

Science for Students with Significant
Disabilities
Part 5 of 5

Lisa Mangham

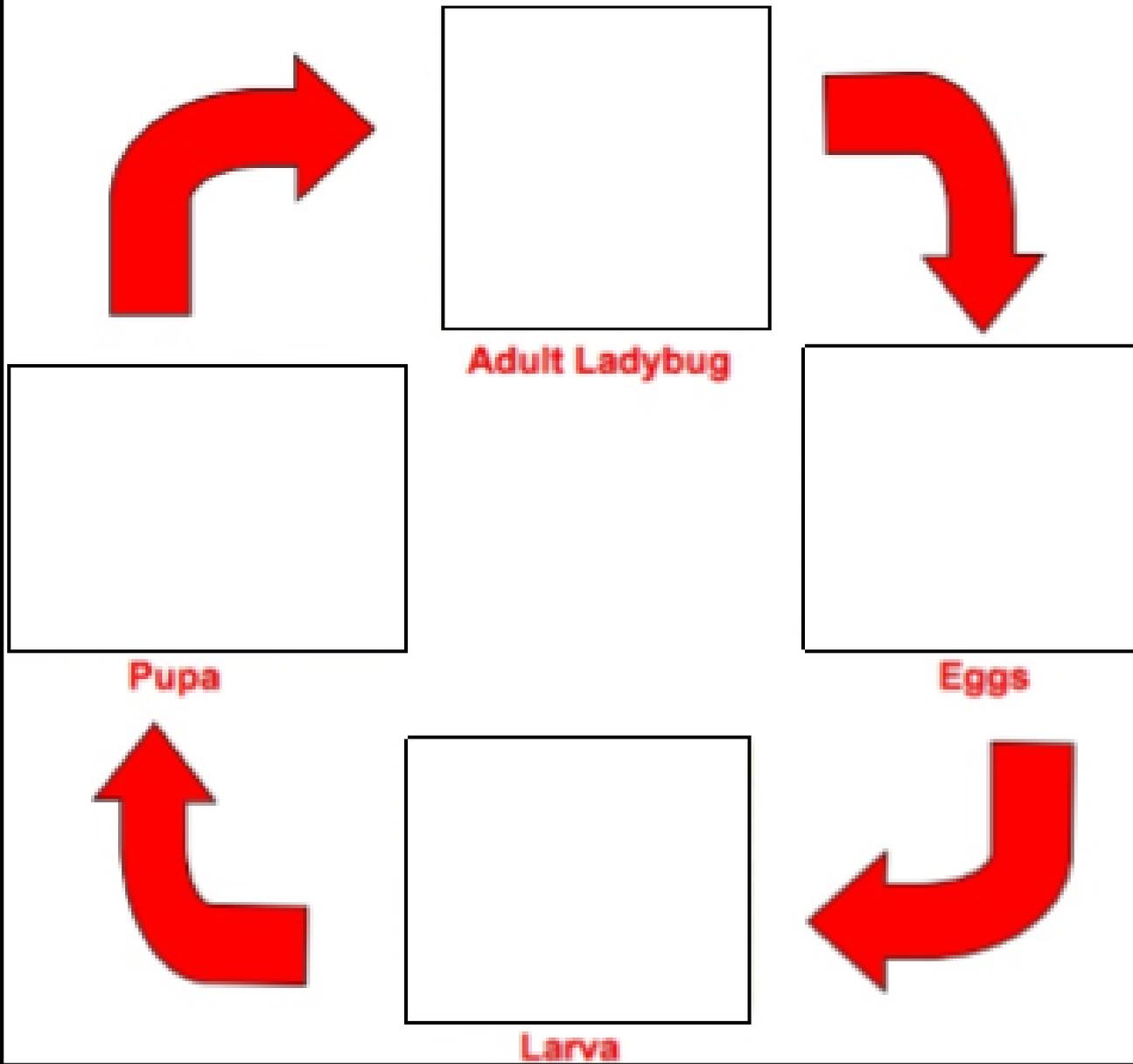
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10th Grade CDL.7.B.8

Life Cycles

Classification and the Diversity of Life	Content Standard 7. Students shall demonstrate an understanding that organisms are diverse.				
<i>Student Learning Expectation</i>	<i>Essence of Student Learning Expectation</i>	Less Complex  More Complex			
CDL.7.B.8 Compare and contrast life cycles of familiar organisms <ul style="list-style-type: none"> ▪ sexual reproduction ▪ asexual reproduction • metamorphosis • <i>alternation of generations</i> Resources: United Streaming, Reproduction	Describe how organisms reproduce and develop	Sequence different metamorphic organisms Examples: Ladybugs, frogs, butterflies	Illustrate types of asexual reproduction Example: Create a visual of one or more asexual processes (e.g., budding, regeneration, binary fission, vegetative propagation)	Distinguish different steps of fertilization Example: Label the steps in the fertilization of an egg	Compare and contrast sexual and asexual reproduction Example: Create a Venn diagram

Life Cycle of a Ladybug CDL.7.B.8



Life Cycles of a Ladybug



The student is learning to identify the life cycles of familiar organisms. 1. She views a video about the life cycle of the ladybug. 2. She is given a chart with the four stages labeled and four objects representing each phase. She is instructed to identify the object representing each phrase and place it on the chart in the correct location. 3. She is shown a photo representation of the eggs. She is then given two objects from which to choose and instructed to identify the eggs. Stephanie looks at her choices, they are eggs and larva. She correctly identifies the eggs.



4. Stephanie places the eggs on the chart in the box labeled "eggs". 5. She continues the task in this manner. 6. Once she has placed all of the manipulatives on the chart, she replaces them with the picture representation. She has successfully demonstrated the ability to identify and sequence the four stages of a ladybug's life cycle.

Life Cycle of a Butterfly



1 Egg 

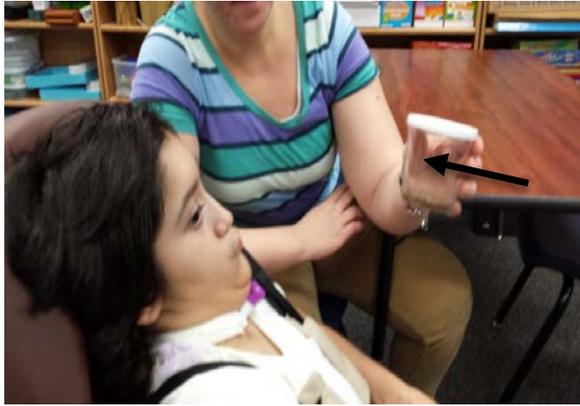
2 Larva (caterpillar) 



3 Pupa (chrysalis) 

4 butterfly 





The student is learning to identify the life cycles of familiar organisms. She has been given the opportunity to watch the transformation of a larva to a butterfly. She observes the larva for 11 days, then records her findings.

