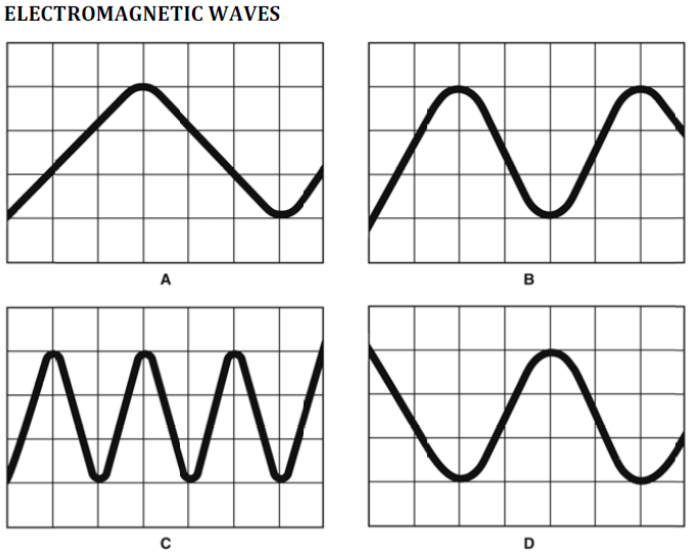
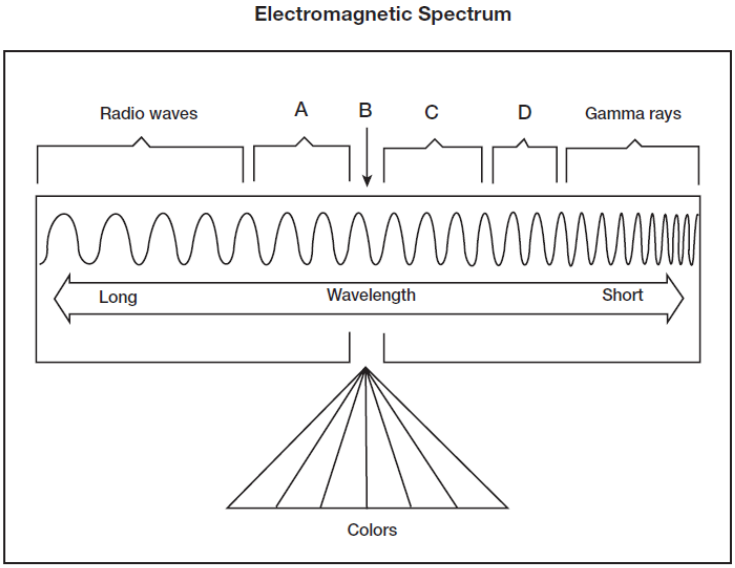
Education Transformation Office (ETO)
8th Grade
Unit #3 Assessment

1. Which graph most likely illustrates radio waves?



2. Visible light is represented by which letter?

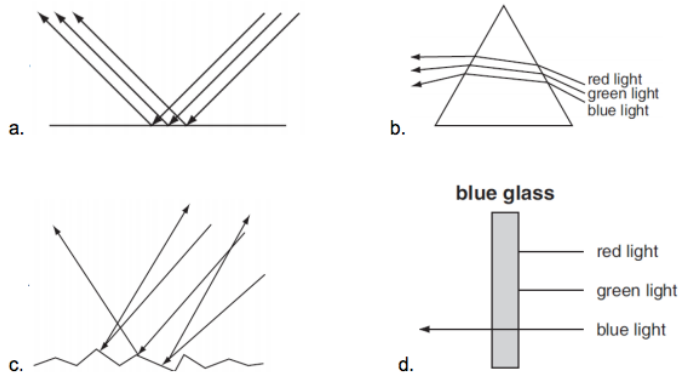


A. A
B. B
C. C
D. D

3. Felipe was enjoying the sunny day at the beach. He told his friend Carl that he was really enjoying the warm feeling that he was getting as he sat in the sun. Carl explained that the electromagnetic radiation was responsible for this warm feeling. Which part of the electromagnetic spectrum was responsible for making Felipe feel warm?
   A. gamma rays
   B. microwaves
   C. visible light
   D. infrared waves

