Name:_____ Date:_____

1. Shaina uses a shovel to dig a hole to plant a tree. A shovel is an example of a compound machine because it is made up of what two simple machines?

A. wheel and axle and lever

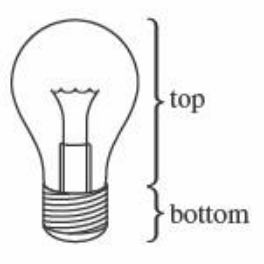
B. lever and wedge

C. screw and wedge

D. inclined plane and wedge

---

2. The picture below shows a light bulb.



The bottom of this light bulb is an example of what type of simple machine?

A. a lever

B. a pulley

C. a screw

D. a wedge

---

3. Mike believes that electricity can be made using a strong magnetic field and a coil of wire. Which question would be appropriate for investigating this statement?

A. How should the coil be moved in the magnetic field to make electricity?
B. What is the largest magnetic field that can be produced?
C. What should the diameter of the wire be?
D. Could solar power be used to generate electricity?

---

4. What type of simple machine is used to pull a flag up to the top of a flagpole?

A. screw
B. wheel and axle
C. inclined plane
D. pulley

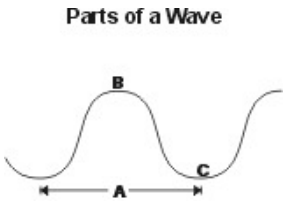
---

5. On Earth, an astronaut has a mass of 140 kg. When the astronaut goes into space, she

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

6.

Use the diagram below to answer this question.

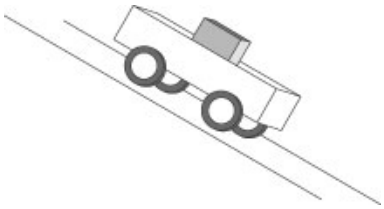


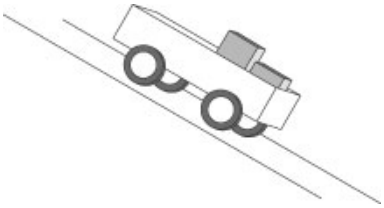
Which correctly identifies the parts of a wave in this diagram?

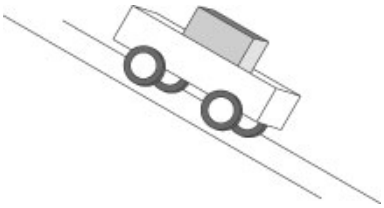
A. A is the crest; B is the trough; C is the wavelength.
B. A is the wavelength; B is the crest; C is the trough.
C. A is the trough; B is the wavelength; C is the crest.
D. A is the trough; B is the crest; C is the wavelength.

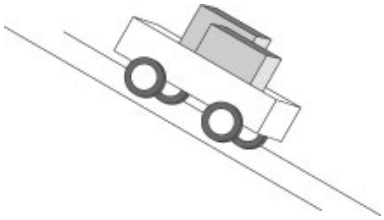
---

7. The blocks shown in the pictures below are all made of wood. Which car will move the fastest?

A. 

B. 

C. 

D. 

---

8. 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?

A. inclined plane
B. pulley
C. wedge
D. lever

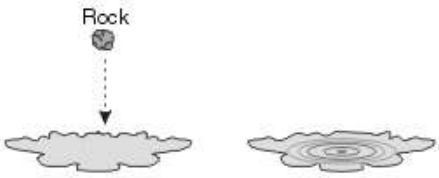
---

9. Which activity makes use of a pulley?

A. raising a flag on a tall flagpole
B. a tug-of-war game
C. tying a knot to hold down a tent
D. a jump-rope game

10.

Use the diagrams below to answer this question.



When a rock is dropped into a large puddle,

A. the energy of the waves is greatest at the center of the puddle.
B. the energy of the waves is greatest at the edge of the puddle.
C. the energy of the waves is greatest between the center and edge of the puddle.
D. the energy of the waves doesn't change as they move away from the center of the puddle.