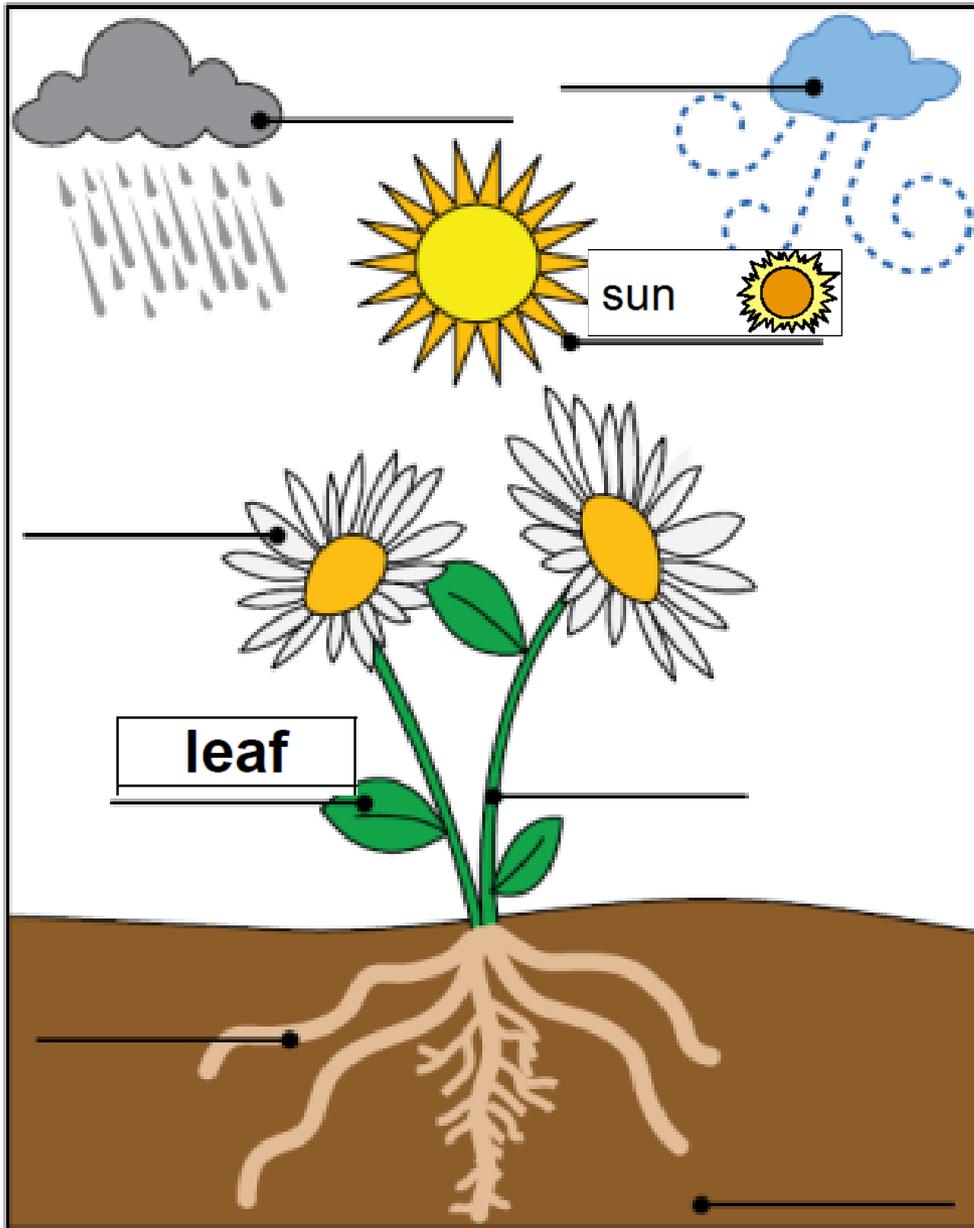


This is an inexpensive activity that the students love!

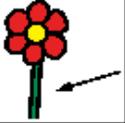
10th Grade CDL.7.B.17

Structure and Function of Major Parts of Plants

Classification and the Diversity of Life	Content Standard 7. Students shall demonstrate an understanding that organisms are diverse.				
<i>Student Learning Expectation</i>	<i>Essence of Student Learning Expectation</i>	Less Complex  More Complex			
CDL.7.B.17 Describe the structure and function of the major parts of a plant: <ul style="list-style-type: none"> ▪ roots ▪ stems ▪ leaves ▪ flowers Resources: Plants	*Identify the various parts of a plant and the corresponding function(s)	Examine a live plant and identify its parts Examples: Lily, zinnia, rose	Label the parts of a plant Example: See diagram in Appendix	Identify the function of each part of the plant. (root, stem, leaf, flower) Example: Label each plant part with the corresponding function(s) by playing pin the function on the plant game	Construct a model of a plant Examples: Create model using clay, paper, chenille wire, foam board, plaster, multimedia slide



Provide picture cues on answer choices if needed.

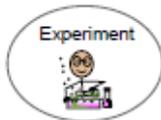
air		soil	
rain		leaves	
roots		stem	
sun		flower	

air	stem
flower	soil

leaf	roots
sun	rain



experiment page



NEED



How Does the Stem Work?



2 white carnations



2 tall vases



red food coloring



blue food coloring



What We Know:

- Plants and flowers need water.
- Flowers have a stem.



Step 1: Ask a Question

- How does water get to the flower?
- What will happen to the flower in the food coloring?



Step 2: Make a Guess / Hypothesis

I think...



The water goes up the stem.



The water comes out of the petals.



The water does nothing.



The flower will stay the same.



The flower will change color.



The flower will die.



Step 3: Do an Experiment

- Fill each vase $\frac{1}{4}$ of the way full of water.



- Add 10 - 20 drops of blue food coloring to one vase. Add 10 - 20 drops of red food coloring to the other vase. (Red and blue can be mixed to make purple, if desired.)



- Cut the stems of the carnations at an angle.



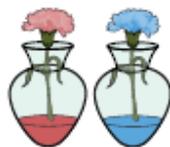


Step 3: Do an Experiment

4. Put a flower in each vase.
Observe for 24 hours.



5. After 24 hours, observe the carnations. Observe the stem, leaves and flower petals.

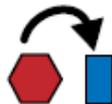


Step 4: Organize Data

What happened to the stem and flower?



