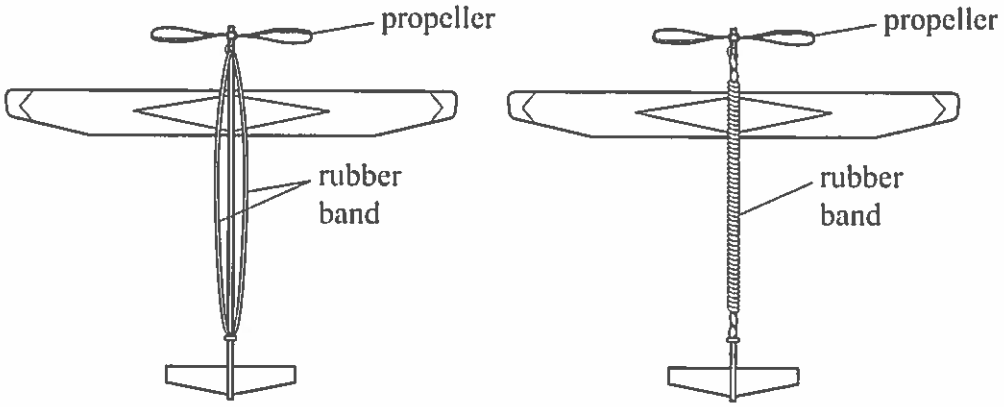
Energy Quiz

Name: _____ **Date:** _____

1. The diagrams below show a model airplane.



before winding rubber band

after winding rubber band

Which energy transformation occurs in a rubber band powered model airplane when it is flown?

A. Thermal energy stored in the rubber band is transformed into chemical energy used by the propeller.

B. Kinetic energy stored in the rubber band is transformed into thermal energy used by the propeller.

C. Chemical energy stored in the rubber band is transformed into potential energy used by the propeller.

D. Potential energy stored in the rubber band is transformed into mechanical energy used by the propeller.

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2. Which of the following converts electrical energy into motion?

A. light switch

B. electric stove

C. light bulb

D. electric fan

3. A high diver steps off a diving platform that is 10 meters above the water. If no air resistance is present, during the fall there will be a decrease in the diver's

A. gravitational potential energy.

B. total mechanical energy.

C. kinetic energy.

D. momentum.

4. Water can provide energy that may be changed into electricity. Which kind of water could be used to provide electricity?

A. pure
B. moving
C. deep
D. cold

5. Windmills are used to convert wind energy into a more useful form. In most cases, there are three steps in this process. The energy is in a different form at each step. Which of the following flowcharts shows the most likely order of the energy changes?

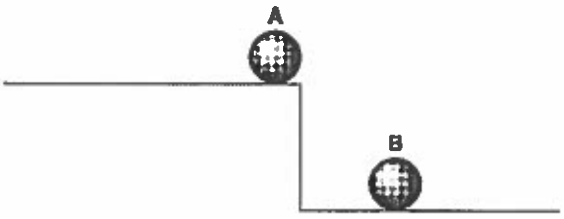
A. wind energy → mechanical energy → solar energy

B. wind energy → thermal energy → mechanical energy

C. wind energy → solar energy → electrical energy

D. wind energy → mechanical energy → electrical energy

6. The diagram shows two bowling balls of equal mass. Ball A is resting near the edge of a shelf. Ball B is resting on the ground below.



Which of these statements *best* describes the diagram above?

A. Ball A has more kinetic energy than Ball B.

B. Ball B has more kinetic energy than Ball A.

C. Ball A has more potential energy than Ball B.

D. Ball B has more potential energy than Ball A.

7.

A family is moving from Pennsylvania to Connecticut during the summer.

As the moving van burns gasoline in its engine, it converts _____.

