

CBL BIOLOGY: LIFE SCIENCE OPTION

BSCS Green Version 10th edition

Biology An Ecological Approach

Lesson Plan Quarter 1, Week 4, Day 1



Outcomes for Today

Standards Focus: 6bc

PREPARE

1. Background knowledge necessary for today's reading.

Water is a very important resource for all life on earth.
 You use water every day. Without it you would not live.
 Clean water is becoming a limited resource.
 Entire civilizations have flourished and declined because of water resources.

2. Vocabulary Word Wall.

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

necessity
utility bill

indirect

contaminated

pollutants

- 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

4. Read directions for investigation/activity. *Water, A Necessity of Life* pp. 54-56

Note: Modified investigation is attached to this lesson plan.

5. Read text.

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

setting	Characters	pages
Your home	You (the user of water)	55

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:

We do use a great deal of water.

I never really thought about it. I just turn on the faucet and there it is.

All life needs water.

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.

Water Use Investigation Attached

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity:

Investigation(s)

Follow the directions in the attached investigation (Modified Investigation 2.2) or refer to Investigation 2.2 in the text.

“Water Walk”

In addition, take a little walk with students in the immediate vicinity. Give them the title “Water Auditor” or something similar. Have them look for ways in which water is used (and/or wasted) in your local environment.

Historical Connections

Share with students information on “Water Wars” (see resource under teacher notes) and how people have fought and died over water.

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 all the ways in which you have used water in the past 24 hours.

What are the ways in which you could reduce your personal water use?

What is the difference between direct and indirect use of water? Give examples of both.

What is the source for the water you use?

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

Bridge to a language building activity

Teach a Mini Lesson using *Write AHEAD* pages # 30 and 31

[The Write Ahead Activities are on individual work-pages in a separate file]

Look at Figure 2:14 (p. 44) in your text. Explain why picture b is more efficient and less wasteful than picture a.

Key Paragraph

In this investigation, you will calculate how much water you use on a daily basis and then calculate the water needs for your family, your class, your school, your town, and your state. You will also discover some of the ways in which you use water indirectly.

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EXTEND

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

The Colorado River

Background Information

Go to mapquest.com and look up the Colorado River in the southwest United States. This river system supplies vast amounts of water to many communities along the way, but when it reaches Mexico, it is all but dried up. Mexican farmers cannot use the water most of the time because of the low flows and high salt content. After explaining this situation to the students, have them write a short paragraph from the perspective of a Mexican farmer in a letter to the United States Government. The farmer is pleading his case for water and his right to the water. He would like to stay in Mexico and work, but life is difficult.

Teacher Notes

A very good resource on water use and the American West can be found in the book, [Cadillac Desert: The American West and Its Disappearing Water, Revised Edition](#) by Marc Reisner.

12. Close with a short summary.

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



Student Investigation # 2.2

Water A Necessity of Life

Objective: To discover how much water is used in our lives and its importance.

Materials: Pocket calculator, graph paper, pencil

Introduction

Discuss the use and importance of water. Ask students to estimate how many gallons of water a day they think they use. Have them record this number.

Procedure

Brainstorm with the class all the ways in which we use water on a day-to-day basis. List these uses on a wall chart.

Use the data on the chart below to determine individual water use per day for each activity that the class listed.

Chart 1 Domestic Uses of Water

Source	Gallons of Water Used
Low-flow faucet	1.5 gallons/minute
Standard faucet	5 gallons/minute
Ultra-low-flow toilet	1.3 gallons/flush
Standard toilet	4 gallons/flush
Faucet or toilet leak	2.0 gallons/minute
Low-flow shower	2.5 gallons/minute
Standard shower	5 gallons/minute
Dishwasher	10 gallons/load
Washing machine	15 gallons/load

Have students compare their individual use with their original estimate.

Extend this figure by having students calculate the amount of water used by all the students in their class and school.

Have students draw a bar graph for their individual use by category.

Supplemental Questions

1. Many people buy bottled water these days. Why do you think this is so? What are some problems associated with buying water in bottles?
2. Water pollution is a problem. Where are examples of water pollution in your neighborhood?

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BSCS Green Version 10th edition

Biology An Ecological Approach

Lesson Plan Quarter 1, Week 4, Day 2



Outcomes for Today

Standards Focus: 6bc

PREPARE

1. Background knowledge necessary for today's reading.

Living populations change in size and numbers due to external and internal factors.

The prefix bio means living, or of life.