It changed color.



nothing



It died.



Step 5: Find the Conclusion

What is the stem's job on the flower?



to get the water to the flower



to stand up tall



Why did the flower change color?



The sun changed it.



The colored water went up the stem.



Does the stem have an important job?



yes



no



Was your guess correct?



yes



no



5th Grade LS.2.5.4

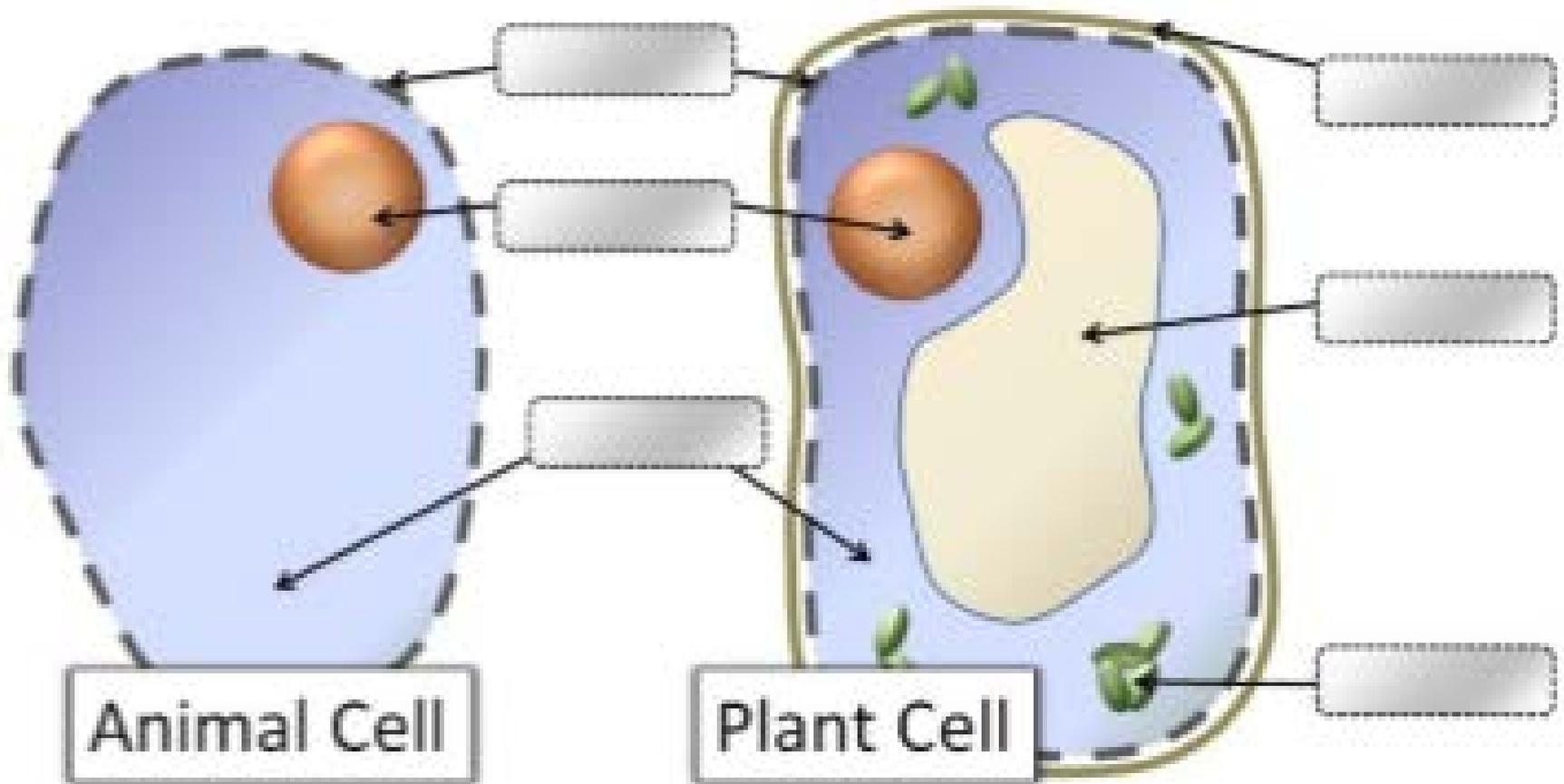
Plant and Animal Cells

Life Science	Content Standard 2: Living Systems: Characteristics, Structure, and Function: Students shall demonstrate and apply knowledge of living systems using appropriate safety procedures, equipment, and technology.				
Student Learning Expectation Grade 5	Essence of Student Learning Expectation	Less Complex  More Complex			
LS.2.5.4- Model and identify the parts of animal cells and plant cells	Identify the cytoplasm, nucleus, and cell membrane of animal and plant cells.	Identify the various parts of an animal or plant cell by matching using a visual model.	Create a model of an animal or plant cell.// Example: --Gelatin- cytoplasm --Orange- (take out pulp and pour gelatin into orange)- cell membrane --Grapes- (nucleus) --Hair gel and found objects in plastic baggie	Dissect food as a representation of an animal or plant cell. Example: -- turtle candy (chocolate- cell membrane, caramel- cytoplasm, nuts- nucleus) -- hot pockets or pita sandwich	Create and label a model of an animal or plant cell. Example: --modeling clay --make turtle candy

10th Grade MC.2.B.5

Plant & Animal Cells

Molecules and Cells	Content Standard 2: Students shall demonstrate an understanding of the structure and function of cells.				
<i>Student Learning Expectation</i>	<i>Essence of Student Learning Expectation</i>	Less Complex  More Complex			
<p>MC.2.B.5 Compare and contrast the structures of an animal cell to a plant cell</p> <p>Resources: Cells</p>	<p>*Demonstrate differences between animal and plant cells</p>	<p>*Demonstrate common structures found in both plant and animal cells (cell membrane, cytoplasm, nucleus)</p> <p>*Example: Using a picture of an animal cell and a picture of a plant cell, identify structures the cells have in common</p>	<p>*Create plant and animal cell models</p> <p>*Examples: Craft foam, edible cell models, colored felt (plant cell model should include chloroplast, cell wall, and large vacuole)</p>	<p>Compare and contrast plant and animal cells</p> <p>Examples: Create a Venn diagram using gallon bags divided into three (3) sections, placing like items in the center section and different items in the outer sections; create a paper Venn diagram</p> <p>See Appendix</p>	<p>Analyze the differences between plant and animal cells</p> <p>*Examples: Observe cells through a microscope and record findings on a lab sheet (plant cell - elodea and animal cell -cheek); draw both a plant and animal cell and label cell structures on both; create a T-chart to compare cell structures; observe plant and animal cells (e.g., video, pictures) and complete observation chart</p> <p>See Appendix</p>

