

PD Leader Master
Practice Identifying One Main Learning Goal
(Answer Key)

Strong Main Learning Goals	Reasons
7. Plants are called producers because they are the only organisms that can make their own food.	This is a key concept in biology. It's challenging for 5th graders, but it's within their range of understanding. It addresses a common student misconception that plants, like people and animals, take in their food from the environment (water and minerals from the soil, and carbon dioxide from the air).
9. Food gives living things both the energy and the matter they need to live and grow.	To appreciate what happens in food webs, there needs to be a shared understanding of how scientists define food. Students typically think that anything you take into your body is food—and they extend this idea to plants. They cannot appreciate the unique ability of plants to make their own food if they don't have a clear understanding that food provides <i>both</i> matter and energy to living things. By this definition, water is <i>not</i> food for living things. It is something living things need, but it doesn't provide them with energy.
11. Every organism's food can be traced back to sunlight.	This is a key concept in biology. Students need to understand this idea to appreciate the unique role of producers in food webs and the importance of having a continual supply of new energy from the Sun.
12. Decomposers recycle matter by breaking down dead organisms into minerals, carbon dioxide, and water that plants can use again.	This learning goal challenges students to go beyond the typical phrase "Decomposers break dead organisms into tiny pieces that can be recycled." Instead, they focus on what those tiny pieces are, which will help them understand how plants can use them again. An important misconception to address is that the minerals decomposers recycle is <i>food</i> for plants. Talking about decomposers giving off carbon dioxide and water can also help students connect this matter back to plants using these substances to make food.
17. Although matter changes forms and moves from organism to organism in food chains, no matter is ever lost or destroyed. The total amount of matter in the system remains the same.	This is a very challenging concept that may be difficult for 5th graders to understand in a deep way. But it's a central idea when talking about how matter is recycled in food webs and ecosystems. Too often, students simply memorize the line that "matter is recycled" and don't appreciate how food matter gets used, changed, reused, and passed around from one organism to

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	another, to the environment, and back to organisms.
19. Organisms can use the matter in food as building blocks for making new body parts.	This is an important concept that challenges a black-box view of what happens to the food we eat. It's common for students to think about food being taken into the body and then excreted as wastes. But they don't think of food being used to build an organism's body parts—as pieces of matter that get turned into an organism's body parts and enable the organism to grow.

Weak Main Learning Goals	Reasons
1. An example of a food chain is when squirrels eat nuts, then hawks eat squirrels, then vultures and bacteria eat a dead hawk.	This isn't a big enough concept to be the focus of a 40-minute lesson. It focuses on specific examples, not on big ideas. And the examples are about "what eats what" in a food chain rather than on ideas about matter and/or energy in food chains.
2. The roles of producers, consumers, and decomposers in food webs	This isn't a complete-sentence idea. Also, it doesn't specify anything about the role of producers, consumers, and decomposers.
3. What did you have for dinner last night, and where did it come from?	This is a good elicit question, but it isn't a learning goal.
4. Energy relationships in food webs	This isn't a complete sentence, nor is it a complete idea that students can understand by the end of the lesson.
5. Cows are consumers, grass is a producer, and bacteria are decomposers.	This is a complete sentence, but it isn't a big enough concept to be the focus of one or more lessons. It's more of a supporting detail.
6. Arrows show what eats what in a food web.	This is a complete sentence, but it isn't a statement of a science idea. It is simply describing a component in a food-web drawing. And it focuses on the idea of "what eats what," which isn't a big idea about food webs. Big ideas about food webs focus on how matter and energy reach all organisms in a food web, and how organisms use them.
8. Describing the food web in a classroom aquarium	This isn't a complete sentence. It also describes what students will do, not what they will learn.
10. Living things need food.	This could be a good learning goal for younger students, but 5th graders typically know that living things need food. So this learning goal would not be challenging for them.

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13. Building and observing the recycling of matter in a compost bin	This isn't a complete sentence. It's also about what students will do, with only a vague topic-level mention of what they will learn.
14. Inside cells, energy stored in food is changed into energy (ATP) that can be used to do the work of the cell.	Talking about ATP is going beyond what is appropriate for 5th graders. However, the idea that cells can change energy stored in food into energy that an organism can use is an important concept that is often misunderstood. A simplified version of this learning goal would be valuable to address.
15. Food webs are organized into trophic levels.	This is a complete-science idea, but it doesn't suggest anything about why it's important for students to understand. Without more elaboration, it's difficult to assess whether this is an appropriate learning goal for 5th graders. (It's probably too technical and detailed for them.)
16. There are differences between energy pyramids, food chains, and food webs.	This is a complete-science idea, but it doesn't suggest anything about why this is important for students to understand. The differences among these three representations are likely too complex and too subtle to address in one lesson for 5th graders.
18. Are minerals in the soil food for plants?	This isn't a complete-sentence idea. It is, however, an interesting elicit question to ask in a lesson where the learning goal is "Plants make their own food out of carbon dioxide, water, and energy from sunlight."
20. Students should be able to draw a picture showing how matter moves from organism to organism in a food web.	This is what students will do, not what they will learn and understand.