What is Ecology?

WORD BREAKDOWN

Ecology *is the study of relationships between organisms and their environment.*

eco = **home/habitat** *ology* = **study of**

Draw or write about things that you rely on in your own habitat.

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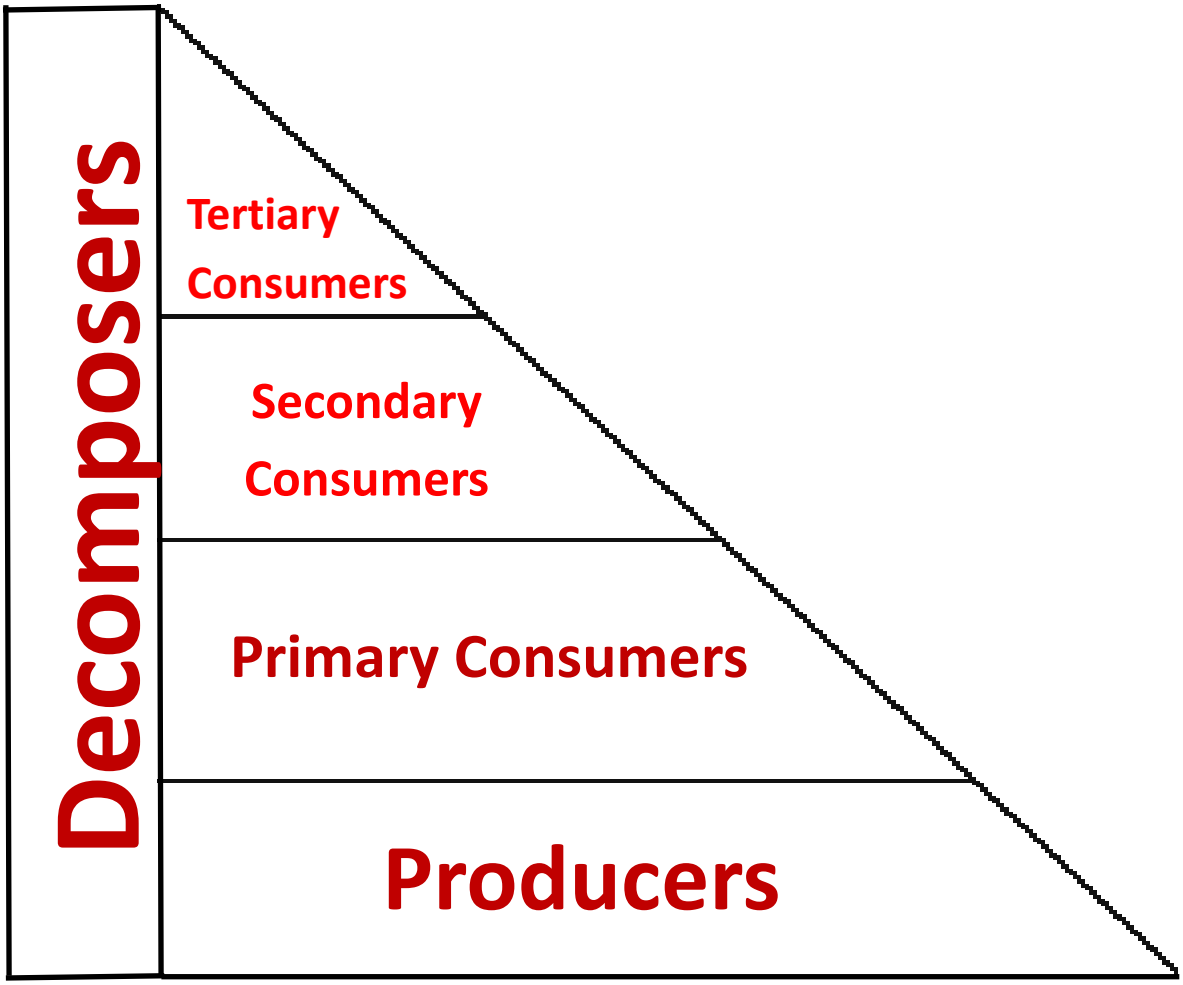
Energy Pyramid

CONSUMERS are HETEROTROPHS.

Heterotrophs eat other organisms to gain energy.

Let's look at how **energy** moves through the ecosystem.
Label and give an example of an organism at each level.



Where does all the energy in an ecosystem ultimately come from?

The Sun

What role do decomposers play in an ecosystem?

Returning nutrients to the smallest most basic elements. Creating soil

WORD BREAKDOWN

Heterotroph

hetero = "other" *troph* = "food or nourishment"

Autotroph

auto = "self" *troph* = "food or nourishment"

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Heterotrophs

Scientists use specific words to say what a consumer eats and when it is active. Fill in the blanks and draw an example for each.

_____ eat plants.

Herbivores

Omnivores eat _____.

Plants and animals

_____ eat meat.

Carnivores

Decomposers eat _____.

