Structure of Matter

**1. During the water cycle, when water vapor changes to liquid water, it is called (S8P1e)**

1. evaporation
2. condensation
3. freezing
4. boiling

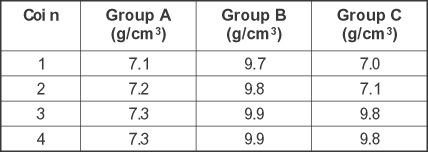
**2. Carbon atoms have 6 protons and 6 neutrons in the nucleus. They also have 6 electrons outside the nucleus. What is carbon’s atomic number and atomic mass? (S8P1f)**

1. atomic number = 12; atomic mass = 12
2. atomic number = 6; atomic mass = 18
3. atomic number = 6; atomic mass =12
4. atomic number = 12; atomic mass = 18

**3. Bill has an unknown liquid. In five different tests the liquid shows the same properties as water. Bill can conclude that the liquid (S8P1d)**

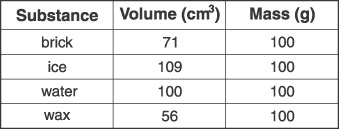
1. is definitely water
2. cannot be water
3. is partly water
4. could be water

**4. Students in three different groups found the density of some coins. Each group was given four coins. Their results are shown in the table below.**



**All of the following are valid conclusions based on the data except (S8P1d)**

1. Group A’s coins were different than Group B’s.
2. Groups A’s coins were all the same type.
3. Groups B’s coins were not all the same type.
4. Group C’s coins were not all the same type.

Use the table below to answer the following question. 

**5. The table lists the volume and mass of four substances. Which substance has the lowest density? (S8P1d)**

1. brick
2. ice
3. water
4. wax

**6. Evidence of a chemical change would be a (S8P1e)**

1. melting Popsicle
2. spinning top
3. spilled bucket of water
4. rusting car fender

**7. Mary wants to find the density of a small stone. Which tools will she need? (S8P1d)**

1. a meter stick and a thermometer
2. a thermometer and a balance
3. a balance and a graduated cylinder
4. a graduated cylinder and a meter stick

**8. A hot air balloon rises because (S8P1c)**

1. molecules become lighter when heated
2. molecules move faster and farther apart when heated
3. molecules are less attracted by gravity when heated
4. molecules become charged and repel each other when heated

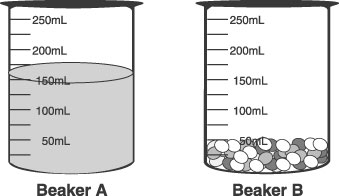
9. **A teaspoon of salt is dissolved in a quart of water. Which of the following is true? (S8P1e)**

1. The salt can be separated from the water by filtering the solution through a fine cloth.
2. The salt grains can be seen in the solution with a microscope.
3. The salt will eventually settle out.
4. The salt can be separated from the water by boiling off the water.

**10. If different kinds of atoms are represented by different colored dots, which picture represents a sample of a compound? (S8P1b)**

|  |  |
| --- | --- |
| A. 56903_option_a01 | B. 56903_option_b01 |
| C. 56903_option_c01 | D. 56903_option_d01 |

Use the picture below to answer the following question.



***11.* Beaker A contains water. Beaker B contains copper pellets. When the copper pellets from Beaker B are poured into Beaker A, what will be the water level in Beaker A? (S8P1d)**

1. below the 150 mL mark
2. at the 150 mL mark
3. above the 150 mL mark, but below the 200 mL mark
4. at the 200 mL mark

**12. Which statement about the molecules in ice and the molecules in liquid water is correct? (S8P1c)**

1. The molecules in ice have more energy than the molecules in liquid water.
2. The molecules in ice contain different atoms than the molecules in liquid water.
3. The molecules in ice move less freely than the molecules in liquid water.
4. The molecules in ice can move more freely than the molecules in liquid water.

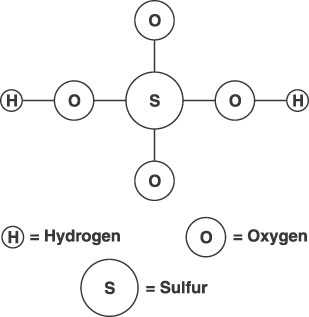
13. **Because calcium cannot be changed by simple chemical methods into two or more different substances, it is classified as (S8P1b)**

1. an element
2. a compound
3. a mixture
4. a base

**14. How many atoms are in one molecule of NH3? (S8P1a)**

1. 2
2. 3
3. 4
4. 6

Use the model below of a sulfuric acid molecule to answer the following question.



**15. According to the model, which is the formula for sulfuric acid? (S8P1a)**

1. H2OS
2. HS2O4
3. H2SO4
4. HSO3

**16. Carbon dioxide (CO2) is made of carbon and oxygen (S8P1a)**

1. atoms
2. compounds
3. electrons
4. molecules

**17. If you dissolved a lot of salt in some water in a large flat dish and put the dish in bright sunlight on a hot day, what would be left in the dish after a long time? (S8P1e)**

1. dry salt
2. water with no salt
3. the same salty water as before
4. nothing

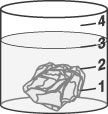
**18. The elements in the periodic table are arranged from (S8P1f)**

1. softest to hardest
2. acids to bases
3. low to high atomic numbers
4. gases to solids

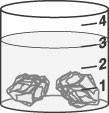
**19. Which is the basic unit of all matter? (S8P1a)**

1. atom
2. compound
3. electron
4. molecule

Use the pictures below to answer the following question .



**20. When a rock is put in a pail of water, the water comes up to the line shown above. Which picture shows where the water level would be if the rock were broken into two pieces? (S8P1g)**

A. 

B. 

C. 

D. 

