are neither accurate nor precise.
11. A manager shows her plans for organizing the flow of information through a workplace using a conceptual model. Why did the manager most likely use a conceptual model and not another type of model?
- A. She used a conceptual model because she wanted to show something that is too large to see.
 - B. She used a conceptual model because she wanted to show patterns of behavior of people.
 - C. She used a conceptual model because she wanted to show the layout of offices in the workplace.
 - D. She used a conceptual model because she wanted to show a process that cannot be studied directly.
12. How is a mathematical model most limited in its use?
- A. It is limited by the existing data and variables.
 - B. It is limited by ideas that can cause misconceptions.
 - C. It is limited by the size of the object that is being modeled.
 - D. It is limited by the model not behaving like the object it represents.

Critical Thinking

Answer the following questions in the space provided.

13. Below are two models of our solar system: the geocentric model on the left and the heliocentric model on the right.



Compare these two models. Briefly explain why scientists rejected one model in favor of the other model.

Name _____ Date _____

Extended Response**Answer the following questions in the space provided.**

14. Scientists are unsure exactly how much oil spilled into the Gulf of Mexico when an oil rig exploded in 2010. Some scientists estimated that thousands of barrels spilled, and some scientists estimated that millions of barrels spilled.

Why did the estimates vary so much?

What tool could scientists use to model the oil spill?

What scientific method could be employed to predict the future spreading of the oil spill?

What is it about the oil spill in the Gulf of Mexico that limits most tools in their ability to measure and collect data?