Dead things

What characteristics could be evidence of what a consumer eats?

Diurnal = awake _____

_____

Daytime

Crepuscular = awake _____

_____

Dusk and Dawn

_____ =

awake at night

Nocturnal

Why are consumers active at different times?

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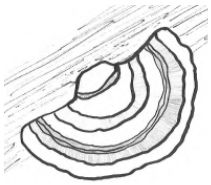
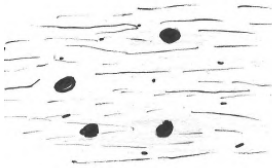
Decomposers

Decomposers are organisms that break down dead plants and animals.

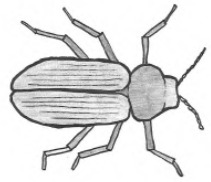
Match each decomposer to the evidence it would leave behind.



white rot fungus

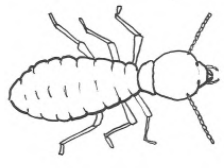


very small holes



boring beetle

stringy white wood



termite

ragged tunnels with wood bits inside

To help you remember what organisms can be decomposers, think of F. B. I.

F = Fungi, B = Bacteria, I = Invertebrates

Did you find any other decomposers or evidence of decomposers? If so, write or draw them here.

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WORD BREAKDOWN

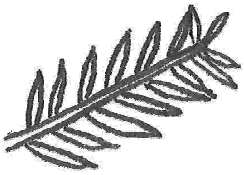
Decomposer

de is the Latin prefix = "opposite of-"

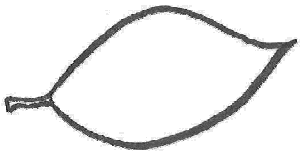
composer is an Old French compound word used to express the idea of uniting two things together

Leaf Characteristics

Type



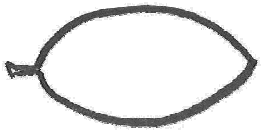
needle leaf



broadleaf

Shape

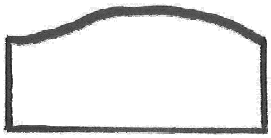
linear



elliptical

Edges

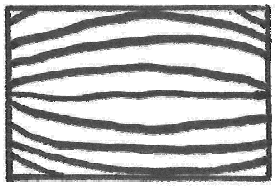
serrated



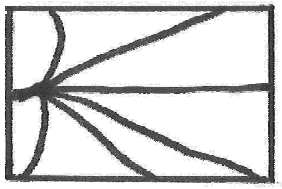
smooth

lobed

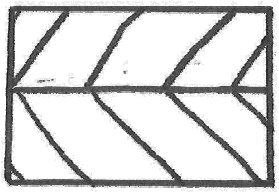
Veins



parallel

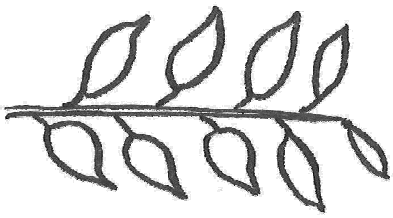


palmate

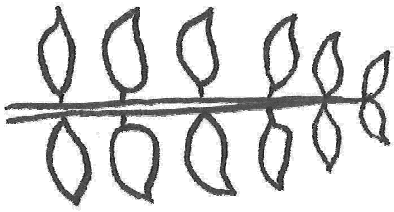


pinnate

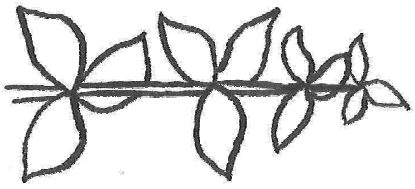
Arrangement



alternate



opposite



whorled

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Resources

Only 1 seed per million lives to become a mature redwood. Once the tree reaches maturity it can produce up to *five million seeds* every year!

A seed needs the perfect circumstances to survive and grow into a mature tree. Label the resources that a plant needs to survive.

This is where the energy comes from to do photosynthesis.

