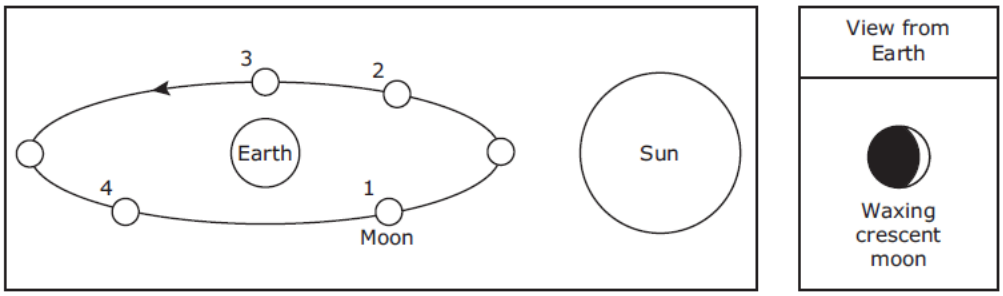
Name _____

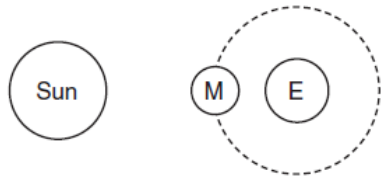
Objective3: Earth and Space Systems



1. The diagram above shows the orbit of the moon around Earth. At which point in the moon's orbit will a person standing on Earth see a waxing crescent moon? (8.7B)
   a. 1
   b. 2
   c. 3
   d. 4

2. Earth's land areas, oceans, and atmosphere maintain fairly constant average temperatures. What is the best explanation for these constant average temperatures? (8.10A)
   a. Earth's Northern Hemisphere and Southern Hemisphere have opposite seasons.
   b. Earth is tilted and rotates daily on its axis.
   c. The continuous motion of air and water distributes the sun's energy.
   d. Global weather systems generally move from west to east.

3. Which of these shows the position of the Sun, Moon, and Earth when a full moon phase occurs? (8.7B)

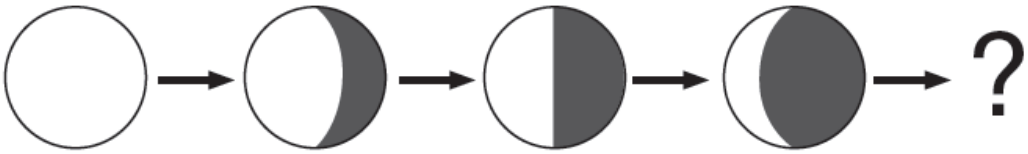


a.

b.

c.

d.



4. Which word best describes the changes in the Moon's appearance during the sequence above? (8.7B)

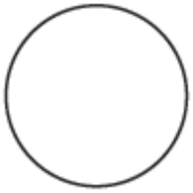
   a. Gibbous

   b. Waning

   c. Crescent

   d. Waxing

5. Which diagram best represents the next phase that will occur in the sequence? (8.7B)

a. 

b. 

c. 

d. 

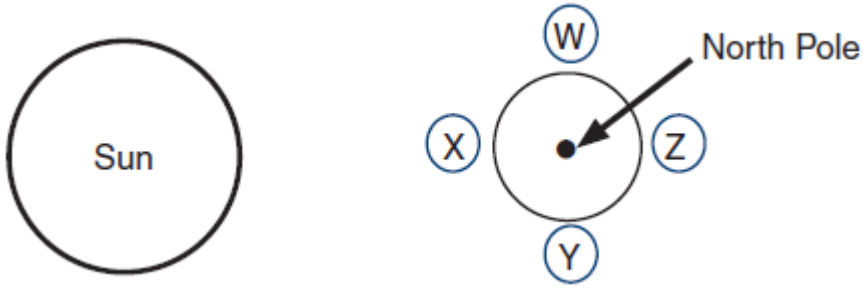
6. Approximately how long does it take for the Moon to go from new moon to full moon? (8.7B)

   a. 1 day

   b. 6–8 days

   c. About 2 weeks

   d. About 1 month



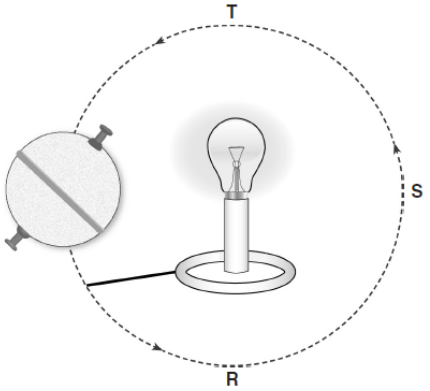
7. Which moon locations represent a spring tide? (8.7C)