---

11. A magnetic resonance imager (MRI) is used in hospitals to observe internal organs. The patient being imaged cannot have anything that will be attracted to the imager's powerful magnet. Which might cause a patient the most problems?

A. an aluminum belt buckle
B. dental fillings made from silver and mercury
C. a brass zipper
D. a steel replacement joint

---

12. David wants to remove the top from a gallon paint can. What kind of simple machine should he use as a tool?

A. lever
B. wheel and axle
C. pulley
D. inclined plane

---

13. The space shuttle uses booster rockets for its launch, but does not need them for the rest of its journey. This is because the booster rockets

A. direct the shuttle onto its correct orbital path.
B. reduce the amount of fuel needed for the launch.
C. allow the shuttle to overcome the pull of gravity.
D. protect the shuttle from damage during the launch.

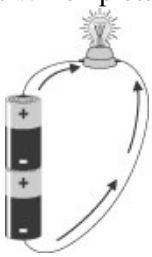
---

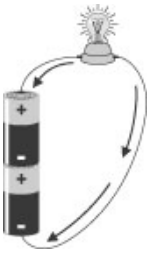
14. What is the negatively charged particle that flows through a circuit?

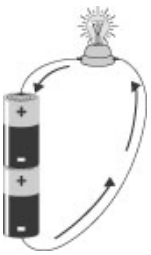
A. electron
B. proton
C. neutron
D. ion

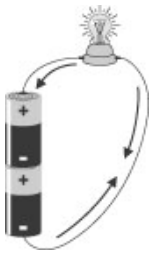
---

15. Which picture could show the direction of the electrical current in the circuit?

A. 

B. 

C. 

D. 

---

16. The lowest point of a wave is its

A. trough.
B. breaker.
C. swell.
D. crest.

---

17. The highest point of a wave is its

A. crest.
B. breaker.
C. trough.
D. swell.

---

18. Which is a type of inclined plane?

A. ramp
B. rope
C. gear
D. wheel

---

19. Sam was learning how to roller-skate. He did not want to go fast. On which kind of floor surface would Sam travel the slowest?

A. carpet
B. concrete
C. tile
D. wood

---

20. Which best explains why a person using a ramp can load heavy boxes onto a truck more easily than a person can using only human strength?

A. The person using a ramp needs less force.
B. The person using human strength needs less force.
C. The ramp reduces the weight of the boxes.
D. Friction makes it harder to lift boxes without a ramp.

---

21. Which term refers to the rate of change of motion?

A. acceleration
B. speed
C. momentum
D. velocity

---

22. What must happen to an object in order to accelerate it?

A. A net force must be applied.
B. Some weight must be removed.
C. Its frictional coefficient must be reduced.
D. It must contain momentum.

---

23. A car is traveling down a hill. Which of the following will affect the amount of energy the car has?

A. how long the car is
B. the time of day
C. how much the car weighs
D. the color of the car

---

24. What type of simple machine is used to split things apart?

A. screw
B. wheel and axle
C. wedge
D. inclined plane

---

25. Which of the following is often used as a lever?

A. file
B. nail
C. saw
D. crowbar

---

26. The attraction of hair to a briskly rubbed plastic comb is an example of

A. magnetism.
B. static electricity.
C. gravity.
D. radiation.

---

27. Which activity involves the use of a simple machine?

A. riding on a seesaw
B. flying a kite
C. listening to a radio
D. skiing down a hill

---

28. All objects in the universe are attracted to each other by the force of

A. effort.
B. friction.
C. gravity.
D. inertia.

---

29. *Use the information below to answer this question.*

Suzan places a marble and a ball of modeling clay on the surface of water in a jar. Both objects sink.

Suzan removes them from the water. Then she molds the clay ball into a bowl shape and again places the two objects on the surface of the water.

What happens next?

A. The marble and the clay bowl both sink.
B. The marble and the clay bowl both float.
C. The marble floats and the clay bowl sinks.
D. The marble sinks and the clay bowl floats.