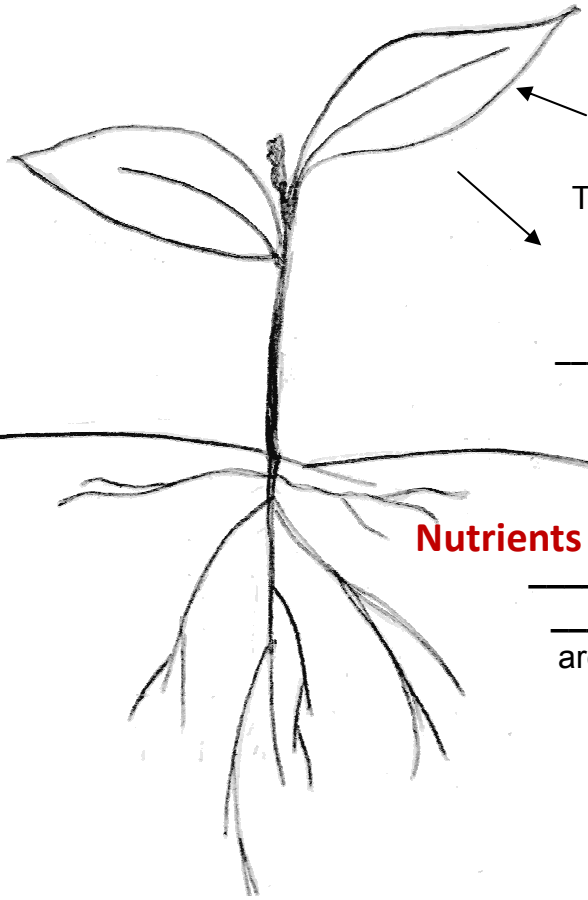
Sun

_____

Plants need the carbon from this gas.

CO2

_____



The plant releases this gas.

Oxygen

_____

The plant uses hydrogen and oxygen from this resource to make glucose.

H2O

_____

Nutrients _____ and **Minerals** _____ are found in the soil.

What can happen if a seed gets too much of a resource?

How can humans help preserve natural resources?

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Elements of a Healthy Forest

There are three main elements that create a healthy forest:
RESOURCES, ADAPTABILITY, and DIVERSITY.
Let's explore how those elements appear in our forest.

Diversity:

Why would even small changes be harmful to an ecosystem with low diversity?

Adaptability:

What are some things that could cause big changes in the forest?

How might the forest adapt to them afterward?

How have trees in your neighborhood adapted to this environment?

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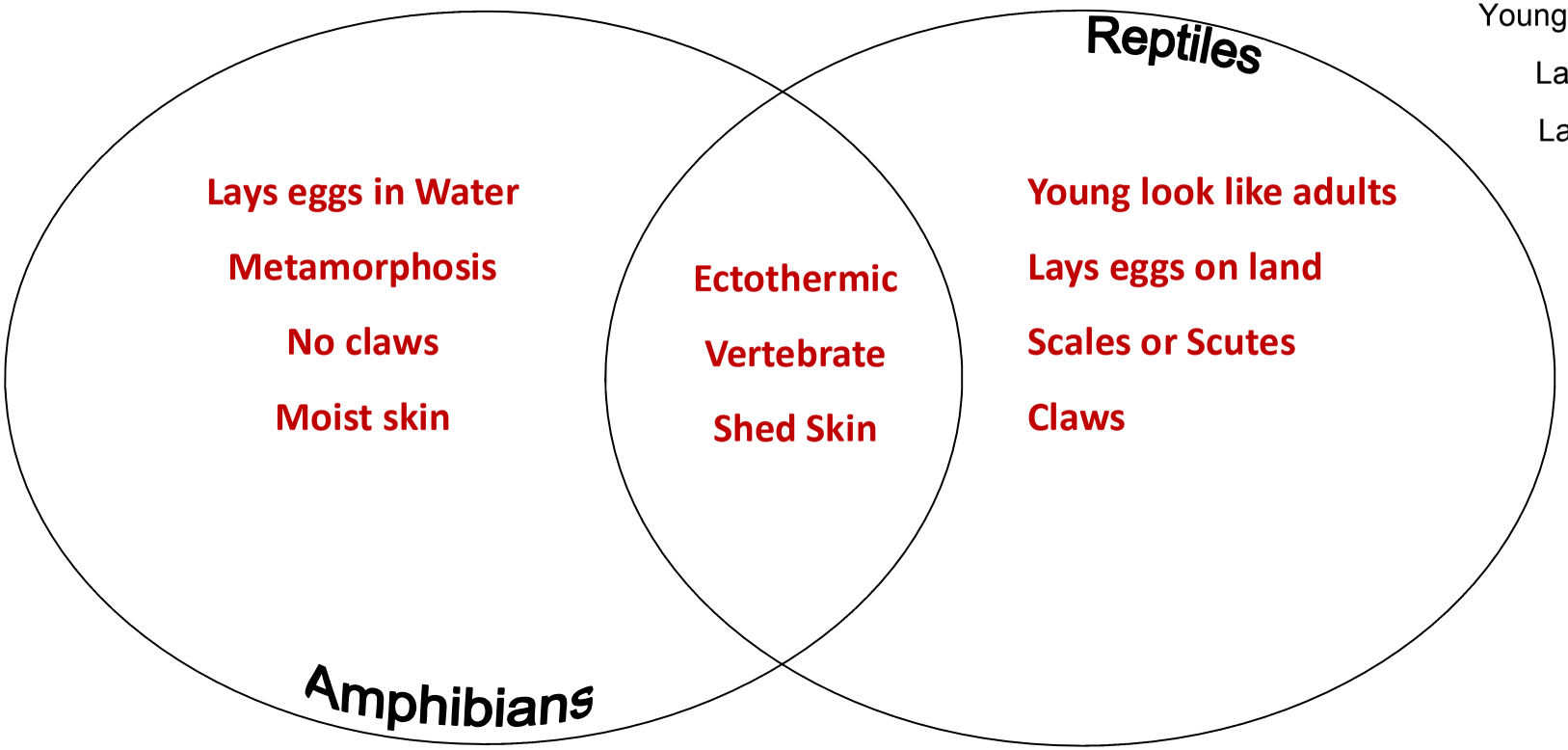
Herpetology

Herpetology is the study of **reptiles** and **amphibians**.
Studying reptiles and amphibians helps scientists see significant changes in the environment.