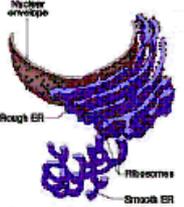
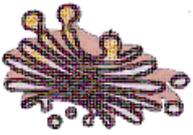
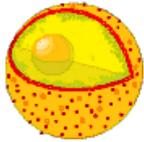


Animal Cell

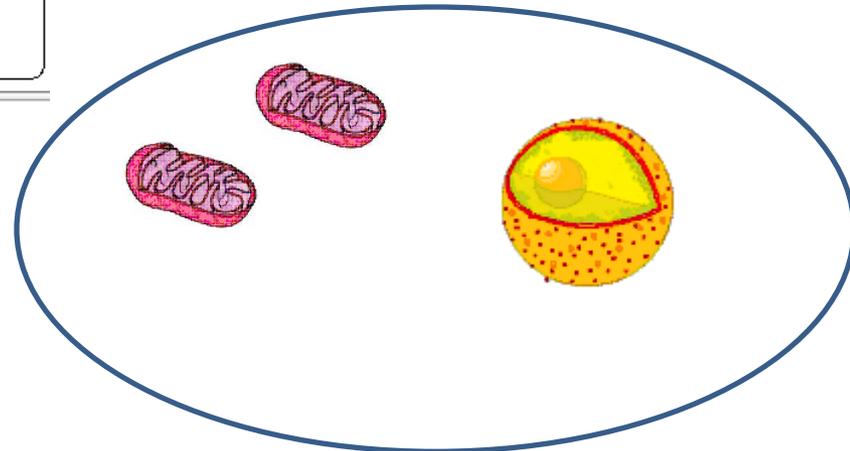
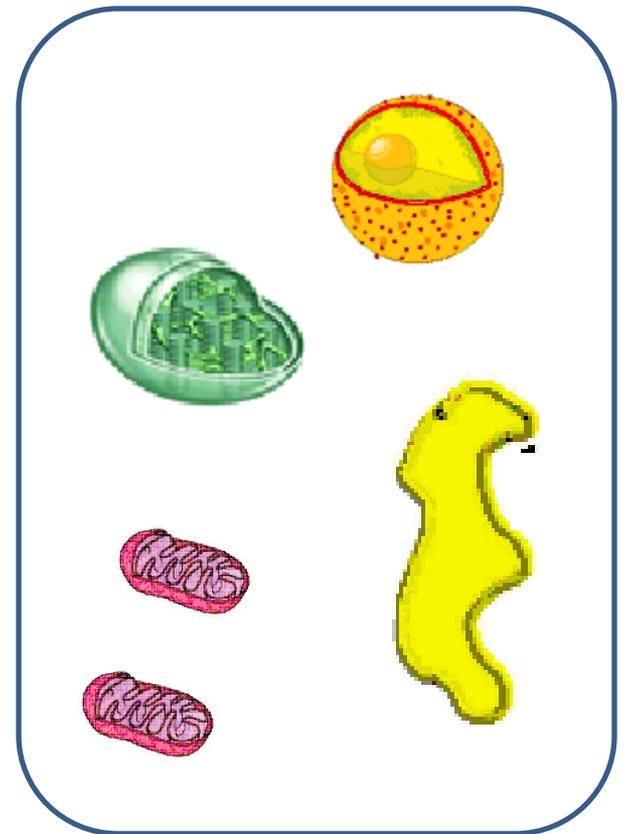
Plant Cell

- Nucleus
- Vacuole
- Cell Wall
- Cell Membrane
- Cytoplasm
- Chloroplast

Communication Overlay

Microtubules 	Chloroplast 	Endoplasmic Reticulum 	Lysosome 
Golgi 	Mitochondria 	Vacuole 	Nucleus 

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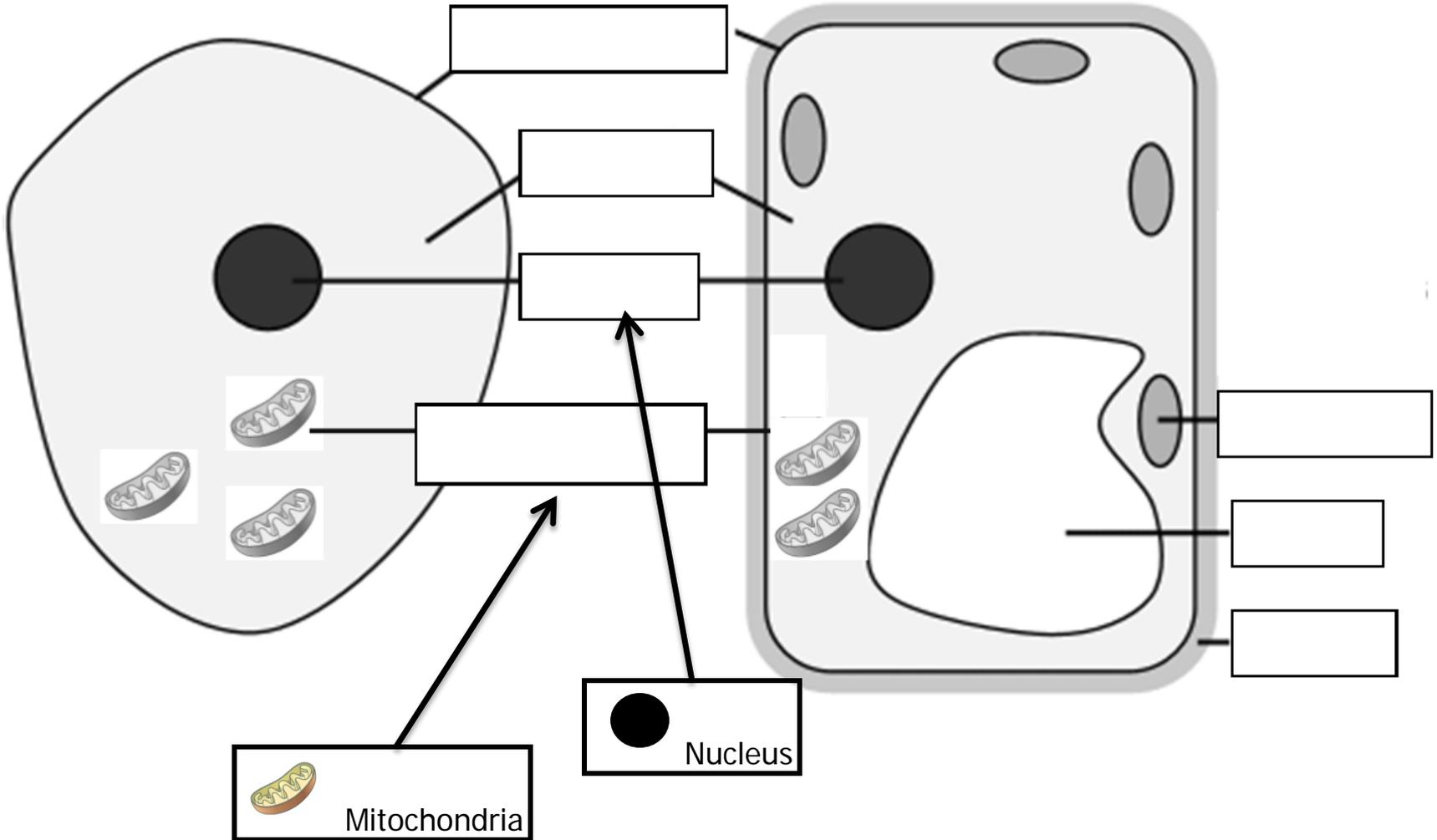


