

Question 1 (1 point)

Scientists do many types of work. Which description characterizes one type of scientific work, an experiment?

Extra Content:

SC.8.N.1.1

- A. Observation of plants or animals in their natural environment
- B. Physical or mathematical representation of an object or process
- C. An organized procedure to study something under controlled conditions
- D. Collection of data from the unregulated world for comparative purposes

Question 2 (1 point)

Raul wants to investigate how the angle of a ramp affects the speed of an object rolling down the ramp. He can conduct his investigation in a number of different ways. Which investigation should he perform?

Extra Content:

SC.8.N.1.1

- A. Observe different bicyclists riding down hills of varying steepness
- B. Record the time it takes one bicyclist to ride down hills of varying steepness
- C. Perform an experiment in a lab in which the angle of the ramp is controlled and the speed of a rolling cart is measured
- D. Observe video of various objects rolling down hills and estimate the angle of the hill and the speed of the object

Question 3 (1 point)

Bryce observes that the Sun always rises in the east. He talks with others and finds that everyone has the same observation. Which statement represents a scientific explanation based on these observations?

Extra Content:

SC.8.N.1.1

- A. The Sun rises in the east
- B. Why does the Sun rise in the east
- C. The Sun appears in the east because of Earth's rotation pattern.
- D. If the Sun appears in the east, then I am in the Western Hemisphere

Question 4 (1 point)

Scientists use different types of tools to investigate how and why things happen. Here are some examples of these tools:

- A diagram of a food chain in the Everglades
- A plastic replica of the human digestive system

Which word describes both of these examples?

Extra Content:

SC.8.N.3.1

- A. Experiment
- B. Hypothesis
- C. Model
- D. Observation

Question 5 (1 point)

Leigh wants to make sure she understands the components of a good scientific investigation. She knows that it should be controlled and have a large sample size. Also, she thinks that the results should be communicated to other scientists. Which is another component that is necessary for a good investigation?

Extra Content:

SC.8.N.1.1

- A. It must be conducted in a big lab
- B. It must be run by a university scientist
- C. It must be done with expensive lab equipment
- D. It must be able to be replicated by other scientists

Question 6 (1 point)

A friend, who knows a lot about science, reads in a science book that a piece of black paper will get warmer in sunlight than a piece of white paper. Which of these is a *scientific* reaction to this information?

Extra Content:

SC.8.N.1.4

- A. Accept the statement as true because your friend knows about science
- B. Design an experiment to show whether the statement is correct or incorrect
- C. Believe the statement is true because it was written in a science book, so you can trust it to be true
- D. Tell your friend that the statement makes no sense because color does not affect temperature

Question 7 (1 point)

Dr Suri works at a veterinary clinic and part of her job is to make sure pets are eating properly. She places a dog on the digital scale and gets a reading of 16 Newtons (N). Which of these explains this measurement?

- A. The dog's mass is 16 N
- B. The dog has an average density of 16 N
- C. The volume of the dog is 16 N
- D. The weight of the dog is 16 N

Question 8 (1 point)

Which of these has the longest wavelength in the electromagnetic spectrum?

- A. radio waves
- B. microwaves
- C. x-rays
- D. gamma rays

Question 9 (1 point)

On the Moon, an object weighs about one-sixth what it weighs on Earth. How is the mass of an object different on the Moon than on Earth?

- A. Its mass is six times greater on Earth.
- B. Its mass is the same as it is on Earth.
- C. Its mass is one-sixth its mass on Earth.
- D. Its mass changes proportionally with its weight.

Question 10 (1 point)

The visible part of the electromagnetic spectrum consists of the colors that we see in a rainbow. Each color that we see corresponds to a different wavelength of light. Which color of visible light has the shortest wavelength?

- A. Red
- B. Green
- C. Violet
- D. Yellow

Question 11 (1 point)

Heather puts a straw into a glass of water and observes the image below:



Which term best explains why the straw looks like it is broken?