Reptile or Amphibian?

Using the word bank below, fill out the **Venn Diagram** of key characteristics for reptiles and amphibians. You can add any others that you know.



WORD BANK

Young Look Like Adults
Lays Eggs in Water
Lays Eggs on Land
Metamorphosis
Scales/Scutes
Ectothermic
Vertebrate
Moist Skin
No Claws
Shed Skin
Claws

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WORD BREAKDOWN

Herpetology comes from the ancient Greek *herpeton*
When translated literally it means “creeping thing”
Reptile comes from the Latin *reptile* which shares the same meaning!
“

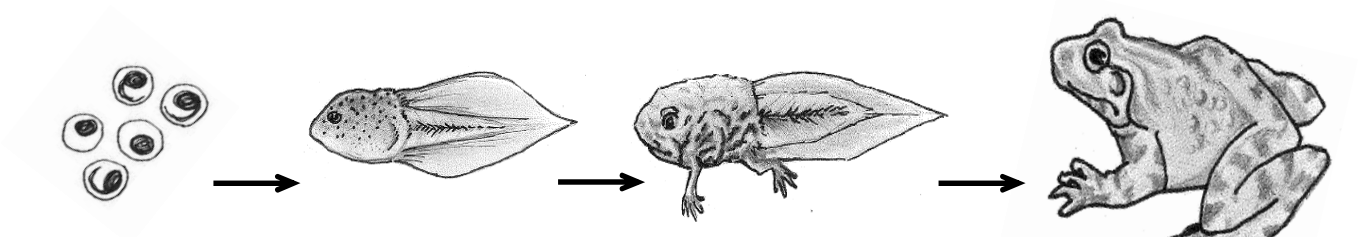
Metamorphosis

Metamorphosis is the process of transformation from an immature form to an adult form in two or more distinct stages.

Fill in the correct terms for these two life cycles.

WORD BANK		
Eggs	Adult	Tadpole
Froglet	Juvenile	Larvae

Eggs **Tadpole** **Froglet** **Adult**



Frog Life Cycle

Salamander Life Cycle

Eggs **Larvae** **Juvenile** **Adult**

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WORD BREAKDOWN

Metamorphosis

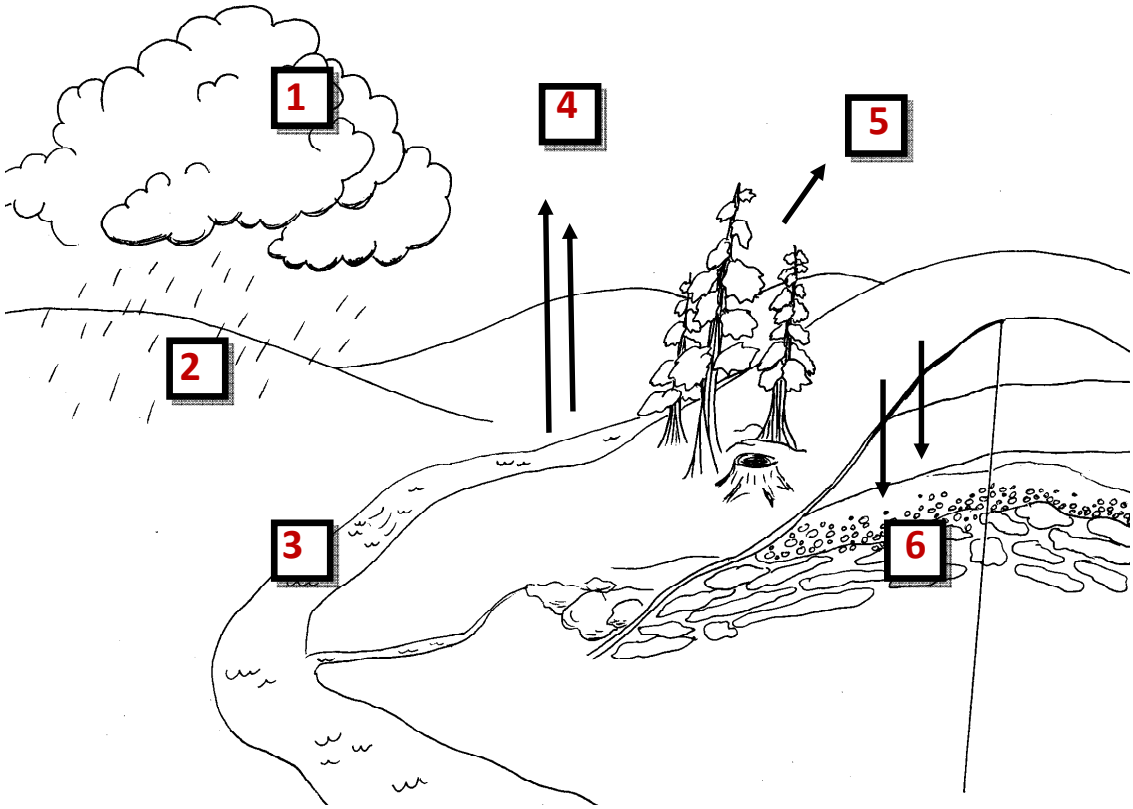
meta = "big or significant" *morphosis* = "transformation"