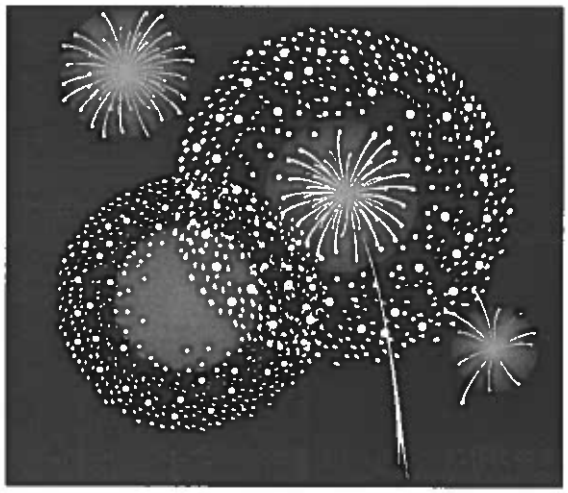
A. chemical energy into mechanical energy

B. kinetic energy into potential energy

C. thermal energy into electrical energy

D. mechanical energy into kinetic energy

8. The Rocket's Red Glare



On the 4th of July there was a fireworks display near the Connecticut River in Hartford. There were many different colorful fireworks in the show.

Energy changes occur during the flight of a firework rocket. Which of the following represents a correct energy change?

A. When the firework rocket left the ground, chemical potential energy was changed into kinetic energy.

B. When the firework rocket exploded, kinetic energy was changed into chemical potential energy.

C. During the rise of the firework rocket, gravitational potential energy was changed to kinetic energy.

D. During the rise of the firework rocket, gravitational potential energy was changed to heat, light and sound.

9. What is an energy change that takes place in a lightbulb?

A. Chemical energy changes to light energy.

B. Chemical energy changes to heat energy.

C. Electrical energy changes to light energy.

D. Electrical energy changes to chemical energy.

10. As a heavy metal ball rolls down a hill, it goes faster and faster. Which statement is true?

A. The ball's potential energy is changing to kinetic energy.

B. The ball is gaining potential energy from the hill.

C. The ball is rapidly losing kinetic energy as it rolls down the hill.

D. The ball will continue gaining kinetic energy until it stops.

11. Which example *best* illustrates kinetic energy?

A. a light bulb that is turned on

B. a car that is parked on top of a hill

C. a comet that is flying through space

D. a battery that is connected to a circuit

12. Noah carried a skateboard up a hill and then rode the skateboard down the hill. When Noah reached the bottom of the hill, he rolled to a stop. When did Noah have the most **potential energy**?

A. while carrying the skateboard up the hill

B. while standing on the skateboard at the top of the hill

C. while riding the skateboard down the hill

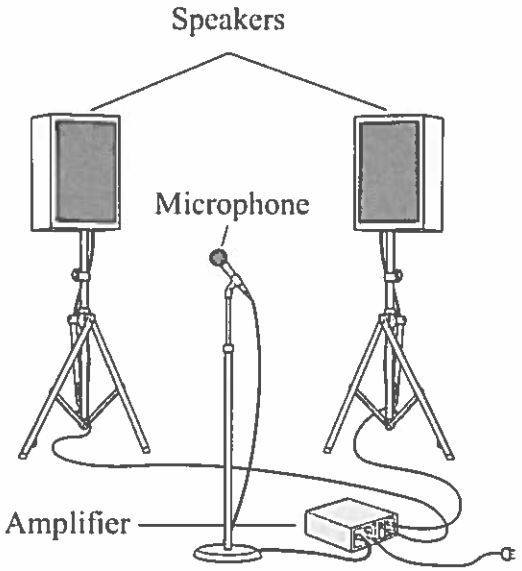
D. while standing on the skateboard at the bottom of the hill

13. Energy appears in many forms. What form of energy is lightning?

A. electrical energy B. mechanical energy

C. magnetic energy D. sound energy

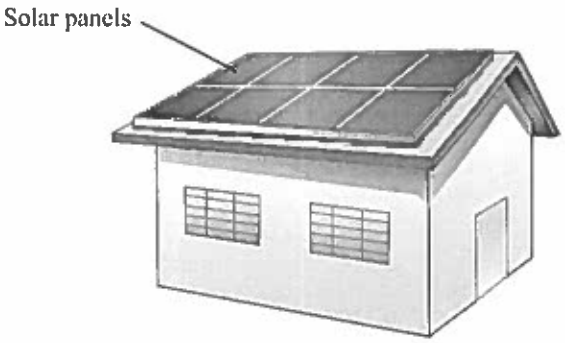
14. The public address system shown below uses a microphone, an amplifier, and speakers to make voices louder.