   a. W and X

   b. Y and Z

   c. W and Y

   d. X and Z



8. In the model above, which hemisphere of Earth is experiencing summer? (8.7A)

   a. Northern Hemisphere

   b. Southern Hemisphere

   c. Eastern Hemisphere

   d. Western Hemisphere

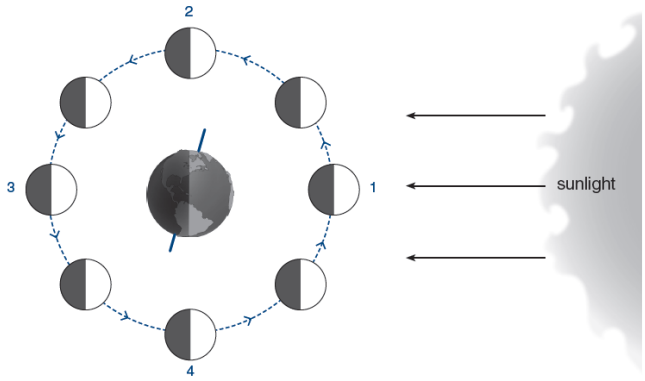
9. When Earth reaches Position T in the model, which season will Texas experience? (8.7A)

   a. Winter

   b. Spring

   c. Summer

   d. Fall



10. At which position in the Moon's orbit would a full moon occur? (8.7B)

a. Position 1

b. Position 2

c. Position 3

d. Position 4

11. About how long does it take the Moon to travel from Position 1 to Position 3? (8.7B)

a. One week

b. Two weeks

c. Three weeks

d. Four weeks

12. Which two positions bring higher than normal high tides? (8.7C)

a. Positions 1 and 2

b. Positions 1 and 3

c. Positions 2 and 3

d. Positions 2 and 4

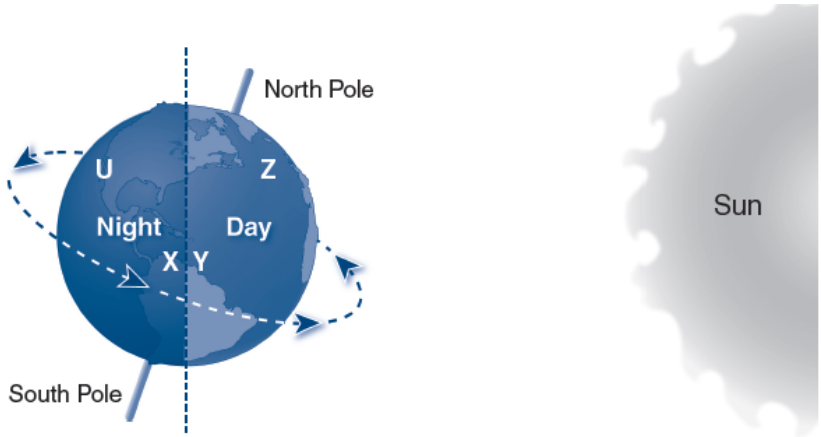
13. Which of the following would astronomers most likely measure in light-years? (8.8D)

a. Distance between stars

b. Distance between Earth and the Moon

c. Time it takes to travel to Jupiter

d. Time it takes sunlight to reach Earth



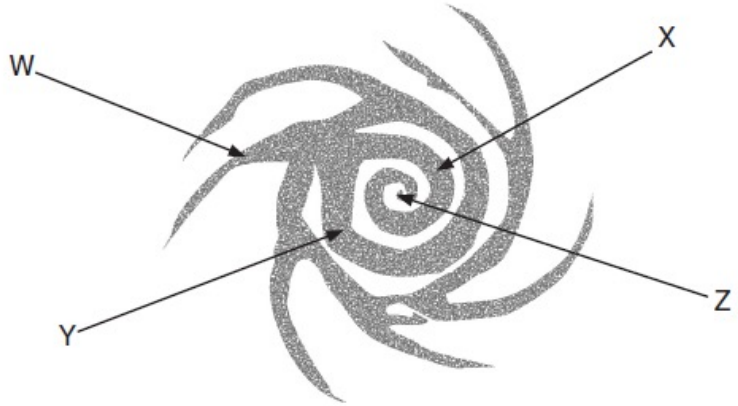
14. Which of the following best describes the days and nights shown in the diagram? (8.7A)

    a. The Northern Hemisphere is having days that last longer than the nights.

    b. The Southern Hemisphere is having days that last longer than the nights.

    c. Both hemispheres are having nights and days that last the same amount of time.

    d. Both hemispheres are having days that last longer than the nights.