Use the pictures to create plant and animal cells.

Compare/Contrast Plant and Animal Cells

Animal Cell

Plant Cell



Animal and Plant Cells T Chart

LS2.5.4 / MC.2.B.5

Directions: Compare the animal and plant cells by sorting the items into the correct column of the T Chart.

Animal Cells



Plant Cells



Cytoplasm

Cytoplasm

Mitochondria



Mitochondria



Nucleus



Nucleus



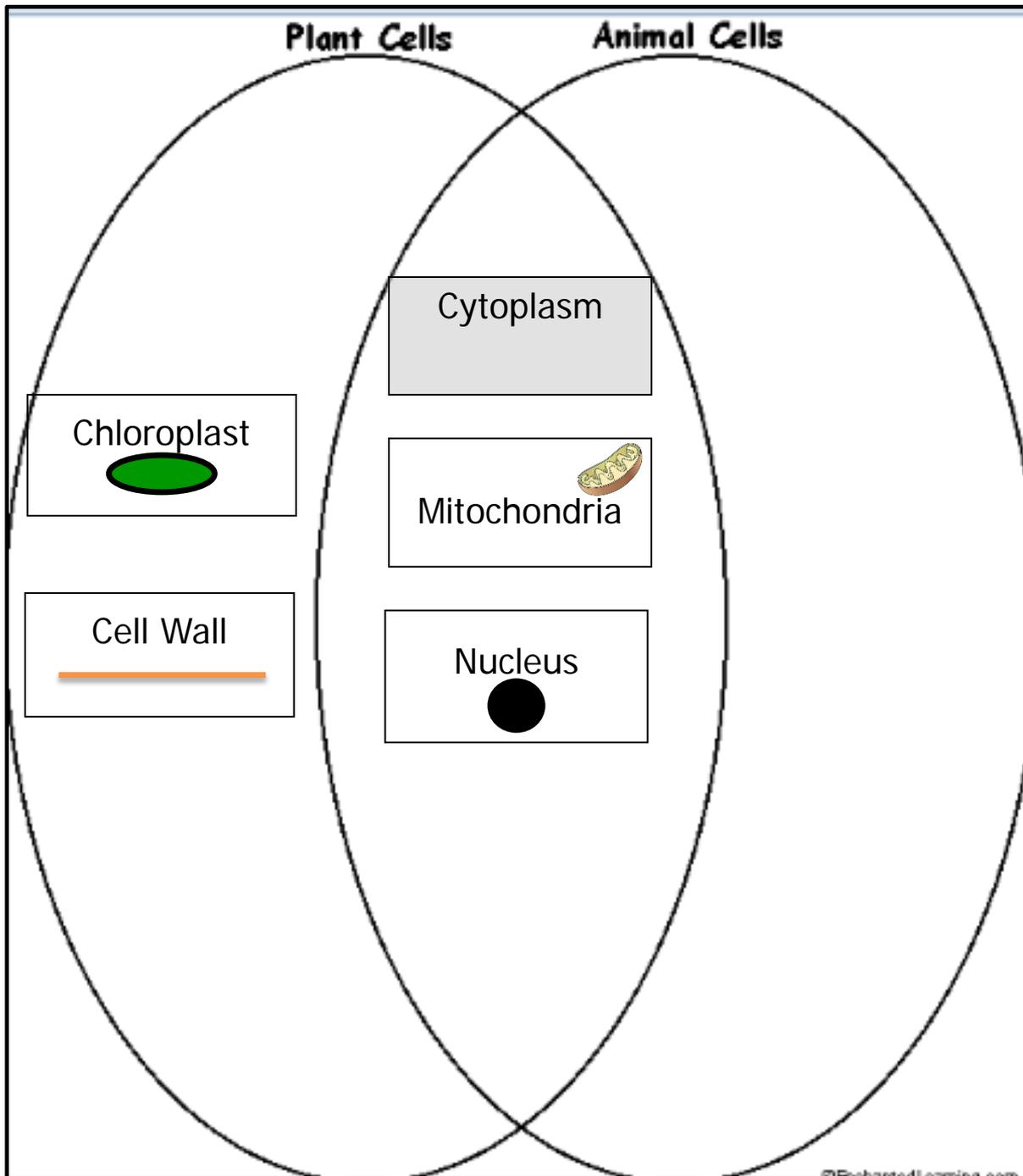
Chloroplast



Cell Wall



Talk buttons with picture cues help non-verbal students communicate their answers. Or simply provide the picture cues and the students can eye gaze or point to the picture representing their choice.



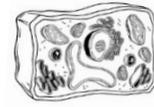


Plant and Animal Cells

LS2.5.4 / MC.2.B.5

Identify the cell structures by cutting the cells out and placing them in the correct column.

Structure	Plant	Animal	Both
Vacuole 			
Mitochondria 			 
Cytoplasm 			 
Nucleus 			
Cell Wall 			
Chloroplast 			
Cell Membrane 			
Ribosome 			



Use Foam Shapes to Create Animal and Plant Cells



When creating a cell model out of manipulatives, make certain the student is shown identifying the necessary components and even if he/she needs a model. Show the student the object he/she is to identify and give him/her two choices from which to choose.

