

CBL BIOLOGY: LIFE SCIENCE OPTION
BSCS Green Version 10th edition
Biology An Ecological Approach
Lesson Plan for Week 3, Day 1



Outcomes for Today

Standards Focus: 2d

PREPARE

1. Background knowledge necessary for today's reading.

This is another lesson devoted to the study of mostly microscopic creatures. They are mostly one-celled. Like other primitive organisms, they arrived on earth many millions of years ago. If you can find some good pictures of creatures such as amoebas, it would be a good visual to begin this lesson with. **Transparency 24** is a good illustration of an amoeba and could be used to build interest.

2. Vocabulary Word Wall.

Introduce five important, useful words from today's reading.

red tide

symbiotic

pseudopods

cilia

plasmodium

- Show, say, explain, expand, explode or buzz about the word briefly.
- Show, say and define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

Start at the beginning and review the concepts and vocabulary covered so far.

- Mention the setting and main ideas.
- Point to the concept chart as you quickly review it.

The eukaryotes include very primitive organisms consisting of protists and fungi. They are mostly unicellular (single-celled).

Some of these primitive organisms can produce their own food with the aid of light.

Most of these organisms need a damp or aquatic environment to live in.

Some organisms in this group, such as the brown and red algae groups, are multicellular.

4. Read directions for investigation/activity.

5. Read text. Ch12, Eukaryotes: Protists and Fungi, Text Sections 12.5-12.9, pp. 329-334

- Shared Reading RRP: Read, React, Predict every 2-3 pages
 Tape Partner Choral Silent Round Robin Reading

Setting	Characters	Pages
damp soil, freshwater habitats, and the ocean the sea	flagellates	329
damp terrestrial environments	radiolarians	330
	slime molds	332

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events to the billboard.

- Discuss the text; clarify the most important facts, concepts, ideas and vocabulary.
- Decide on the 3-5 most important **concepts** and post these on the billboard.

Students might mention:

Flagellates are a type of protozoan.

Euglenoids can make their own food as they contain chloroplasts.

Dinoflagellates produce the red tide which can be very toxic.

An amoeba is a "blob-like" organism.

The amoeba moves by extending part of its mass forward and then filling into it.

Ciliates are small organisms with tiny hairs that help them move about.

A slime mold would be a good character for a cheap horror movie.

7. Post information on the billboard. Add new information to ongoing class projects on the wall.

- New concept information can be added to the billboard.
- An answer can be added to a question from the KWL Chart.
- New information can be added to ongoing charts and investigations.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity: Protozoan Culture (See **Supplemental Investigation 12.1** attached to this lesson.)

Additional activities:

These two links are good for information and illustrations of protozoan life:

Protist Park

http://www.funsci.com/fun3_en/protists/entrance.htm

Pond Life

<http://micro.magnet.fsu.edu/moviegallery/pondscum.html>

Other possible activities for a class group or individual

Bookmark Open Mind Portrait g6 Graphic Organizer

g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop

Poster Ad Map Retelling Reader's Theatre Cartoon Rap

Key Questions

What are flagella used for?

What is a parasite? Give several parasite examples from the eukaryote group studied in this lesson.

How does an amoeba move?

How does a paramecium move?

Who would win a race under normal conditions: a paramecium or an amoeba?

Create an illustration of a slime mold life cycle.

Remember to ask literal structural idea craft author literature life evaluate and inference questions every day.

Key Paragraph

The most specialized and complex of the protozoan protists are ciliates (phylum Ciliophora). Most are unicellular, free-living organisms found in marine or freshwater habitats. They have definite, semi-rigid shapes. Active swimmers such as paramecium have distinct anterior (front) and posterior (back) ends. All ciliates move by means of cilia, short whip like extensions that beat in rhythm, driving the organism through the water.

EXTEND

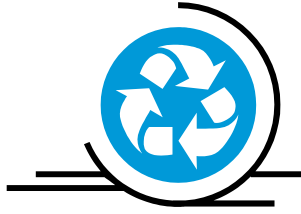
11. Prompt every student to write a short product tied to today's reading.

The Sex Life of a *Paramecium* or What You Always Wanted to Know About Conjugation

Review the conjugation process (page 332 in the text) with students. Now ask them to write their own paragraph on the subject as if they were writing for a supermarket tabloid. Have them think up a racy title and take it from there. For example, there is a famous (among microbiologists) Gary Larson cartoon in which the "woman" paramecium is looking disapprovingly at the male paramecium and he's saying, "You knew I was a lowlife ..."

