

CBL BIOLOGY: LIFE SCIENCE OPTION
BSCS Green Version 10th edition
Biology An Ecological Approach
 Lesson Plan Quarter 1, Week 8, Day 1



Outcomes for Today

Standards Focus: 6abef

PREPARE

1. Background knowledge necessary for today's reading.

Use a map to show students the locations of tropical rainforests (Brazil, Costa Rica, etc.).

Talk about the process of humans domesticating animals and plants for their use. Use common examples of cows, dogs, cats, corn, etc.

Review the idea of diversity. Connect with their prior understanding. For example, talk about diverse music, diverse populations and cultures, and diversity in other things such as automobiles.

2. Vocabulary Word Wall.

Introduce 5 important, useful words from today's reading.

susceptible
domesticated

genetic characteristic
botanist

genetic material

- 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 concept chart as you quickly review it

Review the concept of monoculture as it pertains to large farms.

An introductory understanding of genetics is appropriate here (traits, genes, heredity, etc.).

Review extinction. (Gone forever is a long time!)

4. Read directions for investigation/activity.

5. Read text. Ch 3 *Communities and Ecosystems* Section 3.9 pp. 73-75

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

setting	Characters	pages
Madagascar Madagascar Bear Cr. Nature Center	Madagascar periwinkle Botanist Dave Marshall	75 74

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:

Does it really matter if a few things go extinct?

Every living thing has its own unique genetic code.

Simplified human-made ecosystems are unstable. When all the living things are the same, diseases and pests can wipe out the entire population.

Many medicines beneficial to humans come from plants.

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.

Don't forget to check the growth of the bean seedlings which you began with Investigation 3.3 earlier in this chapter study. Record your results. This activity will culminate on the last day (approx. 2 weeks total) of this chapter.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity:

What is interpretation?

This would be a good time to **invite a guest speaker** who has a job as a naturalist or interpreter. Working in the natural environment has many benefits. Research local nature centers, public agencies, and even colleges of natural science for human resource possibilities.

Another source for guest speakers in this area is **UCSC Predatory Bird Research Group**. They do school visits and talk about endangered species:

http://www2.ucsc.edu/scpbrg/education_program.htm

Here is a good website on biodiversity:

<http://investigate.conservation.org/xp/IB/basics/>

There are many activities accessible through this site including an endangered species virtual field trip.

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

So why does it really matter if an organism becomes extinct?

What is genetic material? Why is it important to preserve genetic material?

What is a simplified ecosystem? Give an example.

Why might a person with cancer care about the rainforest?

Why is it important to maintain and preserve biodiversity?

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

Key Paragraph

The fewer the species in a community, the easier it is for homeostasis to be disrupted.

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

In the natural world, we know that a diverse community tends to be more stable and balanced. Do you think a human community can be stable if the members are of diverse races? Or would it be better if the population of a human community was all of one race or group? Think about this and answer this question in a paragraph explaining your reasoning.

12. Close with a short summary.

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

CBL BIOLOGY: LIFE SCIENCE OPTION

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Biology An Ecological Approach

Lesson Plan Quarter 1, Week 8, Day 2



Outcomes for Today

Standards Focus: 6abef

PREPARE

1. Background knowledge necessary for today's reading.

Many humans really are working hard to save our environment. We generally never hear about it.

Good intentions are noble but scientific knowledge and understanding is also very important when it comes to solving the issues that confront human survival.

2. Vocabulary Word Wall.

Introduce 5 important, useful words from today's reading.

encompass **habitat** **relocate** **reintroduce** **climactic**
changes

- 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 concept chart as you quickly review it

Ecosystems are complex and not relatively easy to understand.

Human activity has greatly altered many habitats and ecosystems on earth.

Preserving biodiversity is crucial to preserving our earth as we now know it.

Animals at the top of the food pyramid are more susceptible to disruption and possible endangered status and extinction.

4. Read directions for investigation/activity.

5. Read text. Ch 3 *Communities and Ecosystems* Section 3.10 pp. 75-77

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

setting	Characters	pages
Africa	Elephant	76
California	Calif. Condor	
North America	Sandhill Cranes	
China	Giant Panda	

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:

Establishing wildlife sanctuaries is one way to preserve natural ecosystems.