4. What is defined as the distance between wave crests?
   A. amplitude
   B. speed
   C. wavelength
   D. frequency

5. The diagram below shows what can happen when light strikes a material.



   Which diagram illustrates the refraction of light?
   A. Diagram A
   B. Diagram B
   C. Diagram C
   D. Diagram D

6. Sound travels faster through solids than it does through either liquids or gases. A student could verify this statement by measuring the
   A. Distance that sound travels through a solid, a liquid, and a gas.
   B. Pitch of sound when it passes through a solid, a liquid, and a gas.
   C. Time required for sound to travel a set distance through a solid, a liquid, and a gas.
   D. Distance sound travels through a solid, a liquid, and a gas at varying temperatures.

7. What happens when light passes from air into water?
   A. The light speeds up.
   B. The light slows down.
   C. The light forms a mirage.
   D. The light continues at the same speed.

8. Melissa tested how fast sound waves travel through different media. She then ordered the speed at which the sound traveled through each medium from fastest to slowest. Which data table represents the correct order that the sound waves traveled from fastest to slowest?

A.

Fastest Speed	Medium Speed	Slowest Speed
air	water	steel

B.

Fastest Speed	Medium Speed	Slowest Speed
water	air	steel

C.

Fastest Speed	Medium Speed	Slowest Speed
steel	water	air

D.

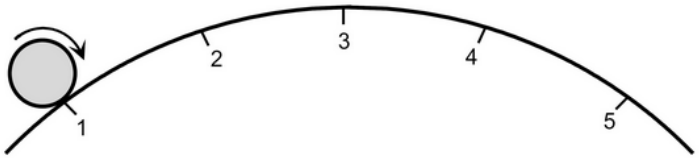
Fastest Speed	Medium Speed	Slowest Speed
air	steel	water

9. Household appliances convert electricity into one or more different forms of energy. An electric fan can best be described as converting electricity into
   A. heat energy only
   B. heat energy and sound energy only
   C. heat energy, sound energy, and mechanical energy only
   D. heat energy, sound energy, mechanical energy, and chemical energy

10. Which type of energy in gasoline is transformed into mechanical energy in a motorcycle engine?
   A. chemical
   B. magnetic
   C. nuclear
   D. electrical

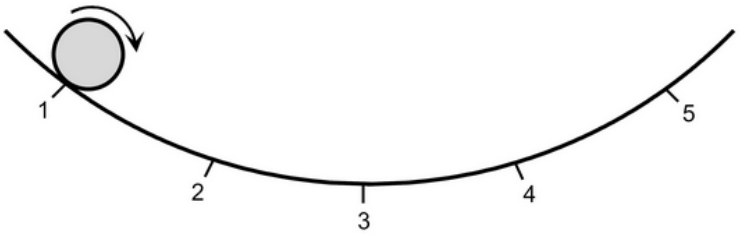
11. Which sequence of energy transformations occurs after a battery-operated flashlight is turned on?
   A. electrical -----→ light -----→ chemical
   B. electrical -----→ chemical -----→ light
   C. chemical -----→ light -----→ electrical
   D. chemical -----→ electrical -----→ light

12. A ball is rolling up and over a hill. The ball slows down as it moves from Position 1 to Position 3, and it speeds up as it moves from Position 3 to Position 5.



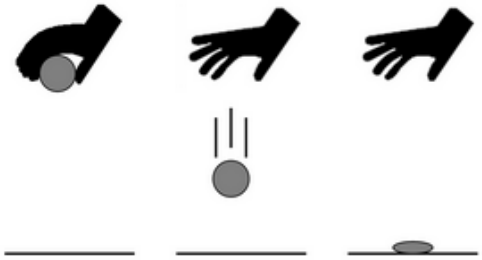
At which point is the ball's kinetic energy being transformed into gravitational potential energy?
   A. Only when the ball rolls from Position 1 to Position 3
   B. Only when the ball rolls from Position 3 to Position 5
   C. The entire time the ball is rolling from Position 1 to Position 5
   D. It is not being transformed at any time because kinetic energy cannot be transformed into gravitational potential energy.