12. Close with a short summary.

Extend the reading to the students' lives or to the world.



Supplemental Student Investigation 12.1 Protozoan Culture

IMPORTANT: You will need to grow the culture at least a week before this lesson!

OVERVIEW: The students will be able to describe one-celled protozoans (i.e. amoeba, paramecium, euglena, etc.)

PURPOSE: By gaining an understanding of protozoans, students will have the knowledge to deal with one-celled organisms, their advantages and disadvantages.

OBJECTIVE(s): STUDENTS WILL BE ABLE TO:

1. Tell what a protozoan is.
2. Draw and label a protozoan.
3. Explain how different protozoans can affect them.
4. Understand protozoans' relationships to their environment.

RESOURCES/MATERIALS:

You will need to start a pond water culture. **The pond water culture should be started 7 to 10 days before its use.** Alfalfa or dry grass in a jar of pond water should be kept in a warm place with subdued light for protists to grow in numbers. The protists are more likely to be found at the bottom of the culture. To get them out of the jar use a pipette or straw. If you use a straw, place one finger over the end of the straw and lower the other end into the culture to the level you want to sample. Lift your finger just long enough to obtain the sample and then lift from the jar. You can purchase pure cultures from a science supply house, but the students seem to have more fun obtaining and growing their own cultures.

MATERIALS:

1. microscope (and knowledge of its use)
2. pond water culture
3. straw or pipette
4. microscope slide and cover slips
5. paper and pencil for notes.

BACKGROUND INFORMATION:

Protists are one-celled organisms. Protists can be classified into four groups by the way they move: Sarcodines who move by pseudopodia (false feet); ciliates who move by cilia; flagellates who move by flagella; and sporozoans who have no method of movement and thus (mostly) live as parasites.

ACTIVITIES AND PROCEDURES: (Make sure students have had experience labeling parts of protozoans before starting this activity.) Have students put a drop of pond water on a microscope slide. Cover the drop with a cover slip. Put the slide on the microscope stage. Focus the microscope, using the techniques discussed in a previous lesson. Have students draw on a piece of paper what microorganisms they are able to see. Have students identify the microorganisms they are drawing. Have students use reference sources to identify and label the microorganisms being viewed. After the lab, discuss the advantages and disadvantages of protozoans (i.e., protozoan diseases, etc.) This will probably be done in another class period. Also discuss how protozoans affect their environment.

CBL BIOLOGY: LIFE SCIENCE OPTION
BSCS Green Version 10th edition
Biology An Ecological Approach
Lesson Plan for Week 3, Day 2



Outcomes for Today

Standards Focus: 2d

PREPARE

1. Background knowledge necessary for today's reading.

It is probably a safe bet that most adolescent (especially true of the so-called “at risk” group) prior knowledge of fungi comes from information in “their world” on hallucinogenic mushrooms or so-called “shrooms.” In an introductory discussion, you will probably find this out. There is much more to the world of fungi, but this initial interest on their part may be quite narrow.

2. Vocabulary Word Wall.

Introduce five important, useful words from today's reading.

hyphae chitin zygosporangium mycelium basidia

- Show, say, explain, expand, explode or buzz about the word briefly.
- Show, say and define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

Start at the beginning and review the concepts and vocabulary covered so far.

- Mention the setting and main ideas.
- Point to the concept chart as you quickly review it.

The protists are a very diverse kingdom. They include a variety of rather simple organisms with often complex life cycles.

Included in this group are the various algae groups (most of which are autotrophic or food producing), the protozoans (which are heterotrophic or food seeking and often motile), and the slime molds.

The fungi make up the other large group of protists.

4. Read directions for investigation/activity.

5. Read text. Ch 12, Eukaryotes: Protists and Fungi, Sections 12.10-12.14, pp. 334-38 and Investigation 12.1, pp.343-44

- Shared Reading RRP: Read, React, Predict every 2-3 pages
 Tape Partner Choral Silent Round Robin Reading

Setting	Characters	Pages
bread left out in the open	bread mold	335
worldwide in temperate (often moist) environments	sac fungi	336
woodlands to supermarket shelves	cap fungi	337

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events to the billboard.