- A. Absorption
- B. Refraction
- C. Reflection
- D. Transmission

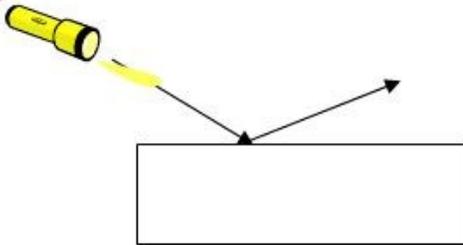
Question 12 (1 point)

The energy generated by the Sun travels to Earth as electromagnetic waves with varying wavelengths. Which statement describes an electromagnetic wave with a long wavelength?

- A. It has a high frequency
- B. It has a low frequency
- C. It can be violet light
- D. It can be a microwave

Question 13 (1 point)

Calvin shines a light onto a surface. The diagram below is a drawing of what he observed.



Which of the following best describes what happened to the light when it hit the surface?

- A. Refraction
- B. Absorption
- C. Transmission
- D. Reflection

Question 14 (1 point)

In which medium does sound travel the fastest?

Extra Content:
SC.7.P.10.3

- A. steel
- B. air
- C. water
- D. The speed is the same in all three mediums.

Question 15 (1 point)

Sonia tapped one end of a long wooden table. Sanjay and Marc listened at the other end of the table for the sounds. Sanjay pressed his ear to the table while Marc did not. Why was Sanjay able to hear the taps before Marc?

- A. Sound travels through air and wood at different speeds
- B. Particles of wood are farther apart than particles of air
- C. The frequency of the taps was different in the wood than in the air
- D. The taps only made the table vibrate, they did not vibrate the air

Question 16 (1 point)

During science class, Sofie warms a beaker of water until it reaches its boiling point of 100°C . What will happen next to the water if she continues to warm it?

- A. It will remain a liquid and continue to get hotter
- B. It will become a gas while remaining the same temperature
- C. It will become a gas while continuing to get hotter
- D. It will remain a liquid and remain the same temperature

Question 17 (1 point)

A group of sheep are grazing in a field. Which form of energy is being transferred to the sheep from the grass as they eat?

- A. Chemical
- B. Mechanical
- C. Nuclear
- D. Thermal

Question 18 (1 point)

Latisha notices that the air in her science classroom is much warmer than the air in her math classroom. Which statement describes how the air particles are different in his colder math classroom?

- A. They are moving faster
- B. They are vibrating
- C. They have less energy
- D. They move more freely

Question 19 (1 point)

Kito puts his cold, metal spoon into a bowl of hot, mashed potatoes. Which process takes place when the spoon touches the mashed potatoes?

- A. The temperature of the spoon increases, but its thermal energy does not change
- B. Energy flows as heat from the warmer mashed potatoes to the colder spoon
- C. The thermal energy of both the mashed potatoes and the spoon increases
- D. Heat is not transferred and the spoon's temperature will remain constant

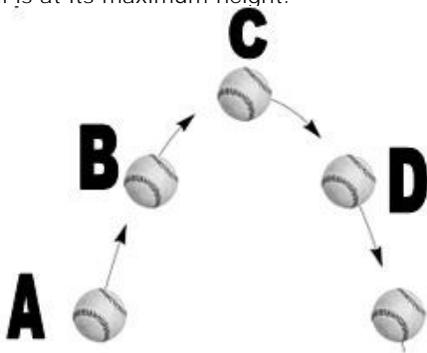
Question 20 (1 point)

Pictures of Earth's surface based on computer data are called

- A. planetary images.
- B. x-ray images.
- C. ultraviolet images.
- D. satellite photographs.

Question 21 (1 point)

Gordon throws a baseball into the air as shown below. Assume point A is just before he releases the ball and point C is when the ball is at its maximum height.



At which point is kinetic energy converting to potential energy?

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

Question 22 (1 point)

Liang is warming a pot of soup on the stove. How does the motion of the particles in the soup change as the temperature of the soup increases?

- A. They are moving faster
- B. They have less energy
- C. They move less freely
- D. They are closer together

Question 23 (1 point)

Damon plays guitar and he knows that when he plucks a single guitar string, the string will move rapidly back and forth. Which of these statements explains what happens to the kinetic energy of the moving string?