Individuals come and go. Life (the species) usually goes on.

When one form of life ceases, it is called extinction. Give some examples and the reasons for their extinction.

There is no other place in the universe for humans to migrate to in order to live. Earth is our only home.

2. Vocabulary Word Wall.

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

biotic abiotic

limiting factor

resources

carrying capacity

- 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.

In a population the difference in the number of births (birthrate) and deaths (mortality) will determine whether a population grows or decreases in numbers. In addition, organisms moving into a population (immigration) or leaving the population (emigration) will also partially determine whether this population grows or decreases.

The setting here is earth and the individual environments that populations live in. A "micro environment" is a very small system.

- mention the setting and main ideas

- point to concept chart as you quickly review it

4. Read directions for investigation/activity.

5. Read text. Ch 2 *Populations* pp. 32-35 (2.4 & 2.5)

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

setting	Characters	pages
An area of land	coyotes and rabbits	32
Mouse cage	mice	34
Green valley in the mountains	deer and mountain lions	35

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:

There are living (biotic) and non-living (abiotic) parts of the environment.
 Some things can limit (limiting factor) the number of organisms living in a particular area.

Water is a very important factor for survival.

We need space to live.

There is a limit to the number of organisms that can live in a given area (carrying capacity).

The balance of nature is a condition in which the organisms living in an area thrive in stability.

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:

Addicted to Oil

Talk about the idea of limited resources and the fact that America consumes a large percentage of the earth's resources. Of particular interest is our use of oil and oil-related products. This has often been referred to as "U.S. oil addiction." Ask students how addicted humans can address their personal addiction situations. Of course, many approaches involve a "12 – step" program. Go to this website to learn more about a 12 – step program for oil addiction:

http://ran.org/what_we_do/12steps/

After learning about and sharing this 12 – step program with the class, have students construct a personal chart about how they might begin to address the issue of United States dependence on fossil fuels. They could create group or personal charts for the billboard. As a variation of this activity have students create a poster inviting interested people to a 12 – step meeting on oil addiction. Illustrations would add greatly to the format.

Note: These are the types of student projects that could be posted in local art galleries, or other public places (County Offices of Education, etc.) utilizing student art display opportunities,

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 the factors that determine a population size?

What are limiting factors? Please give some specific examples.

What are some local impacts of human population growth?

What is the population density in the area where you live (home, apartment, etc.)?

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

Key Paragraph

The environment is everything that surrounds and affects an organism. The environment is made up of two parts: the living part and the nonliving part of organism's surroundings.

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EXTEND

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

Ask students to consider their environment (their space in the universe). Have them list all the biotic and abiotic factors. Have them consider the things that affect them. Direct them to create charts. One could be titled, What Is, while the other could be What I'd like it to Be. Have them post their charts. Use of illustrations is always a good addition, but this activity should be primarily in written word format.

12. Close with a short summary.

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

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Biology An Ecological Approach

Lesson Plan Quarter 1, Week 4, Day 3



Outcomes for Today

Standards Focus: 6bc

PREPARE

1. Background knowledge necessary for today's reading.

The earth's resources and space for human growth are limited.

Human population continues to grow.

As the number of individuals continues to grow, there are consequences for all of earth's inhabitants.

Quality of life for humans is dependent on a variety of issues including space.

2. Vocabulary Word Wall.

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

alter

relocate

environment

growth

uninhabitable

- 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

4. Read directions for investigation/activity.

5. Read text. Paul Erlich's book: *The Population Bomb*

Attached to this lesson plan.

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

setting	Characters	pages
Earth	humans	N/A

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:

- Population growth isn't a problem for me directly.
- One author predicted the wrong outcomes.

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:

After researching population growth issues as outlined in the Supplemental Investigation and reading from [The Population Bomb](#), students could present their findings in several formats including but not limited to:

- A collage
- A cube
- A rap

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 is population control important?
 What are the reasons for increasing population on earth?
 Why is population growth much faster in some areas of the earth than others?
 How do religious values influence population growth?

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

Bridge to a language building activity

Teach a Mini Lesson using *Write AHEAD* pages # 30 and 31
 [The Write Ahead Activities are on individual work-pages in a separate file]

Go to page 700 in the text. Have students read section 24.5. Ask them to explain the diagrams on page 701 (Figure 24.6). They could do a diagram of their family.

Key Paragraph

"The battle to feed all of humanity is over. In the 1970s and 1980s hundreds of millions of people will starve to death in spite of any crash programs embarked upon now. At this late date nothing can prevent a substantial increase in the world death rate..."