- Discuss the text; clarify the most important facts, concepts, ideas and vocabulary.
- Decide on the 3-5 most important **concepts** and post these on the billboard.

Students might mention:

Fungi cannot make their own food so they are heterotrophic.

Fungi include mushrooms, molds, mildews, rusts and smuts.

Fungi are very important decomposers and fungi and bacteria are the largest group of decomposers on earth.

Fungi reproduce both sexually and asexually (by spores and a process called conjugation).

Yeast is a type of fungus.

Some fungi are edible and some are poisonous.

7. Post information on the billboard. Add new information to ongoing class projects on the wall.

- New concept information can be added to the billboard.
- An answer can be added to a question from the KWL Chart.
- New information can be added to ongoing charts and investigations.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

Two possible activities:

To Mold or Not to Mold (See **Supplemental Student Investigation 12.2** attached to this lesson.)

Investigation 12.1

Variety among Protists and Cyanobacteria

If you have access to the necessary materials, this is an excellent investigation. Please review the details on page 344 of your text first.

Other possible activities for a class group or individual

Bookmark Open Mind Portrait g6 Graphic Organizer

g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop

Poster Ad Map Retelling Reader's Theatre Cartoon Rap

Key Questions

Make an illustration of a "generic fungus" showing **hyphae** and **mycelium**.

What group of fungi are probably most well known for being edible?

What is the death cap? How did it get this name?

How do scientists classify the various fungus groups?

Name some diseases caused by fungus.

What are some of the beneficial uses of fungi to humans?

Remember to ask literal structural idea craft author literature life
evaluate and inference questions every day.

Key Paragraph

Fungi are heterotrophic eukaryotes. Most forms are nonmotile. They include mushrooms, molds, mildews, rusts, smuts, and many other less familiar organisms. Many fungi cause diseases, especially plant diseases, but many more form essential symbiotic relationships with plants. Others are used for baking breads, making alcoholic beverages, and producing drugs. Fungi reproduce by means of spores that germinate and grow slender tubes called hyphae. A tangled mass of hyphae is called a mycelium. A mycelium will grow on virtually anything on which the fungus can obtain food.

EXTEND

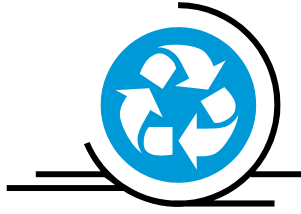
11. Prompt every student to write a short product tied to today's reading.

There is a Fungus Among Us

Almost everyone has heard this statement. Ask students to begin with this statement and follow up with a little story about fungus. Remember such human conditions as Athlete's Foot and various yeast infections are all due to fungus.

12. Close with a short summary.

Extend the reading to the students' lives or to the world.



Supplemental Student Investigation 12.2 To Mold or Not to Mold

Objective: To discover what conditions make bread mold grow the fastest

Materials: :

bread, tortillas, OR leftover rice – do not use all three
water
three plastic bags

Introduction

Review the life cycle of bread mold (*Rizopus stolonifer*) on page 335 of the text.
Draw a picture of bread mold. Answer the following question: How is mold different from and the same as plants and animals?

Hypothesis

Which conditions do you think will work best for the mold to grow: warm or cold, moist or dry?

Procedure

1. Put some of the bread, tortillas, or leftover rice in all three bags.
2. Label the bags by putting a piece of paper in each bag with letter A, B, or C.
3. Bag A: Add a little water to the bread and put the bag in a dark place.
4. Bag B: Put the bag in the refrigerator.
5. Bag C: Do not add anything to the bag, but keep it out of the light.
6. Make sure each bag is sealed tightly.
7. Check each bag daily and record any changes in the way the food looks.
8. Enrichment: What could you do to test to see if mold grows better in light or dark? Write a procedure and do what you come up with as part of this project.

Data Collection

Make a data table to record your observations for each day. Be sure to include your drawings from your research.

Conclusions

This is not optional. You must explain what you learned by doing this activity. Remember that you must answer the question you asked in your original problem statement.

Possible Conclusion

Mold should grow better where it is warm and moist. Students should discuss the observations that support the conclusion.

CBL BIOLOGY: LIFE SCIENCE OPTION
BSCS Green Version 10th edition
Biology An Ecological Approach
Lesson Plan for Week 3, Day 3



Outcomes for Today

Standards Focus: 2d

PREPARE

1. Background knowledge necessary for today's reading.

This little jingle is a good way to look at the larger picture:

We recycle matter from animals and plants,
 adding nutrients back to the Earth.
 We are the fungi and microorganisms.
 We are the fungi and some insects too!

