SCIENCE FOUNDATIONS

Drawing conclusions from evidence

Difficulty level: Intermediate

Science Foundations

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Overview of the concept

This is how you decide what a science experiment actually proved, by matching the claim to the numbers you measured instead of guessing. A student who tested three fertilizers can say which one worked best only if the data really shows a difference. A news report claiming a new food cures something needs the same check, does the evidence support the claim or just sound impressive. Knowing how to draw conclusions keeps you from claiming more than your results actually show.

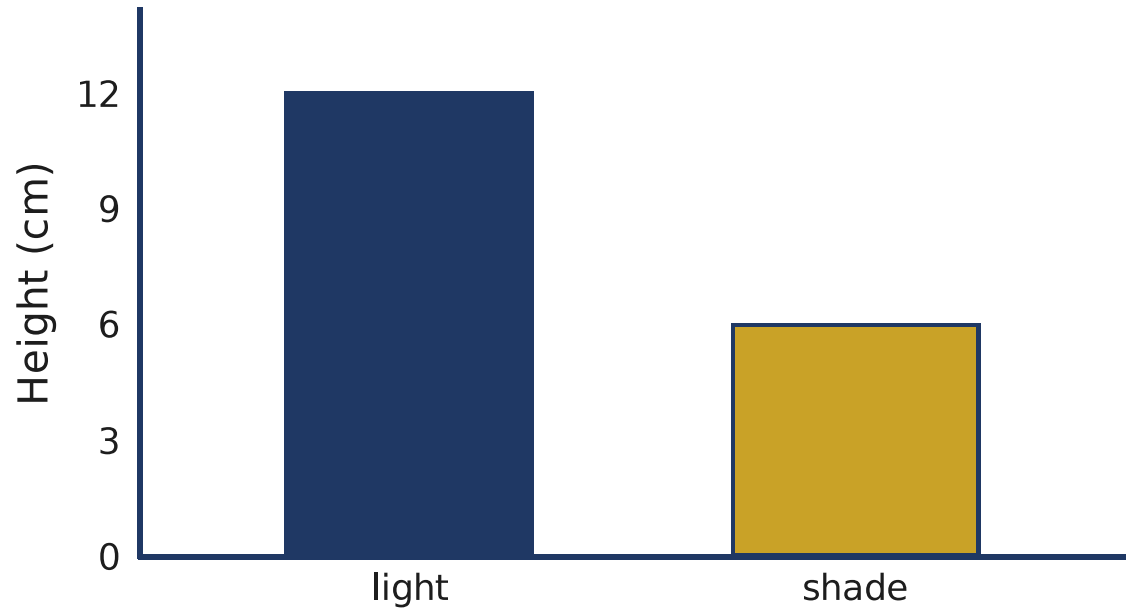


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Worked examples

EXAMPLE 1

Q In a light experiment, plants in light grew 12 cm and plants in shade grew 6 cm. Does light affect plant growth?



SOLUTION

Recall the question: does light affect plant growth?

Use the evidence: light group averaged 12 cm, shade group 6 cm.