In this system, which of the following types of energy is used to make a person's voice louder?

A. electrical
B. heat
C. light
D. nuclear

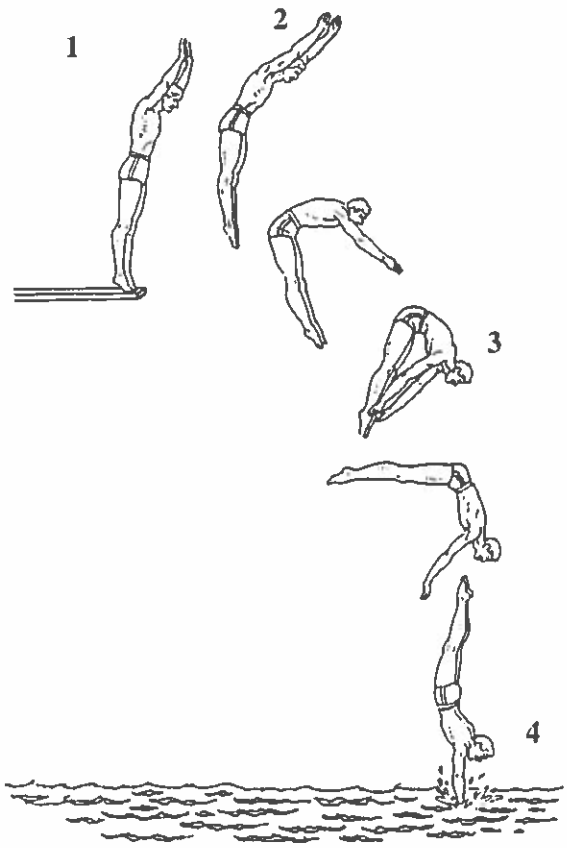
15. A solar panel is used to collect energy from the Sun and change it into other forms of energy. The picture below shows some solar panels on the roof of a building.



Which form of energy is collected by the solar panels?

A. wind
B. sound
C. magnetic
D. light

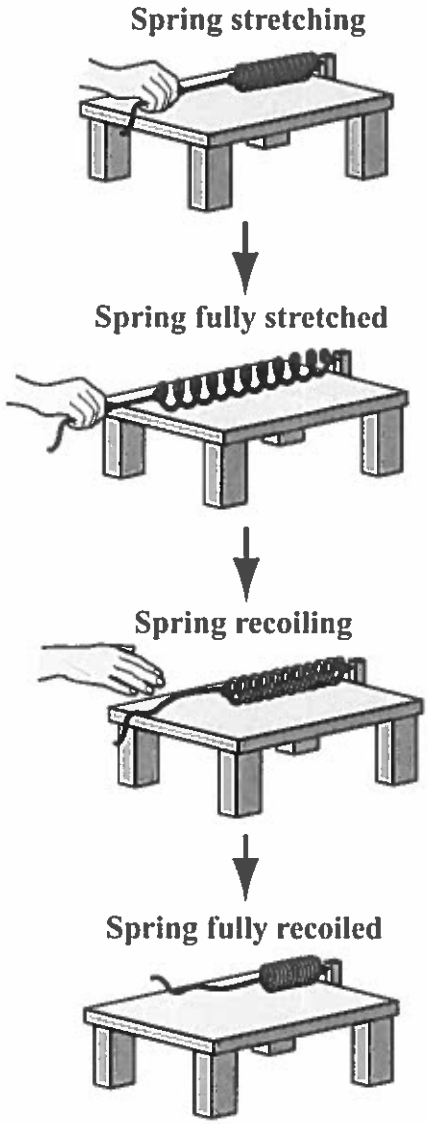
16. The diagram below represents a diver's motion from the top of a high diving board into a pool of water.



