

Skills Worksheet

Directed Reading B**Section: Scientific Models and Knowledge** (pp. 26–31)**TYPES OF SCIENTIFIC MODELS**

a model

1. What is a representation of an object or a system called?
- the real thing
 - a structure
 - a model
 - a prediction

a.

2. What is a limitation of models?
- They are never exactly like the real thing.
 - They are too small to be used.
 - They are only concepts.
 - They are on computers.

a.

3. What are three types of scientific models?
- physical, mathematical, and conceptual
 - small, medium, and large
 - atomic, molecular, and elemental
 - animal, vegetable, and mineral

a toy rocket

4. Which is an example of a physical model?
- an equation
 - a microscope
 - a toy rocket
 - human bones

d.

5. What may a mathematical model be made up of?
- plastic organs and bones
 - paint and plaster
 - concepts and computers
 - numbers and equations

a graph

6. Which is an example of a mathematical model?
- a map
 - a graph
 - an action figure
 - a theory

c.

7. It is NOT true that computers
- make fewer mistakes than humans.
 - are useful for creating mathematical models.
 - always make correct models.
 - can keep track of more variables than humans can.

Directed Reading B *continued*

- a. 8. Which of the following is a conceptual model?
- a. a diagram of scientific methods
 - b. a model dinosaur skeleton
 - c. $6 \times 2 + 2 = 14$
 - d. a plastic human heart

9. What is a conceptual model?

A model that has verbal descriptions, drawings or diagrams.

USING SCALE IN MODELS

- an equation 10. Which of the following models would NOT use scale?
- a. a model of a sailing ship
 - b. an equation
 - c. a road map
 - d. a floor plan of a house

11. What does scale represent?

The aspect ratio between the model and the real thing.
Ex. one tenth sized scaled model of a table.

12. Why can scale models, maps, and diagrams accurately communicate scientific knowledge?

Models like airplanes can be tested to give knowledge before building the real thing. This way you can make small design changes that are safer and cheaper.

BENEFITS OF MODELS

- hypothesis 13. A model can be a kind of testable
- a. question.
 - b. dinosaur.
 - c. variable.
 - d. hypothesis.

14. What can models be used to represent?

Models can represent objects that are too large or small to test in a laboratory.
Also they can represent concepts that are too difficult to imagine all the scenarios at once.