

InterActions Unit 4 Cycle2 Sample Quiz KEY

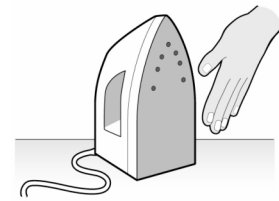
REMEMBER exams are given for the last cycle in a unit. They are comprehensive. So practice taking the Unit 4 Cycle 1 quiz again along with this practice exam. This practice exam only asks questions about Unit 4 Cycle 2.

See the Scientists' Consensus Sheets for assistance.

1. A hot iron is turned off and cools down to room temperature. The iron cools because
 - a. the iron does not hold heat very well.
 - b. the room transfers cold energy to the iron
 - c. heat energy is transferred from the warm iron to the cooler room.
 - d. the thermal energy is destroyed during an interaction with the room.

To answer this question you need to know that heat energy is transferred from warmer to cooler objects.

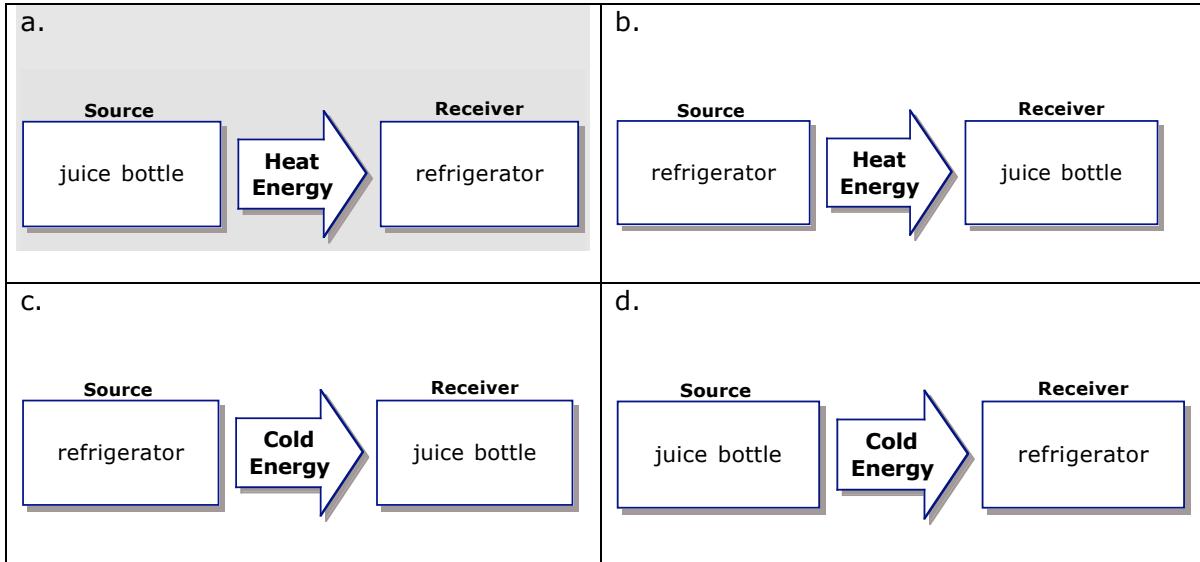
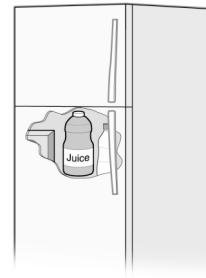
2. To check if the iron is hot, you place your hand near the iron and feel that it is warm without touching it. The interaction between you and the iron is



- a. a heat-conduction interaction.
- b. an infrared-radiation interaction
- c. a thermal interaction.
- d. a phase change interaction.

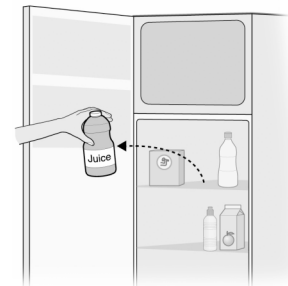
An infrared-radiation interaction occurs between two objects that are near each other and have different temperatures. To answer this question you need to know what an infrared-radiation interaction is.

