Scientific Method Part 1: Inquiry Practice (Demo Version)

Read each question carefully.

1) Explain how experiments support scientific ideas.

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2) Which best explains why controlled experiments are important to science?

A) They lead to new ideas.

B) They can be done with few materials.

C) They do not take long to complete.

D) They produce results that are easy to understand.

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3) Which best explains why controlled experiments are important to science?

A) They are easy to design.

B) They do not cost much money.

C) They produce data that can be changed.

D) They test predictions about how the world works.

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4) Explain how working together helps scientists form new ideas.

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5)

Which statement is an interpretation of an observation?

A) The world's oceans are filled with tiny plants.

B) The more sunlight a plant gets, the more food it can make.

C) In northern states, frost can kill outdoor plants.

D) Outdoor plants get more sunlight than indoor plants.

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6)

Which statement is an interpretation of an observation?

A) Femur is the name of the bone in a person's thigh.

B) The femur is the longest bone in the human body.

C) The femur is the strongest bone in the human body.

D) It must be difficult to break the femur bone.

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7) Which statement is an interpretation of an observation?

A) Volcanoes may have been responsible for the first life on Earth.

B) Very high temperatures in volcanoes have been shown to melt rocks.

C) Mauna Loa on the Island of Hawaii is the largest volcano on Earth.

D) Scientists are able to figure out when a volcano is going to explode.

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8) Which statement is an interpretation of an observation?

A) Brand Y batteries lasted longer than Brand X batteries.

B) The flashlight did not turn on without batteries.

C) The flashlight was brighter using Brand Y batteries.

D) Brand Y batteries are better than Brand X batteries.

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9) Which statement is an interpretation of an observation?

A) Some landslides have been caused by earthquakes or large amounts of rain.

B) Landslides are a more serious threat than avalanches.

C) If there is a danger that a landslide may occur, one should leave the area.

D) A landslide may include rocks falling off of a cliff.

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10) Which statement is an interpretation of an observation?

A) The Richter scale measures the strength of an earthquake.

B) An earthquake measuring less than 3 on the Richter scale is too weak to be felt by people.

C) Strong earthquakes can destroy buildings and hurt people and animals that live in the area.

D) Earthquakes that destroy buildings must measure higher than 3 on the Richter scale.

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11) Which statement is an observation?

A) Iron reacts with water to form rust.

B) The soda can did not rust after being soaked in water.

C) Soda cans are made out of a metal called aluminum.

D) Aluminum is known for being lightweight and flexible.

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12) Which statement is an observation?

A) I watched a video of a volcano exploding.

B) As the lava hardened, it turned black.

C) The explosion was quite beautiful.

D) There are several different types of volcanoes.

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13) Which statement is an interpretation of an observation?

A) Copper is a metal.

B) Electrical cords contain copper wire.

C) Some cooking pots are made of copper.

D) Metals can be molded into different shapes.

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14) Which statement is an interpretation of an observation?

A) Solar lights use energy from sunlight to make light.

B) Solar lights work even on days that are cloudy.

C) The energy in sunlight must be able to travel through clouds.

D) The light from solar lights is not as bright as other lights.

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15) Reginald noticed that his curly hair feels different than his brother's straight hair.

What question can he ask about this observation that he could test in an investigation?

A) Was his hair curly when he was a baby?

B) What kind of shampoo does his brother use?

C) Does straight hair grow faster than curly hair?

D) In what ways is curly hair different from straight hair?

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16) Aiden noticed that the leaves of his spinach plant have holes in them.

What question can he ask about this observation that he could test in an investigation?

A) Does the spinach taste good?

B) What kind of a spinach plant is it?

C) Are the holes being made by insects?

D) How much sunlight does the plant get?

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17) Hailey noticed that there were bubbles in the water glass that she left sitting on the counter overnight.

What question can she ask about this observation that she can test in an experiment?

A) Does air dissolve into water over time?

B) Did any of the water evaporate overnight?

