

Grade 4

Indicator: 4.1.3 Summarize the characteristics of a simple scientific investigation that represent a fair test. (See standards guide for details)

A student was studying earthworms. In the investigation

- moist soil was placed in the left half of a shoebox
- dry soil was placed in the right half of a shoebox
- 6 earthworms were placed where the two soils met

After three minutes, the student recorded the direction in which the worms moved. Which question was the student trying to answer?

- A. How do earthworms move in containers?
- B. Do earthworms like moist soil better than dry soil?
- C. How many minutes does it take for an earthworm to move?
- D. Do earthworms like shoeboxes or another type of container?

Answer: B

Indicator 4.2.4 Distinguish between the characteristics of an organism that are inherited and those that are acquired over time.

Which of the following was probably inherited?

- A. a human child riding a bike to school
- B. a young bear going to campsites to find food
- C. a baby horse having a white stripe in its black hair
- D. a young chimpanzee making a tool to catch termites

Answer: C

Grade 5

Indicator 5.1.3 Plan and conduct controlled scientific investigations, manipulating one variable at a time. (See standards guide for details)

Which statement is a quantitative observation about a bird's feet?

- A. The bird has small feet.
- B. The bird is able to swim.
- C. The bird has webbed toes on its feet.
- D. The bird has three toes on each foot.

Answer: D

Indicator: 5.4.3 Summarize the characteristics of a mixture, recognizing a solution as a kind of mixture.

A student put ice and pebbles in a glass and allowed the ice to melt. Which term describes what was in the glass after the ice melted?

- A. a liquid-solid mixture
- B. a liquid-solid solution
- C. a solid-solid mixture
- D. a solid-solid solution

Answer: A

Grade 6

Indicator: 6.1.4 Use a technological design process to plan and produce a solution to a problem or a product (including identifying a problem, designing a solution or a product, implementing the design, and evaluating the solution or the product).

A student is using her knowledge of wind and forces to build a windmill.
What is the student doing?

- A. predicting the weather
- B. making a scientific discovery
- C. observing atmospheric processes
- D. creating an example of technology

Answer: D

Indicator: 6-5.4 Illustrate energy transformations (including the production of light, sound, heat, and mechanical motion) in electrical circuits.

Household appliances convert electricity into one or more different forms of energy. An electric fan can best be described as converting electricity into _____.

- A. heat energy and sound energy only
- B. heat energy and chemical energy only
- C. heat energy, sound energy, and mechanical energy only
- D. heat energy, mechanical energy, and chemical energy

Answer: C

Grade 7

Indicator: 7.1.3 Explain the reasons for testing one independent variable at a time in a controlled investigation. (See standards guide for details.)

A patient had trouble breathing during exercise. His doctor examined him and wrote these statements in his chart.

- The patient complains of difficulty breathing during exercise.
- During the office visit, the patient was wheezing.
- The patient most likely has asthma.
- The condition will be treated with an inhaling medication.

Which statement is an inference, but not a prediction?

- A. The patient complains of difficulty breathing during exercise.
- B. During the office visit, the patient was wheezing.
- C. The patient most likely has asthma.
- D. The condition will be treated with an inhaling medication.

Answer: C.

Indicator 7.4.1 Summarize the characteristics of the levels of organization within ecosystems (including populations, communities, habitats, niches, and biomes).

Trout are found in rapidly flowing streams that have high levels of oxygen, stony bottoms, and an abundance of aquatic insects. These streams represent a trout's

_____.

- A. niche
- B. biome
- C. habitat
- D. community

Answer: C

Science Grade 8

Indicator 8.1.3 Construct explanations and conclusions from interpretations of data obtained during a controlled scientific investigation.

A class performed an experiment with four brands of paper towels.

- One sheet of each brand was soaked in 200 mL of water for 1 minute.
- A 5-g cube was placed on each paper towel and more 5-g cubes were added until the towel began to tear.

The table shows the students' observations.

Brand	Strength of Paper Towels	
	Time Soaked	Mass Held
A	60 sec.	45 g
B	60 sec.	75 g
C	60 sec.	50 g
D	60 sec.	80 g

What is the independent (manipulated) variable in this experiment?

- A. The brand of paper towel
- B. The amount of water used
- C. The mass each towel held
- D. The amount of time soaked

Answer: A

Indicator: 8-2.2 Summarize how scientists study Earth's past environment and diverse life-forms by examining different types of fossils (including molds, casts, petrified fossils, preserved and carbonized remains of plants and animals, and trace fossils).

An unusual type of fossil clam is found in rock layers high in the Swiss Alps. The same type of fossil clam is also found in the Rocky Mountains of North America. From this, scientists conclude that _____.

- A. glaciers carried the fossils up the mountains
- B. the Rocky Mountains and the Swiss Alps are both volcanic in origin
- C. clams once lived in mountains, but have since evolved into sea-dwelling creatures
- D. the layers of rocks in which the fossils were found are from the same geologic age

Answer: D