Amphibian

amphi = "of both kinds" *bios* = "life"

Water Cycle

Number the parts of the water cycle.



1. Condensation
2. Precipitation
3. Run-off
4. Evaporation
5.Transpiration
6. Collection

A Water Droplet's Journey

Tally how many times you visit these locations:

Location	# of Visits	%	Location	# of Visits	%
Cloud					
Glacier					
Groundwater			Ocean		
Plant			Animal		
			Soil		

See water droplet game in separate file

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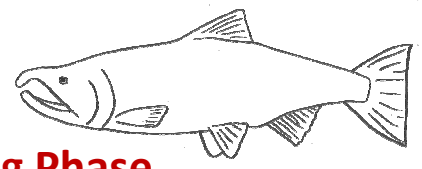
The Story of Salmon

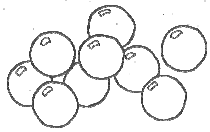
What is something that surprised you about the Coho salmon's journey?

What is a challenge that the Coho salmon must overcome in order to survive?

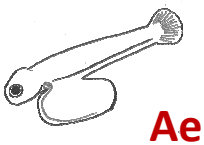
What is a challenge that you have overcome?



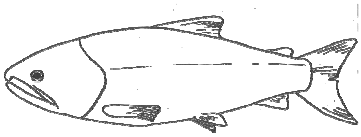
Spawning Phase



Eggs

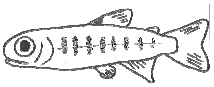


Aelvin

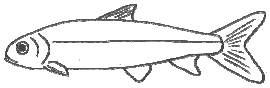


Ocean Phase

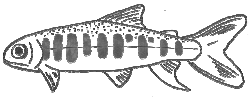
Can you name each phase of the Coho's life cycle?



Fry



Smolt



Parr

Fish Facts...

Salmon prefer cool water, about 55°F.

Salmon prefer water that is neutral (7) on the pH scale.

Salmon prefer lots of oxygen in the water, about 8ppm (parts per million) or more.

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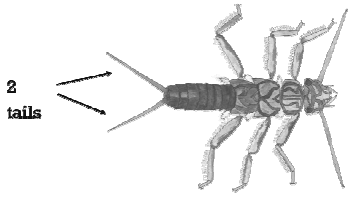
Indicator Species

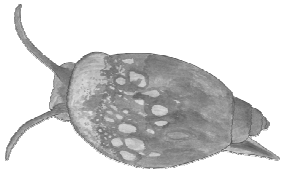
These aquatic macroinvertebrates can give us clues about the water quality at the pond and the stream. Mark down the species you find during you exploration.