**21. William put a sugar cube in a cup of hot water. After a period of time, what happened to the sugar cube**? (S8P1e)

1. It dissolved.
2. It stayed on the bottom of the cup.
3. It evaporated.
4. It changed color.

**22. All of the following except one are made up of atoms. Which one is NOT made up of atoms? (S8P1a)**

1. energy
2. people
3. gasoline
4. sodium chloride

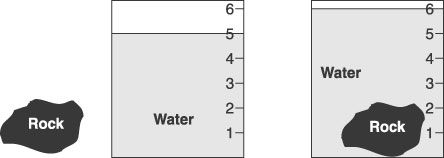
**23. The mass of a solid object stays the same until (S8P1d)**

1. it is put into orbit in space
2. it changes volume by expanding or contracting
3. matter is taken away from or added to the object
4. the object is taken to another planet where the force of gravity is different

**24. When water boils (S8P1e)**

1. a physical change takes place
2. a chemical change takes place
3. it breaks down into atoms
4. a new substance is formed

Use the pictures below to answer the following question .



**25. A rock is put into a pail that has some water in it. Before the rock is put into the pail, the water is at the 5-liter line. After the rock is added, the water rises to the 6-liter line. The space taken up by the rock is (This is a measurement/experimental design question.)**

1. 1 liter
2. 5 liters
3. 6 liters
4. 11 liters

**26. In which substance are the molecules closest to each other? (S8P1c)**

1. steam
2. water
3. oil
4. iron

**27. Plastic, wood, and iron are ALL made of (S8P1a)**

1. energy
2. plant or animal cells
3. carbon molecules
4. atoms

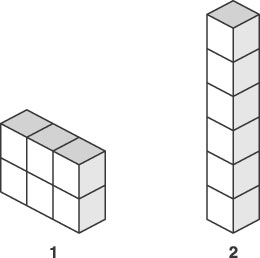
**28. If you added sand to a container until you doubled the container’s weight, you would also double the container’s (S8P1d)**

1. volume
2. temperature
3. mass
4. pressure

**29. Which of the following combine to form a molecule? (S8P1a)**

1. atoms
2. neutrons
3. mixtures
4. protons

Use the pictures below to answer the following question.



30. **Two objects of different shapes are each made from 6 cubes stuck together as shown above. If all the cubes are exactly alike, how do the two objects compare in weight and volume? (S8P1d,g)**

1. Both weigh the same and have the same volume
2. Both weigh the same but object 1 has the greater volume
3. Object 2 weighs more and has the greater volume
4. Object 1 weighs more but both have the same volume

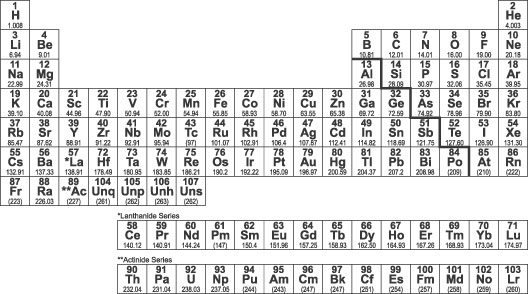
31. **A different chemical substance is formed when (S8P1e)**

1. a cloth is cut
2. a cup breaks
3. a candle burns
4. a piece of chalk falls

**32. Jeff has two different metal samples. Which tools would Jeff MOST LIKELY use to compare the two metals? (This is a measurements/experimental design question related to S8P1d.)**

1. litmus paper and ruler
2. ruler and balance scales
3. thermometer and litmus paper
4. balance scales and thermometer

Use the table below to answer the following question.



**33. All of the elements we know are shown in this table. This table is called (S8P1f)**

1. the molecular table
2. the atomic theory table
3. the matter table
4. the periodic table

# 34. When water gets very hot it changes to (S8P1e)

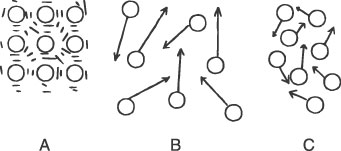
A. air.

B. ice.

C. steam.

D. liquid.

Use the diagrams below to answer the following question.



**35. The diagrams represent the movement and distribution of particles in different states of matter. Which statement about the diagrams is true? (S8P1c)**

1. A is the liquid, B is the solid, and C is the gas.
2. A is the liquid, B is the gas, and C is the solid.
3. A is the solid, B is the gas, and C is the liquid.
4. A is the solid, B is the liquid, and C is the gas.

**36. Flour is a fine powder obtained by grinding wheat or other cereal grains. A pile of grain burns very slowly whereas flour dust suspended in air is explosive. Which is the best explanation of this? (S8P1e)**

1. The heat produced when small particles burn is greater than the heat produced by the burning of large particles of the same substance.
2. Grinding the grain changes its chemical composition.
3. For the same quantity of material, small particles have a greater surface area in contact with air than large particles.
4. Small particles possess more energy than large particles.

**37. Connie adds a package of powdered drink mix and some sugar to a pitcher of water, then stirs it well. What is the best description of the substance in the pitcher? (S8P1b)**

1. It is an element.
2. It is a compound.
3. It is a mixture of elements.
4. It is a mixture of compounds.

------------------------------------------------------

Energy

1. A person wants curtains that let in some light but prevent people outside from seeing into the house. The best choice of material would be one that is (S8P4d)

* 1. opaque
  2. reflecting
  3. transparent
  4. translucent

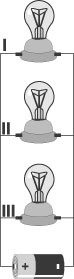
# 2. The major reason for burning gasoline in an automobile engine is to convert (S8P2c)

1. chemical energy to mechanical energy
2. kinetic energy to potential energy
3. radiation to electrical energy
4. thermal energy to electrical energy

3. Which test would determine that an electric current is flowing in a straight copper wire connected to a battery? (S8P5c)

1. Touch the wire.
2. Hold a flashlight bulb near the wire.
3. Hold a small compass near the wire.
4. Disconnect the wire form the battery.