13. A ball, starting from rest at Position 1, rolls down and then up a curved track towards Position 5. The ball speeds up as it rolls from Position 1 to Position 3, and it slows down as it rolls from Position 3 to Position 5. When it reaches Position 5, it rolls back down the track.



At which point is gravitational potential energy being transformed into kinetic energy)?
   A. Only when the ball rolls from Position 1 to Position 3
   B. Only when the ball rolls from Position 3 to Position 5
   C. When the ball rolls from Position 1 to 3, and from Position 5 to 3.
   D. The entire time the ball is rolling from Position 1 to Position 5

14. A boy holds a ball of clay above the floor. He drops the clay ball, and it speeds up as it falls to the floor. The clay ball flattens as it hits the floor and remains flat. When the clay ball hits the floor, the clay and the floor get a little warmer. (Assume that no energy is transferred between the clay ball and the air or between the floor and the air.)



As the clay ball falls and hits the floor, does the total amount of energy in the system (the clay ball and the floor) increase, decrease, or stay the same? Why?

A. The total amount of energy in the system increases because the clay ball and the floor are warmer, and therefore, have more energy.
B. The total amount of energy in the system decreases. Although the energy of the clay ball and the floor increases as they get warmer, the energy of the clay ball decreases by an even greater amount as it moves closer to the ground.
C. The total amount of energy in the system stays the same because the decrease in energy due to the clay ball moving closer to the ground is equal to the increase in energy due to the clay ball and floor getting warmer.
D. The total amount of energy in the system stays the same. Even though the clay ball and the floor are warmer, being warmer is not associated with the amount of energy an object has.

15. Joe places two solid objects in contact with each other. Which property determines the direction of the flow of heat between the two objects?
    A. Material of the objects
    B. Volume of the objects
    C. Density of the objects
    D. Temperature of the objects

16. Sabrina places a hot pot with a temperature of 72 ºC on top of a cool table at 28 ºC. After 45 minutes, the pot and the table are the same temperature. Which of the following best describes what occurred?
    A. The temperature of the pot and the table both decreased to 20 ºC.
    B. The temperature of the pot decreases to 40 ºC, while the temperature of the table increases to 40 ºC.
    C. The temperature of the pot stays the same, while the temperature of the table increases to 72 ºC.
    D. The temperature of the table stays the same, while the temperature of the pot decreases to 28 ºC.

17. Kirby leaves a beaker of water at 80 ºC in a room with an air temperature of 20 ºC. He measures the temperature of the water in the beaker every five minutes. At what temperature will the water temperature stop decreasing?
    A. 0 °C
    B. 20 °C
    C. 50 °C
    D. 80 °C

18. Changes of state occur when there is a change in
    A. Thermal energy
    B. Electromagnetic energy
    C. Chemical energy
    D. Electrical energy

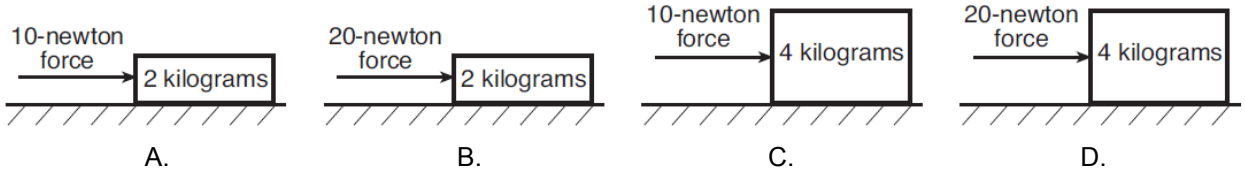
19. To keep a heavy box sliding across a carpeted floor at constant speed, a person must continually exert a force on the box. This force is used primarily to overcome which of the following forces?
    A. Air resistance
    B. The weight of the box
    C. The frictional force exerted by the floor on the box
    D. The gravitational force exerted by the Earth on the box