From The Population Bomb by Paul Erlich

EXTEND

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

Many people choose to believe what they want to believe. This is often true in matters of science. Building on what you know, write a short paragraph on what you believe the future of the earth will be in your lifetime. Do you believe you can create your own future? Why or why not?

12. Close with a short summary.

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



Supplemental Student Investigation Ch. 2

Current Population Issues *Beginning Awareness*

Objective: To become aware of local, national, and world population growth issues.

Materials: Current newspapers/magazines, internet access, scissors, paste

Introduction

Begin with the question, “Is human population growth a problem?” Ask questions like, “If you can afford children, what’s the big deal?”

Review the concepts on human population growth and challenges to the earth’s environment. Review the concept of man’s ability to alter the environment and relocate to previously uninhabitable environments.

Activity Level I

Instruct students to research the newspapers and magazines, and/or the internet to find examples of these concepts. Have students cut and paste articles and prepare a short written summary. Have students share their work with the class. Post student work on the billboard. Have students include the URL of any internet references. Students could prepare a cube according to the directions in the CBL Source Book.

Note: the classic reference to population issues is the book, [The Population Bomb](#) written by Paul Erlich over 30 years ago. You may want to research this book as it has a number of predictions. You could certainly see what short-term predictions came to pass. Here is more information from the book:

The Population Bomb

From Wikipedia, the free encyclopedia

The Population Bomb (1968) is a book written by [Paul R. Ehrlich](#). A best-selling work, it predicted disaster for humanity due to [overpopulation](#) and the "population explosion." The book predicted that "in the [1970s](#) and [1980s](#) hundreds of millions of people will starve to death," that nothing can be done to avoid mass famine greater than any in the history, and radical action is needed to limit the overpopulation.

The book is primarily a repetition of the [Malthusian catastrophe](#) argument, that [population](#) growth will outpace [agricultural](#) growth unless controlled. It assumes that the population is going to rise exponentially; on the other hand the resources, in particular food, are already at their limits.

Unlike [Malthus](#), Ehrlich predicted not only that overpopulation will hit in some indefinite future, but it is certain to lead to a massive disaster in the next few years. Also unlike Malthus, Ehrlich didn't see any means of avoiding the catastrophe, and the solutions for limiting its scope he proposed were much more radical, including starving whole countries that refused to implement population control measures.

"The battle to feed all of humanity is over. In the 1970s and 1980s hundreds of millions of people will starve to death in spite of any crash programs embarked upon now. At this late date nothing can prevent a substantial increase in the world death rate..."

The book deals not only with food shortage, but also with other kinds of crises caused by rapid population growth, expressing the possibility of disaster in broader terms. A "population bomb," as defined in the book, requires only three things:

- A rapid rate of change
- A limit of some sort
- Delays in perceiving the limit

Also worth noting is Ehrlich's introduction of the Impact formula:

$I = PAT$ (where I=Impact, PAT = Population x Affluence x Technology)

Hence, Ehrlich argues, affluent technological nations have a greater [per capita](#) impact than poorer nations.

The predictions not only did not come true, the world developed in a direction completely opposite to the one predicted by Ehrlich, without implementing any of his proposed measures. World food production grows exponentially at a rate much higher than the population growth, in both developed and developing countries, partially due to the efforts of [Norman Borlaug's "Green Revolution"](#) of the [1960s](#), and the food per capita level is the highest in the history. On the other hand, population growth rates significantly slowed down, especially in the developed world [\[1\]](#). Famine has not been eliminated, but its root cause is political instability, not global food shortage [\[2\]](#). On the other hand, in the 1980s and 1990s in a number of countries (first of all in Tropical Africa) [population growth](#) rates still exceeded [economic growth](#) rates, and on quite a few occasions political instability was caused just by food shortages (see, for example, [Secular Cycles and Millennial Trends in Africa](#) by [Andrey Korotayev](#) and Daria Khalitourina).