---

30. Why do some competitive swimmers shave their heads and bodies?

A. to decrease weight
B. to decrease friction
C. to increase buoyancy
D. to increase blood flow

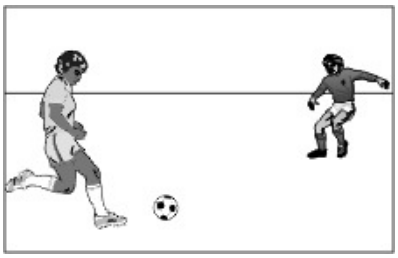
---

31. Oliver the dog doesn't want to walk in the rain. He can make his owner pull harder on the leash to get him out the door by

A. sitting on the vinyl floor.
B. sitting on the tile floor.
C. sitting on the carpeted floor.
D. sitting on the wood floor.

32.

Use the illustration below to answer this question.



Katie sent a soccer ball toward Andy on a flat field. The ball started moving because of which force?

A. her kick
B. gravity
C. friction
D. air inside the ball

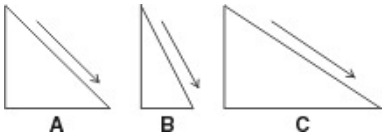
---

33. As an astronaut travels from Earth to a space station orbiting Earth, what happens to her mass and weight?

A. Her mass decreases, but her weight remains the same.
B. Her mass increases as her weight decreases.
C. Her mass remains the same, but her weight decreases.
D. Her mass decreases and her weight also decreases.

---

34. Which hill would you slide down the **fastest**?



A. hill A
B. hill B
C. hill C
D. It would take the same time to slide down all of the hills.

35.

Use the table below to answer this question.

Object	Attraction to Magnet
lead fishing weight	No
a glass marble	No
copper wire	No
iron nail	Yes
a nickel	No
steel scissors	Yes
plastic comb	No
wool glove	No

Which conclusion is **best** supported by the results in the table?

A. All metals are magnetic.
B. Some metals are magnetic.
C. Some nonmetals are magnetic.
D. All nonmetals are magnetic.

---

36. The force that holds you to Earth's surface is

A. gravity.
B. weight.
C. mass.
D. pressure.

---

37. On which simple machine is a fulcrum found?

A. pulley
B. wheel
C. axle
D. lever

---

38. The color red that we see depends upon the

A. speed of the red light wave.
B. wavelength of the red light wave.
C. temperature of the red light wave.
D. direction of the red light wave.

39.

Use the table below to answer this question.

Light Coming In	**Color of Filter**	**Light Coming Out**
red	red	red
red	blue	none
white	red	red
white	blue	blue

The table shows the effects of certain filters on different colors of light. Based on the table, when red light shines on a blue filter,

A. no light will come out.
B. blue light will come out.
C. red light will come out.
D. white light will come out.

---

40. 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?

A. frequency
B. wavelength
C. amplitude
D. speed

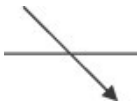
---

41. The leaves on a tree appear to be green because the molecules of the leaves

A. emit only green light.
B. absorb only green light.
C. absorb all colors except green.
D. reflect the light back unchanged.

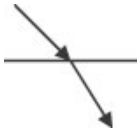
---

42. Which drawing is an example of reflection?

A. 

B. 

C. 

D. 

---

43. For Kathy to see the image, light must have entered her eyes. What specifically entered Kathy's eyes?

A. only matter
B. only energy
C. both matter and energy
D. neither matter nor energy

---

44. If a light ray hits the back of the spoon at a 30° angle, the angle that the ray will reflect off the spoon is

A. less than 30°.
B. 30°.
C. more than 30°.
D. unpredictable.

---

45. Which is true about friction and gravity?

A. Both are forces.
B. Both cause energy loss.
C. Both cause things to speed up.
D. Both cause heat.

---

46. Which is a result of the effect of gravity?

A. Rocket engines can force objects into space.
B. Air friction causes falling objects to slow down.
C. Released objects always fall toward Earth's surface.
D. Airplanes are able to fly without falling to the ground.

