

CBL Biology: Life Science Option
BSCS Green Version 10th edition *Biology An Ecological Approach*
Lesson Plan for Week 1, Day 1
Standards Focus: **7c 8f 9d 10a**

PREPARE

1. Background knowledge necessary for today's reading

Classification should be a concept easily understood by students once they can relate it to their world. Engage them in a quick discussion as to how they classify people, groups, music, neighborhoods, cars, and any number of other categories. Guide them to the realization that classification systems are all devised by humans in order to make sense of the vast amounts of information available.

2. Vocabulary Word Wall

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

species taxonomy homology related ancestry fossil

- 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 basic unit of classification is the species.

There are almost two million different organisms presently living on our earth.

Evolution is the process which has produced the great diversity in living things.

Humans create systems which allow them to make sense of the vast complexity of life on earth.

4. Read directions for investigation.

5. Read Text Chapter 10, Introduction, Sections 10.1 & 10.2 pp. 264-268.

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

Setting	Characters	Pages
The visible light spectrum (red colors)	rose, red alga, sea urchin, earthworm, summer tanager	266

RESPOND

6. Fix the facts. Clarify what is important.

Discuss the reading 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:

New species are still being discovered.

The physical structure of living things (bones, etc.) is often used to classify organisms.

DNA is another way to classify organisms.

Animal behavior is also a way to classify living things.

A common ancestor is an organism that is related to a number of present day organisms.

Fossils can give us clues to life from the past, but it is hard to tell the chemical make up of fossils.

Fossils can give us clues as to animal behavior. An example is fossil animal tracks.

7. Post information on the billboard. Add new information to ongoing whole class projects posted 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:

Sub-Culture Classification Activity

Introduction

As mentioned in the background Information, today's students are busy classifying their peers and sub-culture groups daily. They have constructed artificial groupings to describe each other and make sense of their world.

Note: See the attached article on high school subcultures. Note that these subcultures continually change with the times, fads, geographic location, etc. However, the internet and media tend to keep many regional differences mitigated.

Objective

To describe observable student characteristics

Activity

First ask individual students to brainstorm a list of the possible groups represented in your particular school setting. Next come up with at least 5-8 agreed-upon groups. Avoid any editorial comments on any of the groups. Next ask students individually to list the observable characteristics of each group. Follow this individual activity with a similar group process to obtain agreed-upon lists. Finally, put the names of the various groups in a hat and ask students to draw the group names. Students with the same group name will then cooperatively create a poster with an illustration and distinguishing characteristics of an illustrated individual. Upon completion, each group will share its creative work with the class and post the illustration.

Additional Notes

Try to approach this with students as though they are scientific researchers. Encourage students to not make value judgments. This is all for the good of science. This might be a good time to discuss how many of the terms can be hurtful and downright vengeful as well. Science attempts to be objective. What does this mean?

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. Name at least five characteristics that biologists use to classify organisms.
2. Is color a good characteristic to use in animal classification? Why or why not?
3. Give examples of structural homologies and molecular homologies in living things.
4. What are fossils? Why is it difficult to use biochemical classification techniques on fossils?
5. How can scientists determine the behavior of a once living fossil?

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

Key Paragraph

The diversity of the living world is awe inspiring. Even the molecules and structures that make up the great variety of living organisms are diverse. From earliest times, however, humans have searched for order in the diversity of nature. They have tried to find ways to distinguish the many types of living things. From these efforts has grown the science of classifying organisms, or taxonomy.

EXTEND

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

Into the Future - Artifacts from the Past

Pose this question to your students and have them write a paragraph on the concept:

Suppose a group of scientists were studying the remains of your community several million years into the future. What artifacts might they find that would totally confuse them?

12. Close with a short summary.

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

August 19, 2006

Finding Their Place: High School Subcultures Burrow Deeply

By DON MILLER

MANAGING EDITOR

Here are a few terms used to classify high-school subcultures. This list is hardly definitive, and could be out of date, and certainly some kids labeled with them would not accept the terms. Many are insulting and hurtful; still, kids in some of these subcultures interact socially and recreationally, eat meals together, wear similar clothes, and use language differently that often includes slang and special group jargon.