15. The Sun is a star in the Milky Way galaxy. Which location above best represents the location of the Sun? (8.8B)

    a. Location W

    b. Location X

    c. Location Y

    d. Location Z

16. Which of the following provides the energy that drives convection within the ocean? (8.10A)

    a. Pressure

    b. Sun

    c. Weather

    d. Winds

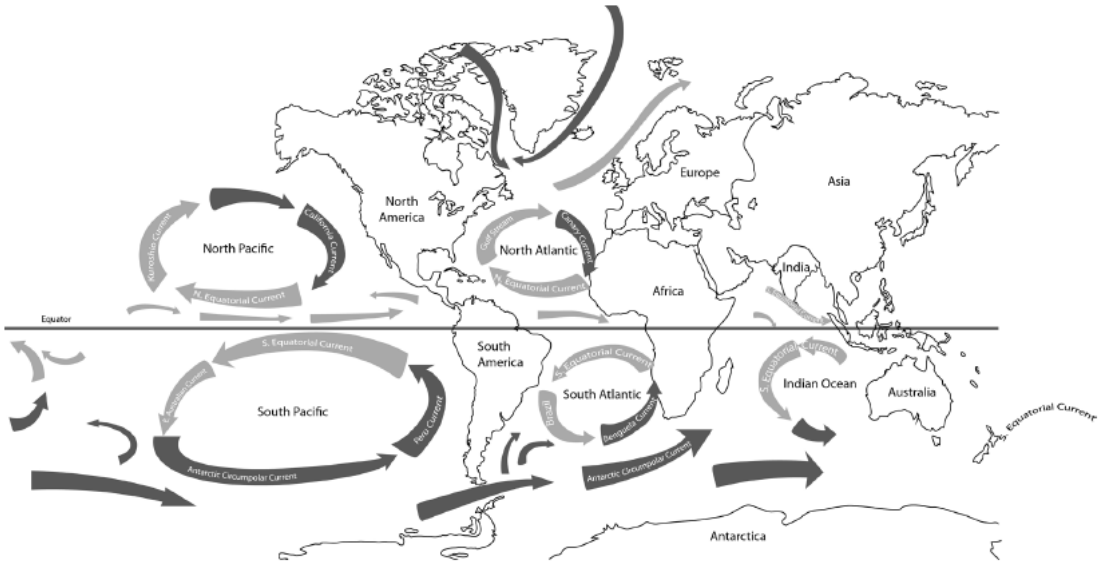
17. Why does Earth experience unequal heating? (8.10A)

    a. The atmosphere is not equally distributed around Earth.

    b. Earth is tilted on its axis.

    c. Oceans do not equally cover Earth.

    d. Earth's revolution is longer than its rotation



18. Which of the following statements is supported by the map of ocean currents? (8.10C)

    a. Warm ocean currents bring warmer temperatures to the west coast of the United States.

    b. Warm ocean currents bring warmer temperatures to the west coast of South America.

    c. Cool ocean currents bring cooler temperatures to the west coast of the United States.

    d. Warm ocean currents bring cooler temperatures to the west coast of southern Africa.

19. When air is heated, its — (8.10A)

a. density increases, forming an area of high pressure

b. density increases, forming an area of low pressure

c. density decreases, forming an area of high pressure

d. density decreases, forming an area of low pressure

20. When air moves from an area of high pressure to an area of low pressure, it causes — (8.10C)

a. an increase in temperature

b. rain to fall

c. the wind to blow

d. a decrease in elevation

21. A student heard the weather forecaster on television say that an area of high pressure was located over his region of the state. What type of weather is the area most likely to experience? (8.10B)

a. Cold and wet

b. Dry and clear

c. Stormy

d. Cloudy and wet

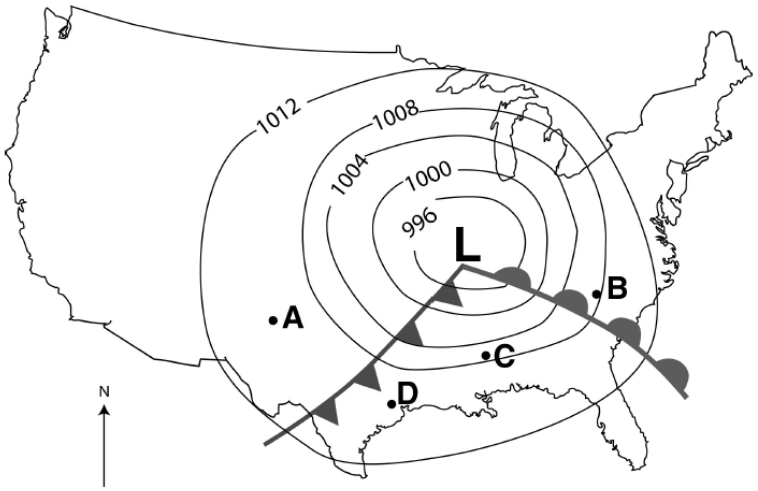
22. Which of these best explains why the oceans have a greater impact on the weather than areas over the continents? (8.10C)

a. Ocean waves move more easily than continental rock.

b. The oceans contain a wider variety of organisms than the continents.

c. The oceans store and transfer more heat than the continents.

d. Ocean water contains more salt than most continental lake water



23. Which location on the map is experiencing cool temperatures and clear skies?(8.10B)

a. Location A

b. Location B

c. Location C

d. Location D

24. The ocean plays an important role in the formation of storm systems such as hurricanes because — (8.10C)

a. the wide, open area allows strong winds to develop

b. the warm, tropical waters provide the energy that drives the storm

c. the high tides push the water higher on the beaches

d. salt water holds thermal energy longer than freshwater

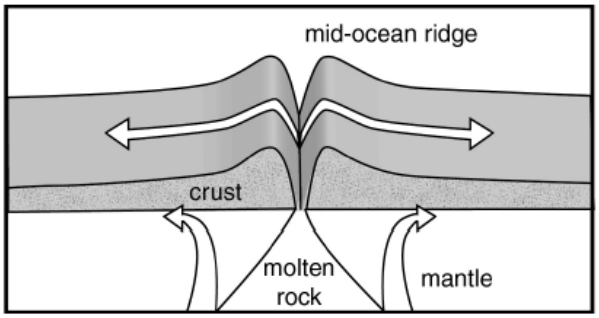
25. Which of the following statements is not supported by the plate tectonic theory? (8.9A)

a. Continents move through the seafloor crust.