*Use the picture to answer the following question.*

**

4. Three identical light bulbs are connected in parallel with a battery, as shown above, and all are lit. If bulb I is unscrewed and removed, what will happen to the other two light bulbs? (S8P5b)

1. Both will stay lit.
2. II will go out, but III will stay lit.
3. II will stay lit, but III will go out.
4. Both will go out.

5. Denny pedals his bicycle to the top of a small hill and stops to rest. What kind of energy does Denny’s bicycle now have? (S8P2b)

1. all kinetic energy
2. all potential energy
3. some potential energy and some kinetic energy
4. no energy at all

# 6. Which item is the best conductor of heat? (S8P2d)

|  |  |
| --- | --- |
| A. 56174_option_a01 | https://level2a.gacrct.org/media/web/56174_option_b01.jpg  B. |
| C. 56174_option_c01 | D56174_option_d01. |

# 7. Which picture could show the direction of the electrical current in the circuit? (S8P5b)

|  |  |
| --- | --- |
| A. 65650_option_a01 | B. 65650_option_b01 |
| C. 65650_option_c01 | D. 65650_option_d01 |

# 8. Which color reflects all colors of light? (S8P4c)

1. black
2. white
3. green
4. red

9. As Maria stood knee-deep in the ocean, she noted how high the waves came up on her compared to the day before. Which property of waves was Maria observing? (S8P4f)

1. frequency
2. wavelength
3. amplitude
4. speed

# 10. Materials that absorb all light hitting them are (S8P4b)

1. opaque
2. transparent
3. luminous
4. translucent

# 11. The color red that we see depends upon the (S8P4c)

1. speed of the red light wave
2. wavelength of the red light wave
3. temperature of the red light wave
4. direction of the red light wave

# 12. Which occurs when light bounces off a smooth, hard surface? (S8P4b)

1. absorption
2. reflection
3. magnetism
4. magnification

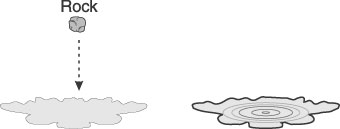
13. A student rides a bike at night and wants to add a light to the front of the bike. A good power source for the light will be (S8P2a)

1. an electromagnet
2. an electric motor
3. a generator
4. a transformer

14. **Which of the following best explains why the end of a spoon sticking out of a cup of hot water also gets hot? (S8P2d)**

1. The hot water causes a chemical reaction to take place in the spoon.
2. The heat from the hot water is conducted to the spoon
3. The hot water heats the air surrounding the upper part of the spoon.
4. The hot water causes a physical change in the spoon handle.

Use the pictures below to answer the following question.



**15. When do the waves created by a rock dropped into a puddle of water have the least amount of energy? (S8P4a)**

1. when they are farthest from the source
2. when they are closest to the source
3. when the object hits the water
4. when they are halfway to the edge of the pond

**16. When a rock is thrown straight up into the air, it reaches its highest point and briefly comes to a complete stop before it starts to fall back to the ground. Which is greatest at the point where the rock stops? (S8P2b)**

1. potential energy
2. kinetic energy
3. force due to gravity
4. friction due to moving air

**17. When Marcia yelled from the top of a canyon, an echo was created. This happened because the sound waves of her voice bounced back from the canyon walls. Which property of waves occurred? (S8P4b)**

1. diffraction
2. reflection
3. interference
4. refraction

**18. When walking along an asphalt street after sundown, a person often feels heat coming off the pavement. The heat is moving from the asphalt to the person by (S8P2d)**

1. conduction
2. convection
3. expansion
4. radiation

**19. Which material is translucent? (S8P4b)**

1. clear glass
2. clean air
3. concrete
4. waxed paper

**20. Which tool should a class use to separate light into the visible spectrum? (S8P4b)**

1. magnifying glass
2. prism
3. microscope
4. mirror

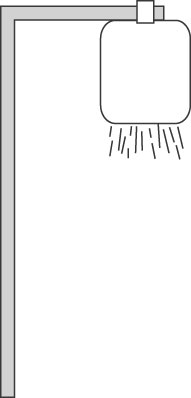
**21. Why are light-colored clothes cooler to wear in the summer than dark-colored clothes? (S8P4b)**

1. Light-colored clothes let more air in.
2. Light-colored clothes prevent sweating.
3. Light colored clothes are not as heavy as dark-colored clothes.
4. Light-colored clothes reflect more light than dark-colored clothes.

**22. When light hits a dark object, most of the light is (S8P4b)**

1. absorbed
2. reflected
3. diffused
4. refracted

Use the picture below to answer the following question.



**23. A family is building an outdoor shower at their cottage by hanging a plastic container from a post, as shown above. The container will be exposed to full sunlight. What color should the container be to make the water as warm as possible? (S8P4b)**

1. white
2. yellow
3. black
4. red

**24. Which of these will reflect the most light? (S8P4b)**

1. an apple
2. a mirror
3. a book
4. a dog

**25. Which demonstrates that light travels in straight lines? (S8P4a)**

1. the forming of shadows
2. the speed of light
3. the rainbow effect
4. the brightness of the Sun

**26. Which is an example of an opaque material? (S8P4b)**

1. clear glass
2. brick wall
3. waxed paper
4. colored paper

27. **In which circuit will the bulb light up? (S8P5b)**

|  |  |
| --- | --- |
| A. 57269_option_a01 | B. 57269_option_b01 |
| C. 57269_option_c01 | D. 57269_option_d01 |

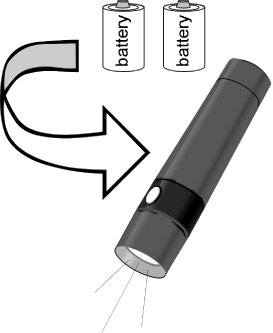
**28. Which electromagnet will pick up the most paper clips? (S8P5c)**

|  |  |
| --- | --- |
| A. 61354_option_a01 | B. 61354_option_b01 |
| C. 61354_option_c01 | D. 61354_option_d01 |

**29. Which material is the best conductor of electricity? (S8P1d)**

1. wood
2. rubber
3. plastic
4. copper

Use the picture below to answer the following question.