Pollution Sensitive

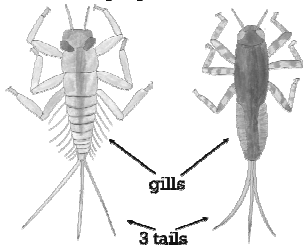
stonefly



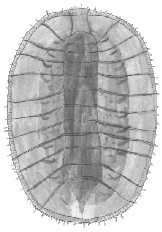
gilled snail



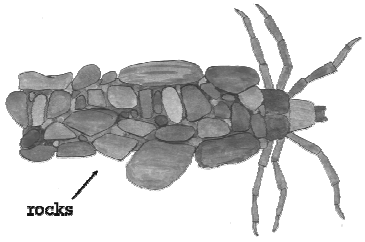
mayfly larva



water penny



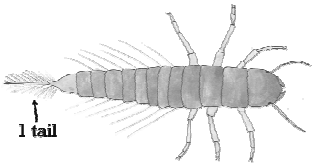
caddisfly larva



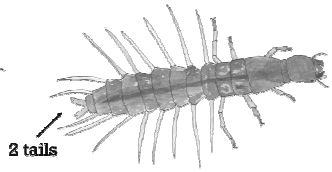
Somewhat Sensitive

cranefly larva

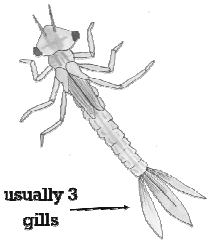
alderfly larva



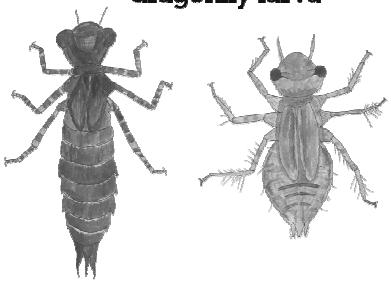
hellgrammite



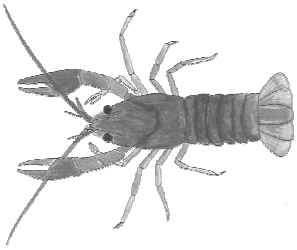
damselfly larva



dragonfly larva

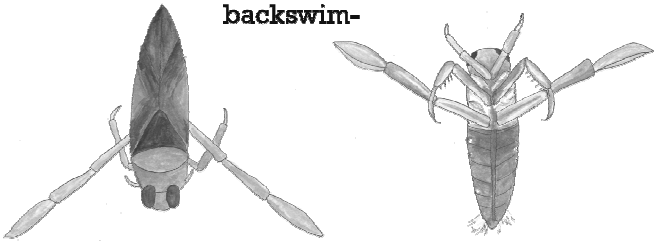


crayfish

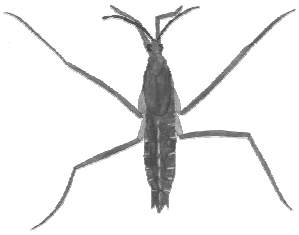


Pollution Tolerant

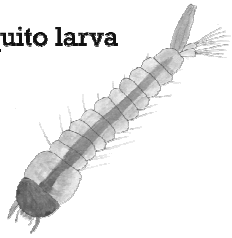
backswim-



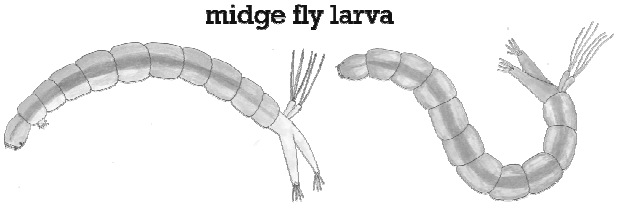
water strider



mosquito larva



midge fly larva



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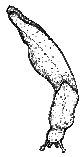
Compare and Contrast



Mark down what you find at each location.

Aquatic Habitat (e.g. pond)			
Air Temperature		°F	°F
Water Temperature		°F	°F
Dissolved Oxygen		ppm	ppm
pH			
Sensitive Pollution	Stonefly Nymph		
	Gilled Snail		
	Mayfly Nymph		
	Caddisfly Larva		
	Water Penny		
Sensitive Somewhat	Damselfly Larva		
	Dragonfly Larva		
	Crayfish		
	Cranefly Larva		
	Alderfly Larva		
	Hellgrammite		
Tolerant Pollution	Water Strider		
	Mosquito Larva		
	Midgefly Larva		
	Backswimmer		

What other similarities and differences are there between different aquatic habitats? What do these clues indicate about the habitat health?

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Geology Rocks!

WORD BREAKDOWN

Geology *is the study of Earth's physical composition and the forces that act on it.*

geo = **earth** *ology* = **study of**

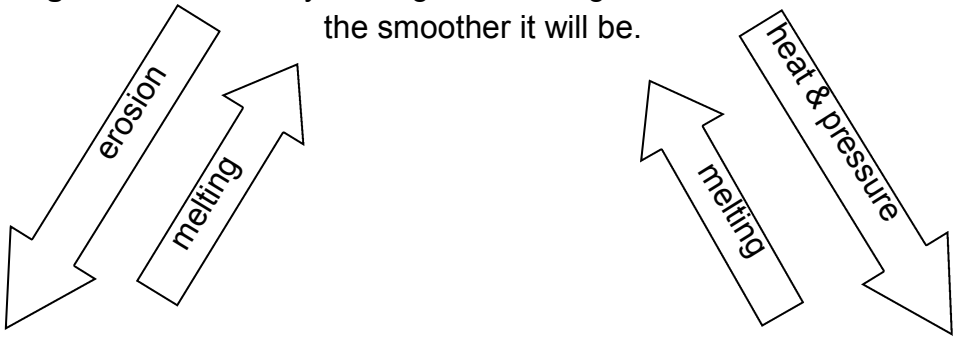
Why aren't all rocks the same?

What are some different characteristics you noticed about the rocks you found?

What methods did you use to determine differences between rocks?

The Rock Cycle

Igneous: formed by cooling lava or magma. The faster it cools, the smoother it will be.



Sedimentary: formed from cemented sediment. (Example: Limestone)

erosion

heat & pressure

Metamorphic: formed by heat and pressure (Example: Marble)

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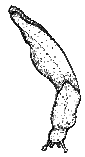
Rock Paint



Discover about rock hardness by experimenting with rock paint!
Make a mark of rock paint on this page in each color you find. Be sure to label which rock it belongs to in your **Nature Journal** notes.