At which labeled point does the diver have the *least* potential energy?

A. 1 B. 2 C. 3 D. 4

17. A student is investigating potential and kinetic energy by stretching a spring across a table. When the student lets go, the spring recoils.



At which time is potential energy in the spring being converted into kinetic energy in this system?

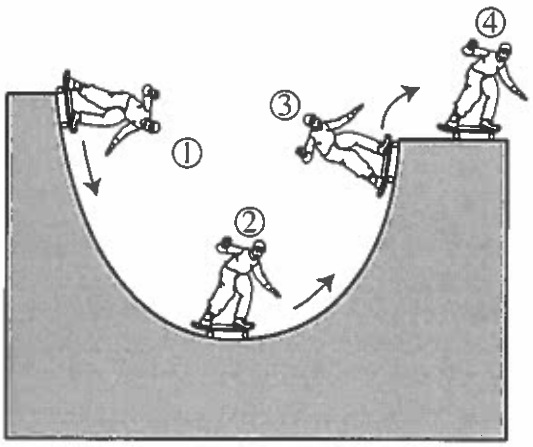
A. when the spring is stretching

B. when the spring is fully stretched

C. when the spring is recoiling

D. when the spring is fully recoiled

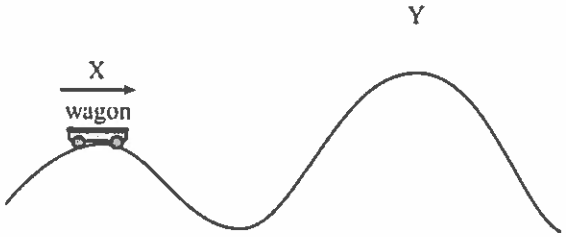
18. A skateboarder travels from location 1 to location 4 as shown below.



At which location does the skateboarder have the *most* kinetic energy and the *least* potential energy?

A. 1 B. 2 C. 3 D. 4

19. The figure below shows a wagon that moves from point *X* to point *Y*.



Which of the following best describes the wagon's change in energy as it coasts from point *X* to point *Y*?

A. The wagon has the same kinetic energy at point *Y* and at point *X*.

B. The wagon has more kinetic energy at point *Y* than at point *X*.

C. The wagon has the same gravitational potential energy at point *Y* and at point *X*.

D. The wagon has more gravitational potential energy at point *Y* than at point *X*.

20. Which of the following describes the mechanical energy of a cart at rest at the top of a steep hill?

A. The cart has no mechanical energy.

B. The cart's mechanical energy is all kinetic.

C. The cart's mechanical energy is all potential.

D. The cart's mechanical energy is half potential and half kinetic.

21. A cart at the top of a hill is released and rolls down the hill. Which of the following describes the energy of the cart just as it reaches the bottom of the hill?

A. The cart has no energy.

B. The cart has maximum kinetic energy.

C. The cart has maximum gravitational potential energy.

D. The cart has equal gravitational potential and kinetic energy.

22. Which of the following increases when a metal spring is stretched horizontally?

A. potential energy B. kinetic energy

C. gravitational energy D. electrical energy

23. Which of the following is the *best* example of work being done on an object?

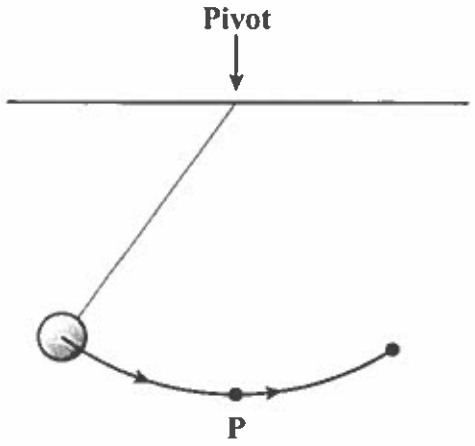
A. holding a 50 kg barbell

B. lifting a bag of groceries

C. keeping a board in place

D. pushing on a car that will not move

24. The figure below represents a pendulum's motion with the lowest point of its swing labeled *P*.



What happens to *most* of the pendulum's gravitational potential energy as it reaches the lowest point *P*?