- A. It is changed into potential energy and stored
- B. It is converted to sound energy and thermal energy
- C. It is being destroyed until the string stops moving
- D. It is increasing as the sound is produced

Question 24 (1 point)

The space shuttle must produce a great amount of thrust in order to reach the height it needs to maintain its constant path around the Earth. What term describes the circular path that the shuttle makes around the Earth?

Extra Content:

SC.6.P.13.2

- A. Orbit
- B. Gravity
- C. Free fall
- D. Weight

Question 25 (1 point)

A weather station reports that the wind is moving northeast at 12 km/hr. Which of the following **best** describes that measurement?

- A. Speed, because it is given in km/hr
- B. Velocity, because it includes a direction
- C. Speed, because it indicates motion
- D. Velocity, because it includes a number

Question 26 (1 point)

Penny says that dust particles in space cannot be pulled together by gravity because they have very little mass. Emma says that as long as the dust particles have any mass at all, gravity can pull them together. Who has the better argument and why?

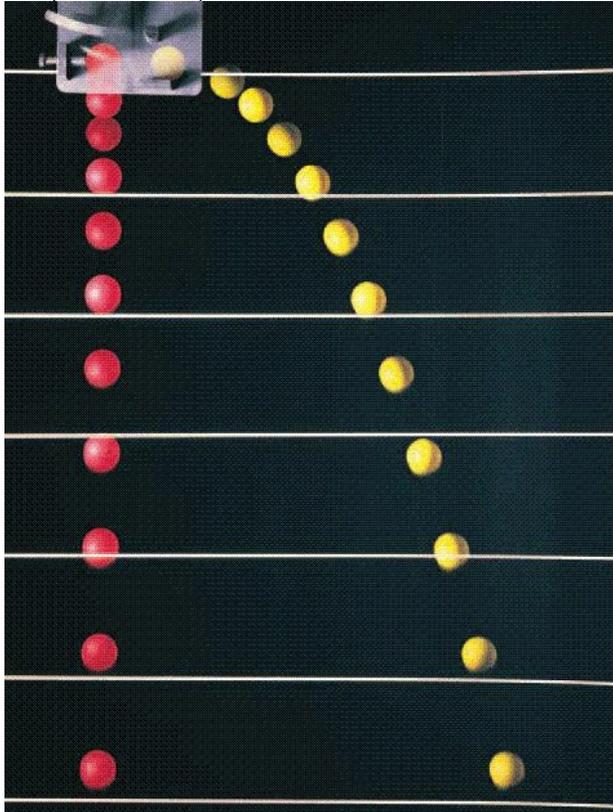
Extra Content:

SC.6.P.13.2

- A. Penny, because objects with only a little mass are not affected by gravity
- B. Penny, because dust particles in space are far from Earth so there is no gravity
- C. Emma, because any two objects exert a gravitational force on each other
- D. Emma, because objects with smaller mass have more gravity acting on them

Question 27 (1 point)

The diagram below shows the path of motion of two balls as they are dropped. The red ball is released straight down while the yellow ball is pushed to the side as it is released.



Why don't both balls have the same path of motion as they fall?

- A. The yellow ball falls in a curve because gravity and a horizontal force are acting on it
- B. The yellow ball falls down because of gravity but curves because of its inertia
- C. The red ball has a force acting on it to prevent the curve
- D. The red ball has no force acting on it as it falls

Question 28 (1 point)

Luis is trying to push a box of new soccer balls across the floor. If the box is not moving, which of the following must be true?

- A. The box is exerting a larger force on Luis than he is exerting on the box
- B. There is another force acting on the box that balances Luis's force
- C. Luis is applying too much force on the box
- D. There is no other force acting on the box

Question 29 (1 point)

Ignacio uses a hammer to hit a nail into a board on the floor. How does gravity make it easier to hammer in the nail?