DECOMPOSERS in the food chain.

So hard to see with human eyes.
 First to the scene when something dies.
 We are the fungi and microorganisms.
 We are the fungi and some insects too!

From Kenny Hood's *Decomposer Song*

2. Vocabulary Word Wall.

Introduce five important, useful words from today's reading.

decomposer mycorrhizae symbiotic lichen dormant

- Show, say, explain, expand, explode or buzz about the word briefly.
- Show, say and define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

Start at the beginning and review the concepts and vocabulary covered so far.

- Mention the setting and main ideas.
- Point to the concept chart as you quickly review it.

There are two kingdoms of the eukaryotes. They are the protists and the fungi. Algae are protists that make their own food as they contain chloroplasts.

Algae colors range from green to yellow to brown to red. This is due to the dominant pigment present in these groups of organisms.

Other protists that must find their food (heterotrophic) include the protozoans and slime molds. Some of these can move with the aid of such structures as cilia and flagella.

Many of these organisms cause diseases of plants and animals but life as we know it would not be possible without them.

4. Read directions for investigation/activity.

5. Read text. Ch12, Eukaryotes: Protists and Fungi, Sections 12.15-12.17, pp. 339-43 and Investigation 12.2 pp. 344-48

- Shared Reading RRP: Read, React, Predict every 2-3 pages
 Tape Partner Choral Silent Round Robin Reading

Setting	Characters	Pages
various soil habitats	fungi and mycorrhizal fungi	339-340
bare rocks	lichen	340
the Arctic	reindeer moss	341

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events to the billboard.

- Discuss the text; clarify the most important facts, concepts, ideas and vocabulary.
- Decide on the 3-5 most important **concepts** and post these on the billboard.

Students might mention:

Decomposers are everywhere and help return basic nutrients to the soil.

Some fungi act like predators in that they can capture some small organisms.

Mycorrhizae is an association of fungus and plant roots which are united in a process in which both the plants and fungus gain from the connection.

Lichens can grow just about anywhere on land and can go dormant until they receive moisture again.

Reindeer moss is a type of lichen growing in the Arctic.

7. Post information on the billboard. Add new information to ongoing class projects on the wall.

- New concept information can be added to the billboard.
- An answer can be added to a question from the KWL Chart.
- New information can be added to ongoing charts and investigations.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity:

Lichen Land (See Supplemental Investigation 12.3 attached to this lesson.)

Life in a Single Cell

If you have the necessary lab materials, refer to Investigation 12.2 in the text beginning on page 344.

Additional Note:

Transparency 27 in the Transparency Book is a good review overhead.

Other possible activities for a class group or individual

Bookmark Open Mind Portrait g6 Graphic Organizer

g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop

Poster Ad Map Retelling Reader's Theatre Cartoon Rap

Key Questions

What is a decomposer? List several examples.

Give examples of several steps in a decomposer food chain.

How can some fungi be predatory?

What is a symbiotic relationship?

How is it that lichens can survive almost anywhere on land?

What is meant by the statement, "The materials are passed along the food chain?" Give an example of this.

Remember to ask literal structural idea craft author literature life evaluate and inference questions every day.

Key Paragraph

A soil system is like a city in that its food supply comes from the outside. Most soil organisms are consumers and live below the surface of the soil. In soil, food made during photosynthesis comes down into plant roots from the leaves and stems. Plant roots serve as food for some consumers, but for most of them, the food supply comes from the remains of other organisms. Therefore, decomposers such as fungi and bacteria are very important in soil communities.

EXTEND

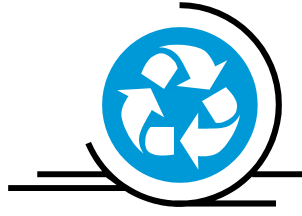
11. Prompt every student to write a short product tied to today's reading.

The Fungi Rap

Review the key paragraph with students. Perhaps an illustration would help. Instruct students to write a little rap on this concept. You might review the words of the song in the background information section of this lesson to help here.

12. Close with a short summary.

Extend the reading to the students' lives or to the world.



Supplemental Student Investigation 12.3 Lichen Land

Objective:

Students will understand the three basic types of lichens.
Students will learn to construct a simple Riker mount.