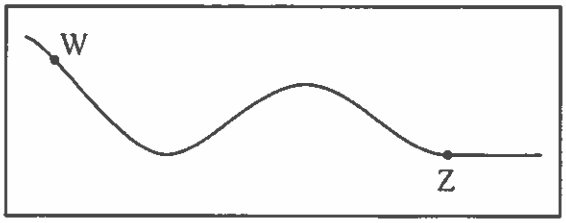
A. It is transformed into inertia.

B. It is transformed into kinetic energy.

C. It is transformed into thermal energy.

D. It is transformed into chemical energy.

25. The diagram below shows the path of a student on a sled starting from rest at point *W*.



The student slides down a frictionless, snow-covered hill past point *Z*, which is at ground level.

Which of the following statements *best* describes the energy of the student and sled from point *W* to point *Z*?

A. The total energy at point *W* is less than at point *Z*.

B. The total energy at point *W* is greater than at point *Z*.

C. The potential energy at point *W* becomes all kinetic energy at point *Z*.

D. The kinetic energy at point *W* becomes all potential energy at point *Z*.

26. An inventor claims to have designed a perpetual motion machine, a device that creates its own power. Which of the following laws *best* explains why a perpetual motion machine cannot work?

A. law of conservation of energy

B. law of conservation of matter

C. Newton's second law

D. Newton's third law

27. A hand-held video game is powered by batteries. After playing the game for several minutes, a student notices that the game feels warm.

Which of the following is the *most likely* explanation for this observation?

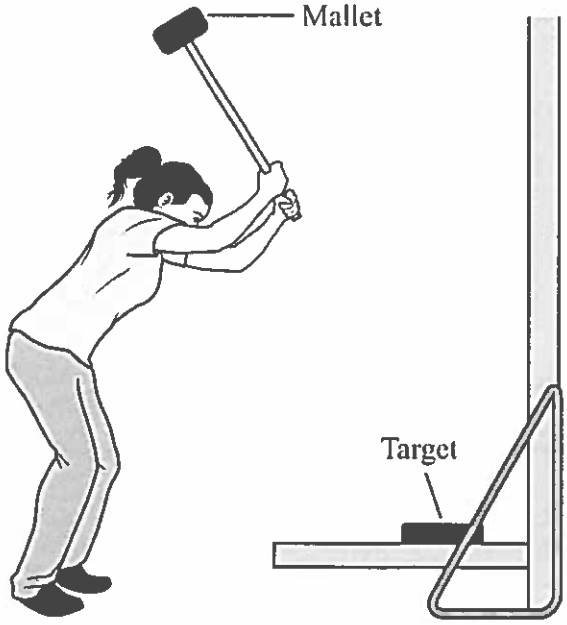
A. The game creates energy when it is turned on.

B. Some of the energy from the batteries is changed to heat.

C. Some of the energy from the batteries is changed to friction.

D. The game receives heat energy from the person playing it.

28. While playing a game at a fair, a person lifts a mallet above her head. She then lets the mallet fall toward a target, as shown below.



Which of the following statements describes an energy change that takes place as the person lifts the mallet and then lets it fall toward the target?

A. Kinetic energy increases as the mallet reaches its highest point.

B. Potential energy decreases as the mallet reaches its highest point.

C. Kinetic energy converts to potential energy as the mallet falls toward the target.

D. Potential energy converts to kinetic energy as the mallet falls toward the target.

29. Which of the following is an example of a form of energy?

A. the air in a sealed jar

B. the wire in a metal hanger

C. the water in a small puddle

D. the sound in a loud classroom

30. Two identical books are placed on a bookshelf. Book 1 is on a shelf one meter above the floor and Book 2 is on a shelf two meters above the floor.