- Advanced Placement students: Are interested mainly in schoolwork and grades.
- Airheads: Girls who wear expensive designer clothes; usually not so bright socially or intellectually. Overlaps sometimes with the preps.
- Band geeks, Bandies or Bandos: Students taking marching band, concert band, pep band and/or other musical instruments.
- Bullies: Students who torment others through verbal harassment, physical assault or other more subtle methods of coercion. Also called "thugs."
- Bros: Students with Famous Stars and Straps, Skin, Harley T-shirts, Dickies shorts, and skate shoes; obsessed with dirt biking and Motocross. Bros always call each other Bros, hence the name.
- Cheerleaders: Female students who are part of the cheerleading squad. Often overlaps with the in-crowd, female jocks, blondes and wannabe-preppies. Many "queen bees" have come from this group.
- Church people: Kids who go to church and are involved with youth groups and other activities. These people tend to avoid sin, get good grades, avoid stereotypes and be nice to other people. Most likely enemies with goth, gangsta', druggie, skater and bully.
- Crombies: An in-crowd jock. Name derived from the clothing chain, Abercrombie and Fitch. White baseball caps and upturned collars are a common identifying feature. Often overlaps with wannabe preppies.
- Druggies: Stoners, burnouts, pot-heads, crackheads, dope heads, junkies, chronics. Students who take illicit drugs, especially marijuana. Sometimes overlaps with gangsta.
- Emo: Kids who are in the emo subculture, dyed long hair, tight sweaters and jeans, horn-rimmed glasses.
- Gamers: Play and are sometimes obsessed with video games and other technology, such as computers. Stereotypically, they are seen as people who never leave their rooms and never go outside. Often overlap with geeks and nerds.
- Gangsta: May or may not actually engage in street gang activities. In cities with little or no actual gang activity, a subculture identifying with the gangster subculture often nonetheless develops, most likely through positive depictions of

gangsters as cool outlaws in the media. Frequently overlaps with druggies and bullies.

- Gear heads: Those who obsessively love cars, trucks, motorcycles.
- Geeks: A geek is a version of nerd.
- Ghetto: White people who tend to act like black people. Some of them really live in the ghetto, but most of them are wannabe gangstas.
- Goths: Usually listen to music of the gothic rock genre. Typically characterized by dark clothing, outlandish hair and clothing styles, many piercings and dark interests/worldview; frequently overlaps with "alternative" and wannabe "mallgoths."
- Hackers: Sometimes called computer geeks, these young people take pride in computers and other modern technologies.
- Hip Hoppers: Students who listen to hip-hop and other forms of such rap music. Overlaps with the gangsta subculture.
- Hippies: Identify with the hippie subculture.
- In-crowd, popular, or the beautiful people "ASB crowd": Students who pride themselves on being very popular with other students and who view their group as socially advanced and exclusive. Often overlaps with jocks, airheads, "plastics" and wannabe-preppies.
- Indie kids: Listeners to independent rock music. Often clothed in retro or thrift-store clothing, fans of obscure film and music.
- Jocks: Students with interests in participatory athletics; traditional enemy of nerds, geeks, loners and, nowadays, homosexuals. Traditionally male, but as the 21st century progresses, female jocks have come out of the woodwork.
- Joe Schmo: Students who do not really stand out for any particular reason. They aren't part of the clique system but not completely outcasts either. They go with the flow of things.
- Loners: Usually introverts, but some may be complete extroverts, with few friends. They may be seen eating lunch or on the street alone.
- Metalheads: Students who listen to heavy metal music, often with long hair and wearing band T-shirts and jeans. Occasionally mistaken as goths or punks.
- MySpacers: These kids are constantly on MySpace and tend to talk about that in their conversations.
- Nerds: Students with interests in math, sciences, computers and specific areas of knowledge; traditional target of jock bullying and by definition more intelligent than the majority of the student body.
- Outcasts: Rejects, usually by choice, but not always the case. The outcast is a person who does not fit into any specific clique, and at times faces physical and psychological aggression from clique members.
- Wannabe Preppies or Preps: Those identifying with the upper classes and prep school subcultures. Stereotyped as clean-cut and wearing fashionable, expensive clothing inspired by that of preparatory schools.