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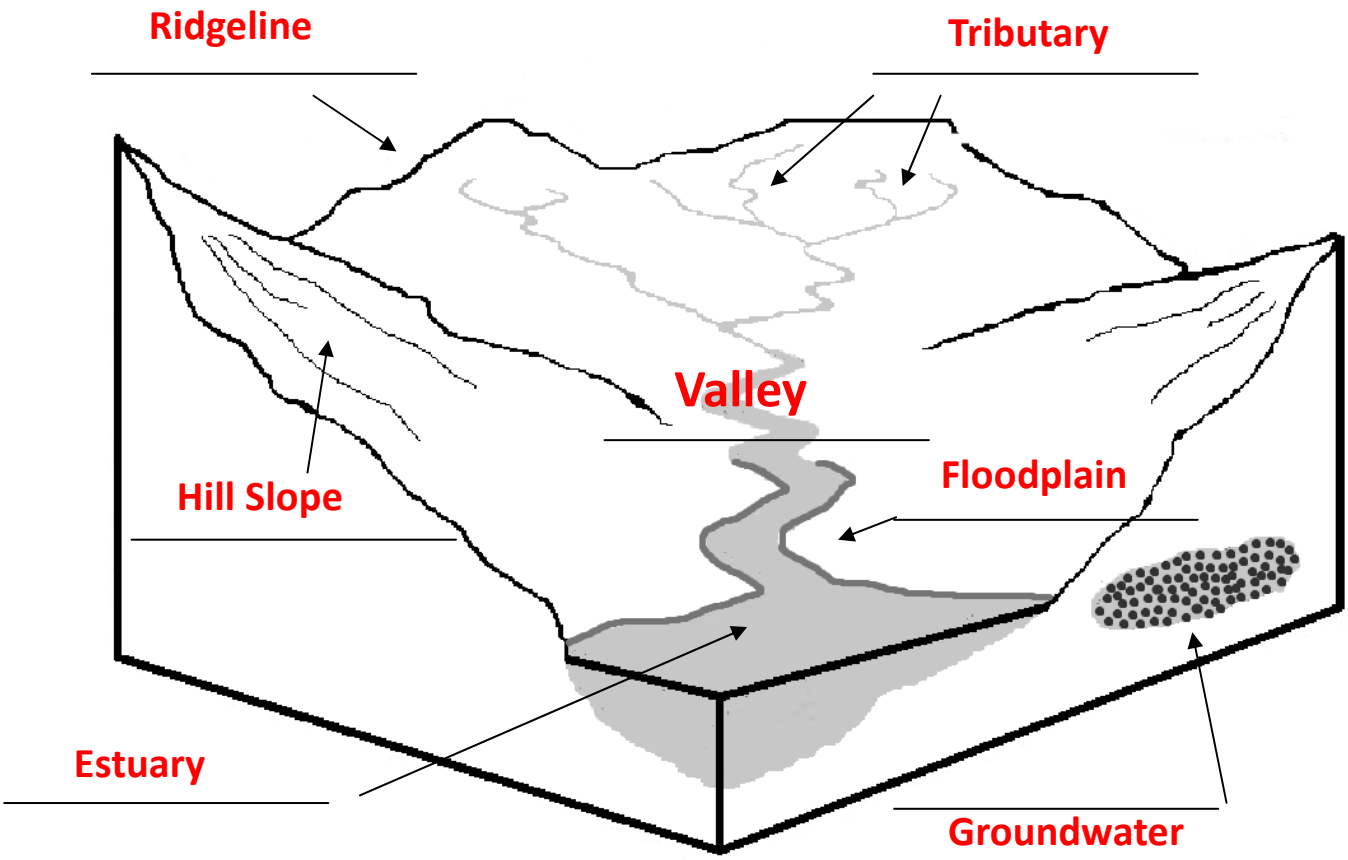
How many colors can you find? Some may give you a hint about what minerals are in the rock.

Nature Journal

Word Bank		
Tributary	Hill Slope	Valley
Groundwater	Floodplain	Estuary
	Ridgeline	

Match the words above to the watershed diagram below.



What are some other features in a watershed not shown here? (ex. Trees, houses…)

Why is it important to know about watersheds?

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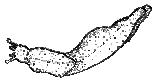


Challenge Zones

1. _____

This is the zone where you normally spend most of your time

2. _____

This is the zone where you are trying new things that you may or may not like. You may feel energized, scared, excited, or nervous.