Which statement *best* compares the potential energy of the books?

A. Book 2 has half as much potential energy as Book 1.

B. Book 2 has twice as much potential energy as Book 1.

C. Book 1 has twice as much potential energy as Book 2.

D. Book 1 has four times as much potential energy as Book 2.

31. A light bulb transforms electrical energy into light energy.

A light bulb also transforms electrical energy into

A. heat energy

B. potential energy

C. magnetic energy

D. mechanical energy

32. A car and a truck are traveling at the same rate of speed. The vehicles approach a stop sign.

Which statement *best* explains why the car stops in a shorter distance than the truck?

A. The car has a larger mass requiring less force to stop.

B. The car has a smaller mass requiring more force to stop.

C. The truck has a smaller mass requiring less force to stop.

D. The truck has a larger mass requiring more force to stop.

33. When you are sitting in a room listening to a radio, to what form of energy are your ears reacting?

A. sound B. electrical

C. heat D. light

34. Which device produces mechanical energy?

A. a battery B. an electric motor

C. a lightbulb D. a solar cooker

35. A car, a train, a bicycle, and a skateboard are traveling at the same speed. Which object has the *greatest* kinetic energy?

A. Car B. Train

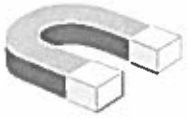
C. Bicycle D. Skateboard

36. Kerry is studying how potential energy is converted into kinetic energy. Which of the devices below shows this transformation?

A.

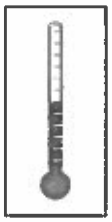
A Light Bulb

B.



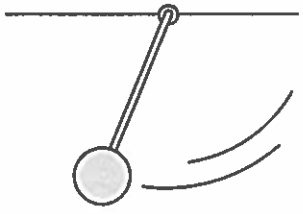
A Magnet

C.



A Thermometer

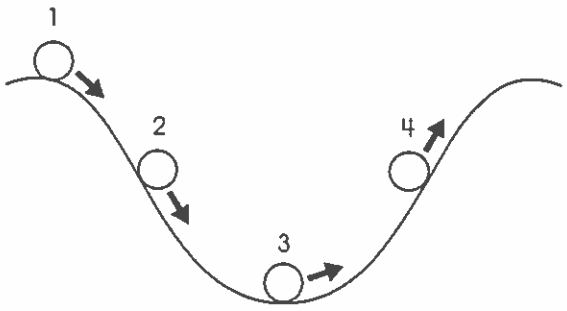
D.



A Pendulum

37. Use the following information and diagram to answer the question.

A ball is released from rest at position 1. The diagram shows the ball in four positions as it rolls along a track from left to right.



In which position does the ball have its minimum gravitational potential energy and maximum kinetic energy?

A. 1 B. 2 C. 3 D. 4

38. **SURFER**

A surfer paddles out from shore in search of the perfect wave. The surfer has a weight of 500 N and the surfboard weighs 100 N.

As a large wave reaches the surfer, she is pushed forward and upward. Which statement about her kinetic and potential energy is correct?

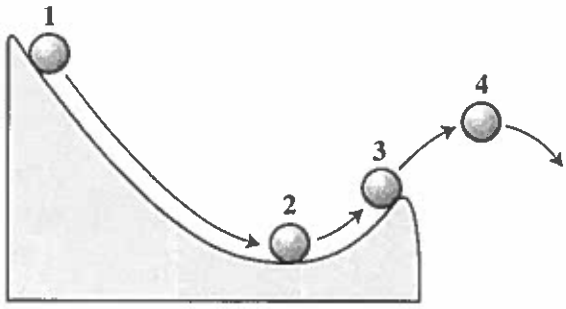
A. There is an increase in her kinetic energy only.