20. The gravitational force between two objects depends on the distance between the objects and each object's
    A. mass
    B. pressure
    C. volume
    D. temperature

21. A rocket burns fuel to create hot gases that explode violently out of the rocket engine. This explosion creates thrust. Thrust is a force that pushes the rocket upward. What force must thrust overcome in order to send a rocket up into space?
    A. Gravity acting on the rocket
    B. Gravity acting on the exploding gases
    C. Friction between the rocket and the ground
    D. Electric force between the rocket and the exploding gases

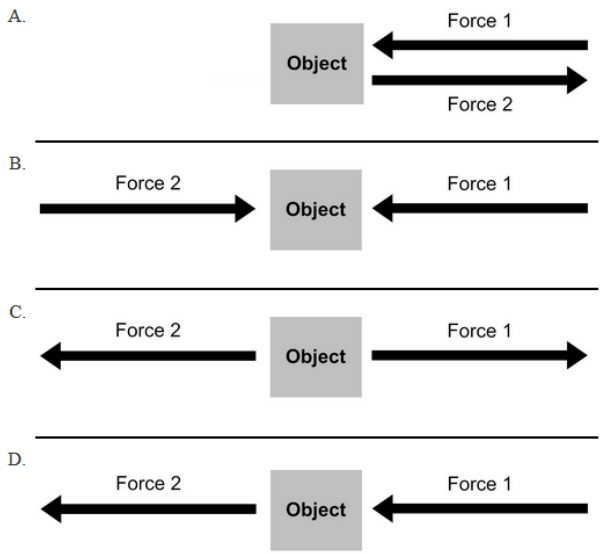
22. Richard uses a device called a compass to help him navigate through the forest when he goes camping. A compass is helpful to campers because it has a pointer that spins to indicate which direction is north. Which of the following allows the pointer of a compass to always point north?
    A. gravity
    B. electrical force
    C. friction
    D. magnetic force

23. The diagrams below show smooth blocks of wood being pushed across the same surface. The mass of the block and amount of force applied are labeled in each diagram. In which diagram would the block of wood have the greatest acceleration?

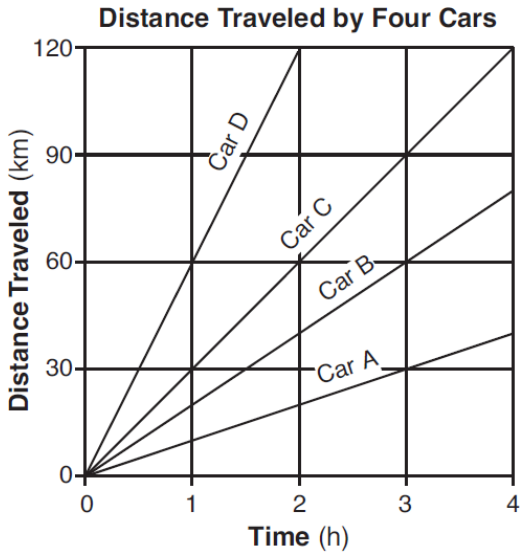


    A. Diagram A
    B. Diagram B
    C. Diagram C
    D. Diagram D

24. In the drawing below, the arrows labeled Force 1 and Force 2 represent two forces acting on an object. The directions of the arrows show the directions of the forces, and the lengths of the arrows represent the strengths of the forces. Which diagram shows an object being acted on by forces that do NOT add up to a Net Force of zero?



25. The graph below shows the distance traveled by four cars, *A*, *B*, *C*, and *D*, over a period of time.



The average speed of a moving object can be determined by using the equation below.

$$\text{Average Speed} = \frac{\text{Distance Traveled}}{\text{Time}}$$

Which car traveled at an average speed of 20 kilometers per hour?

A. A
B. B
C. C
D. D