3. A warm bottle of juice is placed into the refrigerator. Which diagram best describes the interaction between the cool air in the refrigerator and the juice bottle.



To answer this question you need to know that heat energy is transferred from the warmer to the cooler object.

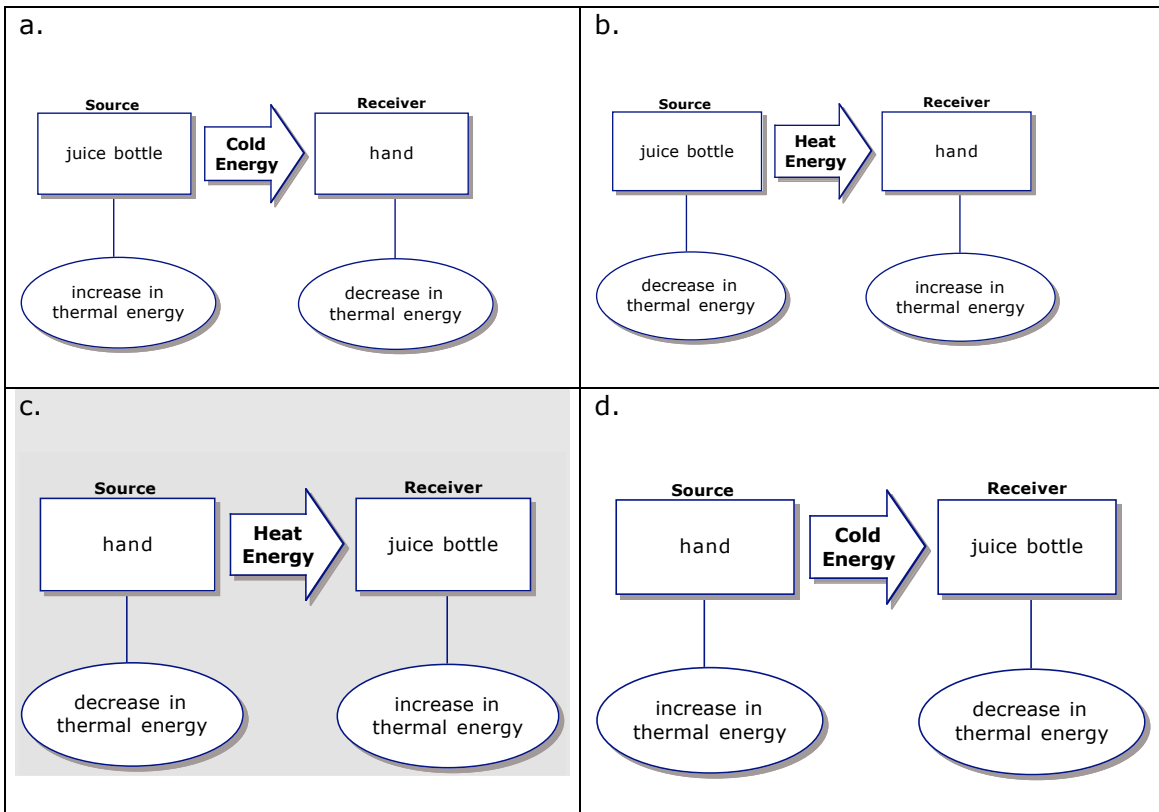
4. After a while the juice bottle cools down. You get the cold juice bottle out of the fridge. The interaction between your hand and the juice bottle is



- a. a heat-conduction interaction.
- b. an infrared-radiation interaction
- c. a thermal interaction.
- d. a phase change interaction.

Heat-conduction interactions require that two objects of different temperatures are touching each other. To answer this question you need to know what a heat-conduction interaction is.

5. Which diagram best describes the interaction between the cold juice bottle and your hand?



To answer this question you need to know that heat energy is transferred from the warmer to the cooler objects.

6. A motor has an energy input of 300 units. The motor increases in thermal energy by 70 units. What is the total *output energy* of the motor?

- There is not enough information to determine the total output energy of the motor.
- 370 units.
- 300 units.
- 230 units.