b. Locations of volcanoes and earthquakes can be explained.

c. Seafloor spreading provides evidence to support the plate tectonic theory.

d. There are three different types of plate boundaries associated with the direction of plate movement



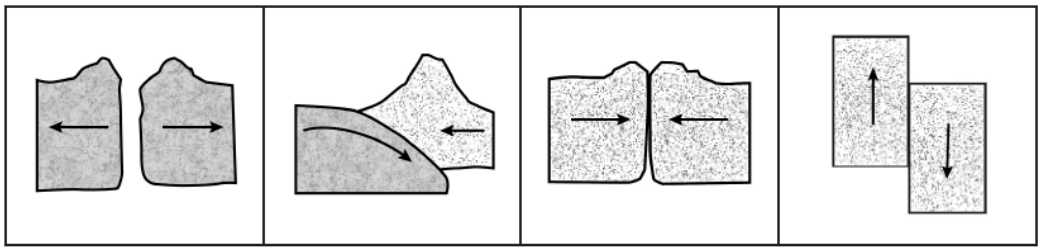
26. The diagram shows how the ocean floor is spreading. The new ocean floor made of molten rock is being formed at a mid-ocean ridge. Which best describes where the molten rock comes from? (8.9B)

    a. The crust

    b. Volcanoes under the ocean floor

    c. Masses of land to either side of the ocean

    d. The mantle just beneath Earth's crust



Q R S T

27. Which table represents a land feature or geologic process that occurs at each type of boundary pictured? (8.9B)

a.

Q	Mid-Ocean Ridge
R	Volcano
S	Folded Mountain
T	Earthquake

b.

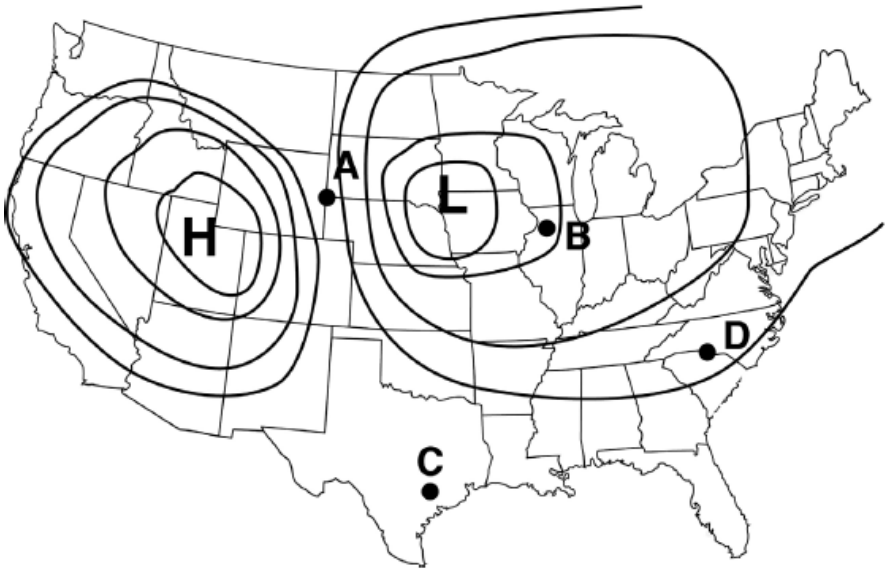
Q	Earthquake
R	Mid-Ocean Ridge
S	Volcano
T	Folded Mountain

c.

Q	Volcano
R	Folded Mountain
S	Mid-Ocean Ridge
T	Earthquake

d.

Q	Mid-Ocean Ridge
R	Volcano
S	Earthquake
T	Folded Mountain



28. Which of the following best describes the weather conditions at Location B? (8.10B)

a. Cloudy

b. Windy

c. Clear skies

d. Clear skies and rain

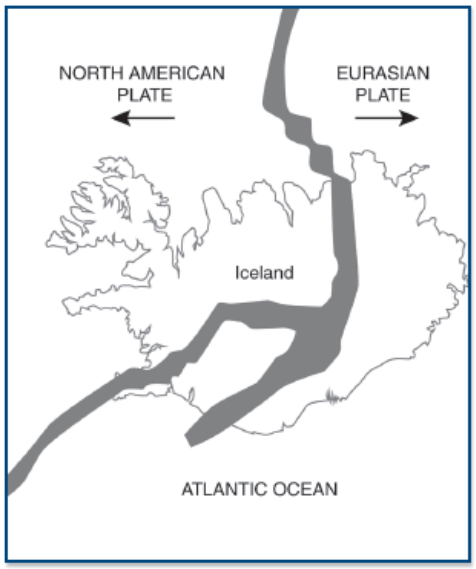
29. Which of these features is formed by the separation of the North American and Eurasian tectonic plates? (8.9B)

a. Ice cave

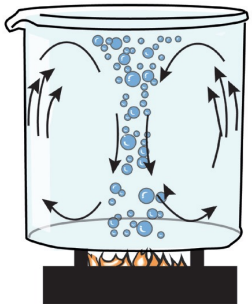
b. Rift valley

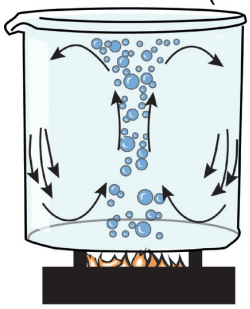
c. Deep trench

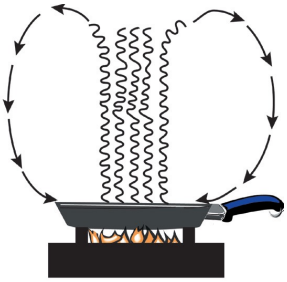
d. Flat plateau



30. Which of the following best models convection of an ocean current? (8.10A)

a. 

b. 

c. 

d. 

