

Name _____

Reviewing Experimental Design

Purpose: To practice identifying the basic parts of an experiment

Scenario A –

Students in sixth grade science spent several weeks studying conservation and recycling. Students then investigated how different recycled products affected plant growth. The second period class compared the **effect** of different aged grass compost on the height of bean plants. Because the decomposition that occurs during composting is needed to release the nutrients in the grass, this class **hypothesized** that older grass compost would produce taller bean plants. Three flats of bean plant (25 plants in each flat) were grown for 30 days. All of the bean plants had been plant 10 days before the start of the investigation.

- Flat 1 received 450g of 3 month old compost.
- Flat 2 received 450g of 6 month old compost.
- Flat 3 received no compost.

All of the bean plants received the same amount of water and sunlight each day.

At the end of 30 days, all of the bean plants were measured in cm and the data recorded.

Complete a testable question for this investigation.

What is the effect of _____ on
the _____?

Try it another way.

How does _____
affect _____?

Identify the independent/manipulated variable in this experiment. What did the student scientists change on purpose? _____

Identify the dependent/responding variable in this experiment. What changed because of the independent variable? What did the student scientists observe and measure?

Identify three controlled variables/constants in this experiment. What did the student scientists keep the same during the investigation? _____

Scenario B –

Science students saw a movie about insects. In the movie they saw that some chemicals would upset and agitate bees. Some of the students noticed that the bees in plants outside of the classroom would follow students after fitness, sports, or dance. They wondered if the chemicals in the scented products they used after class affected the behavior of the bees. Students placed a dish containing 10mL of scented shampoo near the plants. They timed how long it took for the bees to emerge and made observations about their behavior. They repeated the investigation with a different shampoo at the same time the next day. They did this for five days, with five different shampoos. Each day the students observed the bees at the same time. The weather conditions (temperature, wind) were the same each day.

What qualitative observations did the students make during this investigation?

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Complete a testable question for this investigation.

What is the effect of _____ on
the _____?

Identify the independent/manipulated variable in this experiment. What did the student scientists change on purpose? _____

Identify the dependent/responding variable in this experiment. What changed because of the independent variable? What did the student scientists observe and measure?

Identify three controlled variables/constants in this experiment. What did the student scientists keep the same during the investigation? _____

Scenario C –

Science students were playing in the park over the weekend. There were several different types of balls available to use. The students began a game of kickball using an old basketball. When other students wanted the basketball to shoot hoops, the kickball players found soccer ball to use. After a while, someone brought a rubber playground ball, and the students used it too. Students noticed that how far they could kick the ball varied with the type of ball they used.

What qualitative observations did the students make while playing in the park?

What is an inference the students may have made about this observation?

If a student wanted to do an investigation based on these observations, what would testable question be?

What is a possible hypothesis (using an If, then statement) for the question?

Identify the independent/manipulated variable in this investigation.

Identify the dependent/responding variable in this experiment.

Identify possible three controlled variables/constants in this experiment.

Scenario D –

Science students were investigating stimulus-response in earthworms. Students put earthworms on trays with different surfaces (sand, potting soil, grass). They observed the behaviors of the worms.

What qualitative observations did the students make during this investigation?

Complete a testable question for this investigation.

What is the effect of _____ on
the _____?

Identify the independent/manipulated variable in this experiment. What did the student scientists change on purpose? _____

Identify the dependent/responding variable in this experiment. What changed because of the independent variable?

Identify three controlled variables/constants in this experiment. What did the student scientists keep the same during the investigation?

Scenario E –

While on summer vacation, a student spent the day at the zoo observing the black bears. The student observed and recorded the behavior of the bears at 8:00 am, 10:00 am, 12:00 pm, 2:00 pm, 4:00 pm, and 6:00 pm. He noticed that the bear was most active at 8:00 am, fairly active at 10:00 am and 6:00 pm, not very active at all from 12:00 – 4:00.

Complete a testable question for this investigation.

What is the effect of _____ on
the _____?

Try it another way.

How does _____
affect _____?

What inference can be made based on these observations?

Create a data table to show how you would collect and record these observations.