The total energy input into the motor is equal to the energy increase of the motor plus the energy output from the motor. To answer this question you need know that energy is neither created nor destroyed.

7. George is on his skateboard moving with a certain amount of motion energy. He stops pushing forward and begins to slow down. While he is slowing down most of the energy is transformed into thermal energy of the rubbing wheel parts of the skateboard. The rest of the energy
- is destroyed during the friction interaction between the wheel parts.
 - disappears and cannot be found anywhere else.
 - is transformed into the motion energy of the scooter.

d. is transferred to the surroundings.

Some of the energy goes into the sound heard and the motion energy of the air George is moving during the drag interaction with the air. To answer this question you need know that energy is neither created nor destroyed, it shows up in different forms

8. Tom boils some water to make a cup of tea. While the water is boiling the temperature
- increases.
 - decreases.
 - stays the same.
 - There is not enough information to say.

When water is boiling it is changing from a liquid to a gas. To answer this question you need know that the temperature remains constant during a phase change.

9. When water boils and changes from a *liquid* to a *gas* its stored phase energy
- increases.
 - decreases.
 - stays the same.
 - There is not enough information to say.

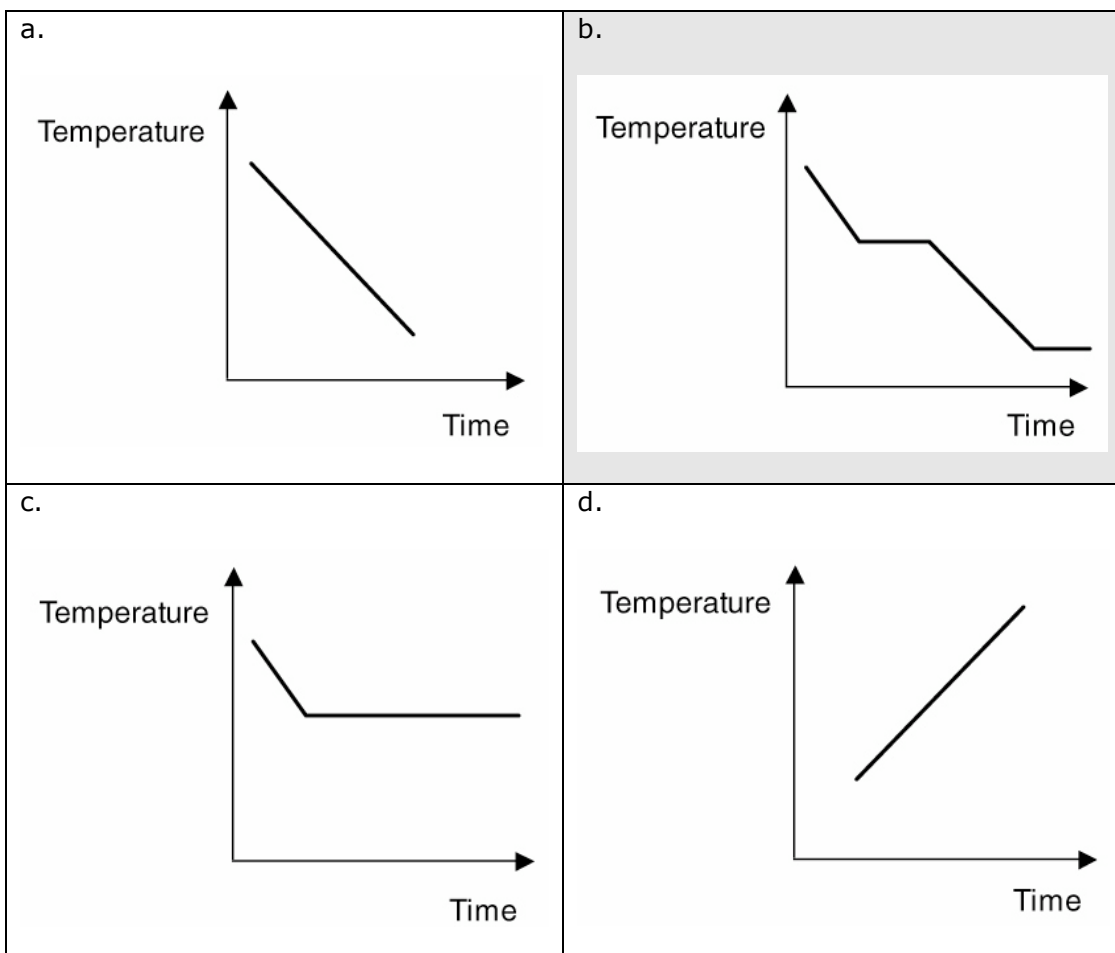
The phase energy increases as a substance changes from a liquid to a gas. To answer this question you need to know how stored phase energy changes during a phase change.