---

47. Which is true about the relationship between an object's mass and its weight?

A. The object's mass is caused by the weight of the object pushing downward.
B. Weight is gravity's force on the object, which is determined by its mass.
C. An object's weight and its mass are the same, but they are measured differently.
D. An object's weight and its mass are independent of each other.

---

48. Both the wedge and the lever are used in the operation of a

A. garden shovel.
B. wheelbarrow.
C. block and tackle.
D. steering wheel.

---

49. Jeff was riding in a car. Which change demonstrates the GREATEST effect of inertia?

A. The car makes a sudden stop.
B. The car slows down gradually.
C. The car changes into another lane.
D. The car runs out of gas and rolls to a stop.

---

50. Manuel is coasting on his bike. Because he is not pedaling, his bike will come to a stop. Which of these will cause Manuel's bike to stop?

A. an increase in kinetic energy
B. Earth's magnetic field
C. the property of inertia
D. the force of friction

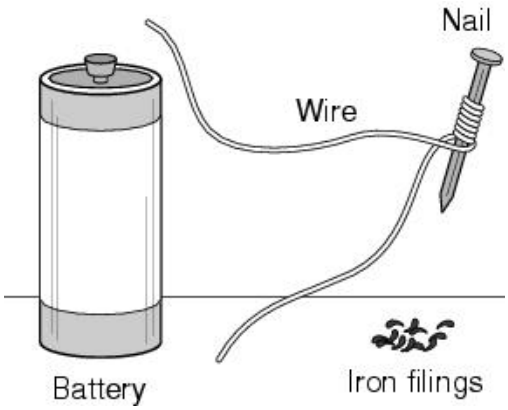
---

51. Simon rolled a ball down a hill. The ball stopped before it reached the bottom of the hill. Which of these MOST LIKELY stopped the ball from rolling?

A. mass
B. gravity
C. friction
D. inertia

---

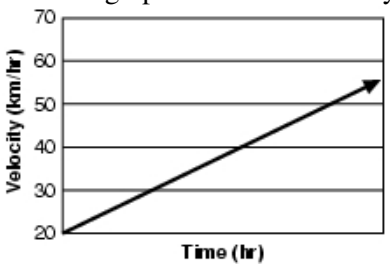
52. How can the materials in the diagram be used to make a magnet?



A. replace the iron nail with a wood rod
B. add more loops of wire to the iron nail
C. connect the ends of the wire to each other
D. touch the ends of the wire to the ends of the battery

---

53. This graph shows the velocity of a car.

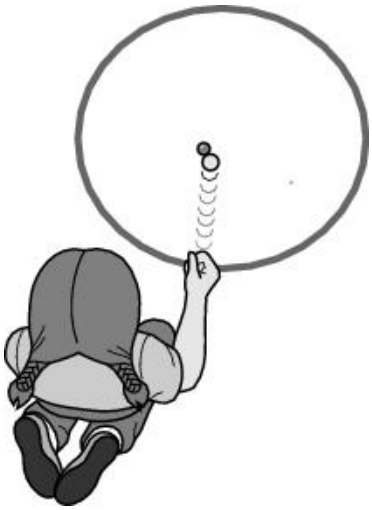


Which statement BEST explains how the car is moving?

A. Velocity is increasing, so the car is accelerating.
B. Velocity is decreasing, so the car is accelerating.
C. Velocity is increasing, so the car is not accelerating.
D. Velocity is decreasing, so the car is not accelerating.

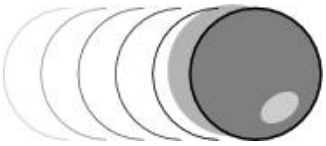
---

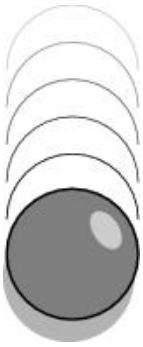
54. Susan plays a game of marbles with John. She tries to knock John's marble out of the circle. She rolls her marble and it hits John's marble.