- Posers: Kids who act like somebody they are not and who try extremely hard to fit into a certain subculture, sometimes to very annoying levels.
- Punks: Identifying with the punk rock subculture.
- Queen bees: The queen bee is the clique's leader. Characteristics often associated to her are a pleasant appearance, charisma, skill in manipulation and monetary power. The queen bee has substantial influence and power over the clique, and is usually envied and looked upon as a role model by clique members and at times by outsiders to the clique.
- Rockers: Students who are members of a local garage band or ones who play rock instruments. Overlaps with punk and band geek.
- Skaters: Kids who are obsessed with skateboarding or extreme sports.
- Slackers: Students who essentially remain detached from their academic work, and show no interest in it. Slackers primarily look out for themselves and show no interest in excelling in high school academics or activities.
- Sluts: Female or male students who are extremely promiscuous. They give in to their overpowering biological urges without caring about other people's opinions.
- Special Education/Sped: Students who go to the learning center, or have some sort of reading or social skills disorders such as autism and dyslexia. Also known as the retards, and the "short busers."
- Stoners: Similar to druggies, though the word is often associated primarily with the use of marijuana.
- Surfers: These kids like the beach, surfing and extreme sports.

Sources: Wikipedia, local youth subculture

-- Don Miller

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Lesson Plan for Week 1, Day 2
Standards Focus: **7c 8f 9d 10a**

PREPARE

1. Background knowledge necessary for today's reading

Keep poor Charlie's overalls from getting soiled. (kingdom – phylum– class – order – family – genus – species) This is just a little way of remembering the hierarchy of classification for living things. A rap, a poem, a rhyme can all be aids to recalling information. Work with students to develop their own.

2. Vocabulary Word Wall

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

genus family order phylum kingdom

- 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.

Classification is a method in which scientists have organized the diversity of life for study.

A number of characteristics can be used to classify living things. They include:

- structural similarities
- genetic similarities
- behavioral similarities
- fossils

4. Read directions for investigation.

5. Read Text Chapter 10, Text Sections 10.3 & 10.4 pp. 268-272.

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

Setting	Characters	Pages
the natural environment	dogs, coyotes, wolves	268-
	weasels, bears, foxes	269
	monkeys	269

RESPOND

6. Fix the facts. Clarify what is 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:

As scientists discovered more plants and animals, classification became more complicated.

The closer a plant or animal is in shape and structure, the closer it is related.

The levels of classification are (from the most specific to the least specific):

species
 genus
 family
 order
 phylum
 kingdom

As scientists discover new information, the classification category of an organism may change.

Scientists use the Latin language to name the genus and species of living things. In this way, scientists from all over the world will recognize the organism.

This naming method was developed by Carolus Linnaeus, many years ago and is called binomial nomenclature.

7. Post information on the billboard. Add new information to ongoing whole class projects posted 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:

Name that Plant

Please see supplemental Investigation 10.1 attached to this lesson.

Internet Work

Here are two good sites on classification:

http://en.wikipedia.org/wiki/Scientific_classification

http://anthro.palomar.edu/animal/animal_1.htm

This one also includes a quiz.

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. Devise your own way of memorizing the levels of classification through some sort of saying.
2. Why is the use of common names problematic for scientists.
3. What factors could alter the placement of an organism into a certain category?
4. Why is Latin used to name the genus and species of an organism?
5. What are the rules of binomial nomenclature?