10. When water boils and changes from a *liquid to a gas* its thermal energy

- a. increases.
- b. decreases.
- c. stays the same.
- d. There is not enough information to say.

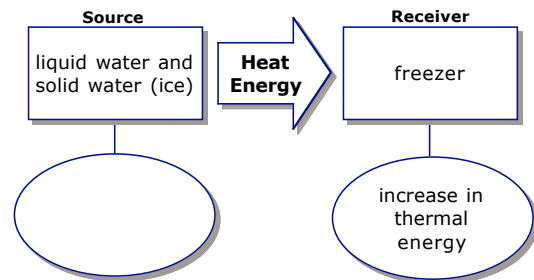
The thermal energy stays the same as a substance changes from a liquid to a gas. To answer this question you need to know that thermal energy doesn't change during a phase change.

11. Mom melted chocolate and poured it into molds. She then put it in the fridge to cool. She left it overnight, so it stayed in the fridge even after the chocolate became hard. Which graph best shows the temperature of the chocolate while in the fridge.



The chocolate's temperature decreases as it begins to cool. Its temperature remains constant as it changes from liquid to solid. The solid chocolate's temperature decreases until it reaches the temperature of the fridge, and then it remains constant. To answer this question you need know the temperature remains constant during a phase change.

12. The energy diagram shown describes what happens as water freezes in a freezer. Choose the best answer for completing the diagram.



- a. Increase in thermal energy.
- b. Decrease in thermal energy.
- c. Increase in stored phase energy.
- d. Decrease in stored phase energy.

The thermal energy of the water and ice stays the same and the stored phase energy decreases as a liquid turns to a solid. To answer this question you need to know how thermal and stored phase energy change during a phase change.

13. A light bulb transforms 5% of its energy input to light energy. The rest of the energy

- a. increases the bulb's thermal energy and the thermal energy of the surroundings.
- b. decreases the bulb's thermal energy and the energy of the surroundings.
- c. disappears in the bulb.
- d. is destroyed.

The energy not transformed into light energy goes into the bulb and the surroundings. To answer this question you need to know that energy in the form of heat is always transferred to the surroundings.

14. How could you improve the efficiency of a skateboard?

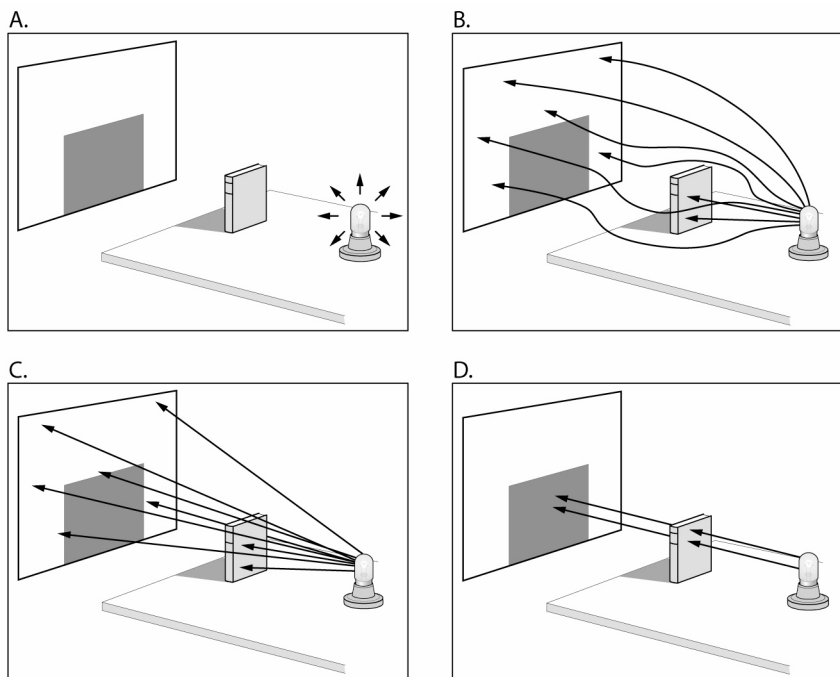
- a. Increase the amount of heat it produces due to rubbing wheel parts.
- b. Reduce the amount of heat it produces due to rubbing wheel parts.
- c. Increase its speed.
- d. is destroyed.