Plant and Animal Cell Models

- PLANT CELL MODEL
 - Cytoplasm small Styrofoam tray
 - Cell Membrane plastic wrap
 - Cell Wall modeling clay, or play dough
 - Nucleus half of one large marshmallow
 - Nuclear Envelope plastic wrap
 - Nucleolus one M & M
 - Chromatin sprinkles
 - Central Vacuole plastic sandwich bag
 - Rough ER clay and sprinkles
 - Smooth ER clay
 - Chloroplasts green clay or play dough
 - Grana green M&Ms
- ANIMAL CELL MODEL
 - Same as plant model without the cell wall, central vacuole, chloroplasts, or grana. Use yarn folded over several times for the Golgi apparatus. Use M & Ms scattered throughout the Styrofoam base to represent vacuoles. Use macaroni noodles scattered throughout the Styrofoam base to represent mitochondria. Stick the scattered organelles to the Styrofoam using small bits of clay or play dough. At the base of the nucleus place two groups of two macaroni noodles at right angles to each other to represent the centrioles.

10th Grade CDL.7.8.7

Evaluate the Medical and Economic
Importance of Viruses



VIRUS

Experiment with Balloon and Confetti



The student demonstrated how germs are spread by blowing up a balloon filled with confetti, popped it with a pin and watched the confetti spread like a virus. The student popped the balloon with a pin and felt the confetti fly and spread across the floor like a virus would spread.

Experiment with Gel and Sequins



After a lesson on how viruses affect life, the student demonstrated how germs are spread by using gel and sequins. The student is blind so the teacher used sequins as germs. He was able to feel the sequins. The student touched the germ covered table then touched his peer. He could feel the germs as they spread to his hands and then to his partner.



experiment page

Experiment



Wash Your Hands!

NEED



washable marker



running water



liquid hand soap



paper towels



What We Know:



- We have germs on our hands.
- Germs can make us and others sick.
- We get rid of germs by washing our hands.



Step 1: Ask a Question



- What is the best way to wash our hands to make sure we get rid of germs?



Step 2: Make a Guess / Hypothesis



I think...

My guess:

	yes	no	
Washing hands with cold water will get rid of germs.			
Washing hands with soap and warm water will get rid of germs.			
Washing hands with soap and warm water, scrubbing for 30 seconds will get rid of germs.			



Step 3: Do an Experiment

Before beginning the experiment, use the washable marker to draw 10 dots on each student's hands. Explain that the dots are pretend germs. If students are not comfortable with you drawing on their hands, draw dots on your own hands. Then have students observe as you try different ways to wash the dots away.

1. Rinse hands in cold water. Count to 5. Dry. Did the germs come off? Chart the results.



2. Put two squirts of soap on hands. Rub hands together. Count to 5. Rinse hands with warm water. Dry. Did the germs come off? Chart the results.



3. Put two squirts of soap on hands. Rub hands together. Count to 30 or sing the alphabet song. Rinse hands with warm water. Dry. Did the germs come off? Chart the results.





Step 4: Organize Data

Did the germs wash off when you...

Washed your hands with cold water?



yes



no



Washed your hands with soap and warm water?



yes



no



Washed your hands with soap and warm water, scrubbing for 30 seconds?



yes



no



Step 5: Find the Conclusion

What is the best way of washing your hands to get rid of germs?



Washing hands with cold water.



Washing hands with soap and warm water.



Washing hands with soap and warm water, scrubbing for 30 seconds.



Was your guess correct?



yes



no



Discussion Questions



- Why is washing your hands after using the restroom or before eating a rule?
- Why is this rule important?
- What might happen if you didn't follow this rule?

10th Grade EBR.8.B.2

Biomes

Ecology and Behavioral Relationships	Content Standard 8. Students shall demonstrate an understanding of ecological and behavioral relationships among organisms.				
<i>Student Learning Expectation</i>	<i>Essence of Student Learning Expectation</i>	Less Complex  More Complex			
EBR.8.B.2 Compare and contrast the characteristics of <i>biomes</i> Resources: Ecology, United Streaming	*Compare characteristics of biomes	*Recognize that there are a variety of biomes on Earth *Examples: Using pictures, group biomes by characteristics (e.g., hot-cold, dry-wet, trees-no trees)	Determine the types of biomes *Examples: Match pictures of biomes to the appropriate name; create a biome collage or notebook	Classify organisms to their biomes Example: Match plants and animals to the appropriate biome	Illustrate the characteristics of a biome *Examples: Create a representation of a biome (e.g., diorama, slide presentation, poster)

