

Pill Bug Proof

Use repeated data to judge a claim and improve an investigation.

LS.1.c.iv "interpreting, analyzing, and evaluating data consider limitations of data analysis and/or seek to improve precision and accuracy of data"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the evidence that supports the class's claim, circle each limit on the data, and number the steps that could improve precision or accuracy. These marks will help you judge how strong the conclusion is.

Testing a Habitat Choice

- ① A class investigated whether pill bugs prefer moist or dry habitats. In each trial, students placed 20 pill bugs in a tray with two equal sections. One section held damp paper towel, and the other held dry paper towel. After ten minutes, they counted the pill bugs in each section. The table shows results from three trials.

PILL BUG LOCATIONS AFTER 10 MINUTES

Trial	Moist Side	Dry Side	Total Pill Bugs
1	14	6	20
2	11	9	20
3	13	7	20

- ② Across the trials, more pill bugs were found on the moist side each time. However, the counts were not identical. Differences among trials can come from variation, such as starting position or exploring speed. A pattern is stronger when it appears in repeated trials, not just once. The results support a moist-side preference, but they do not show that every pill bug always chooses moisture.
- ③ Several limits could affect the data. Students may not have made both sections equally bright, warm, or sized. They might count a moving pill bug differently near the center line. To improve precision, the class could use a clear counting rule and repeat more trials. To improve accuracy, they could use tools to make sections differ only in moisture.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What pattern appears in all three trials? Use numbers from the table as evidence.

2 Why do the three trials support a moist-side preference but not prove that every pill bug always chooses moisture?

3 Name one condition besides moisture that may not have been equal in the tray. Explain how it could limit the conclusion.

4 Describe one step that would improve precision and one different step that would improve accuracy in this investigation.

3 YOUR TURN _____ Your own words

A group wants to test whether bean seeds sprout better in light or darkness. Fill both rows with a possible limitation, how it could affect the results, and a better method. Include one method that improves accuracy and one that improves precision.

POSSIBLE LIMITATION	HOW IT COULD AFFECT RESULTS	BETTER METHOD

PART 1 • READ AND MARK

Underline the evidence that supports the class's claim, circle each limit on the data, and number the steps that could improve precision or accuracy. These marks will help you judge how strong the conclusion is. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What pattern appears in all three trials? Use numbers from the table as evidence.	More pill bugs were on the moist side in every trial: 14 versus 6, 11 versus 9, and 13 versus 7.
2	Why do the three trials support a moist-side preference but not prove that every pill bug always chooses moisture?	The moist side had more pill bugs in each repeated trial, but some pill bugs were on the dry side each time and results can vary.
3	Name one condition besides moisture that may not have been equal in the tray. Explain how it could limit the conclusion.	Accept brightness, warmth, or section size, with an explanation that pill bugs may respond to that condition instead of moisture.
4	Describe one step that would improve precision and one different step that would improve accuracy in this investigation.	Precision: use a clear counting rule and/or repeat more trials. Accuracy: use tools to make the sections differ only in moisture.

PART 3 • YOUR TURN (SAMPLE ANSWER)

POSSIBLE LIMITATION	HOW IT COULD AFFECT RESULTS	BETTER METHOD
Different amounts of water in the groups	Seeds may sprout because of water, not light	Give every cup the same measured amount of water.
Counting tiny roots differently	Totals may change because of counting choices	Set a root-length rule and have two people check counts.

Accept equivalent evidence-based explanations for the questions. In Part 3, accept reasonable limits and matching improvements, as long as one method controls conditions for accuracy and one method makes measurement or counting more consistent for precision.