- A. Gravity pushes the board up to help the nail go in
- B. Gravity pulls the board and the nail toward each other
- C. Gravity pulls the hammer down so that it has greater force on the nail
- D. Gravity pulls the nail down so the hammer hits with less force

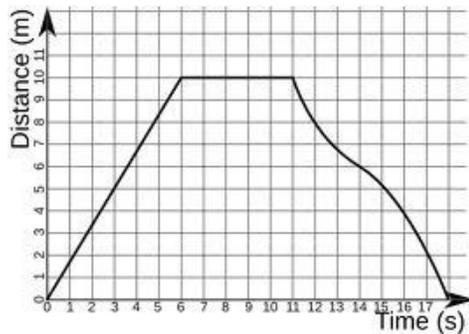
Question 30 (1 point)

A motorcycle, car, van, and bus are traveling at the same speed on a highway. What do we know about the kinetic energy of the vehicles?

- A. The motorcycle has the most kinetic energy because it has the least mass
- B. All of the vehicles have the same kinetic energy because they are moving at the same speed
- C. The bus has the greatest kinetic energy because its mass is greater than the other vehicles
- D. The van has the least kinetic energy because it has the most air resistance

Question 31 (1 point)

Andre conducted an experiment to find the speed of his remote controlled car. He used his data to create the graph below.



How would you describe the motion of the remote controlled car during the first 12 seconds?

- A. The car traveled up a ramp and then traveled straight on a flat surface.
- B. The car's speed increased the entire time.
- C. The car moved forward and then backward.
- D. The car traveled at a constant rate and then stopped for a few seconds.

Question 32 (1 point)

Measuring speed requires the appropriate units. Which of the following is the SI unit for speed?

- A. meters (m)
- B. grams/cubic centimeter (g/cm^3)
- C. meters/second (m/s)
- D. newtons (N)

Question 33 (1 point)

Two identical space probes are orbiting Jupiter. Scientists determine that one probe has a greater gravitational force acting on it than the other. Which statement is the most likely reason for the difference?

- A. One probe reached Jupiter before the other.
- B. One probe has more air resistance than the other.
- C. One probe is pulling on the other.
- D. One probe is closer to Jupiter than the other.

Question 34 (1 point)

Blair and Aaron competed in a 400m running race. Blair finished in 55 seconds and Aaron finished in 58 seconds. Which of the following **must** be true?

- A. Blair had a lower top speed
- B. Aaron had a greater initial speed
- C. Blair had a greater average speed
- D. Aaron had lower final speed

Question 35 (1 point)

In a system, when energy is transformed from one form to another,

- A. some energy is always destroyed.
- B. new energy is created.
- C. the total energy is conserved.
- D. all energy changes to friction.

Question 36 (1 point)

Which of the following is an example of a contact force?

- A. electrical force
- B. magnetic force
- C. friction force
- D. gravitational force

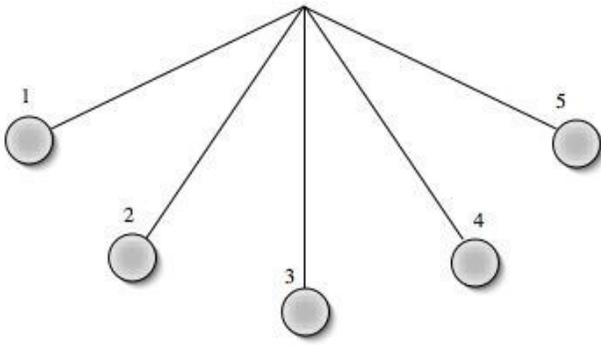
Question 37 (1 point)

Which of the following has kinetic energy?

- A. a rock poised for a fall
- B. an archer's bow that is drawn back
- C. a rolling bowling ball
- D. a car waiting at a red light

Question 38 (1 point)

The motion of a pendulum is shown in the diagram below.



At which point(s) does the pendulum have the greatest potential energy?

- A. 1 and 5
- B. 2 and 4
- C. 3
- D. There is no potential energy because it is always moving

Question 39 (1 point)

The diagram below shows the forces involved when 2 soccer players kick a ball at the same time. Based on the diagram, what will be the net force acting on the ball?



- A. 200 N
- B. <-----
50 N
- C. 0 N
- D. ----->
125 N