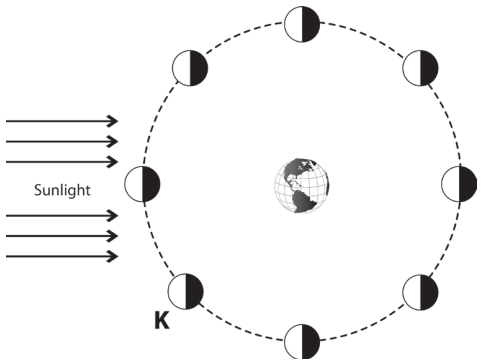
31. Street signs around the city of Austin, Texas warn citizens against dumping waste liquids in certain areas. The signs state that these areas are aquifer recharge zones where large quantities of water can flow into the aquifer. Why should dumping be limited in recharge areas? (7.8C)

    a. Liquid waste may directly enter the groundwater.
    b. Austin is too close to the Gulf coast.
    c. Water should be recycled.
    d. There is a water shortage in Austin.

1 2 3 4 5 6 7 8

32. The images above show how the Moon appears on eight different days of a month from the same position on Earth. Which statement best explains why the Moon appears to change as seen from Earth? (8.7B)

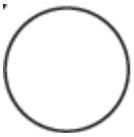
a. The Moon only revolves around Earth and does not rotate.
b. Earth casts a shadow on the Moon as it moves through the lunar cycle.
c. The amount of light produced by the Moon varies throughout the month.
d. The Moon, or part of the Moon, is unlit as seen from Earth.



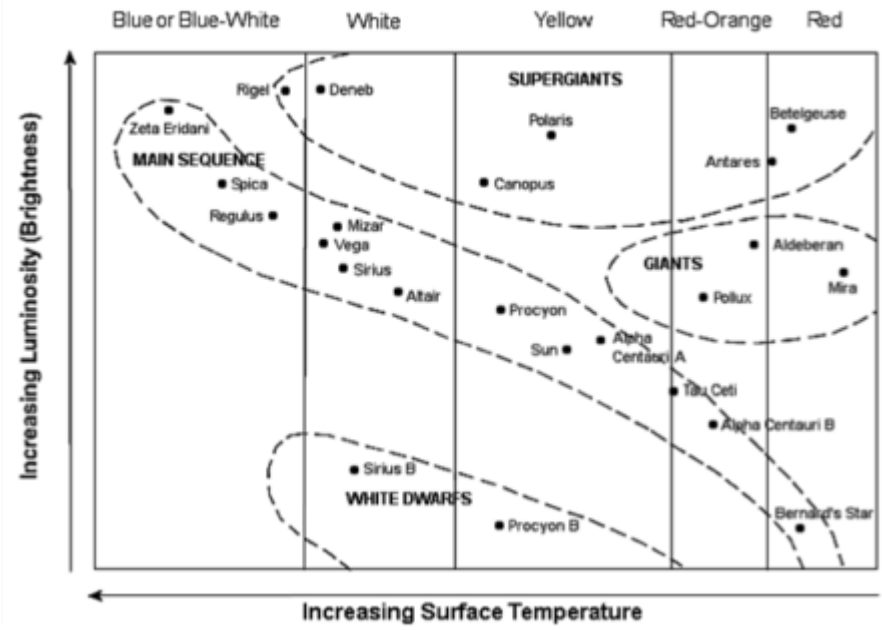
33. The diagram above shows the Moon orbiting Earth. Which of the following best represents how the Moon will appear at Position K when viewed from Earth? (8.7B)

a. 

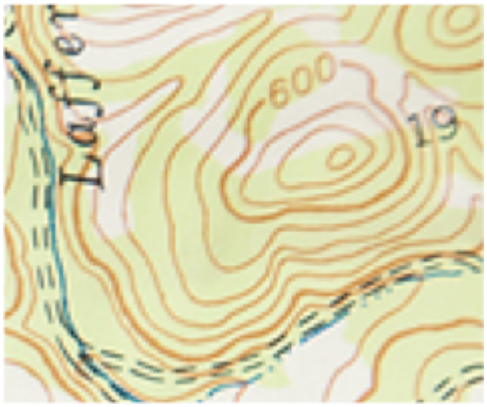
b. 

c. 

d. 



