

Austin is interested in learning about mice. Which of the following is a scientific question that he could ask?

- A. Is it ethical to own a pet mouse?
  - B. Do big mice make better pets than small mice?
  - C. Are mice that eat cheese prettier than mice that eat peanut butter?
  - D. Do mice grow faster when they eat cheese or when they eat peanut butter?
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### Question 2

Remove

Annabelle loves to learn about plants. For a class project, she thought of the following question:

Do plants enjoy it when people sing to them?

This question is

- A. not a valid scientific question because it is not testable.
  - B. a valid scientific question because it is about plants.
  - C. a valid scientific question because it is testable.
  - D. not a valid scientific question because it is about plants.
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### Question 3

Remove

Nancy needs to do a scientific investigation for her class. She is interested in pottery, plants, and basketball. Which of the following questions would be suitable for use in a scientific investigation?

- A. What color of carnation flowers do people find most attractive?
  - B. What is the most number of points ever scored in a professional basketball game?
  - C. How many needles grow on the giant redwoods in California?
  - D. What length of time is best to use for the firing of pottery to make it strong?
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### Question 4

Remove

A good question to use for a scientific investigation should be testable, and it should be connected to science concepts.

Casey wants to do a scientific investigation about light. Which of the following questions would be **best** to use to guide his scientific investigation?

- A. Which type of light bulb is easiest to catch?
  - B. Which type of light bulb is preferred by moms?
  - C. Which type of light bulb burns the longest?
  - D. What color of light is the prettiest?
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### Question 5

Remove

Katy has to do a science project that involves making a model. Which of the following questions would she answer with a model?

- A. Which type of bug can move the fastest?
  - B. How fast can different plant species grow?
  - C. What type of tree is the prettiest?
  - D. How does a volcano's lava flow affect the plants and objects in its path?
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### Question 6

Remove

The children in Ms. Murray's class have to perform an investigation. The question their study must answer is "How do various types of plants differ in their physical features?"

What type of investigation must the children do?

- A. find several new species of plants
  - B. do an experiment on the chemical components of plants
  - C. make a model of a plant, since they are hard to observe
  - D. observe and record physical characteristics of plants
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### Question 7

Remove

Peter wants to figure out which insects have 4 legs, 6 legs, and 8 legs. He decides to do this by

- A. making a model of an insect and counting the number of legs.
  - B. performing experiments on several types of insect legs.
  - C. trying to remember how many legs each type of insect has.
  - D. collecting several types of insects and counting the number of legs.
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### Question 8

Remove

A wildlife researcher wants to know how a species of fox behaves in its natural habitat. The researcher should

- A. make a model of the foxes and their habitat.
  - B. observe the foxes in their environment.
  - C. perform an experiment on the foxes.
  - D. observe the foxes in a laboratory.
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### Question 9

Remove

Which of the following questions would be answered by performing a scientific experiment?

- A. What type of food is the most nutritious?
  - B. What type of food looks the best?
  - C. What type of food is the most enjoyable?
  - D. How many types of food are available?
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### Question 10

Remove

A scientist wants to determine which fertilizer is more effective—Fertilizer X or Fertilizer Y. The best way for her to proceed would be to design an experiment with

- A. two groups of plants—a group fertilized by Y and a control group with no fertilizer.
  - B. three groups of plants—a group fertilized by X, a group fertilized by Y, and a control group with no fertilizer.
  - C. two groups of plants—a group fertilized by X and a control group with no fertilizer.
  - D. three groups of plants—a group fertilized by X, a group fertilized by both X and Y, and a control group with no fertilizer.
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### Question 11

Remove

Anna is conducting an experiment to determine how weather affects cell phone reception. She is trying to decide the best way to conduct her experiment in order to collect meaningful data.

Which of the following experiments would help Anna collect the best data?

- A. Test a cell phone's reception in one location with clear weather and in another location with rainy weather.
  - B. Test a cell phone's reception in the exact same location under various atmospheric conditions.
  - C. Test different cell phones in different locations on days with clear weather.
  - D. Test different cell phones in different locations on days with rainy weather.
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### Question 12

Remove

Maria wants to determine which type of disinfectant kills the most bacteria.

Which of the following is the best way for Maria to determine this?

- A. Ask ten different companies that make disinfectants which type is best.
- B. Put the same amount and species of bacteria on ten identical plates, and add ten different kinds of disinfectant to each plate.
- C. Interview ten different people to determine which type of disinfectant they prefer.

- D. Put the same amount and species of bacteria on ten identical plates, and add a different disinfectant to each plate.
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### Question 13

Remove

Julian designs an experiment to see how well different liquids lubricate wooden surfaces. He sets up a number of identical wooden ramps and prepares to slide identical wooden blocks down them. He will time how long it takes each block to reach the end of the ramp. He covers one ramp with water, the second with motor oil, and the third with corn syrup.

What can Julian use as a control group for the experiment?

- A. a second set of ramps covered with water, oil, and syrup respectively
  - B. a ramp with no liquid on it
  - C. a block that drops straight down instead of sliding down a ramp
  - D. a ramp with no friction on its surface
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### Question 14

Remove

Mario believes he has found the reason that some things glow in the dark while others do not. What is the most important thing he will need to do before his theory will be accepted by other scientists?