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

Key Paragraph

When relatively few plants and animals were known, there was little need to group them into larger, more inclusive units that reflected common characteristics. As thousands of plants and animals became known, however, larger groupings were necessary to distinguish specific organisms within this bewildering array. In a universal system of classification, organisms of different species are grouped into larger, more general categories based on homologies.

EXTEND

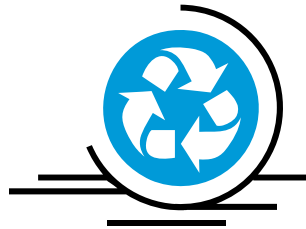
11. Prompt every student to write a short product tied to today's reading.

What's in a name?

Review again the rules of binomial nomenclature with students. Ask students to assign themselves a new scientific name. They could then write a short paragraph on how they arrived at this name.

12. Close with a short summary.

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



Supplemental Student Investigation 10.1 Naming of Plants

Objective:

To understand binomial nomenclature by naming common plants

Materials: A variety of local plants

Introduction

Review the following introduction with students. Explain to them how plants (and animals) are named according to the rules of binomial nomenclature.

Most plants also have one or more common names. Gardeners prefer to use common names instead of scientific names ---- which they often perceive as too difficult to learn. However, the use of only common names may be confusing. A plant may have a common name that varies from one region to another. For example, Kalmia latifolia is called mountain laurel, mountain ivy, Virginia ivy, mountain kalmia, or kalmia laurel. Or, we can have one name applied to several plants. For example, tea or the tea plant could be Camellia sinensis, Chenopodium ambrosioides, Ilex glabra, Monarda didyma or others.

The scientific name is in Latin, which is the international language of science. Some people have difficulty with Latin names.

Binomial nomenclature is the system of giving each plant a scientific name consisting of two parts. The first is the generic name that designates the genus --- a group of related species. The generic name is capitalized, underlined, or written in italics. Genera are grouped into families, families into orders, and on up the hierarchical levels of classification. Each level of this classification includes plants with many characteristics in common. So plant classification is in a very meaningful and useful system.

The second part of the scientific name is the specific epithet, an adjective describing members of a genus. The species is the basic unit of classification for a group of individual plants in a population having common characteristics, yet distinct from others of another species. The epithet is written in lower case letters, underlined, or italicized. The name of a species is a binomial ---- the generic name and species epithet. The species of red maple for example is Acer rubrum, not just rubrum.

The following is an example from the Chart of Latin/Common Names:

<u>Cornus</u>	dogwood
<u>Cornus florida</u>	flowering dogwood

Epithets are derived from: a description of the flower or leaf, the area where the plant was discovered, in honor of a person, or its habitat. Examples include:

<u>grandiflora</u>	large flower	<u>parvifolia</u>	small leaves
<u>americana</u>	America	<u>japonica</u>	Japan
<u>wilsoniana</u>	Wilson	<u>sylvatica</u>	of the forest
<u>autumnale</u>	Autumn	<u>praecox</u>	very early

Activity Level I (Demonstration)

Now take students on a short walk out of the classroom. Have them locate and describe at least five local plants. Encourage them to select plants that are quite different from one another. Descriptions should include such characteristics as leaf shape and size, flower color, arrangement of leaves, and so on. Once they have created a written description of each plant, instruct them to name their plant according to the rules of binomial nomenclature. Encourage them to select at least two very similar plants and give them the same genus. They should be encouraged to name plants after shapes or colors as well. You might want to do a little introductory Latin lesson as well. Student work can then be posted.

CBL Biology: Life Science Option
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Lesson Plan for Week 1, Day 3
Standards Focus: **7c 8f 9d 10a**

PREPARE

1. Background knowledge necessary for today's reading

What is a kingdom? You might want to brainstorm this concept with students. Of course, a kingdom is a very large grouping, hence the name for this level of classification. It is a concept that should be rather easy for students to grasp.