34. What does the Hertzsprung-Russell diagram tell us about the star, Betelgeuse? (8.8A)
    a. It has a low surface temperature and high luminosity
    b. It has high surface temperature and high luminosity
    c. It has low surface temperature and low luminosity
    d. It has high surface temperature and low luminosity



35. What does a grouping of close contour lines indicate? (8.9C)
    a. The location of water
    b. A meadow
    c. A steep slope
    d. A railroad

36. On September 13, 2008, Hurricane Ike struck the Texas coast. What information can be observed from the aerial photos taken before and after the storm? (8.9C)
    a. The change in landforms due to erosion caused by the storm
    b. The depth of the water in the area
    c. The wind speed of the storm
    d. The tide levels expected for the next storm

Credit:
U.S. Geological Survey Department of the Interior USGS U.S. Geological Survey

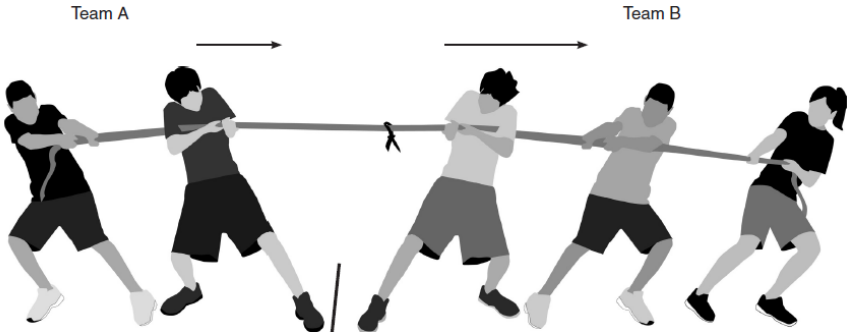
37. City planners want to build a new airport. The city is located near a river that often changes course. How could satellite views assist the planners in choosing a location for the airport? (8.9C)
    a. Views could be used to locate the areas of least vegetation
    b. Views could be used to predict the future course of the river
    c. Views could be used to locate flat and level areas
    d. Views could be used to make topographic maps of the area
38. A motorcycle traveling 35 mi/hr slows as it approaches a stop sign. This is an example of __ (8.6B)

a. acceleration

b. distance

c. speed

d. velocity



39. In the picture above, two teams of students are playing tug-of-war. Each team is pulling in the opposite direction, but both teams are moving in the same direction. Which of the following best describes the forces in this situation? (8.6A)

a. The forces are balanced and the net force is zero.

b. The forces are balanced and Team A is exerting a greater force.

c. The forces are unbalanced and Team A's force is greater.

d. The forces are unbalanced and Team B's force is greater.

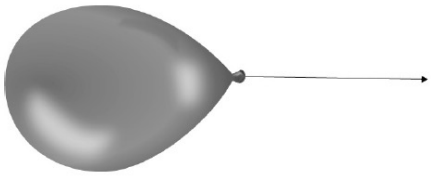
40. A bike racer travels 17 mi/hr in a southerly direction. This is an example of — (8.6B)

a. distance

b. speed

c. velocity

d. acceleration



41. When the air is released from a balloon, the air moves out one end and the balloon moves in the other direction. Which statement does this situation best illustrate? (8.6C)

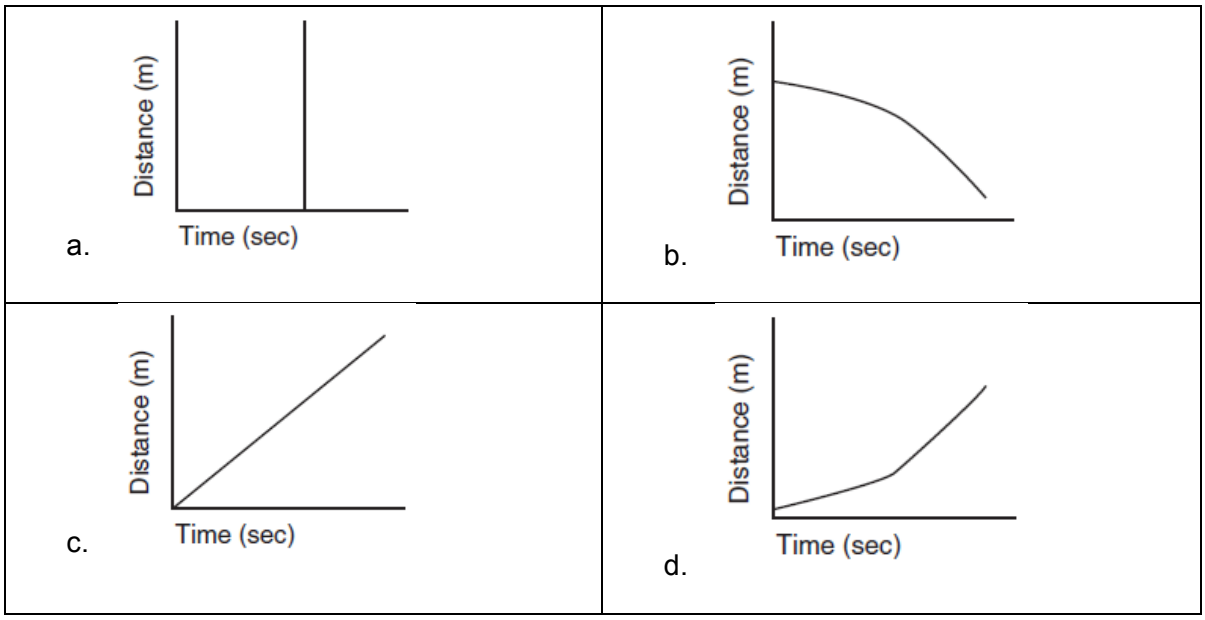
a. What goes up must come down.