B. There is an increase in her potential energy only.

C. There is an increase in both her potential and kinetic energy.

D. There is no change in her potential or kinetic energy.

39. The diagram below shows four positions of a ball rolling down and off a curved ramp.



At which position is the kinetic energy of the ball being converted into potential energy.

A. Position 1 B. Position 2

C. Position 3 D. Position 4

40. When a steel block at 100° C is placed on top of a copper block at 20° C, the thermal energy of the copper begins to increase. Which of the following is the source of this increase in energy?

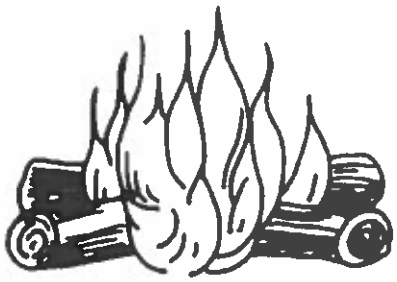
A. the work done by the molecules within the copper

B. the work done by the interaction of the two metals

C. heat flowing by means of conduction

D. heat flowing by means of radiation

41.



Which of the following statements best describes the energy transformation that occurs when a log burns?

A. Mechanical energy changes to chemical energy.

B. Chemical energy changes to heat and light energy.

C. Heat and light energy changes to chemical energy.

D. Mechanical energy changes to heat and light energy.

42. The microwave oven heats the broccoli, but not the dish handles or the plate underneath.

Which statement *best* explains why this happens?

A. The microwave oven creates radiation, and the radiation is absorbed by the broccoli but passes through the dish and the plate.

B. The microwave oven heats using convection currents and the currents collide with the broccoli but slide over the smooth dishes.

C. The microwave oven heats the air and the hot air heats the broccoli, but the dishes do not conduct heat, so they stay cool.

D. The microwave oven produces heat, which flows through the floor of the microwave into the dishes, and up out of the dishes into the broccoli.

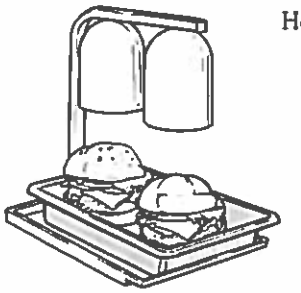
43. When one end of a short metal bar is heated, the opposite end will eventually become hot. Which of the following processes transfers the heat through the bar?

