

Ecological Relationships

Environmental Sciences 11/12

Learning Concepts

- ▶ Unit #1: Okanagan Ecosystems & Animals At-risk
- ▶ Unit #2: Earth's Water
- ▶ Unit #3: Earth's Air
- ▶ Unit #4: Earth's Land
- ▶ Unit #5: Human Impact and Restoration

Okanagan Ecosystems



(b)



(c)



(d)



(a)



(e)

Okanagan Animals At Risk



Earth's Water



Earth's Air



Earth's Land

Display



A mobile device's glass screen is very durable because glassmakers combine its main ingredient, **silica** (silicon dioxide or quartz) **sand**, with ceramic materials and then add potassium.



Layers of indium-tin-oxide are used to create transparent circuits in the display. Tin is also the ingredient in circuit board solder, and **cassiterite** is a primary source of tin.



Gallium provides light emitting diode (LED) backlighting. **Bauxite** is the primary source of this commodity.

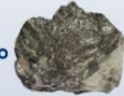


Sphalerite is the source of indium (used in the screen's conductive coating) and germanium (used in displays and LEDs).

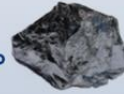


Electronics and Circuitry

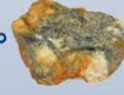
The content of copper in a mobile device far exceeds the amount of any other metal. Copper conducts electricity and heat and comes from the source mineral **chalcopyrite**.



Tetrahedrite is a primary source of silver. Silver-based inks on composite boards create electrical pathways through a device.



Silicon, very abundant in the Earth's crust, is produced from the source mineral quartz and is the basis of integrated circuits.



Arsenopyrite is a source of arsenic, which is used in radio frequency and power amplifiers.



Tantalum, from the source mineral **tantalite**, is added to capacitors to regulate voltage and improve the audio quality of a device.

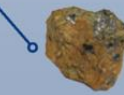


Wolframite is a source of tungsten, which acts as a heat sink and provides the mass for mobile phone vibration.

Battery



Spodumene and subsurface brines are the sources of lithium used in cathodes of lithium-ion batteries.



Graphite is used for the anodes of lithium-ion batteries because of its electrical and thermal conductivity.



Speakers and Vibration

Bastnaesite is a source of rare-earth elements used to produce magnets in speakers, microphones, and vibration motors.



Human Impact and Restoration



Classroom Expectations

- ▶ How do we act as a learning community?
- ▶ How do we bring out the best in others learning?

Environmental Sciences 12
Course Outline
Quarter 3 (Feb 1 – April 22)



Mrs. Becker

sbecker@sd67.bc.ca
www.beckersciences.weebly.com
 250-770-7650

Welcome to Environmental Sciences 12. In this course we will focus on appreciating the world around us. We will

The topics and units covered in this course are:

- Ecology and Endangered Species
- Water (fresh and ocean)
- Land (sustainable resources management)
- Air (climate change and global atmosphere patterns)

There are many actions you can take in order to be successful in this course:

- Be present in class with all necessary tools
- Be committed to your learning
- Hand in projects on time
- Use my website to access videos that will help reinforce the concepts
- Have a problem solving curiosity
- Come in for extra help (each morning 8am – 8:30am)

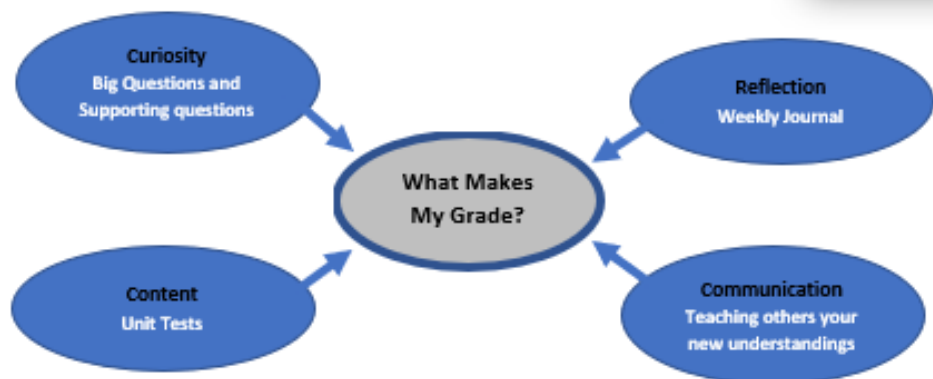
If you are away, visit my website to find out what you missed and try to complete it while away. You can also email me if you have any questions

Your Course Grade:

On the back of this page is the list of individual learning goals that we will be covering in this course. As we move through our projects and unit tests, be sure to write down your scores so that you can keep track of your progress.

Each learning goal will be marked on a 1 – 4 scale. See below for a translation of what that means:

Category	Level	What Does This Mean?
Sophisticated	4-/4+	I can tie several concepts together and make connections
Proficient	3	I am consistently showing understanding
Developing	2	I am starting to understand, but have gaps
Beginning	1	I have not shown enough understanding to pass
No Evidence	NE	I did not attempt this concept



Your final grade will be 80% learning goals and 20% final exam.