**30. The batteries in a flashlight make electricity using (S8P2a)**

1. chemical energy
2. solar energy
3. heat energy
4. mechanical energy

**31**. **When electricity moves through a metal wire, the wire is (S8P2d)**

1. a conductor
2. an insulator
3. a generator
4. a multiplier

**32. Which is an insulator? (S8P2d)**

1. copper coin
2. aluminum ladder
3. glass
4. water

**33. An advantage of an electromagnet compared to a permanent magnet is that it is (S8P5c)**

1. less complex
2. smaller
3. easily turned off
4. safer
   1. **Which diagram is a parallel circuit? (S8P5b)**

|  |  |
| --- | --- |
| A. 61393_option_a01 | B. 61393_option_b01 |
| C. 61393_option_c01 | D. 61393_option_d01 |

**35. Which item would conduct electricity? (S8P1d)**

1. a glass cup
2. a chicken feather
3. a plastic straw
4. a metal fork

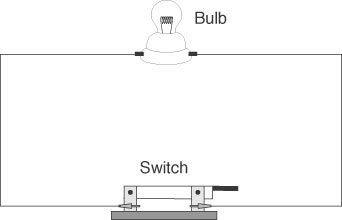
**36. An electromagnet has just enough strength to pick up five paper clips. Which would most likely happen if ten more loops of wire were wrapped around the nail? (S8P5c)**

1. Exactly two clips would fall off the nail.
2. All of the clips would fall off the nail.
3. The electromagnet would be able to pick up more clips.
4. The strength of the electromagnet would stay the same.

**37. A farmer is building an electric fence. Which material would be best to attach the fence wire to trees so the trees are protected from the electricity? (S8P1d)**

1. plastic
2. aluminum
3. copper
4. gold

Use the picture below to answer the following question.



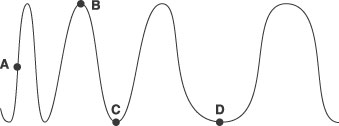
**38. The bulb in the electric circuit will NOT light because (S8P5b)**

1. the switch is too far away from the bulb
2. the bulb has to be larger
3. the wires are not long enough
4. there is no energy source

**39. In old movies, people sometimes put their ear on a railroad track to see if a train is coming. This works because the iron rail (S8P4e)**

1. is heated by friction
2. carries sound better than air
3. is cooler than air
4. is connected directly to the train

Use the wave chart below to answer the following question.



**40. At which point in the series of waves is the frequency the lowest? (S8P4f)**

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

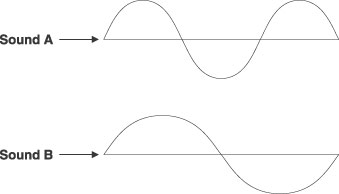
**41. A guitar string makes a higher-pitched sound when you tighten the string. Which of the following explains why tightening the string causes this change? (S8P4e)**

1. It changes the shape of the guitar.
2. It causes the string to get thinner.
3. Tightening the string makes it vibrate faster.
4. Tightening the string makes it longer.

**42. Sound does not move through (S8P4e)**

1. air
2. outer space
3. rocks
4. water

Use the diagrams below to answer the following question.



**43. Sound A has a shorter wavelength than Sound B. This means that Sound A will (S8P4e)**

1. be louder than Sound B.
2. be softer than Sound B.
3. have a lower pitch than Sound B.
4. have a higher pitch than Sound B.

**44.** **Sound can travel fastest through (S8P4e)**

1. air
2. metal
3. water
4. outer space

**45.** **Hilda shouts “hello” in an empty hall at the shopping mall. The sound bounces off the walls and she hears “hello” over and over again. Hilda has just made (S8P4e)**

1. a recording
2. an echo
3. a circuit
4. a wavelength

**46. Sound waves are produced by (S8P4e)**

1. gravity
2. heat
3. vibration
4. light

**47. When heat is added to water, the water gets (S8P2a)**

1. warm
2. cool
3. light
4. dark

# 48. Which uses electricity to make sound? (S8P2a)

|  |  |
| --- | --- |
| A. 56551_option_a01 | B. 56551_option_b01 |
| C. 56551_option_c01 | D. 56551_option_d01 |

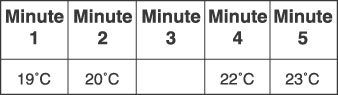
**49. When you run fast, you feel hot. Where does this heat come from? (S8P2a)**

1. clothes you wear
2. food you eat
3. water you drink
4. heat from the ground

**50. Four different spoons were put into a pan of boiling water. Which spoon will have a hot handle first? (S8P2d)**

1. metal spoon
2. rubber spoon
3. wooden spoon
4. plastic spoon

**51. Jane put a glass of water in the sun. She measured the temperature every minute. Jane made this table. (Good question on predicting.)**



**The temperature at Minute 3 is MOST LIKELY**

1. 18°C
2. 20°C
3. 21°C
4. 24°C

**52. Heat, light, and electricity are all forms of (S8P2a)**

1. atoms
2. energy
3. cells
4. motion

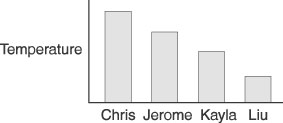
**53. When one end of a steel rod is held in a flame, the other end also gets hot. This happens because steel (S8P2d)**

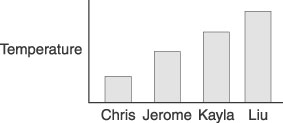
1. makes its own heat
2. is a good conductor of heat
3. makes the flame hotter
4. keeps cold away from the flame

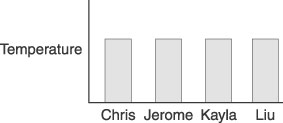
*Use this picture to answer the question below:*

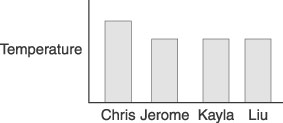


**54. Which graph shows how hot the fire makes each person feel? (S8P2d)**

A. 