Although Ehrlich's theory influenced 1960s and 1970s public policy, a post-analysis by [Keith Greiner](#) (1994) observed that Ehrlich's projections could not possibly have held the scrutiny of time because Ehrlich applied the financial compound interest formula to population growth. Using two sets of assumptions based on the Ehrlich theory, it was shown that the theorized growth in population and subsequent scarcity of resources could not have occurred on Ehrlich's time schedule. The historical US population growth was more linear than exponential. Nevertheless *The Population Bomb* sold many copies and raised the general awareness of population and environmental issues. Early 21st century analyses of the age distribution of the US population show that growth in population declined after "[the pill](#)" was approved for widespread use (though the population continues to grow at a rate of 0.91% per annum [\[3\]](#)). That approval was likely influenced by Ehrlich's work. (Reference: [Greiner, K.](#) (1994, Winter). "The Baby Boom Generation and How They Grew," *Chance: A Magazine of the American Statistical Association.*) I assume "The Baby Boom Generation and How They Grew" is the name of an article from *Chance*.

CBL BIOLOGY: LIFE SCIENCE OPTION

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Biology An Ecological Approach

Lesson Plan Quarter 1, Week 4, Day 4



Outcomes for Today

Standards Focus: 6bc

PREPARE

1. Background knowledge necessary for today's reading.

Animals often need to move for survival.

What kinds of barriers might keep animals from moving?

What could happen to animal populations that don't move?

2. Vocabulary Word Wall.

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

homeostasis

population fluctuation

dispersal

ranges

pipit

- 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

Animals can move to different areas by a process called migration.

The reasons for moving include food, shelter, and weather.

There is a limit to the number of organisms that can live in a specific area.

Plants cannot move. They depend on environmental factors including wind, water, and other factors to help them with moving or relocating.

Many plants and animals have become extinct because of environmental conditions and changes and they could not adapt to or emigrate from.

4. Read directions for investigation/activity.

5. Read text. Ch2 Populations pp. 35-38 (2.6 & 2.7)

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

setting	Characters	pages
Arctic (North Pole)	Polar Bears	37
Antarctic (South Pole)	Penguins	37
Land		
Dandelion seed Do these belong in here?	Lemming	36
"Fairy Duster"	Widespread Should this be in Setting and Dandelion and Fairy Duster be in Characters?	36

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:

Humans can migrate anywhere they choose.

There are obstacles to animal migration such as mountains and oceans.

Many students have migrated from other areas.

Some animals migrate great distances.

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:

Incredible Penguin Migration

The movie, March of the Penguins, is an excellent resource to demonstrate animal migration under the harshest of conditions. A study guide with questions and work-related projects and ideas is attached to this lesson plan:

This activity could take place over the time span of several days.

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 the reasons a population decreases in size?

What are the reasons a population increases in size?

What are some of the obstacles to animal migration?

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

Key Paragraph

The ability of populations of living things to spread from a central place to others is called dispersal. In the case of organisms that can move, dispersal may occur through flying, swimming, walking, running, crawling, or burrowing.

EXTEND

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

Many people living in the United States have emigrated from a different area. Do you know of anyone (including yourself) who has emigrated to where you are now? Write a short paragraph describing this journey with a "scientific" point of view as discussed in your text. Look at the key paragraph for hints.

12. Close with a short summary.

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

MARCH OF THE PENGUINS
Teaching Ideas for Animal Migration
Edited by Gary Stebbins

Description: This film describes a year in the life of an Emperor Penguin colony. The special features provide additional information concerning penguins, their environment, and the filming of the movie.

Benefits of the movie: "March of the Penguins" shows how these beautiful birds have adapted to one of the most challenging environments on earth. The film shows the amazing beauty and harshness of Antarctica. It is an excellent supplement to units on biology that deal with birds or the Antarctic.

Helpful Background:

The movie is a documentary and provides its own factual background. A number of themes run through the movie. If these are discussed with young viewers, the film can help to convey several basic concepts in biology.

Despite losses caused by the harsh environment and by predators, the Emperor Penguin population is relatively stable. Only 19% of the chicks live beyond their first year. However, once they reach adulthood, 95% of the penguins survive from year to year. The average life expectancy of an adult Emperor Penguin is 19 years. After the age of four or five, penguins start to lay eggs and reproduce. A rough calculation shows how these statistics are consistent with a relatively stable population: 14 (reproductive years) \times $.19$ (survival rate for chicks to one year) \times $.5$ (for two penguins required for one egg) = 1.33 chicks who reach adulthood per penguin. This number does not take into account lost and frozen eggs or chicks that die after the first year but before they begin to reproduce, so it is too high. That is probably the extra $.33$.

There are between 20 and 40 Emperor Penguin colonies in Antarctica. As of 1995 the Emperor Penguin population was estimated to be approximately 200,000 breeding pairs or a total population of about 400,000 - 450,000. There is no evidence that global climate change or human disturbance have substantially decreased their numbers.

