

Pond Model Detectives

Study what a scientific model shows and misses.

4.1.e.ii "developing and using models identify limitations of models"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline details that tell what the pond model helps the class study. Circle details that tell what the model cannot show, so you can find its limits.

A Model of Pond Life

- ① Ms. Chen's class built a model of a pond ecosystem with yarn, cards, and paper animals. Arrows showed which living things ate others. The model helped the class trace energy from pond plants to insects, fish, and herons. It made a hard-to-see set of feeding relationships easier to study during a single lesson at their tables.
- ② Still, the pond model was not the real pond. It showed only a few kinds of organisms, even though many more live near pond water. The arrows did not show how much energy moved or when animals ate. It also could not show changes from rain, temperature, disease, or seasons. Those changes affect real feeding relationships.
- ③ To use the model wisely, the class wrote limits on sticky notes beside it. They compared its arrows with pond observations and a field guide. Then they added a new card for frogs, because they had observed frogs eating insects. A model can be useful without being complete. Scientists explain what a model shows and what it leaves out.

2 ANSWER WITH EVIDENCE Use the passage

1 What did the arrows in the pond model show?

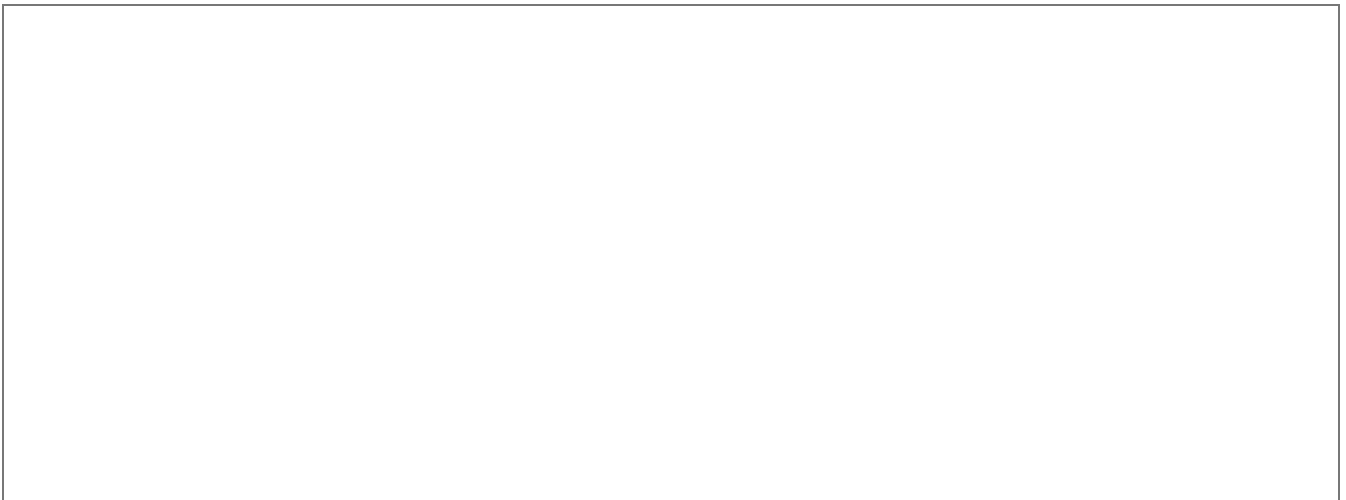
2 Name two things the pond model could not show.

3 How did the class use observations to improve its model?

4 Why can a model be useful even when it is not complete?

3 YOUR TURN Your own words

Draw a simple model of a plant growing from a seed. Label two things your model shows, then write two limits, or things your model cannot show about a real growing plant.



PART 1 • READ AND MARK

Underline details that tell what the pond model helps the class study. Circle details that tell what the model cannot show, so you can find its limits. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What did the arrows in the pond model show?	They showed which living things ate other living things.
2	Name two things the pond model could not show.	It could not show how much energy moved or when animals ate. It also could not show changes from rain, temperature, disease, or seasons.
3	How did the class use observations to improve its model?	They compared the model with pond observations and added a frog card after observing frogs eating insects.
4	Why can a model be useful even when it is not complete?	A model can make hard-to-see relationships easier to study, even though it leaves out some parts of the real system.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Sample drawing: A seed in soil with roots growing down and a stem with leaves growing up. Labels: roots take in water; leaves grow above the soil. Limits: The drawing cannot show how fast the plant grows. It cannot show changes in sunlight, rain, or temperature.

Accept any clear model that represents a growing plant and includes two accurate labels. The two limits should identify real information or changes the drawing does not show, rather than incorrect facts about plants.