B. 

C. 

D. 

**55. Jo’s hot chocolate is too hot to drink, so she puts an ice cube in it. Why does the drink get cooler? (S8P2d)**

1. Heat from the ice is lost to the drink.
2. Heat from the drink is lost to the ice.
3. The ice gives the drink a larger volume.
4. The ice gives the drink a pale color.

Use this picture to answer the question below:



# 56. On a sunny day, which takes the longest to get warm? (S8P2a)

1. the rocks
2. the sand
3. the lake
4. the sidewalk

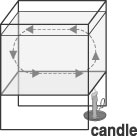
# 57. When water gets very hot it changes to (S8P1d)

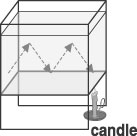
1. air.
2. ice.
3. steam.
4. liquid.

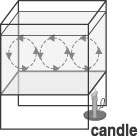
# 58. When a hot rock is put in cool water (S8P2d)

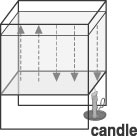
1. the water gets warmer and the rock cools down.
2. the water cools down and the rock gets warmer.
3. the water and rock both get warmer.
4. the water and rock both get cooler

**59. In the pictures below, the candle is heating the water in the tank. Which picture shows how the water will move as it gets hot?** (S8P2d)]

A. 

B. 

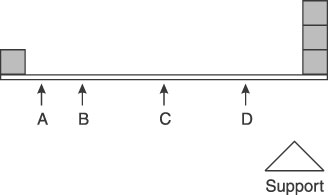
C. 

D. 

--------------------------------------------------------------------------

Motion/Forces/Energy

Use the diagram below to answer the following question.



**1. The board is holding some heavy blocks. All of the blocks are the same size and weight. If you wanted to make the board balance, at which point should you put the support? (S8P3 b, c)**

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

**2. When you bend your arm at the elbow, the bones and muscles in your arm are acting as a system. What simple machine does this system represent? (S8P3c)**

1. inclined plane
2. pulley
3. wedge
4. lever

**3. On Earth, an astronaut has a mass of 140 kg. When the astronaut goes into space, she (S8P5a)**

A. will have a mass of 140 kg, but will have less weight.

B. will have less mass and weight.

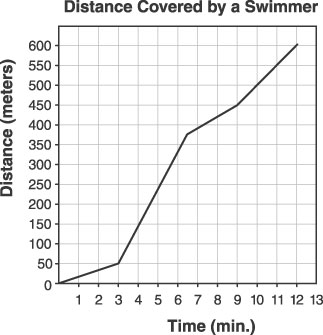
C. will have a mass and weight of 140 kg

D. will have less mass and a weight of 140 kg.

4. **The muscles, bones, and elbow in the arm act together as a lever. Which model best describes the lever? (S8P3c)**

1. The muscle provides the force; the elbow is the fulcrum.
2. The muscle provides the force; the bone is the fulcrum.
3. The bone provides the force; the elbow is the fulcrum.
4. The elbow provides the force; the bone is the fulcrum.

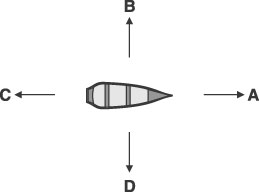
Use the graph below to answer the following question.



**5. During a workout, a swimmer varies speed during warm-up and cool-down. During which time interval is the speed of the swimmer the greatest? (S8P3a)**

1. 0-3.0 minutes
2. 3.0 – 6.5 minutes
3. 6.5-9.0 minutes
4. 9.0 – 12.0 minutes

Use the diagram below to answer the following question.



**6. A person dives out of a nonmoving boat in the direction indicated by Arrow A. Which arrow shows the direction in which the boat would move? (S8P3b)**

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

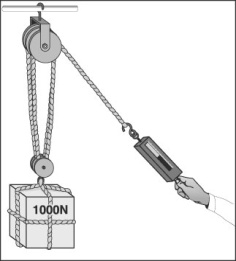
Use the picture below to answer the following question.



**7. Which simple machine is a pair of scissors? (S8P3c)**

1. wheel and axle
2. pulley
3. inclined plane
4. lever

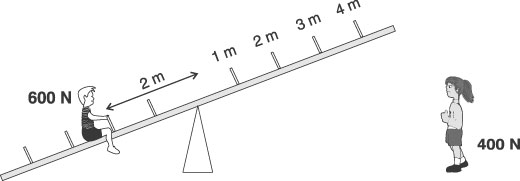
Use the picture below to answer the following question.



**8. To lift an object weighing 1000 newtons a distance of 1 meter using a block and tackle system of pulleys similar to the one pictured, you exert a constant force at the end of the rope for a distance of 10 meters. Which size force must you exert? (S8P3c)**

1. 10 newtons
2. 100 newtons
3. 200 newtons
4. 1000 newtons

Use the picture below to answer the following question.