Materials:

- Cardboard squares approximately eight inches by eight inches
- Clear food wrap (1 roll)
- Cotton backing
- Cellophane tape

Introduction

Review the three basic types of lichens with students. They are fruticose, foliose, and crustose.

This is a good resource: <http://mgd.nacse.org/hyperSQL/lichenland/>

Activity Level I

If you have access to a local woodlot or natural area, you can probably take a walk with your students to collect specimens. If not possible, use this opportunity to do the collecting yourself. Lichens are everywhere there are natural habitats and can be obtained almost any time of year. Bring the lichens back to the classroom and arrange them in a mixed format. Have students obtain a specimen from each of the three groups.

Activity Level II

Demonstrate how to construct a Riker mount. In outline format:

Simply wrap the cardboard with a layer of cotton.

Place the specimens on the cotton using white glue.

Label the specimens.

Wrap the project with the clear food wrap and secure on the backside with cellophane tape.

Here are examples of commercial Riker mounts as an illustration:



Student projects may be put on display.

Note: This is a good way to display a variety of biological specimens such as leaves, stems, bark, and all manner of life forms.

CBL BIOLOGY: LIFE SCIENCE OPTION
BSCS Green Version 10th edition
Biology An Ecological Approach
Lesson Plan for Week 3, Day 4



Outcomes for Today

Standards Focus: 2d

PREPARE

1. Background knowledge necessary for today's reading.

Note: This is a new chapter (13).

When we say plants, it is the flowering land plants most people visualize as these are the ones they are most familiar with. As a warm-up activity, ask students to write down the names of at least 20 different plants. List these on the board. Look for patterns in their responses, and after the introduction to vascular plants (further in this lesson), take note of how many other types of plants students listed. Use this opportunity to briefly review the more primitive plants studied to date.

2. Vocabulary Word Wall.

Introduce five important, useful words from today's reading.

multicellular vascular spores bryophyte stomates

- Show, say, explain, expand, explode or buzz about the word briefly.
- Show, say and define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

Start at the beginning and review the concepts and vocabulary covered so far.

- Mention the setting and main ideas.
- Point to the concept chart as you quickly review it.

The land surfaces of earth had no plants for much (most) of the earth's history.
 The first plants were simple and lived in the waters and seas of earth.

4. Read directions for investigation/activity.

5. Read text. Ch13. Eukaryotes: Plants Text Introduction, Sections 13.1-13.2, pp. 352-56

- Shared Reading RRP: Read, React, Predict every 2-3 pages
 Tape Partner Choral Silent Round Robin Reading

Setting	Characters	Pages
the ancient seas of earth	one-celled algae	353
California	Redwoods, the largest living organism	353
plant leaves	stomates	355

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events to the billboard.

- Discuss the text; clarify the most important facts, concepts, ideas and vocabulary.
- Decide on the 3-5 most important **concepts** and post these on the billboard.

Students might mention:

Redwood trees are the tallest and the largest living things on earth.

In order to live on land, plants must be more complex than simple algae.

Vascular tissue is like the plumbing of a plant as it is used to transport fluids throughout the plant.

Mosses cannot grow in dry or arid areas.

Water is vital for the survival of plants. When water is not available, there are no plants growing.

More advanced plants also exchange gases (carbon dioxide and oxygen).

More advanced plants have special structures which allows them to survive in many areas. Roots are an example of a specialized plant structure.

7. Post information on the billboard. Add new information to ongoing class projects on the wall.

- New concept information can be added to the billboard.
- An answer can be added to a question from the KWL Chart.
- New information can be added to ongoing charts and investigations.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity:

Do Plants Lose Water?

We have learned from the text that plants lose water through their leaves. However, how do we know if this is really true? Brainstorm this question with students.

The purpose of this little activity is for students to write a hypothesis and then test it.

MATERIALS:

- One growing plant (you may use a plant in the garden if available)
- Two clear plastic bags (like a sandwich bag or vegetable bag from the grocery store)
- Tape

PROCEDURE:

1. Place one sandwich bag over one leaf of the plant.
2. Secure the bag on the stem with the tape.
3. Place the plant in the sunlight for two or three hours. (If you are using a plant from the garden, be sure to choose one that will be in the sunlight for at least three hours.)

Control (explain what a control is to students).