SOUTH AMERICAN RAIN FOREST ANIMALS

MONARCH BUTTERFLY



insect

ANACONDA



reptile

JAGUAR



mammal

PIRANHA



fish

POISON DART FROG



amphibian

MACAW



bird

abcteach.com

BIOMES

FLASHCARDS—print 2 for a matching game

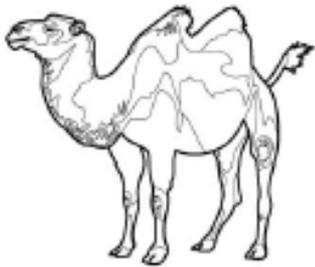
coral reef



savannah



desert



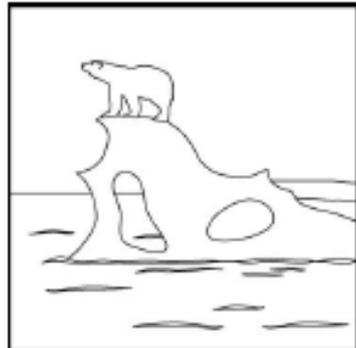
ocean



rain forest



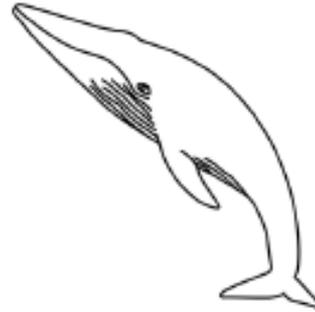
Arctic



MARINE ANIMALS

FLASHCARDS—print 2 for a matching game

blue whale



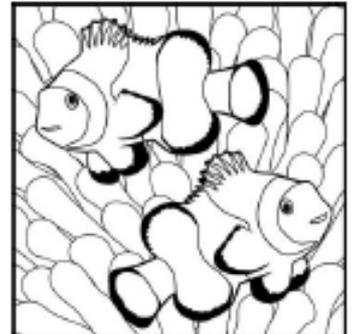
dolphin



shark



clownfish



octopus



jellyfish



RAIN FOREST ANIMALS

FLASHCARDS—print 2 for a matching game

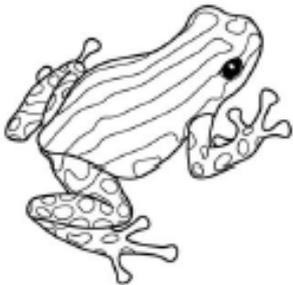
Monarch butterfly



gorilla



frog



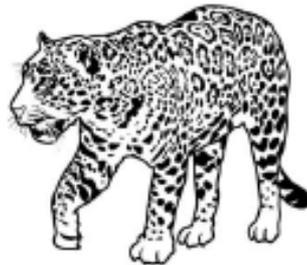
toucan



sloth



jaguar



ARCTIC ANIMALS

FLASHCARDS—print 2 for a matching game

arctic fox



puffin



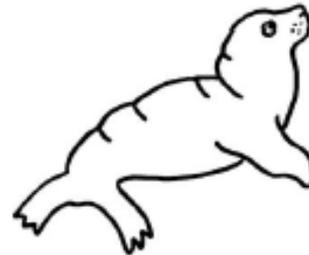
polar bear



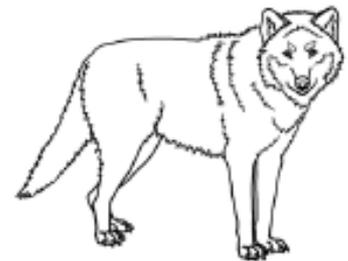
killer whale



seal

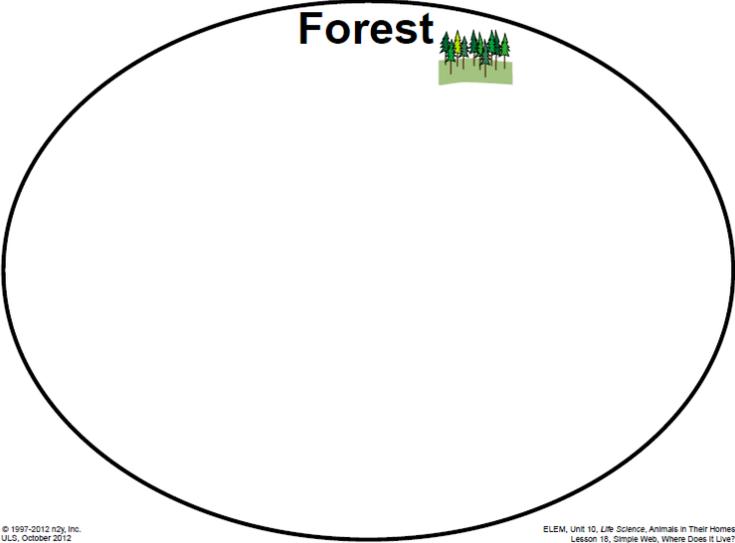


wolf



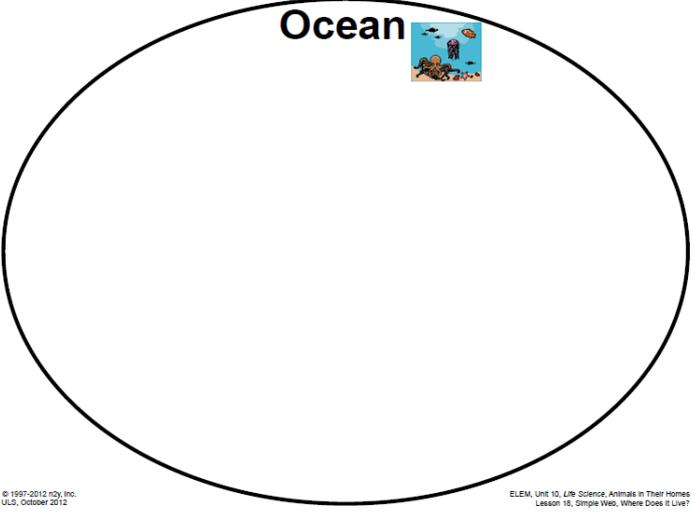
Animal Habitats

Forest 



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Ocean 



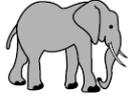
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Jungle 