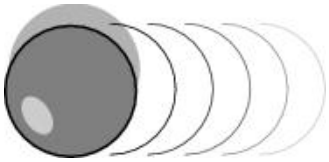


How would John's marble move after being hit?

A. 

B. 

C. 

D. 

55.

Sam and Brian went mountain climbing. Each boy carried a 196 Newton backpack. As the boys climbed to the top of the mountain, the weight of the packs actually decreased by a small amount. This decrease in weight was caused by

A. increased air pressure.
B. decreased air temperature.
C. increased attraction from the moon.
D. increased distance from the earth's center.

56.

If you were to travel to the moon, your weight would be about one-sixth less than it is on earth. This is because the moon

A. has a much smaller circumference than earth.
B. is much less massive than earth.
C. rotates much slower than earth.
D. has no water on its surface.

57.

When doing work using simple machines, what happens when the effort distance is increased?

A. The effort force is decreased.
B. The effort force is increased.
C. The resistance force is increased.
D. The direction of the effort force is changed.

58.

Your mother asks you to move a large rock from of her garden. The rock is too heavy to lift. Because you are an excellent science student, you understand how simple machines make work easier. You use a long pole balanced on a brick to lift the rock and start it rolling. You push down on one end of the pole and the rock moves up. This simple machine is an example of
a(n)

A. fixed pulley.
B. inclined plane.
C. first class lever.
D. second class lever.

59.

When you turn a screw with a screwdriver, you are actually using two simple machines: a screw and the screwdriver is an example of a(n)

A. lever.
B. wedge.
C. inclined plane.
D. wheel and axle.

60.

A(n) _____ circuit has only one path for the current to take.

A. open
B. parallel
C. resistant
D. series

61.

A circuit contains four light bulbs. One light bulb goes out but the other three stay lit. This must be a(n) _____ circuit.

A. open
B. series
C. parallel
D. resistant

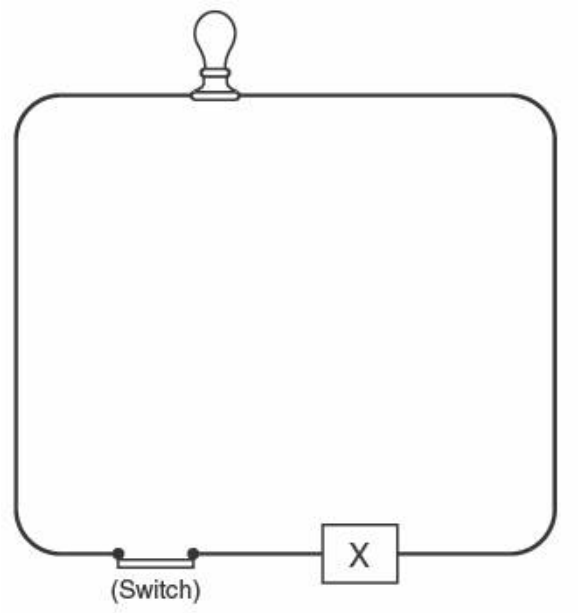
62.

One day in the future, a planet with half the mass of the Earth is found. If everything else is the same, what would happen to your weight if you visited this planet?

A. Your weight would stay the same.
B. You would no longer have any weight.
C. Your weight would increase by one-half.
D. Your weight would also decrease by one-half.

---

63. **In the diagram, what essential part of an electric circuit is missing at position X?**



A. Load

B. On/off switch

C. Wires

D. Source of electric current

---

64. **Which of the following is a true statement about the magnetic field between two magnets?**

A. The south pole of one magnet is attracted to the south pole of the other magnet.

B. The south pole of one magnet is attracted to the north pole of the other magnet.

C. The north pole of one magnet is attracted to the north pole of the other magnet.

D. The south pole of one magnet is attracted to both poles of the other magnet.