2. Vocabulary Word Wall

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

autotroph heterotroph protists fungi plantae

- 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.
- All organisms are made of cells.
All living organisms are either prokaryotes or eukaryotes depending upon their cell structure.
Living organisms are divided into different classifications based on:

structural similarities
genetic similarities
behavioral similarities
fossils

The level of classification from general to specific is as follows:

kingdom
 phylum
 class
 order
 genus
 species

4. Read directions for investigation .

5. Read Text Chapter 10, Text Sections 10.5 -10.7 pp. 272-279.

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

Setting	Characters	Pages
the plant world	moss, sword fern, sunflower	277
the animal world	mountain goat, butterfly, sea slug	277

RESPOND

6. Fix the facts. Clarify what is important.

Discuss the reading 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 five kingdoms of living things, prokaryotae, protista, plantae, fungi, and animalia.

The prokaryotae include simple forms of life such as bacteria.

The protista include single celled organisms.

The fungi include mushrooms and other non-green organisms.

The plantae include green plants.

The animalia include animals most of us know.

Not all biologists agree on the present classification system.

7. Post information on the billboard. Add new information to ongoing whole class projects posted 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:

Classify That

See the details in Supplemental Investigation 10.2 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

1. What are the differences between prokaryotes and eukaryotes?
2. Explain heterotrophs and autotrophs?
3. List the five kingdoms and list several examples of each.
4. Why do all scientists not agree on the present classification system?

What are some of the characteristics biologists use to sort living things into kingdoms.

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

Key Paragraph

Because organisms may look dissimilar at the kingdom level of classification, biologists consider several questions about the evolutionary history of an organism before classifying it. Is it a prokaryote or a eukaryote? Is it a producer, or autotroph? Is it a consumer, or heterotroph? Does it reproduce sexually or asexually and does it develop from an embryo? Finally, biologists consider the general structure and function of an organism. None of these questions, however, resolves all the problems of classification, and the systems continually change as new knowledge emerges.

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

Ask students to write to this prompt:

How would you classify yourself using only scientific terms? Write a short paragraph which could apply only to you.

12. Close with a short summary.

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



Supplemental Student Investigation 10.2 Classify That

Objective

To expand students' knowledge of living organisms and further develop their ability to group, or classify, living organisms according to a variety of common features. To introduce students to scientific groupings of organisms.

Introduction

In this lesson, students will get acquainted with diverse forms of life by using modern biological classification systems to group animals that are related. Students will learn about basic scientific groupings like genus, species, mammals, fish, birds, amphibians, and reptiles. The website used in this lesson will allow them to pair different vertebrate animals and learn more about their common traits. By doing this, students will begin to classify organisms in a more sophisticated way.

Activity

Materials:

- A plant and living animal (even a human!) available for group classification exercises
- "Classify That," a student sheet available as a PDF file at http://www.sciencenetlinks.com/pdfs/classify_actsheet.pdf

Note: If your classroom doesn't allow all students to be online at once, print out and duplicate pertinent pages from this Classifying Critters website:

<http://www.hhmi.org/coolscience/critters/critters.html>

Begin the lesson by warming students up with a review that will illustrate useful groupings of plants, animals, and non-living objects. Ask students to volunteer objects (such as a pen, a book, a coat) for scientific observation. Then add living objects such as plants or animals to the collection. Line up the objects on a table or in one area of the room. Now ask the students to observe the group.

Ask students questions such as:

- How many different ways can you find to group or pair these elements?
- Which elements are non-living objects?
- Which are living organisms?
- What features determine whether something is alive or not?

After the discussion, expand the activity by asking students to choose a living organism from the original group and then group it with two other living organisms in the classroom.

Ask students:

- What features did you use to group the organisms?

What might be the purposes of these features?

Development

Direct students to the first page of the Classifying Critters website.

Read the first two paragraphs aloud and ask students why scientists group plants and animals (to help them understand and study the world's vast array of living things).