**9. Tom weighs 600 N and is 2 m from the center of a seesaw. Gloria, who weighs 400 N, wants to sit on the seesaw across from Tom. In order to balance the seesaw, how far from the center should Gloria sit? (S8P3c)**

1. 1m
2. 2m
3. 3m
4. 4m

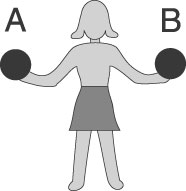
**10. Which term refers to the rate of change of motion? (S8P3a)**

1. acceleration
2. speed
3. momentum
4. velocity

**11. What must happen to an object in order to accelerate it? (S8P3a)**

1. A net force must be applied.
2. Some weight must be removed.
3. Its frictional coefficient must be reduced.
4. It must contain momentum.

Use the picture below to answer the following question.



**12. Carissa holds two spheres the same distance from the floor and drops them. Sphere A is twice as heavy as sphere B. What happens if she lets go of both at exactly the same time? (S8P3b)**

1. Sphere A hits the floor a little before Sphere B.
2. Sphere B hits the floor first.
3. Both spheres hit the floor at the same time.
4. Sphere A takes half as long to hit the floor as Sphere B.

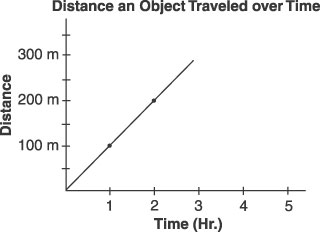
**13. Which is true about the relationship between an object’s mass and its weight? (S8P5a)**

1. The object’s mass is caused by the weight of the object pushing downward.
2. Weight is gravity’s force on an object, which is determined by its mass.
3. An object’s weight and mass are the same, but they are measured differently.
4. An object’s weight and mass are independent of each other.

**14. On Earth, a box has a mass of 50 kg. On the Moon, the box would have (S8P5a)**

1. greater mass
2. greater weight
3. the same mass
4. the same weight

*Use the graph below to answer the following question.*



**16. According to the graph, what was the speed of the object? (S8P3a)**

1. 2 m/hr
2. 25 m/hr
3. 50 m/hr
4. 100 m/hr

**17. Which is a result of the effect of gravity? (S8P5a)**

1. Rocket engines can force objects into space.
2. Air friction causes falling objects to slow down.
3. Released objects always fall toward Earth’s surface.
4. Airplanes are able to fly without falling to the ground.

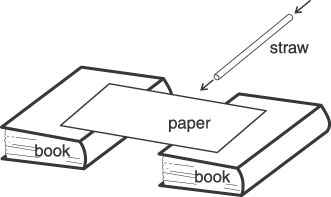
Use the picture below to answer the following question.



**18. Which simple machine is shown in the picture? (S8P3c)**

1. pulley
2. wheel and axle
3. lever
4. inclined plane

Use the picture below to answer the following question.



**19. According to Bernoulli’s principle what should happen when air is blown through the straw and under the paper bridge? (S8P3b)**

1. The paper will sink lower in the middle.
2. The paper’s position will not change.
3. The paper will rise into the air.
4. The paper will rise and flip over.

**20. Which statement is correct concerning the mass of a ball of clay? (S8P5a, S8P1g)**

1. The mass changes as the altitude of the ball of clay changes.
2. The mass changes as the shape of the ball changes.
3. The mass of the ball of clay is unchanged by altitude or shape.
4. The mass is doubled when the ball of clay is divided in two equal pieces.

**21 A hockey puck sits motionless at one end of an empty ice rink until it is hit with a stick. Unless friction slows it down, the puck will travel to the other end of the rink. This is an example of (S8P3b)**

1. Newton’s First law of Motion
2. Newton’s Second Law of Motion
3. Newton’s Third Law of Motion
4. Newton’s Law of Gravitation

**22. The tendency for a body at rest to remain at rest is known as (S8P3b)**

1. inertia
2. torque
3. momentum
4. mass

**23. Which force causes a moving object to slow and then stop? (S8P3b)**

1. acceleration
2. inertia
3. friction
4. lift

**24. A small steel ball bearing and a large glass marble were dropped from the same height at the same instant. Which would happen? (S8P5a)**

1. They would hit the floor at the same time.
2. The steel ball bearing would hit first because it is smaller.
3. The glass marble would hit first because it is larger.
4. The steel ball bearing would hit first because it is heavier.

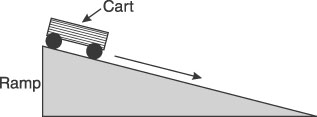
Use the chart below to answer the following question.



**25. A racecar completes its laps as shown. The chart indicates that the car is (S8P3a)**

1. accelerating
2. increasing inertia
3. maintaining its velocity
4. increasing its potential energy

Use the picture below to answer the following question.



**26. Anne is testing toy carts by seeing how fast they are rolling when they reach the end of a ramp she built. How can she change the investigation so the carts will be going faster when they reach the end? (S8P3c)**

1. Add carpet to the surface of the ramp.
2. Start the cars further down the ramp.
3. Raise the angle of the ramp.
4. Take some weight off of the carts.

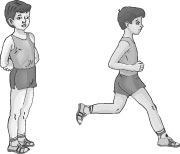
**27. Which type of force causes a moving train to come to a stop? (S8P3a)**

1. gravitational
2. frictional
3. magnetic
4. chemical

**28. The force that keeps a communications satellite in orbit around Earth is (S8P3b, S8P5a)**

1. gravity
2. friction
3. magnetism
4. electricity

Use the picture below to answer the following question.