tiger



elephant



giraffe



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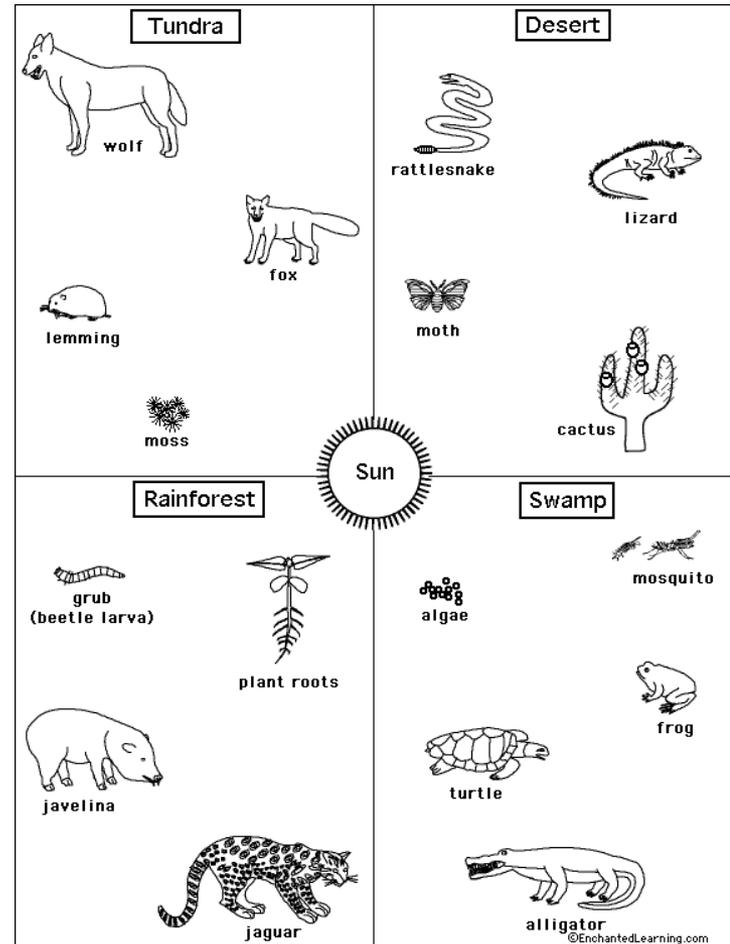
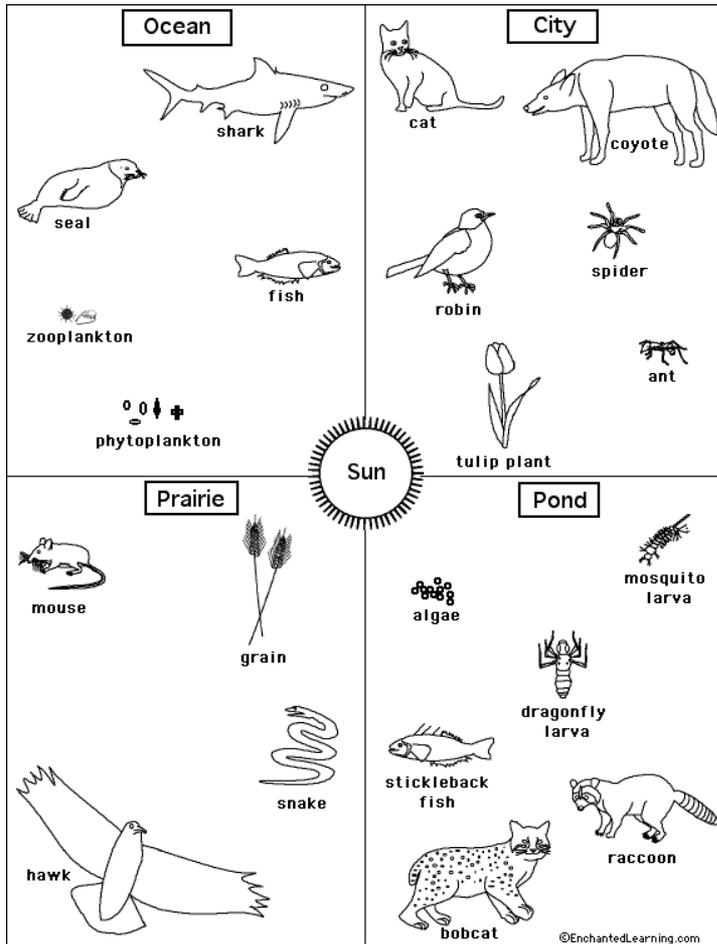
deer 	squirrel 	rabbit 	owl 
chipmunk 	shark 	fish 	whale 
octopus 	starfish 	lion 	monkey 

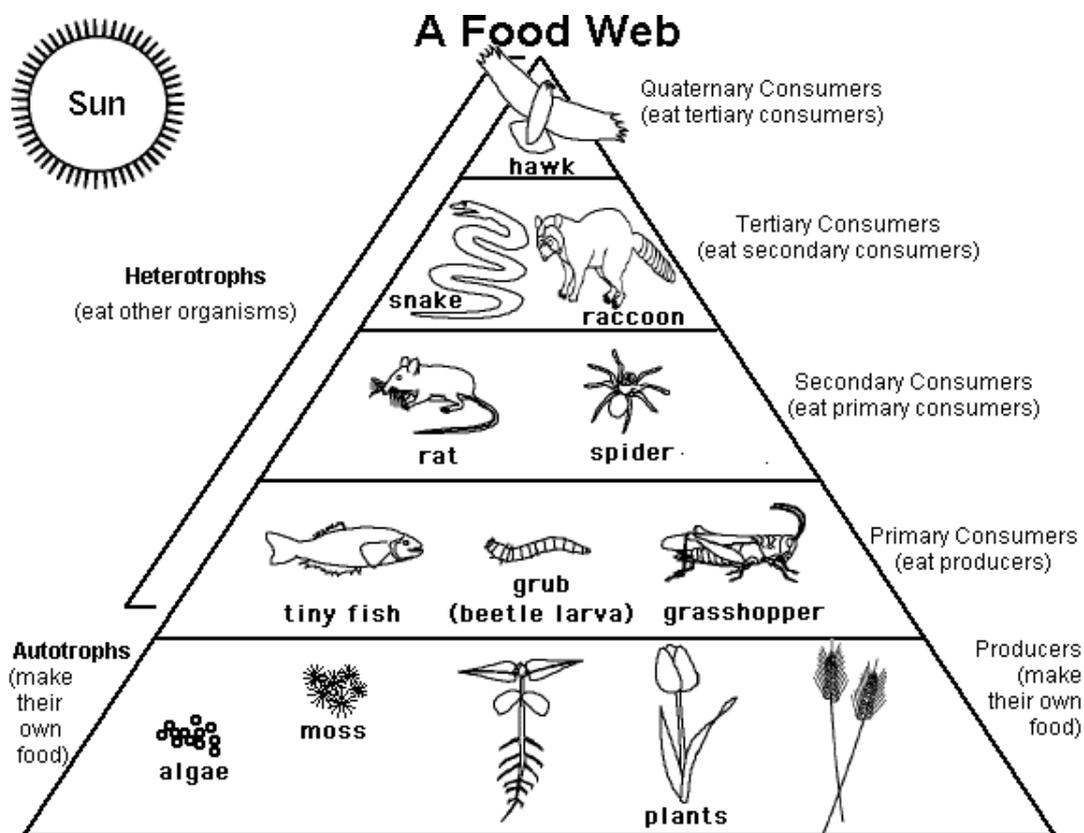
10th Grade EBR 8.B.4

Food Chain & Food Webs

Ecology and Behavioral Relationships	Content Standard 8. Students shall demonstrate an understanding of ecological and behavioral relationships among organisms.				
<i>Student Learning Expectation</i>	<i>Essence of Student Learning Expectation</i>	<i>Less Complex</i>			<i>More Complex</i>
EBR.8.B.4 Analyze an <i>ecosystem's</i> energy flow through food chains, food webs, and <i>energy pyramids</i> Resources: Ecology, United Streaming	Recognize how energy flows through an ecosystem	Recognize that organisms need energy Example: Students respond to questions (e.g., Why do you need to eat? Why do plants need water and sunlight?)	Demonstrate the linear flow of energy in living things Example: Construct a food chain	Distinguish between producers and consumers Examples: Sort pictures; create T- chart or Venn diagram	Describe complex energy flow among living things in an ecosystem Example: Construct a food web indicating the flow of energy through an ecosystem

Food Chains





- There are many more _____
than there are primary consumers.
- Organisms that eat other organisms are called _____.
- Organisms that make their own food are called _____
or _____.
- Grass is _____.
- Zebras (grass-eaters) are _____.
- Lions (zebra-eaters) are _____.