To help students get a general understanding of this classification system, explain that scientists have grouped millions of plants and animals into just five large "kingdoms." These are Animal, Plant, Fungus (like mushrooms), Protist (like algae), and Prokaryote (bacteria). The members of these kingdoms share similar traits, like cell structure, food procurement, movement, and reproduction. Each kingdom has smaller and smaller groups that are determined by more specific shared traits. For example, point out that their classroom could be said to be on earth, in the United States, in your state, your town, on your street, on your floor, on your side of the hall, etc.

Now ask students to reread the information about animal groupings in the second paragraph. Prompt them to explain the relationships between species, genus, and family. Explain that the Classifying Critters website will help them study a particular group of animals—vertebrates, or animals with backbones (which includes them!).

Guide students through the site's five "challenges." Ask students to write down the information about genus and species found on the site's opening page and to note common traits found in each vertebrate animal.

After completing the challenges, ask students questions such as:

- Can a bird be an animal and a vertebrate?
- How can a dog be related to a cat?
- Why would scientists find this way of grouping vertebrates useful?
- Can scientists use what they've learned to establish relationships between other vertebrates?

Why do you think scientists would be more interested in the details of internal and external structures than the behavior or general appearance of a vertebrate?

Assessment

Remind students that living things can be grouped in many ways according to various characteristics. Scientists have created groups within groups to show relationships among the multitude of living organisms. To illustrate how these scientific classifications relate, have students complete the "Classify That" student sheet. This sheet includes a simple concept map to help students understand the hierarchical relationships between each of the scientific groupings they have learned about.

Have students fill out the map, using their notes from the website and class discussion. You may have to review and expand on the terms, but keep it simple—the focus should not be on the definitions, but rather on the order of terms and their general relationships. In addition to writing the terms in the circles, you could have students describe the relationship between the terms on the arrows connecting the circles.

There are several resources on the Internet that describe the use of concept maps (and other graphic organizers) in the K-12 classroom. Go to <http://www.graphic.org/concept.html> for more information.

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Lesson Plan for Week 1, Day 4
Standards Focus: **7c 8f 9d 10a**

PREPARE

1. Background knowledge necessary for today's reading

How did life first begin? This is the real focus of this lesson. Understanding current student thoughts in this area is important before beginning. Since current life began from previous life, this can become a “chicken and egg” type of discussion. It is important to understand what student thinking is in this area since popular culture and religious beliefs can have a large impact on student thinking. Take some time to explore here first with your classes.

2. Vocabulary Word Wall

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

stromatolites “organic soup” greenhouse effect coacervates
heterotroph 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.

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 is a huge variety of living things on this earth.

In order to study living things, scientists have devised systems of classifications to group organisms.

These groupings are based on several categories including similarities and differences in body structure, body substances, genetic makeup, behavior, and the fossil record.

Groupings from the general to the specific are as follows: kingdom, phylum, class, order, family, genus, and species.

Binomial nomenclature is the naming system which makes use of the Latin language to describe individual species.

4. Read directions for investigation.**5. Read Text Chapter 10, Text Sections 10.8-10.10 pp. 280-284.**

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

Setting	Characters	Pages
Earth 280 million years ago	reptiles (dinosaurs, and modern reptiles)	280
Earth (over time)	earliest life, first plants, mammals, humans	284

RESPOND**6. Fix the facts. Clarify what is important.**

Discuss the reading 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:

Living things come only from other living things so where did it all begin?

Life has been on earth for about 3.5 billion years.

There were times in the past when certain species dominated the earth (like dinosaurs).

By studying the formation of stars, scientists could begin to understand how life on earth began.

In order to understand how primitive life first developed on earth, scientists developed experiments to simulate the conditions of early earth.

7. Post information on the billboard. Add new information to ongoing whole class projects posted 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:

Timelines

The concept of human time on earth is often somewhat difficult for students to grasp. Perhaps a good activity to help gain an understanding of time is the development of a personal timeline. Have students begin with their birth and then create their timeline up to the present. Several things to consider:

Make sure you have an agreed-upon format for the timeline. (For example, one inch = 1 year.)

Include some events that took place in the world (such as the attack on the Twin Towers) to give reference.