4. Fill the second bag with air without blowing into the bag.
5. Secure the bag the same way you did the first bag but do not put it over a leaf.
6. Place the second bag near the leaf you placed the first bag on you to test your hypothesis.

DATA: Have students make a data table to record their observations.

Discussion

Ask students to write a short paragraph outlining their findings and whether their hypothesis has been supported or not.

Other possible activities for a class group or individual

- Bookmark Open Mind Portrait g6 Graphic Organizer
- g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop
- Poster Ad Map Retelling Reader's Theatre Cartoon Rap

Key Questions

List some adaptations that have allowed plants to survive and thrive on land.

List at least three reasons why it was an advantage for plants to evolve and thrive on land.

What is a vascular plant?

What is the primary factor that can impact the survival of plants on land?
 How can plants keep from drying out on land?
 What are the functions (at least three) of plant roots?

Remember to ask literal structural idea craft author literature life
evaluate and inference questions every day.

Key Paragraph

The success of plants on land depends largely on their ability to absorb and hold water. Structures that enable them to do so include roots, vascular tissue, and an outer covering that retards water loss.

EXTEND

11. Prompt every student to write a short product tied to today's reading.

Follow up to *Do Plants Lose Water?* Activity

Ask students to write a short paragraph from the plant's perspective about this experiment. The prompt could be something like: "Here I am enjoying the morning sun, when along comes some kid and covers me with a clear bag."

12. Close with a short summary.

Extend the reading to the students' lives or to the world.

CBL BIOLOGY: LIFE SCIENCE OPTION
BSCS Green Version 10th edition
Biology An Ecological Approach
Lesson Plan for Week 3, Day 5



Outcomes for Today

Standards Focus: 2d

PREPARE

1. Background knowledge necessary for today's reading.

This is an important lesson because it addresses the basics of flowering plant reproduction. We begin the lesson with some information on the moss group which is not something most students have much prior knowledge of. A good "prior knowledge" activity might be to have them just do a little quick write on their understanding of how plants reproduce. Quick writes are a good technique for the following reasons:

- They get that pencil/pen moving.
- They provide you with an opportunity to do a quick assessment of knowledge.
- They provide an opportunity to establish procedure and routine.

2. Vocabulary Word Wall.

Introduce five important, useful words from today's reading.

sporophyte gametophyte embryo pollination seed

- Show, say, explain, expand, explode or buzz about the word briefly.
- Show, say and define the word quickly and add to the word wall.

READ

3. Review the vocabulary and concepts previously covered in this chapter.

Start at the beginning and review the concepts and vocabulary covered so far.

- Mention the setting and main ideas.
- Point to the concept chart as you quickly review it.

The ancestors to land plants were probably algae growing in lakes and seas. These algae were probably multicellular and so were better adapted towards specialization.

A plant with many cells is better able to survive on land because it has specialized cells that are used to transport and store water which is necessary for plant survival. A land plant also needs structures to hold it in the ground (roots), keep water in the leaves (cuticle), and transport water (vascular tissue).

4. Read directions for investigation/activity.

5. Read text. Ch1e, Eukaryotes: Plants Week 3 Day 5: Text Sections. 13.3-13.4, pp. 356-61

- Shared Reading RRP: Read, React, Predict every 2-3 pages
 Tape Partner Choral Silent Round Robin Reading

Setting	Characters	Pages
wet and moist areas on land	bryophytes aka mosses	356-357
individual moss plants	gametophytes and sporophytes	358

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events to the billboard.

- Discuss the text; clarify the most important facts, concepts, ideas and vocabulary.
- Decide on the 3-5 most important **concepts** and post these on the billboard.

Students might mention:

Plants have sperm. I never knew that. That's crazy!

Moss plants can reproduce in two ways.

Moss needs water to reproduce sexually.

Flowering plants are more advanced and do not need water for reproduction.

The flower is the important reproductive part of the plant.

Pollen is distributed by wind and animals such as birds.

A seed contains a tiny embryo of the plant.

Seeds are a dormant phase of plant growth.

7. Post information on the billboard. Add new information to ongoing class projects on the wall.

- New concept information can be added to the billboard.
- An answer can be added to a question from the KWL Chart.
- New information can be added to ongoing charts and investigations.

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity:

Student-Constructed Flower Model

In this activity, students will construct a flower model using play dough.

Procedure

Please refer to **Supplemental Investigation 13.1** attached to this lesson.

