

Category II Summaries for Life Science Examples

Assisting teacher in identifying own students' ideas

Material A

Consider the benchmark 5E6-8#1:

Food provides the molecules that serve as fuel and building material for all organisms. Plants use the energy from light to make sugars from carbon dioxide and water. This food can be used immediately or stored for later use. Organisms that eat plants break down the plant structures to produce the materials and energy they need to survive. Then they are consumed by other organisms (American Association for the Advancement of Science, 1993)

The first page of a middle school unit that targets this benchmark includes three questions that are intended to help teachers to find out what their students think (p. [4st](#)).

Only two of the questions/tasks included are relevant for this benchmark: the question "What is food for plants?" and the activity they are asked to complete. The number and variety of questions are not sufficient to elicit students' ideas that relate to this benchmark, nor do the questions require students to make predictions or provide explanations based on their own ideas. Nevertheless, the questions require students to do more than merely define technical terms and are likely to be comprehensible to most students, even those who have not yet studied the topic. The material does not encourage teachers to use probing questions to clarify what students mean or to get more information about students' thinking.

Connecting to Other Chapters

Chapter 1
investigates the importance of photosynthesis and the plant structures that make it possible.

Chapter 2
focuses on water transport, with an emphasis on transpiration, diffusion, osmosis, and cohesion.

Chapter 3
explores how cells turn food into energy through the process of respiration.

Prior Knowledge and Misconceptions

Your students' responses to the ScienceLog questions on this page will reveal the kind of information—and misinformation—they bring to this chapter. Use what you find out about your students' knowledge to choose which chapter concepts and activities to emphasize in your teaching. After students complete the material in this chapter, they will be asked to revise their answers based on what they have learned. Sample revised answers can be found on page 27.

In addition to having your students answer the questions on this page, you may wish to have them complete the following activity: Ask students to make a labeled drawing that represents the process by which plants make food. Ask students to include water, sun, oxygen, carbon dioxide, and any plant structures that they think might be important, so that their drawings are as detailed as possible. Assure the students that there

CHAPTER
1

Energy for Life

1 Where do plants get their food?

2 Describe a typical plant.

3 What's inside a leaf?

4

ScienceLog

Think about these questions for a moment, and answer them in your ScienceLog. When you've finished this chapter, you'll have the opportunity to revise your answers based on what you've learned.

are no right or wrong answers to this question. Collect the papers, but do not grade them. Instead, use the students' drawings to identify possible problem areas in the chapter. Read the papers to find out what students know about life processes, what misconceptions students may have, and what aspects of this topic are interesting to them.