**29. Harry was standing. Now he is running. When he is running he has more (S8P2b)**

1. potential energy
2. kinetic energy
3. mass
4. gravity

**30. What force pulls things toward the center of Earth? (S8P5a)**

1. friction
2. gravity
3. magnetism
4. electricity

**31. Objects in an orbiting space shuttle float because (S8P5a)**

1. the space shuttle slows down when it reaches orbit
2. Earth’s gravity has less effect on objects as they get farther away from Earth.
3. the weight of the object is less when orbiting the Earth
4. the space shuttle’s engines cause too much vibration for objects to remain still

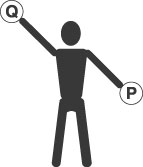
**32. The Sun’s gravity holds each planet in its orbit. Pluto is farther away from the Sun than Earth is. How does the effect of the Sun’s gravity on Pluto compare with the effect of the Sun’s gravity on Earth? (S8P5a)**

1. The Sun has the same gravitational pull on all planets that are in orbit.
2. The Sun has more gravitational pull on Pluto because it is smaller.
3. The Sun has less gravitational pull on Earth because it is closer
4. The Sun has less gravitational pull on Pluto because it is farther away.

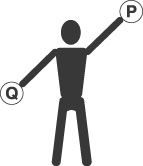
33. **The school bus is moving at 55 miles per hour. Before it can go 60 miles per hour, (S8P3b)**

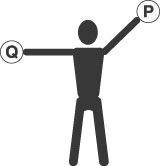
1. an additional force must act on the bus
2. the bus must have more inertia
3. a physical change must happen
4. there must be less air resistance

**34. Suppose that you want to drop a penny and a quarter at exactly the same time and have them hit the floor at exactly the same time. Which picture BEST shows how you should hold the penny (P) and the quarter (Q) just before you drop them? (Experimental Design)**

A. 

B. 

C. 

D. 

**35. Which of the following BEST describes “distance”? (S8P3a)**

1. a large, flat space
2. how long it takes for something to happen
3. a long way to go
4. how far it is between two points

**36. A swimmer is able to swim at a rate of 75 meters per minute. How long would it take the swimmer to complete a 1500-meter race? (S8P5a)**

1. 20 minutes
2. 75 minutes
3. 112 minutes
4. 1425 minutes

**37. While riding in the backseat of a car, a child holds a cup of juice. When the car suddenly stops, the liquid in the cup will (S8P3b)**

1. flow off to one side of the cup
2. flow toward the back of the cup
3. flow in the direction the car was moving
4. stop as suddenly as the car stops

**38. Which ball has the MOST potential energy? (S8P2b)**

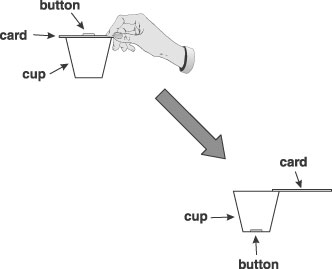
A. 

B. 70394_option_b01

C. 70394_option_c01

D. 70394_option_d01

Use the picture below to answer the following question.



**39. If you pull the card away very quickly the button will fall into the bottom of the cup. This trick works because the (S8P3b)**

1. card has gravity
2. button has inertia
3. card has kinetic energy
4. button has potential energy

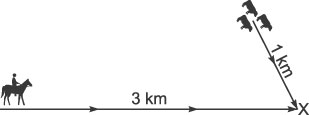
**40. A crumpled sheet of paper will fall to the ground faster than an uncrumpled sheet because crumpling the paper (S8P3b)**

1. causes it to have less mass
2. causes it to have less air resistance
3. changes the chemical state of the paper
4. adds potential energy

**41. A roller-coaster car raced down a track going faster and faster as it neared the bottom of a hill. What term describes this increase in speed? (S8P3a)**

1. inertia
2. velocity
3. potential energy
4. acceleration

Use the picture below to answer the following question.



**42. If the horse rider is traveling at a rate of 1 km every four minutes and the cattle are traveling at a rate of 1 km every 12 minutes, will the rider meet the cattle at the point labeled “X” ? (S8P3a)**

1. No, the rider will arrive 4 minutes after the cattle pass point “X”
2. No the rider will arrive 8 minutes after the cattle pass point “X”
3. Yes the rider and the cattle will arrive at point “X” in 12 minutes
4. Yes, the rider and the cattle will arrive at point “X” in 4 minutes

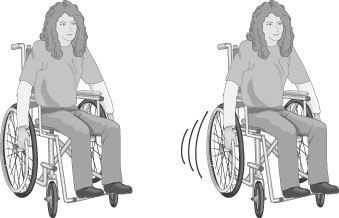
**43. A car traveling from Jesup to Macon has an average velocity of 45 miles per hour. The distance between these two cities is 149 miles. Approximately how long will it take the car to complete the trip? (S8P3a)**

1. 1.5 hours
2. 2.0 hours
3. 3.0 hours
4. 5.0 hours

**44. Which is an example of kinetic energy? (S8P2b)**

1. sitting at a desk reading a book
2. lifting a book from the floor to the table
3. holding a bag full of heavy books
4. pushing against a large tree

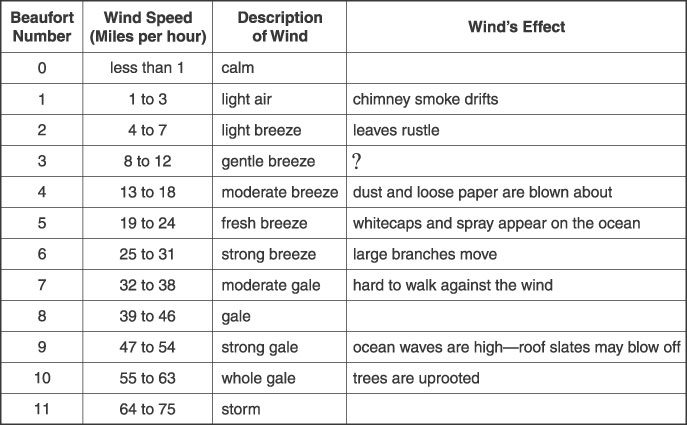
Use the picture below to answer the following question.



