Growth Clues

Use comparison data to explain what affects organism growth.

MS-LS1-5 "Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. Clarification Statement: Examples of local environmental conditions could include availability of food..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline every average height measurement. Circle each mention of water amount or seed variety, then write 1 beside a comparison that changes water only and 2 beside a comparison that changes variety only.

Bean Plant Investigation

1. This classroom example uses simulated data, not measurements from a reported study. At the school garden, students investigated why bean plants did not all grow alike. They planted seeds from two bean varieties, Blue Lake and Kentucky Wonder, in identical pots of the same soil. Each pot received the same amount of light and space. Half of the pots received 100 milliliters of water each day. The other half received 40 milliliters. The students measured each plant's height after four weeks. They wrote the water amount and variety name on every pot label.

2. The measurements showed a pattern. Blue Lake plants given 100 milliliters of water averaged 18 centimeters tall. Blue Lake plants given 40 milliliters averaged 11 centimeters. Kentucky Wonder plants given 100 milliliters averaged 14 centimeters, while those given 40 milliliters averaged 8 centimeters. Each group had six plants. The students used averages so that one unusually tall or short plant would have less effect on the group's result. They recorded each measurement in a chart for comparison.

3. After collecting measurements, the class prepared to write scientific explanations. Each explanation would need a claim about a factor, number evidence from the averages, and reasoning that links the evidence to the claim. Students first sorted their comparisons into pairs. In one kind of pair, the variety stayed the same while the water amount changed. In the other kind, the water amount stayed the same while the variety changed. They also checked which conditions, such as light, soil, pot size, and space, did not change.

2 ANSWER WITH EVIDENCE

Use the passage

1. Use the Blue Lake results to explain whether water amount influenced plant height. Include both average heights as evidence.

2. Use the groups that received 100 milliliters of water to explain whether seed variety influenced plant height.

3. A student claims that the 18-centimeter average was caused only by the Blue Lake variety. Is this claim supported? Use evidence from the investigation.

4. Why is comparing Blue Lake plants at 100 milliliters and 40 milliliters a better test of water amount than comparing Blue Lake plants at 100 milliliters with Kentucky Wonder plants at 40 milliliters?

3 YOUR TURN

Your own words

Use this additional simulated classroom dataset. Farmers grow two grass species in equal plots with the same light, soil, and space. With 2 liters of water each week, meadow fescue averages 22 cm and prairie rye averages 17 cm. With 5 liters, meadow fescue averages 34 cm and prairie rye averages 28 cm. Write a three-sentence scientific explanation describing how water amount and grass species influenced growth. Include at least two numerical comparisons.

ANSWER KEY

Growth Clues

GRADES 6-8 · MS-LS1-5

PART 1 · READ AND MARK

Underline every average height measurement. Circle each mention of water amount or seed variety, then write 1 beside a comparison that changes water only and 2 beside a comparison that changes variety only. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Use the Blue Lake results to explain whether water amount influenced plant height. Include both average heights as evidence.	**Water amount influenced Blue Lake height. Blue Lake plants averaged 18 cm with 100 mL of water and 11 cm with 40 mL.**
2	Use the groups that received 100 milliliters of water to explain whether seed variety influenced plant height.	**At 100 mL, Blue Lake averaged 18 cm and Kentucky Wonder averaged 14 cm. Because the water amount was the same, the difference supports the claim that variety influenced height.**
3	A student claims that the 18-centimeter average was caused only by the Blue Lake variety. Is this claim supported? Use evidence from the investigation.	**No. Blue Lake plants averaged 18 cm with 100 mL of water but 11 cm with 40 mL, showing that water amount also influenced their height.**
4	Why is comparing Blue Lake plants at 100 milliliters and 40 milliliters a better test of water amount than comparing Blue Lake plants at 100 milliliters with Kentucky Wonder plants at 40 milliliters?	**The first comparison changes water amount while keeping variety the same. The second comparison changes both water amount and variety, so it cannot isolate the effect of water.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Both water amount and grass species influenced growth. Meadow fescue increased from 22 cm with 2 liters to 34 cm with 5 liters, and prairie rye increased from 17 cm to 28 cm. At both water amounts, meadow fescue was taller than prairie rye, 22 versus 17 cm and 34 versus 28 cm, so species also affected growth when other conditions stayed the same.

Accept scientifically accurate claims that use the averages as evidence and connect the evidence to water amount, variety or species, or both. For the open task, accept different wording if the response has exactly three sentences and includes at least two accurate numerical comparisons.