The heat produced because of the friction interaction between rubbing wheel parts goes into the surroundings rather than into useful output energy. To answer this question you need to know that increasing the efficiency means increasing the usable output energy.

Learning About Questions

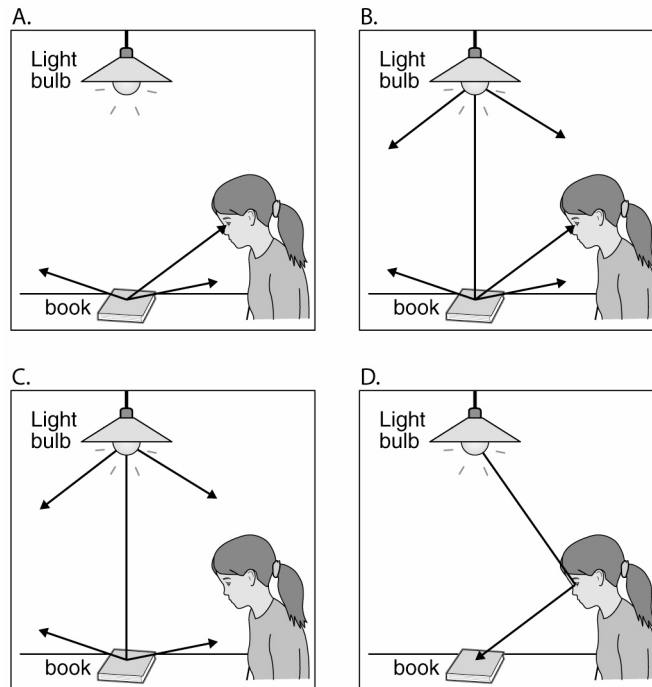
Activity 9 Reflection of Light

15. Which diagram best describes how shadows are formed?



The answer is C. The light travels in straight lines from the lamp. The light striking the card reflects off the card and hence does not illuminate the screen behind. To answer this question you need to know that light travels in straight lines

16. Which light ray diagram best describes how the girl can see the book?



The answer is B. Light travels from the source to the paper, reflects from the paper in more than one direction and then into the eye.

Activity 10

17. When light goes from air into glass the light

- a. travels in the same direction in a straight line
- b. curves
- c. changes direction but still goes in a straight line
- d. spreads out

When light goes from one material to another it changes direction. To answer this question you need to know about refraction.

Activity 11

18. Which object absorbs the most light energy?

- a. A red object
- b. A shiny white object
- c. A non-shiny white object
- d. A transparent object

A red object reflects red light and absorbs most of the other colors of light. To answer this question you need to know why objects appear as they do.

Activity 12

19. Which energy source is NOT renewable?

- a. Solar Energy
- b. Nuclear Energy
- c. Wind Energy
- d. Geothermal Energy

Nuclear energy comes from stored chemical energy from materials in the Earth. To answer this question you need to know what a nonrenewable energy source.

Activity 13

20. Astronomers can determine the temperature of a star by its

- a. luminosity
- b. mass
- c. size
- d. color

To answer this question you need know that the color of a star is related to its temperature.