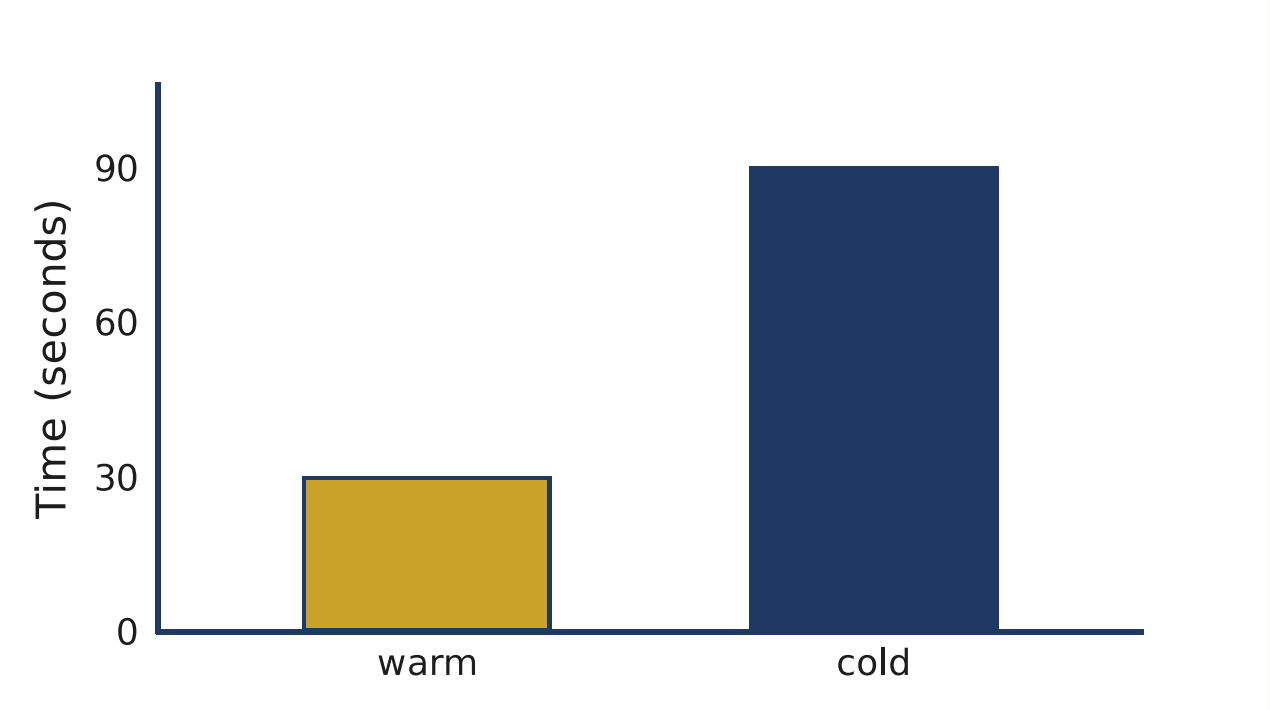
So the answer is yes, and the hypothesis was supported.

The result is light increased growth in this test; hypothesis supported.

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EXAMPLE 2

Q **In a dissolving test, sugar took 30 s to dissolve in warm water and 90 s in cold water. Does temperature affect how fast sugar dissolves?**



SOLUTION

Recall the question: does temperature affect dissolving speed?

Use the evidence: warm water took 30 s, cold water 90 s.

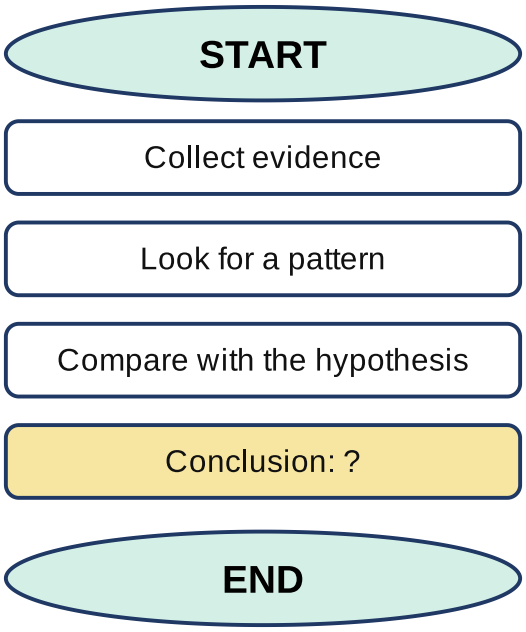
So the answer is yes, and the hypothesis was supported.

The result is warmer water dissolved sugar faster; hypothesis supported.