C) Why do carbonated drinks become flat over time?

D) Is the water's temperature the same as the room temperature?

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18) Jack noticed that metal paperclips were attracted to an iron nail he found in the family toolbox.

What question can he ask about this observation that he can test in an experiment?

A) What do the paperclips feel like?

B) What caused the nail to become magnetized?

C) What size is the nail?

D) What other objects are made of iron?

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19) Sally baked muffins without baking powder because she did not have any. She also used bananas in the muffins instead of blueberries. When she took the muffins out of the oven, she saw that they were small and hard instead of large and soft.

What is the best prediction for what will happen if Sally bakes a cake without using baking powder?

A) The cake will be flat.

B) The cake will taste like a muffin.

C) The cake will not be sweet.

D) The cake will not cook.

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20) Janine's mother warned her not to pick the scab off of her cut. She said that Janine would get a scar if she did. Janine picked the scab anyway and saw that her mother was right.

What is the best prediction for what will happen if Janine does not pick the scab off of a second cut?

A) The cut will not heal.

B) The cut will take a longer time to heal.

C) The cut will heal without a scar.

D) The cut will result in a scar anyhow.

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21) Celia read that plastics are an environmental problem because they do not break down easily.

Based on this information, which is most likely to be true?

A) If she buries a plastic bag in her yard and digs it up a year later, it will still be there.

B) If people take their groceries home in cloth bags, plastics will no longer be an environmental problem.

C) If plastic is heated, it will break down more easily than if left at room temperature.

D) If a landfill contains many plastic items, the landfill is more likely to leak chemicals into the environment.

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22) Will tested seven objects as switches in a circuit to find out if they would close the circuit, turning on the light bulb. His results are shown below.

What is the best prediction for what will happen if he tests a piece of cardboard as a circuit switch?

Turned On the Lightbulb	Did Not Turn On the Lightbulb
paperclip	rubber band
tin foil	straw
quarter	toothpick
	floss

A) It will not turn on the light bulb.

B) It will turn on the light bulb for a few seconds.

C) It will cause the light bulb to burn out.

D) It will take longer to turn on the light bulb than the metal objects.

Scientific Method Part 1: Inquiry Practice (Demo Version)

"Carlos's Pill Bug Experiment"

Carlos wanted to find out if pill bugs like warm temperatures or cool temperatures. He tested this by filling one cup with cool water and the other with warm water. He balanced a strip of cardboard along the tops of the two cups. One end sat on one cup and the other end on the other cup. There was 20 centimeters of space between the two cups. He placed ten pill bugs onto the cardboard in the middle of the two cups. He watched the pill bugs to see what they did. He tested this three times. Each time he used water with different temperatures. His results are below.

Observations During Pill Bug Experiment

13 °C and 28 °C

At first, three of the 10 pill bugs moved toward the cool water. Then they turned around, and all 10 pill bugs moved toward the warm water.

10 °C and 30 °C

Eight of the 10 pill bugs moved toward the warm water. The other two sat still in between the two cups of water.

8 °C and 33 °C

One pill bug moved toward the cool water and then became still. The other nine moved toward the warm water.

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23) from "Carlos's Pill Bug Experiment"

Which of the following would best help Carlos find more information about how temperature affects insects?

A) an encyclopedia entry about pill bugs

B) a website about insects that live in Carlos's state

C) a poster about the life cycles of insects

D) a book chapter about cold-blooded and warm-blooded animals

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24) Which of the following would best help a student find information to use in an experiment testing what things can affect the strength of a magnet?

A) an encyclopedia entry for "magnets"

B) a book chapter titled "What is a Magnet?"

C) photographs of different types of magnets

D) a webpage titled "What Affects Magnet Strength?"

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25) Which of the following would best help a student find information to use in an experiment testing how wire thickness affects circuits?

A) an encyclopedia entry for "circuit"

B) a handout about electrical outlet safety

C) a webpage showing how to build a circuit

D) a book chapter titled "What is Energy?"