Like many other animals (including human beings) the survival of the species depends on social interaction between parents and among parents and chicks. In March or April Emperor Penguins pair off for the breeding season. After each mother produces her egg she transfers it to its father. The mothers then immediately return to the sea to feed. The fathers survive the harsh Arctic winter by huddling together to keep warm. The mothers don't come back until the dead of winter. By then the chicks have just recently hatched. The mothers feed the chicks fish regurgitated from the mothers' stomachs. The fathers, not having eaten anything for more than four months, then have their chance to return to the sea. Before they leave, the fathers memorize the distinctive call of their chicks so that they can later locate their own. Like the fathers, the mothers protect themselves from the cold and storm by huddling together. When the fathers come back to the colony they feed the chicks and the mothers return to the sea.

The parents take turns baby-sitting their chicks on the pack ice and returning to the sea to fish through December or January (the height of the Antarctic summer) when the chicks are large enough to fend for themselves. Any break in the chain (the death of a father or a mother, or a delayed return) will spell the end for the chick.

The survival of the colony also depends upon the social interactions among the group. The penguins march together from the sea to their breeding ground on the pack ice and back to the sea. The penguins huddle together against the cold, rotating positions to allow each to spend some time in the warmer interior of the group. They use their numbers to confuse predators such as the sea lion.

It is sometimes difficult to remember when watching these animals that they are flightless birds with feathers instead of fur. Their actions seem distinctly mammalian.

Emperor Penguins are an important part of the Antarctic ecology. They eat fish, crustaceans, octopi, and squid. In turn they serve as significant food sources for their predators, Leopard Seals, Killer Whales, Antarctic Giant Petrels and Antarctic Skuas (another bird).

The taxonomy of the Emperor Penguin is: Kingdom: Animalia; Phylum: Chordata (animals with spinal cords); Subphylum: Vertebrata (animals with spinal cords encased in vertebrae); Class: Aves (birds); Order: Sphenisciformes (penguins); Family: Spheniscidae (penguins); Genus: Aptenodytes (Emperor Penguin and King Penguin); Species: Aptenodytes forsteri (Emperor Penguins).

1. QUICK DISCUSSION QUESTION: How do Emperor Penguins keep warm?

Suggested response: There are three ways. (1) Their feathers are designed to trap air and insulate them from the cold. (2) They have a lot of body fat. (3) They huddle together in large groups.

BUILDING VOCABULARY: "around-the-clock", beckoning, bereft, "breeding ground", caravan, clambered, docile, endure, entrust, exhaust, harsh, huddle, "ice pack", "in vain", lavish, lingering, momentarily, "mother of all blizzards", negotiable, non-negotiable, noticeably, organism, predator, preen, pout, quench, ravenous, reunion, shuffle, shuttling, "sound their calls", "Southern Lights", stalwart, strut, stumped, teeming, unsupervised, vigil, virtually, weld.

Discussion Questions:

1. How do social interactions benefit Emperor Penguins?
2. How do Emperor Penguin colonies survive with such a substantial loss of chicks and adults when each couple has only one egg each year?

In the summer Emperor Penguins live and feed in Antarctic ocean waters. In the Antarctic fall, March and April, they go onto the pack ice to pair up and to breed. The mother lays the egg which the father (still at the breeding ground on the pack ice) incubates in a special insulated pouch. This takes most of the Arctic winter. Penguins eat fish and other animals found in the ocean. There is no food for them on the pack ice. After the mother lays the egg, she returns to the ocean to feed. When the egg hatches the mother travels back over the pack ice to feed the chick with food regurgitated from her stomach. By that time the father will have been without food for about four months. The mother then takes responsibility for the chick while the starving father returns to the sea. He comes back to the breeding ground with a stomach full of food for the chick. The parents then take turns going back and forth with one babysitting and feeding the chick on the pack ice while the other goes to the ocean to get food for him or herself and the chick. This continues until the summer (December or January) when the chick is old enough to fend for itself. Certainly, the ocean and the pack ice are different biomes. Do Emperor Penguins engage in classic biome migration? (For a shorter version, just ask the question: Do Emperor Penguins engage in classic biome migration?) :

CARING FOR ANIMALS

1. How can we best show our respect for Emperor Penguins?
2. What would be lost if a species such as the Emperor Penguin became extinct?
3. Students can be asked to create a poster board display of the life cycle of the Emperor Penguin

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Lesson Plan Quarter 1, Week 4, Day 5



Outcomes for Today

Standards Focus: 6bc

PREPARE

1. Background knowledge necessary for today's reading.

There are many examples of common grounds that are not owned by anyone but benefit many. Point out local "commons" like parks, etc.
 Not all decisions are based on money and profits.
 Scientists try to describe certain principles that govern the universe.