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Practice questions

1 What question must a conclusion answer? Use the flowchart.

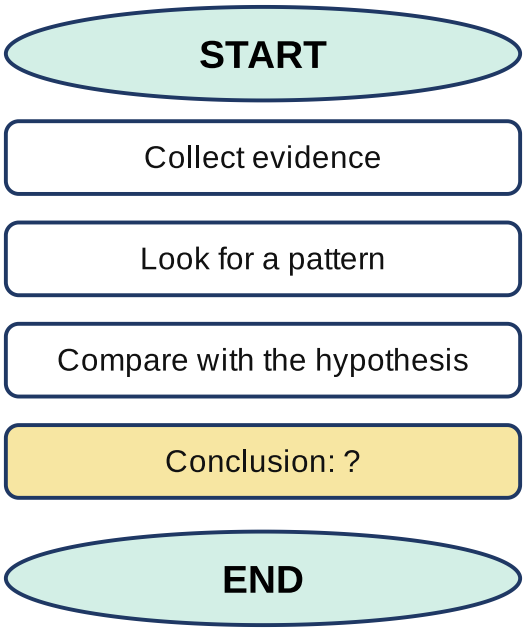


- **A** The next experiment
- **B** The original question
- **C** The equipment list
- **D** The safety rules

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2 **A student tests whether water affects seed sprouting. Watered seeds: 16 of 20 sprouted. Dry seeds: 7 of 20 sprouted. Write a conclusion for the question: does water affect sprouting? Use the flowchart.**



- **A** Water decreased sprouting
- **B** Water made no difference
- **C** Water increased sprouting
- **D** Water stopped all sprouting

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3

A student tests one fertilizer on tomato plants and finds they grew taller. Which conclusion is supported by the evidence?

A. This fertilizer makes all plants grow taller

B. The fertilizer increased growth in this test

C. This fertilizer is the best fertilizer

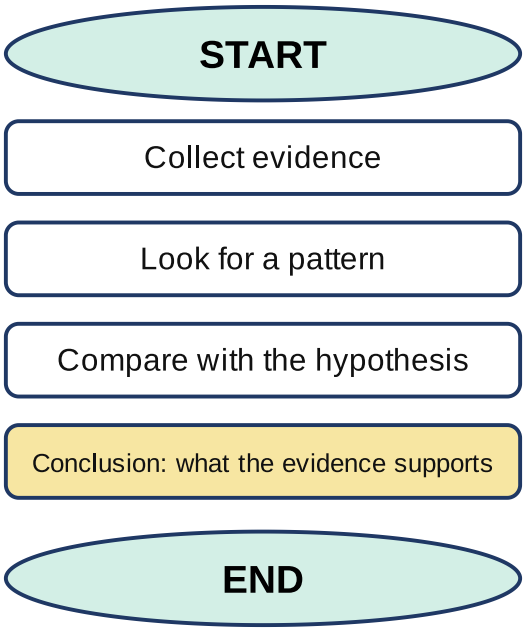
D. Fertilizer always works

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4 **A hypothesis predicted sugar dissolves more slowly in cold water. Sugar in cold water took 120 s, in warm water 45 s. Was the hypothesis supported? Write the conclusion. Use the flowchart.**



- **A** No, cold water was faster
- **B** Yes, warm water was slower
- **C** No, the times were the same
- **D** Yes, cold water was slower

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5 A student tests whether music affects plant growth. Plants with music grew 10 cm, plants without music grew 10 cm. What is the conclusion?

- **A** Music increased growth
- **B** Music decreased growth
- **C** Music made no difference in this test
- **D** Music stopped all growth

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6 Should a conclusion include numbers?

- **A** Only the date
- **B** Only the equipment
- **C** Yes, the key numbers
- **D** No, never any numbers

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7 What if results contradict the hypothesis?

- A Say it was not supported
- B Change the numbers to fit
- C Hide the results
- D Claim the hypothesis was proved

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8 Can a conclusion prove a hypothesis true for all cases?

- A Yes, for all cases
- B Yes, for every plant
- C Yes, if repeated once
- D No, only for this test

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9 What does supported mean?

A The evidence proves it fully

B The evidence agrees with it

C The evidence was ignored

D The hypothesis was changed

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10 A conclusion with no evidence is what?

A A proven fact

B A hypothesis

C An opinion, not a conclusion

D A measurement

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ANSWER KEY

1. The original question
2. Water increased sprouting
3. The fertilizer increased growth in this test
4. Yes, cold water was slower
5. Music made no difference in this test
6. Yes, the key numbers
7. Say it was not supported
8. No, only for this test
9. The evidence agrees with it
10. An opinion, not a conclusion

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