**45. Katie was sitting in her wheelchair. When she moved she changed her energy to (S8P2b)**

1. potential
2. kinetic
3. inertia
4. gravity

Use the incomplete chart of the Beaufort scale below to answer the following question.



**46. The Beaufort scale is used to classify the strength of the wind. In the scale above, some of the wind’s effects are missing. Which of the following could be used to describe the effect of a GENTLE BREEZE?**

**(This is an interpolation problem. Relates somewhat to S8P3b.)**

1. Chimney smoke moves straight upward
2. Buildings are damaged
3. Flags wave slightly on a flagpole
4. Tree branches snap off

**47. Billy was pulling his wagon on the sidewalk. What should he do to keep the wagon moving? (S8P3b)**

1. Walk behind the wagon.
2. Apply a force to the wagon.
3. Put a weight in the wagon.
4. Walk on the side of the wagon.

**48. Which direction will the box move when Maria pushes it? (S8P3b)**

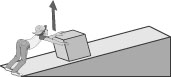
A.

73160_option_a01

B.

73160_option_b01

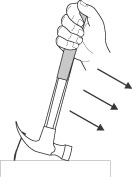
C.



D.

73160_option_d01

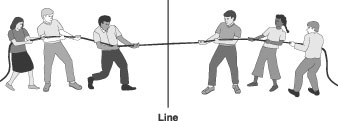
Use the picture to answer the following question:



**49. Jacob needs to pull down on a hammer to take a nail out of a piece of wood. Jacob is using the hammer as (s8P3c)**

1. a lever.
2. a pulley.
3. a wheel and axle.
4. an inclined plane.

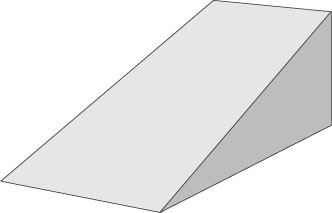
Use the picture to answer the following question:



**50. Two teams are having a tug-of-war. The force used to get the other team across the line is a (S8P3b)**

1. push
2. lever
3. pulley
4. pull

Use the picture to answer the following question:



**51. A loading ramp is a simple machine called (S8P3c)**

1. lever
2. inclined plane
3. pulley
4. screw

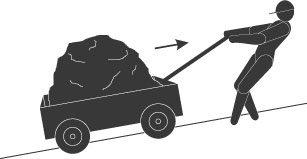
**52. When you walk on the sidewalk and roll your bike, the force you use is a (S8P3b)**

1. pull
2. pulley
3. push
4. lever

**53. Which is a simple machine? (S8P3c)**

1. water
2. chair
3. pulley
4. candle

Use the picture to answer the following question:



**54. The arrow tells you that the boy is (S8P3a)**

1. standing still
2. pushing the wagon
3. pulling the wagon
4. trying to make the wagon stop

**55. A heavy box must be moved from the ground into a truck. Which picture shows the BEST way to do this? (S8P3c)**

A.



B.



C.



D.



|  |  |
| --- | --- |
| A. 56532_option_a01 | B. 56532_option_b01 |
| C. 56532_option_c01 | D. 56532_option_d01 |

**56. Emily is heavier than Blake. Where should she sit to make the seesaw go up and down? (S8P3c)**

Use the picture to answer the following question:



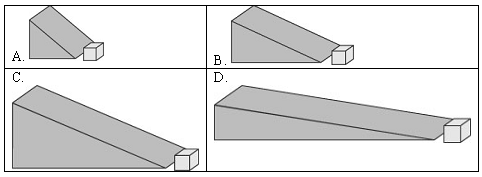
**57. The handle that turns the pencil sharpener is which simple machine? (S8P3c)**

1. screw
2. lever
3. pulley
4. inclined plane

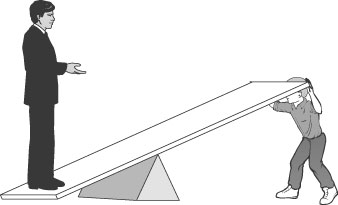
**58. Which could help a person in a wheelchair get from the street onto the sidewalk? (S8P3c)**

1. lever
2. inclined plane
3. screw
4. wheel and axle

**59. It is easiest to push a box up which ramp? (S8P3c)**

****

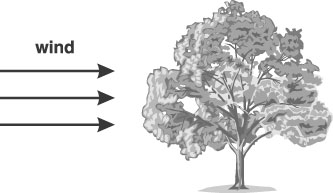
Use the picture to answer the following question:



**60. When Dan pushes down on the long end of the board, what simple machine is he using to lift his father? (S8P3c)**

1. lever
2. pulley
3. wedge
4. wheel

Use the picture to answer the following question:



**61. A strong wind is blowing on the tree. If the tree falls because of the wind, which way would it fall? (S8P3b)**

|  |  |
| --- | --- |
| A. 69409_option_a01 | B. 69409_option_b01 |
| C. 69409_option_c01 | D. 69409_option_d01 |

**62. Which lever will raise the box using the LEAST force? (S8P3c)**

|  |  |
| --- | --- |
| A. 58139_option_a01 | B. 58139_option_b01 |
| C. 58139_option_c01 | D. 58139_option_d01 |

**63. A pulley would be used to (S8P3c)**

1. cut paper
2. lift an object
3. split a log
4. hold objects together

**64. Which is a list of three forms of energy? (S8P2c)**

1. weight, mass, density
2. light, sound, heat
3. volume, speed, pressure
4. force, velocity, speed

**65. Bill wants to lift a box up to the second floor of a barn. Which simple machine should he use? (S8P3c)**

A. wheel

B. wedge

C. incline plane

D. pulley