2. Vocabulary Word Wall.

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

commons **tragedy** **pasture** **controversy** **profits**

- 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

4. Read directions for investigation/activity 2.3 pp. 57-59.

5. Read investigation 2.3 (Modified) attached to this lesson plan.

(You may do Level II or not depending on time.)

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

setting	Characters	pages
The stoop (front steps) Pasture	Sondra & Jason cows	CD CD

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:

- Profits are a good thing. It is all about the money.
- Too much profit can be cause for future problems.
- Cows need food to live.
- Some people don't seem to care about the commons and this hurts us all.
- Some people make their money (profits) and run.

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:

Investigation 2.3, and modified Investigation 2.3 (attached to this lesson plan) contain several levels of activities which make use of the CD, *The Commons*. Make sure you go through the activity first before working with students.

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

See questions listed under activity Level I, II, & III in the attached modified investigation of this lesson plan.

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

Bridge to a language building activity

Teach a Mini Lesson using *Write AHEAD* pages # 30 and 31
 [The Write Ahead Activities are on individual work-pages in a separate file]

You may want to look ahead to Activity 23.3, Crisis in the Gulf of Maine, on page 691 of the text. This activity and reading is also on *The Commons* CD.

Key Paragraph

In Hardin's words, the "tragedy" lies not so much in the loss of the pasture, but in the chain of events that leads to the destruction of the pasture. When you look at a news story about common resources, can you identify a chain of events leading up to the controversy?

EXTEND

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

A Series of Unfortunate Events

When have you ever experienced a series of unfortunate events in your life? What were they and how did they lead up to a larger problem? Write a short paragraph about this chain of events in your life.

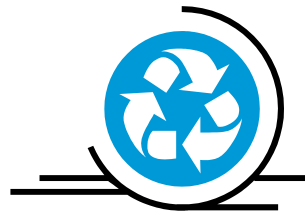
12. Close with a short summary.

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

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Student Investigation 2.3

An Introduction to the Tragedy of The Commons

Objective: To understand the “commons concept” as a model for understanding responsibility.

Materials: CDDVD?: *The Commons*

Introduction

Introduce students to the idea of *The Commons*.

* Activity Level I

Have students follow directions in the text for Investigation 2.3, Activity 1, *The Pasture Story*. This Level I activity is limited to *The Pasture Story*. If you have projection technology, *The Pasture Story* could be projected to the class. In this way you can pause for questions or comments when necessary. During the video the “Q” icon will occasionally flash. Use this to view the question on the screen. When the “I” icon flashes, you can pause the video for additional information and explanation. After viewing the video, instruct students to answer these questions:

1. What are some things in your world that are common resources? Give specific examples.
2. Is there a commons on your school grounds? Where is it? Why is it a commons?
3. In the example of *The Pasture Story*, what are the things that led up to the destruction of the common pasture?
4. What are some local examples of poor use of a commons?

* Activity Level II (Maybe)

Following completion and discussion of *The Pasture Story*, the CD automatically advances to *The Straw Model*. If time permits, proceed through this projection, stopping, questioning, and explaining as necessary. You should go through both *The Pasture Story* and *The Straw Model* before doing the *Pasture Profits* simulation with students. Questions:

1. Why is this called “the straw model”?
2. If you could give it a name, what would it be?

Activity Level III

After completing the videos on *The Pasture Story* and *The Straw Model*, proceed to the *Pasture Profits* simulation. You can follow the directions in the text on page 58 by having students work in pairs or you can run the simulation for the entire class. If you choose the latter, arbitrarily divide the class into two groups to represent the two players in the video. At the completion of each simulation (#3 in Investigation 2.3) you will be given information. Determine what information you want students to record. The questions under #4 in Investigation 2.3 could be used. Here are some other questions:

1. During the simulation, what were the first indications of trouble in the pasture?
2. What do you think would happen to the farmer with the most cows? Would the other farmers just stand by? Why or why not?
3. Why is the pasture called the commons?

This simulation should be run several times. If you want students to try it in pairs, this could be used as an independent learning activity or at a center.

Activity Level IV (and beyond)

There are more involved simulations. Proceed through them as you wish and allow students to do the same. Again, these could be center activities. This is a multi-day process.