- A. Write a book promoting his theory.
  - B. Create a petition and ask everyone who believes in his theory to sign it.
  - C. Develop an on-line survey so people can vote on the accuracy of his theory.
  - D. Develop tests and experiments that can be repeated to prove his theory.
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### Question 15

Remove

You have decided to do an experiment to learn if a certain type of cactus will grow better in a dark closet or a sunny window. To begin your experiment, you place one cactus in a dark closet and one cactus in a sunny window. Over the next month, you record data about the cacti and their appearance every day. At the end of the month,

you determine that the cactus in the sun is alive but didn't grow and that the cactus from the dark closet is alive and grew one centimeter. Can you conclude that a dark closet is better for this type of cacti's growth?

- A. No, you need to repeat an experiment multiple times before accepting a conclusion.
  - B. Yes, when you are a student your results will be accepted on small-scale studies.
  - C. Yes, one cactus can accurately reflect the behavior of all similar cacti.
  - D. No, you need to use one cactus in both conditions.
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### Question 16

Remove

A scientist performs an experiment that indicates anti-inflammatory medications can lead to liver failure if they are used on a daily basis. The scientist publishes her results in a scientific journal. What should be done before the scientific community accepts her results as being accurate?

- A. Different scientists should repeat the experiment to see if they can get the same results.
  - B. The head of a scientific committee must approve the research before the results can be accepted.
  - C. Three other journals must publish the scientist's report before the results can be considered accurate.
  - D. The results must become a scientific theory before they can be considered correct.
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### Question 17

Add

Two companies make baseballs, and each claims that its ball goes farther. Which would be the best scientific evidence to decide which ball goes farther?

- A. hitting each ball with the same force and measuring how far each goes
  - B. using each of the baseballs during a game and recording the results
  - C. reviewing the test data that each company has reported on their product
  - D. asking 25 different baseball players which ball they think goes further
- 

### Question 18

Add

Glenda measured how much salt could be dissolved in water. She measured out 100 mL of water and placed it in a beaker along with a stir bar. She put the beaker on a magnetic mixer and set it to stir the liquid. She added 1 g of salt, watched to see if the salt dissolved and the solution turned clear, and recorded her observations. Then she added another gram of salt. She repeated this many times.

Which variable is observed by (but not changed by) the investigator at each step of the experiment?

- A. how long it takes the salt to dissolve
- B. whether or not all the salt dissolves
- C. the amount of salt in the water
- D. the amount of water to which the salt is being added

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### Question 19

Add

Bryant compared six different kinds of fertilizer. He grew fourteen plants from cuttings of one plant to make sure they would all be the same. He gave each plant the same amount of water and sunlight each day. He also gave each plant a small amount of fertilizer every week. Two plants got each kind of fertilizer. Two plants got no fertilizer.

In this experiment, the kind of plant was a variable that was

- A. observed each day.
- B. measured.
- C. changed by the investigator.
- D. kept the same.

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### Question 20

Add

Mitchell learned about convection in class. In convection, warmer fluids rise and cooler fluids sink because they have different densities. He decides to conduct a scientific investigation to measure how the density of water changes with temperature.

Mitchell measures 100 g of cold water in a graduated cylinder and measures and records its temperature and volume. He uses a microwave to heat the water slightly, measures its temperature, and measures its volume. He repeats this several times.

In this investigation, which variable is changed by the investigator?

- A. the mass of the water
  - B. the phase of the water
  - C. the volume of the water
  - D. the temperature of the water
- 

### Question 21

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Mitchell measures 100 g of cold water in a graduated cylinder and measures and records its temperature and volume. He uses a microwave to heat the water slightly, measures its temperature, and measures its volume. He repeats this several times.

In this investigation, which variable is kept the same?

- A. the temperature of the water
  - B. the phase of the water
  - C. the mass of the water
  - D. the volume of the water
- 

### Question 22

Add

Ignacio has several balls of the same size. Each ball is made of a different material, and each ball has a different mass. Ignacio rolls one ball down a ramp, then measures how long it takes the ball to roll one meter after it reaches the bottom of the ramp. He then repeats this with each ball.

In this experiment, which variable is changed by the investigator?

- A. the mass of the ball
  - B. the height of the ramp
  - C. the time it takes the ball to travel one meter
  - D. the distance traveled by each ball
- 

### Question 23

Add

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In this experiment, which variable is measured by the investigator?

- A. the distance traveled by each ball
- B. the mass of the ball
- C. the height of the ramp
- D. the time it takes the ball to travel one meter

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### Question 24

Remove

Faith's living room is heated by a fireplace in the winter.



Faith has noticed that some parts of the room are warmer than others. She thinks that the air is warmer nearer to the fire. To test this, she places thermometers in different parts of the room: near the fire, far from the fire, near the floor, near the ceiling, and in several places in between. She then records the position of each thermometer and the temperature that it shows.

In this investigation, the temperature is

- A. the constant.
  - B. the variable changed by the investigator.
  - C. the measured variable.
  - D. the variable that is kept the same.
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