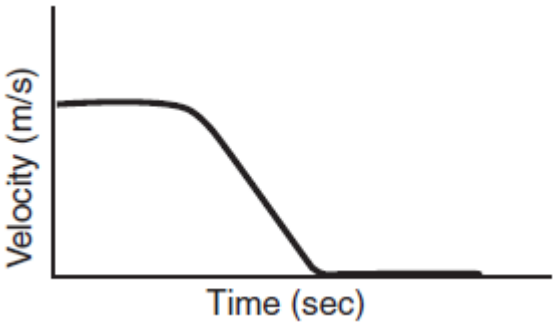
b. For every action there is an equal and opposite reaction.

c. The shape and size of an object affect air resistance.

d. The acceleration due to Earth's gravity is 9.8 m/s^2.

42. Which graph best represents a car traveling down the freeway at a constant speed? (6.8D)





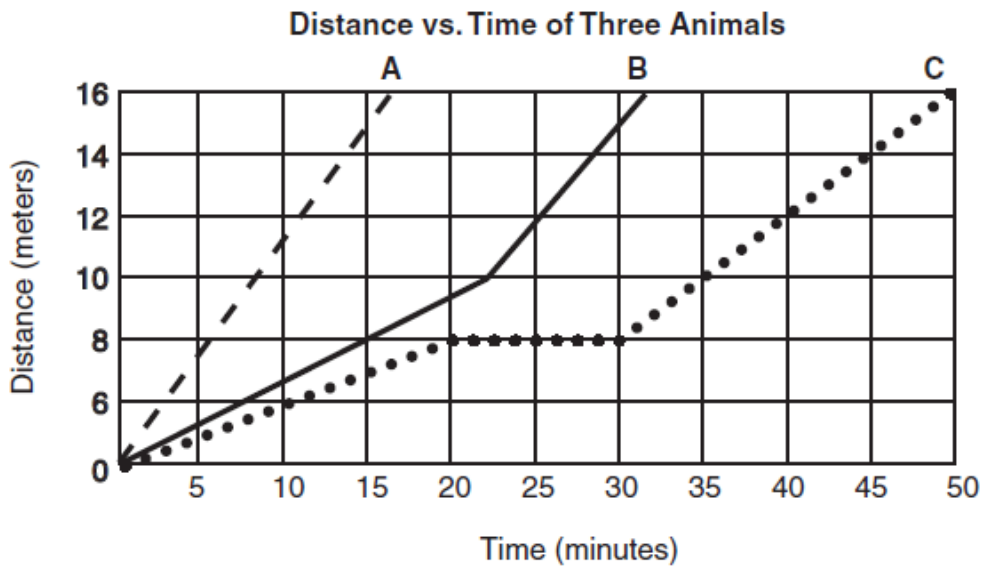
43. The graph most likely applies to which activity? (6.8D)

a. A basketball bouncing up and down on the ground

b. A football at rest, then kicked toward the goalpost

c. A car traveling at a constant speed, then stopping as brakes are applied

d. A person riding a bicycle in a straight line down a level road at a constant speed



44. What is the average speed of Animal A during the race? (6.8C)

a. 1 m/s

b. 5 m/s

c. 16 m/s

d. 32 m/s

Object	Mass (g)
R	250
S	180
T	225
U	290

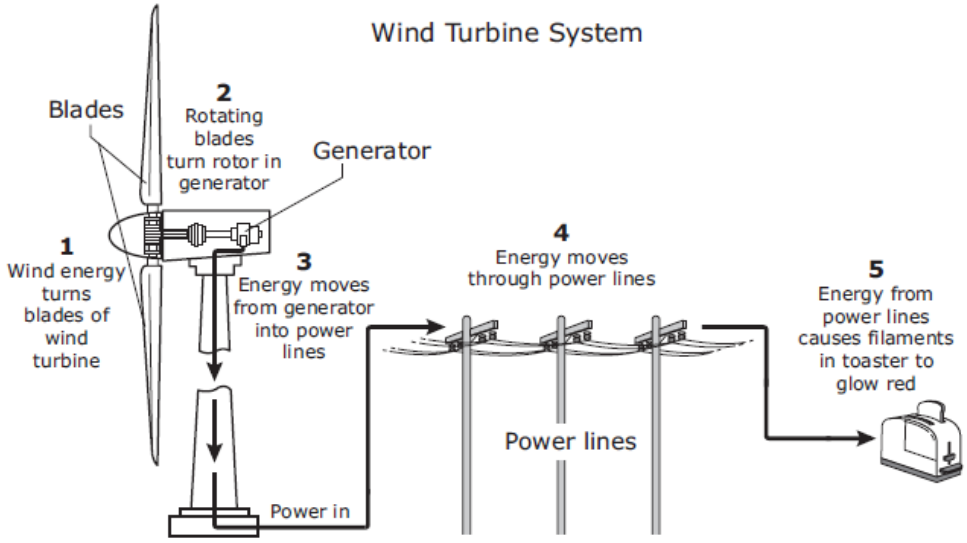
45. A spring scale is used to pull each of the four objects. Based on the information provided, which object experiences the greatest acceleration when pulled with 8 N of force? (8.6A)

a. Object R

b. Object S

c. Object T

d. Object U



46. In the diagram above, a wind turbine is transforming energy from the wind. Between which two steps in the diagram is mechanical energy being converted into electrical energy? (6.9C)
   a. 1 and 2
   b. 2 and 3
   c. 3 and 4
   d. 4 and 5

Segment	During the race, runners . . .
A	. . . wait at the starting line for the starter's signal.
B	. . . speed up on the straight section of the track.
C	. . . change direction as they round the corner of the track.
D	. . . slow down after they cross the finish line.