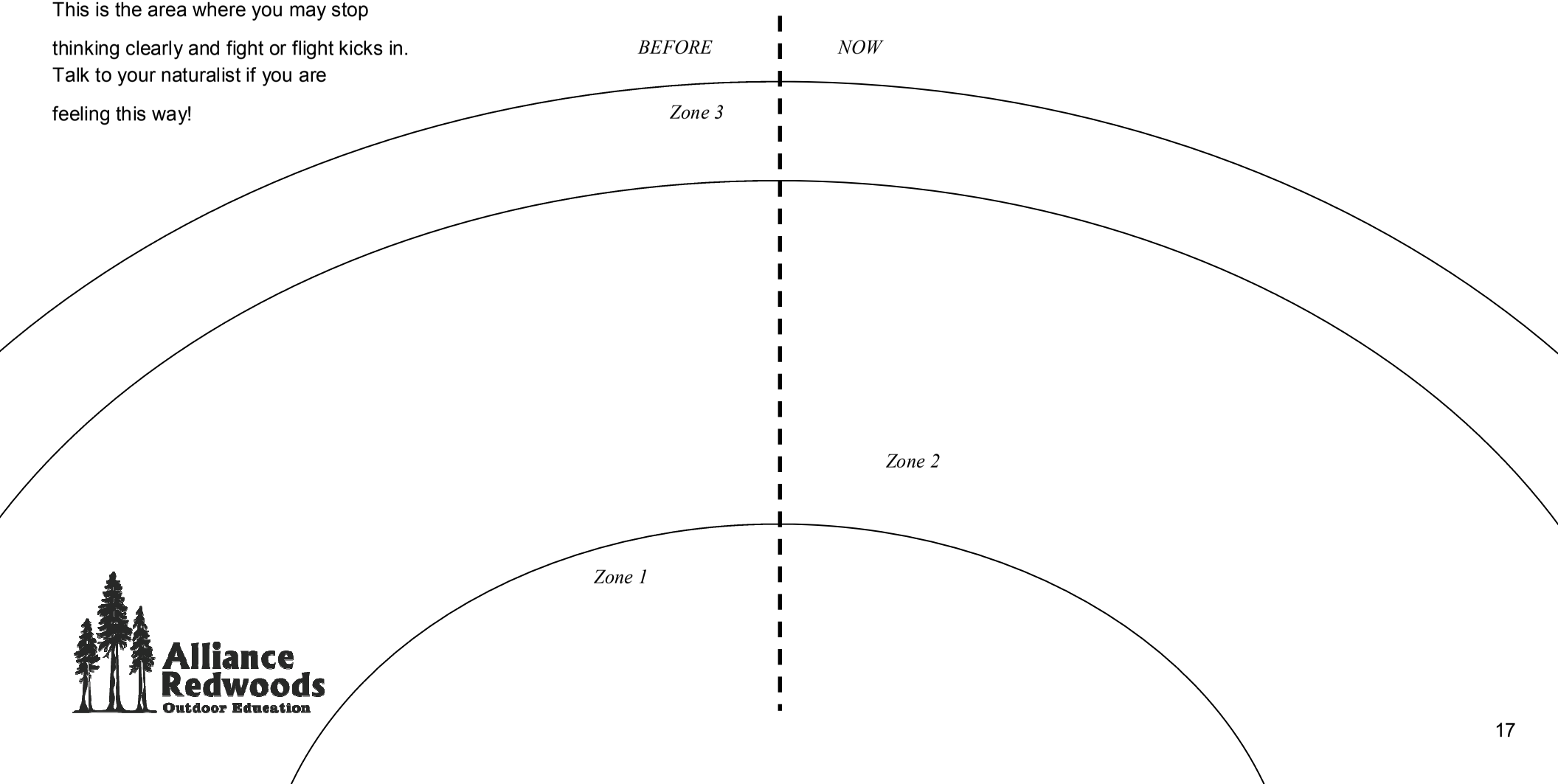
3. _____

This is the area where you may stop thinking clearly and fight or flight kicks in. Talk to your naturalist if you are feeling this way!

GROWTH

As you push into your stretchy zone, your comfort zone also grows. Use these two pages to compare how you felt at the beginning of the school year and now.

Did anything move into your comfort zone?



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Night Hike

How did you feel before your night hike?

What special adaptations do nocturnal animals have?

What did you smell?

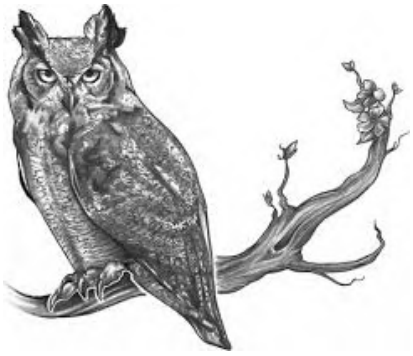
What did you see?

What did you hear?

What did you feel?

What else did you notice?

Describe how you felt before and after the solo time.



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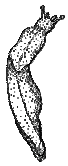
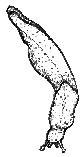


Adaptation Transformation



Please have the following information ready to provide the following information.

Name:

Habitat:

Nocturnal, Diurnal or Crepuscular?

Carnivore, Herbivore, or Omnivore?

Food:

Locomotion: *How does your animal move?*

Adaptations: *How does your animal survive in its habitat?*

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