A. condensation B. conduction

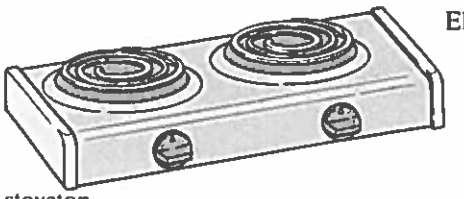
C. convection D. radiation

44. Which of the following objects transfers its energy primarily by radiation?

A. Heat lamp

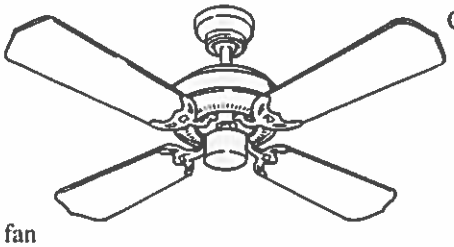


B. Electic



stovetop

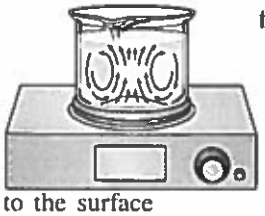
C. Ceiling



fan

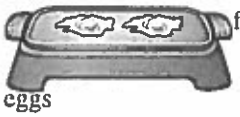
D. Burning candle

45. Which of the following is the best example of heat transfer by convection?

A.  from the lower water to the surface

B.  from the iron to the shirt

C.  from the Sun to Earth

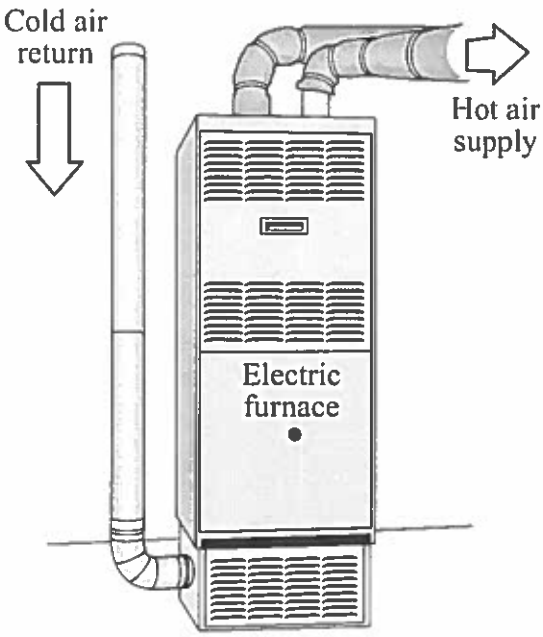
D.  from the griddle to the eggs

46. An architect knows that a home receiving a lot of exposure to the Sun will benefit from the heating effects of sunlight if there is a lot of glass in the home's design.

By which of the following methods will sunlight heat the home?

A. conduction
B. convection
C. evaporation
D. radiation

47. The diagram below represents an electric furnace.



Cold air enters through the cold air return and hot air is blown out the supply duct. Which of the following statements **correctly** describes heat transfer within the furnace?

A. The furnace transfers heat by condensation.
B. The furnace transfers heat through combustion.
C. The furnace decreases heat transfer by radiation.
D. The furnace increases heat transfer through convection.

48. In which of the following examples is heat transferred **primarily** by radiation?

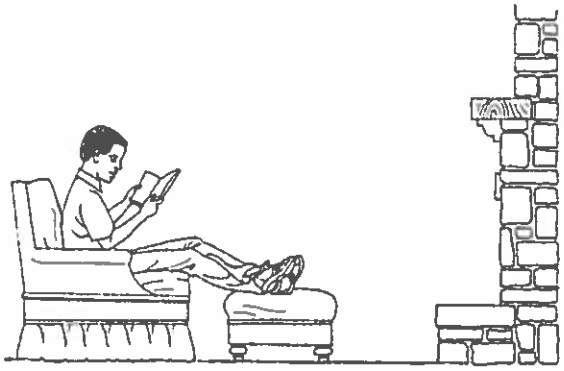
A. A fan blows warm air around a room.

B. A hot water bottle warms a person's feet.

C. Water vapor from a shower warms the room.

D. A spoon held near the side of a flame gets warm.

49. The drawing below shows a person sitting on a sofa in front of a fireplace.



Which of the following are the primary modes of heat transfer from the fire in the fireplace to the person?

A. radiation and convection

B. radiation and condensation

C. convection and conduction

D. conduction and condensation

50. Heat energy from the Sun is transferred to Earth primarily by which of the following processes?

A. conduction

B. convection

C. evaporation

D. radiation

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Energy Quiz 01/20/2016

1. Answer: D
2. Answer: D
3. Answer: A
4. Answer: B
5. Answer:
6. Answer: C
7. Answer: A
8. Answer: A
9. Answer: C
10. Answer: A
11. Answer: C
12. Answer: B
13. Answer: A
14. Answer: A
15. Answer: D
16. Answer: D
17. Answer: C
18. Answer: B
19. Answer: D
20. Answer: C
21. Answer:
22. Answer: A
23. Answer: B
24. Answer: B
25. Answer: C
26. Answer: A
27. Answer: B
28. Answer: D
29. Answer: D
30. Answer: B
31. Answer: A
32. Answer: D
33. Answer: A
34. Answer: B
35. Answer: B
36. Answer:
37. Answer: C
38. Answer: C
39. Answer: C
40. Answer: C

41.
Answer:

42.
Answer: A

43.
Answer:

44.
Answer: A

45.
Answer: A

46.
Answer: D

47.
Answer: D

48.
Answer: D

49.
Answer: A

50.
Answer: D