47. Based on the observations, the runners do not accelerate during — (8.6B)

a. Segment A

b. Segments A and C

c. Segments B and C

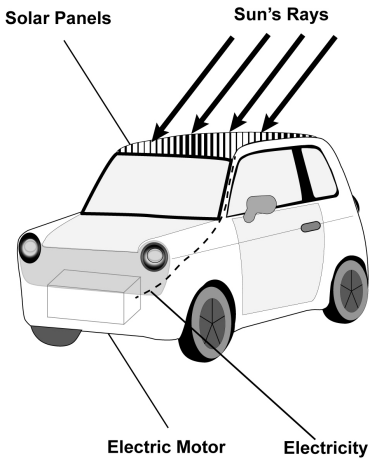
d. Segments C and D

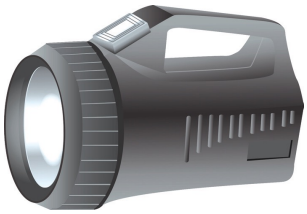
48. Which of the following best describes the energy transformation that occurs in plants during photosynthesis? (6.9C)

a. Radiant energy is changed into thermal energy.
b. Chemical energy is changed into thermal energy.
c. Radiant energy is changed into chemical energy.
d. Chemical energy is changed into radiant energy.

49. The car shown above uses three different forms of energy. Which of the following identifies the energy transformation represented by the car? (6.9C)

a. mechanical →chemical →electrical
b. chemical →electrical →mechanical
c. electrical →radiant →chemical
d. radiant →electrical →mechanical





50. A battery is placed inside a handheld lantern. When the light is turned on, the chemical energy of the battery is changed into all of the following forms of energy *except*— (6.9C)
a. light energy
b. heat energy
c. mechanical energy
d. electrical energy

51. A boy pulls on his dog's leash, but the dog does not move. Since the dog did not move, no – (7.7A)
a. Friction was done on the dog
b. Force was done on the dog

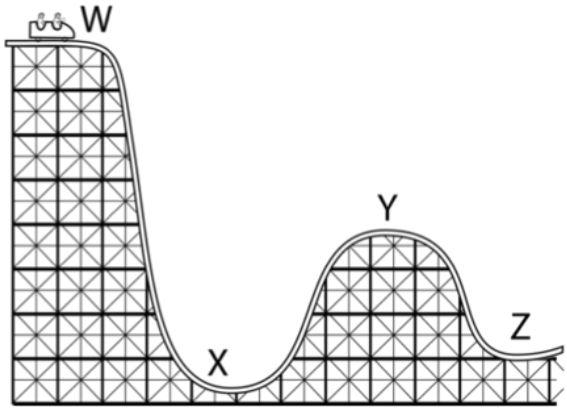
c. Pressure was done on the dog
d. Work was done on the dog

52. What happens to the potential energy of an object as it falls? (6.8A)

a. Potential energy increases
b. Potential energy is destroyed
c. Potential energy transforms (changes) to kinetic energy
d. None of the above

Height of Marble	Depth of Hole
50 cm	.5 cm
100 cm	1.0 cm
150 cm	1.5 cm

53. As they were investigating potential and kinetic energy, students dropped a marble into a tray of flour and recorded data. What was the question of the experiment? (6.8A)
a. What will a marble do when it is dropped into a powdery substance?
b. When an object has more potential energy, will it transform into more kinetic energy?
c. Will the mass of an object affect the force of kinetic energy?
d. Does a falling object have kinetic energy?



54. At which point on the roller coaster does the car have the most kinetic energy? (6.8A)
a. W
b. X
c. Y
d. Z

55. Javelinas need strong leg muscles to help provide enough force for them to accelerate to high speeds. This fast movement can help Javelinas escape from predators and reach the safety of the pack. If a Javelina runs 42 meters in 6 seconds, what is its average speed? (6.8C)

a. 6 m/s
b. 7 m/s
c. 48 m/s
d. 252 m/s

56. According to Newton's Law of Inertia, a ball that is rolling across the ground will _ (8.6C)
    a. Continue to roll indefinitely because there is no force acting on it
    b. Continue to roll unless there is an opposing force acting on it
    c. Will stop unless there is an opposing force acting on it
    d. Continue to roll regardless of the forces acting on it

Object	Mass	Acceleration
Soccer Ball	0.45 kg	5 m/s^2
Tennis Ball	0.055 kg	100 m/s^2
Marble	0.015 kg	1000 m/s^2

57. Examine the table below. Which of the objects is producing the greatest force? (8.6C)
    a. Soccer ball
    b. Tennis ball
    c. Marble
    d. Their accelerations are all equal