Once students have completed their personal life timelines, ask them to compute the amount of time on earth humans have existed if referenced to their timeline. This is a simple ratio and proportion problem. Student work could then be posted.

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

How did scientists figure out that life has been on earth for about 3.5 billion years?

Why do scientists study the stars to learn about the formation of life on earth?

Describe conditions on the earth after it first formed.

Describe the experiments scientists carried out to simulate conditions on earth many years ago.

What are the two essential characteristics of living things?

Where and how did the first primitive organisms obtain their food?

Look at the calendar on page 284 (Figure 10.24) of your text. What does this tell you about the amount of time humans have been around on earth?

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

Key Paragraph

The first life forms must have had two essential characteristics of life: first, a means of self-maintenance (maintaining their organization and order); and second, a means of self-replication (reproducing themselves). An early microorganism could not have lived forever. Hence, for life to evolve successfully, it had to reproduce. There must have been some way to store coded information about how to make new copies of itself.

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

Discuss the calendar on page 284 with students. After the realization that we humans have not been on earth for very long strikes home, ask students to write a short paragraph on how we humans as a species have taken care of the only planet we know.

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 1, Day 5
 Standards Focus: **7c 8f 9d 10a**

PREPARE

1. Background knowledge necessary for today's reading

Organizational structure from the specific to the general is a key concept of this lesson (see figure 10.27 on page 287). Organize some discussion time to work a little with students so that they understand this concept. What are some examples of this principle? Use examples from their world. For example, the concept of all humanity on earth (general) and each person as an individual (specific) could be used in the explanation process.

2. Vocabulary Word Wall

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

anaerobic ozone Gia hypothesis virus crystal

- 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.

Classification has allowed scientists to organize and study the diverse amount of life on earth.

Taxonomy is the study of living classifications.

Binomial nomenclature is the naming method for each specific organism.

All living things belong to one of five kingdoms (general) while each living organism is a specific genus and species.

Fossil evidence has given scientists a history of living organisms now extinct.

4. Read directions for investigation.

5. Read Text Chapter 10, Text Sections 10.11 & 10.12 pp. 285-288.

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

Setting	Characters	Pages
ancient earth (over 3 billion years ago)	clusters of proteins	285

RESPOND

6. Fix the facts. Clarify what is important.

Discuss the reading 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:

It is not easy to say what is living because some things like crystals do grow.

Anaerobic bacteria live in environments with little or no oxygen.

Ozone is a oxygen compound.

All matter on earth is organized according to levels of complexity.

Viruses are sort of a puzzle. They need living cells to grow and reproduce and can't survive on their own.

7. Post information on the billboard. Add new information to ongoing whole class projects posted 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:

Classification Activity - General to Specific

Review the concept of structural complexity with students. With their assistance, create a rather lengthy list of at least 50 objects and groups of objects (living or not) found within the classroom. Ask students to work in small groups to create a list with ALL the objects ranging from general to specific. For example humans and students are two different groupings. Students are more specific.

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 brought about the great change in the earth's atmosphere?

What is the difference between the growth of organisms and the growth of crystals?

Is a virus alive? Why or why not?

Classify the following as living or non-living: tissue, DNA, water, blood cell, cow, human hair, mitochondria

Organize these terms from the most to the least complex: proton, snake, the biosphere, cell nucleus, cell, water, and finally, ecosystem.

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

Key Paragraph

The organization of matter, from the smallest subatomic particles to the biosphere, forms a continuum like the one shown in Figure 10.27. Each level is dependent, to some degree, on the levels above and below. Where do we draw the line between living and nonliving? At present, there is no way to decide how complex a system must be before it is called living. The difference between a stone and a cow is obvious. The difference between the simplest living organism and the most complex nonliving system is not so obvious.

EXTEND

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

Pose this question to students and have them write a short paragraph with their thoughts:

Why do you suppose scientists want to know how life on earth started anyway?

12. Close with a short summary.

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