Other possible activities for a class group or individual

- Bookmark Open Mind Portrait g6 Graphic Organizer
 g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop
 Poster Ad Map Retelling Reader's Theatre Cartoon Rap

Key Questions

Why do mosses need wet or moist conditions to survive?

What is meant by alternation of generations?

Create an illustration of the life cycle of a typical bryophyte (moss).

Create an illustration of a flower of a flowering plant and indicate the following structures: petals, sepals, stamen, stigma, ovules

What is a seed and what does it contain?

Remember to ask literal structural idea craft author literature life
 evaluate and inference questions every day.

Key Paragraph

Flowering plants are considered to be the most complex of the vascular plants. Their reproductive structures are found in flowers. A flower is actually a short branch bearing groups of specialized leaves. Some of these leaves may resemble ordinary leaves in some ways, but others are so different in structure that it is hard to think of them as leaves at all. If you closely examine a flower such as a buttercup, you will see a number of green, leaflike structures called sepals on the underside of a flower. Before the bud opens, the sepals cover and protect the other parts of the flower. The most conspicuous parts of the flower are the colorful petals. Although the petals are leaflike in shape, they are not usually green.

EXTEND

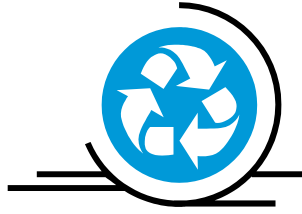
11. Prompt every student to write a short product tied to today's reading.

What's in a flower?

Ask students to think a minute as to why flowers are used as a symbol of love. Now ask them to write a short paragraph indicating a biological reason for this.

12. Close with a short summary.

Extend the reading to the students' lives or to the world.



Supplemental Student Investigation 13.1 Student-Constructed Flower Model

INTRODUCTION:

Although many students have seen flowers, handled, and smelled them, this exercise will aid them in a deeper understanding of the various parts and functions of a flower. As they study pictures of flowers in the text (pages 358-60) they can begin to understand the process of translating a two-dimensional illustration into a three-dimensional model.

Review the information on pollination as you may want to have them design a special flower with a special pollinator. Review the cycle of the Yucca Moth on page 252 of the text.

BACKGROUND:

If students constructed a cell model earlier in this course, this will be an easy follow up. If they have not done this, please revisit Week 1, Day 4's lesson plan to review that process.

PURPOSE:

The purpose of this activity is to provide students with a hands-on activity which will enhance their understanding of the 3-D characteristics of flowers while reinforcing their knowledge of flowering plant reproduction.

OBJECTIVES:

Students will be able to construct the various parts of a flower using play-dough and other materials outlined below:

1. Compare and contrast the flower parts.
2. Demonstrate and understand the three-dimensional aspect of flower structure.
3. Identify the various stages of flowering plant reproduction.

RESOURCES/MATERIALS: Play-dough, food coloring or tempera paints (red, purple, green, blue), one pair disposable gloves, yarn or undercooked spaghetti, pepper, plastic-bubble packing, aluminum foil, plastic wrap, pencil shavings, scissors, one large knife (watch this one), glue

* **Play-dough recipe:** This makes about 850g (30oz) - enough for 3 groups.

- 1 C. baking soda
- 1 C. flour
- 1 C. corn starch
- 4 t. cream of tartar
- 2 T. oil
- 1-3/4 C. water

- **Stove top method:**

Mix and cook until the dough leaves the side of pan. Cool on plate with wet cloth on top.

Oven method: Bake @ 150 F. overnight.

** To color play-dough use food coloring or tempera paints. (Using rubber or disposable gloves is a good idea.)

ACTIVITIES AND PROCEDURES:

1. After studying flower cell structure, divide the class into small groups.
2. Gather all materials and have them laid out according to the number of student groups. (See materials list above.)
3. Distribute materials and illustrations of the various parts of flowers and the stages of flowering plant reproduction to each group.
4. Inform groups they will be designing “their” flower.

PUTTING IT ALL TOGETHER:

The students will (hopefully) be excited to see their different flower creations. This can lead to an excellent opportunity for students to share ideas, reasons, and information with the groups and the class. This is also an ideal opportunity to compare the similarities and differences of the flowers. These should be put on display. Several could be saved for future years. The play-dough will harden. This activity works equally well as a structured, teacher-directed activity or a creative small-group or individual endeavor. The students' own experience and knowledge are the only determinants.