Replanting forests is another way to repair and restore ecosystems.

Working with endangered animals in captivity is yet another way in which humans can help with endangered animals and restore their numbers. This includes breeding, relocating, and reintroducing plants and animals into their natural habitat.

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.

Don't forget to check the growth of the bean seedlings which you began with Investigation 3.3 earlier in this chapter study. Record your results. This activity will culminate on the last day (approx. 2 weeks total) of this chapter.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity:

Endangered Species Card Game:

<http://www.sandiegozoo.org/kids/games/dwes.html>

Here is a link about California endangered species:

http://www.dfg.ca.gov/hcpb/species/t_e_spp/tespp.shtml

After learning about some endangered animals, suppose you have the power to save one animal species. What species would it be and why did you pick this one? Sketch your animal and give it a name. (Remember Smokey the Bear.) Now make a poster for your animal including several reasons why it is worthy of saving.

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 wilderness area? Why are they important even if many people will never see them?

Non-destructive farming practices can help with preservation of wildlife. What is an example of a destructive farming practice?

List some other ways in which humans work to preserve wildlife.

Name at least four endangered species and several facts about each.

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

Key Paragraph

In some cases, human activity can lead to the extinction of another species. The loss of biodiversity may have negative consequences for humans in the future. Humans can use strategies such as preserving natural areas and reintroducing populations, to help slow the rate of species diversity loss.

EXTEND

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

Here is the situation: You are the master of the universe (or at least earth) and you have been granted the power to save one area for future generations to enjoy. What area that you know would you save (or return) to its natural state and why? Write a paragraph detailing your area and why you chose it.

12. Close with a short summary.

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

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Lesson Plan Quarter 1, Week 8, Day 3



Outcomes for Today

Standards Focus: 6abef

PREPARE

1. Background knowledge necessary for today's reading.

Mention that this is the final day of the two week experiment observing the bean seedlings for effects of acid rain (water).

Mention that many scientific studies can last many years.

2. Vocabulary Word Wall.

Introduce 5 important, useful words from today's reading.

sulfur

fossil fuel

nitrogen

acidic

hypothesis

- 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.

Review the data gathered on a daily basis. Be careful to bring new students up to date.

Review the various hypothesis statements written by students.

How are the seedlings doing today?

How did the students measure growth?

Note: Review the modified investigation attached to this lesson plan.

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

- mention the setting and main ideas
- point to concept chart as you quickly review it

4. Read directions for investigation/activity. 3.3

Directions are attached to this lesson plan.

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www.scu.edu/character

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5. Read these websites for information on acid rain.

<http://www.ec.gc.ca/acidrain/>

Here is a similar experiment. You may want to read through this for additional information and insights:

<http://web.stclair.k12.il.us/splashd/acradexp.htm>

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

setting	Characters	pages
Your classroom	The seedlings	

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:

The details about the growth (or lack of it) of their seedlings

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:

Culmination of Investigation (modified) 3.3

This is the last day of this two week activity. Now is the time to have students review the scientific method as it relates to this investigation. Remember to:

- Go back to the original hypothesis.
- Review the data from the various groups and solutions.
- Make general observations.
- Have students chart their data.
- Finally, have them make recommendations based on their findings and add to the KWL chart that was originally started.

Remember to review the modified investigation attached to this lesson plan. Have students complete their charts and post their work. Have them graph their seedling growth. Note: All students should use the same scale so graphs can be posted and compared.

Finishing Up

Understanding acid rain is not particularly easy. Now that the students have completed the experiment, processed the data, and recorded the results, it is time to show the process of acid rain formation in graphic format. Have the students show what they have learned by creating a poster showing the development of acid rain and its effect on the environment.

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

1. In what solution did the seeds do the best growth-wise?
2. In what solution did they do the worst?
3. Do you think acid rain has an impact on seed germination and growth? Why?

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

Key Paragraph

Acid rain is something of a misnomer because natural rainwater is acidic and has a pH of about 5.6. (pH is a measure of acidity; the lower the number the greater the acidity.) A pH of 7 is neutral. Acid rain, therefore, refers to rain which has a pH of lower than 5.6. Acid rain is produced when sulfur and nitrogen compounds released into the

atmosphere combine with water to form sulfuric and nitric acids. It is caused primarily by burning fossil fuels.

EXTEND

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

You know a little more about acid rain. Write a little poem or rap about a little pine tree on top of a mountain worrying about its next shower.

12. Close with a short summary.

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



Ch. 1 Student Investigation # 3.3 2 weeks

Acid Rain and Seed Germination Teacher Directions

Note: This activity is a simplified version of the one in the text. You may choose to extend this activity as outlined in the text. Please read the information on page 83 even if you are going to do the simplified version.

Objective: To begin to understand the impact of acid rain on seed germination (sprouting)

Materials: Observation Form (template attached), pair of working eyes, pencil, bean seeds, paper towels, plastic Petri dishes or clear plastic drinking cups, small ruler.

Introduction

Begin with this question to students. "Do you think acid rain can impact the ability of seeds to sprout? Form a hypothesis (scientific guess) and state your hypothesis." Have them write this on the form.

Teacher Note: Prepare several solutions of different concentrations acidic solutions by simply adding vinegar to bottled water accordingly:

Solution mix	Concentration	Label
Solution 1	Bottled water with no vinegar.	Pure water
Solution 2	30 Parts bottled water 1 part vinegar.	Slightly acidic
Solution 3	20 Parts bottled water 1 part vinegar	Moderately Acidic
Solution 4	10 Parts bottled water 1 part vinegar	Greatly Acidic

Label each solution.

Directions: Prepare the four solutions. Obtain bean seeds. You can use easily obtained Petri dishes (plastic) or you can substitute a suitable container. For example, you could place seeds in a plastic drinking glass (clear) and put paper towels in the center to hold the water and moisture. Divide the class into four groups (one with each solution). Note: it is best to have students work in teams of two-three. There can be several teams in each group. Have students prepare the experiment the first day. Thereafter, have them check the seed germination progress each day. Once the seeds sprout, have them measure the root length and make any other observations.

Activity and Schedule

This activity works best if carried out over a two week time. Spend time coaching the students in setting everything up the first day. Make sure the seeds are kept wet but not overly soaked. Observe the specimens each day to record progress. On the last day have them answer these questions:

4. In what solution did the seeds do the best growth-wise?
5. In what solution did they do the worst?
6. Do you think acid rain has an impact on seed germination and growth? Why?



CBL Seed Growth Observation Form

Name _____ Date _____

Solution _____

Directions: Complete observations and recordings as outlined by your teacher as well as the investigation directions.

Day	Length of Bean Shoot
-----	----------------------

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Comments/ Hypothesis:

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Lesson Plan Quarter 1, Week 8, Day 4



Outcomes for Today

Standards Focus: 6abef

PREPARE

1. Background knowledge necessary for today's reading.

This chapter is all about energy. Nothing happens in life without energy transfer. Try and bring students up to an understanding of this. Remember, energy cannot be created or destroyed.

Note: This can be a challenging chapter. Try to focus on the simple concepts. Read the chapter summary several times. Do not overwhelm them with details.

2. Vocabulary Word Wall.

Introduce 5 important, useful words from today's reading.

organic compound
electron

nucleus

proton

neutron

- 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 concept chart as you quickly review it

Matter has weight and takes up space. It cannot be created or destroyed. It just changes form.

Energy is the ability to do work.

Energy is needed to change matter from one form to another (like water to water vapor: liquid -> vapor)

4. Read directions for supplemental investigation/activity 4.1

Directions are attached to this lesson plan.

5. Read text. Section 4.1 pp. 86-88

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

setting	Characters	pages
Inside the atom	Electron, proton, neutron, orbit	88

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:

Chemical reactions take place in all living things.

Carbon, hydrogen, and oxygen are elements common in all living systems and organisms.

Each element is unique and different.

A molecule is a combination of two or more elements.

All of these particles are really small.

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:

Is Air Matter? (teacher demonstration activity)

This is a simple activity to determine if the air we breathe is matter.

Materials needed: Three rubberized playground balls, a good triple beam balance (or if you are lucky, an electronic scale)

Introduction

Ask students if they believe that air is matter or not. Review the definition of matter with students. Ask students to predict what will happen in each of the following situations:

- One deflated ball
- One regularly inflated ball
- One ball inflated to a high pressure

Have them form a hypothesis.

Procedure

Deflate the balls. Weigh all three of the deflated balls and record the weights. Next inflate two of the three balls. Inflate one just enough to give it a ball shape. Inflate the other to a high pressure. Weigh both of them and note the weights.

Discussion

Discuss the weight differences. Do the findings support their hypothesis? Is air matter?

Play the game, How Small Am I?

Go to this website:

http://www.pbs.org/newshour/extra/teachers/lessonplans/science/nano_files/game.html

If you have projection capabilities, this could be a class activity. Otherwise download and print out the sheets. This is a simple activity designed to help students understand the relative size of some items down to the atom.

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 at least five elements found in most living things.

Name some other familiar elements.

Draw a picture of an atom indicating protons, neutrons, electrons.

What are organic compounds?

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www.scu.edu/character

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

Key Paragraph

Biological molecules are organic compounds. Organic compounds are molecules built of carbon combined with other elements. Like all other compounds, organic compounds can be broken down to the elements carbon, oxygen, hydrogen, and nitrogen.

EXTEND

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

Almost everyone is familiar with the tune, **It's a small world (from *The Lion King* movie and of course, Disneyland.)**

Here is a link to the tune.

<http://wilstar.com/midi/smlworld.mid>

Here are the lyrics:

Artist: Disney

Song: It's A Small World

Album: The Lion King

it's a world of laughter, a world or tears
 its a world of hopes, its a world of fears
 There's so much that we share
 That it's time we're aware
 its a small world after all

CHORUS:

its a small world after all
 its a small world after all
 its a small world after all
 its a small, small world

There is just one moon and one golden sun
 And a smile means friendship to everyone
 Though the mountains divide
 And the oceans are wide
 It's a small, small world

(chorus)

Now rewrite this song to describe the atom, molecule, compounds, and elements or any combination

12. Close with a short summary.

Extend the reading to the student's lives or to the world.

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Lesson Plan Quarter 1, Week 8, Day 5



Outcomes for Today

Standards Focus: 6abef

PREPARE

1. Background knowledge necessary for today's reading.

This section is about chemical bonds. Talk about how opposites (positive & negative) attract each other while likes (positive & positive or negative & negative) repel one another.

2. Vocabulary Word Wall.

Introduce 5 important, useful words from today's reading.

oxygen hydrogen ion carbon dioxide chemical bond

- 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 concept chart as you quickly review it

Electrons = negative

Protons = positive

Neutron = no charge or neutral

Electron + proton + neutron = atom

Level of complexity as follows:

Atom

Element

Molecule
Compound

4. Read directions for investigation/activity.

5. Read text. Section 4.2 pp. 88-89

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

setting	Characters	pages
The micro world of atoms and molecules	Hydrogen, carbon, and oxygen atoms	88
	Sodium chloride and water molecules	89

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:

Atoms connect to make molecules.

When they combine it is a chemical reaction.

An atom that has an electrical charge is an ion.

Elements (atoms) can combine to form compounds like water (H₂O) and table salt (NaCl).

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.

Several possible activities:

All about atoms

This is a very good visual introductory activity. If you have a projection device, it is an excellent short presentation on the parts of the atom. Go to:

<http://education.jlab.org/atomtour/index.html>

Learning More about Matter

This is a more in-depth graphic program on the states of matter and more. It is a good follow up to the activity with the playground balls in the previous lesson. Go to:

<http://antoine.frostburg.edu/chem/senese/101/matter/index.shtml>

How atoms work

This is a great website with good connecting links showing how atoms work. Go to:

<http://science.howstuffworks.com/atom.htm>

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 happens when atoms combine?

If an atom carries an electrical charge, it is known as an _____ .

Give examples of common molecules which share electrons.

What are chemical bonds?

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

Key Paragraph

Atoms combine to form molecules, resulting in different forms of matter. For example, hydrogen and oxygen can combine to form water. Reactions between atoms depend on the number of electrons each atom has.

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

As you have learned, it is a scientific fact and basic principle that particles with opposite charges (+ and -) are attracted to one another. Although much different, the same could be said of people. Have you heard the saying that "opposites attract"? Do you know a couple where this is true? Write a paragraph introducing the reader to this couple, how they are opposite, and why they are attracted to one another.

12. Close with a short summary.

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