One day each week will be a “from the land” learning. We will be either hosting a guest into our classroom space, or heading out to a different part of the Okanagan to learn on the land. For these field trips. These programs and field trips do have a cost. We will be charging students \$40 for the bus costs and programming costs. If this is a challenge at this time, please contact me at sbecker@sd67.bc.ca.

Field Trips: (details and dates TBA)

- Conkle Mountain
- Giants Head Mountain
- Skaha Bluffs
- Hardy Falls (Peachland)
- Vaseux Lake Pictographs
- SORCO (Raptor Society)
- ONA Trout Hatchery
- Summerland Trout Hatchery
- Water Treatment Plants Summerland

Programs:

- Hunting Presentation (SD67 Indigenous Programs)
- Tea Harvest (SD67 Indigenous Programs)

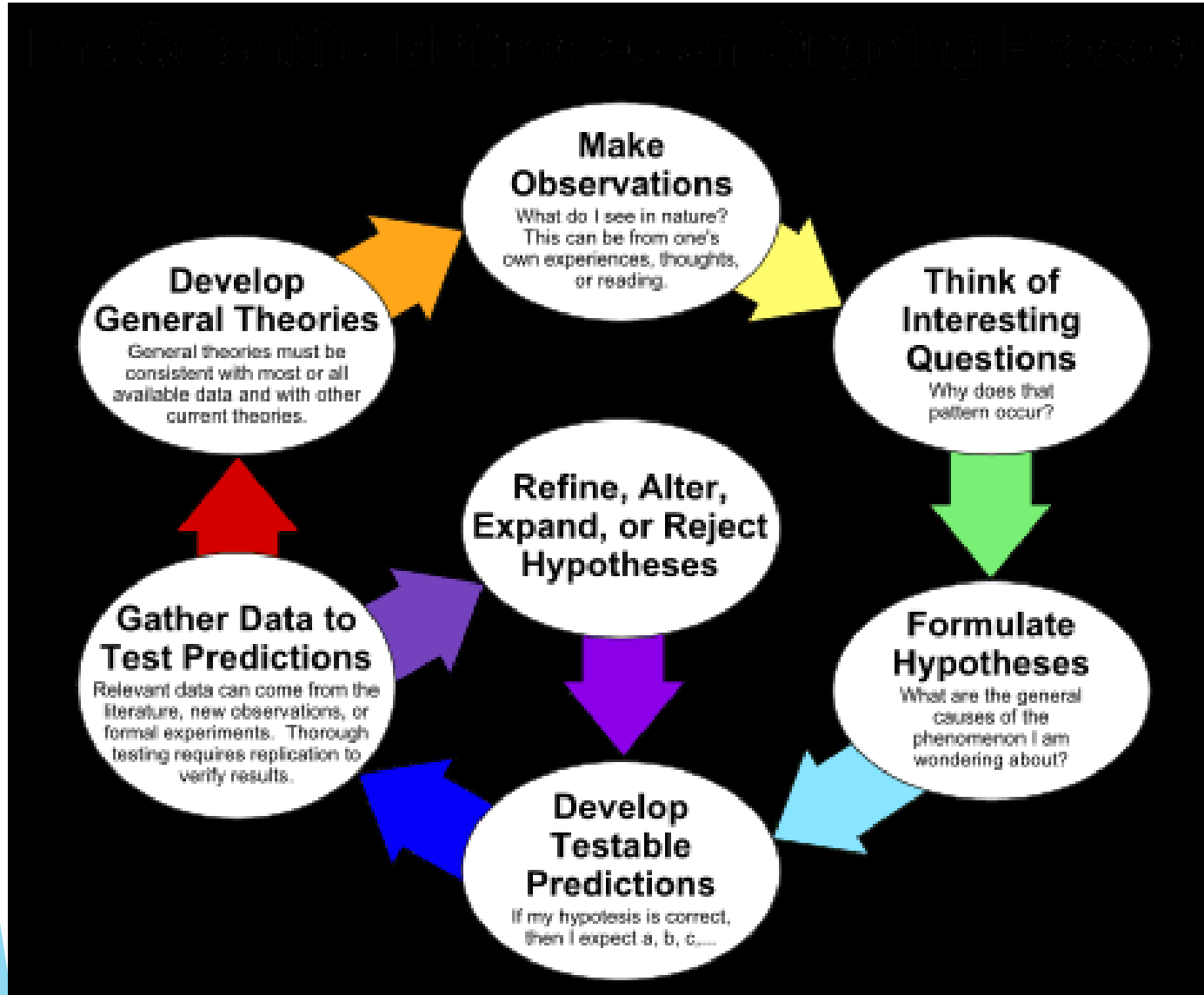
If something is worth doing, it is worth doing to the best of your ability!

Field Trips

- ▶ Learning from the Land
- ▶ Community Clean Up, Lake Clean Up
- ▶ Garden (along Main St)
- ▶ Water Quality, Water Treatment, etc
- ▶ Restoration Projects
- ▶ Hatchery (Summerland and Syilx)
- ▶ Local Farms
- ▶ Pictographs

There will be a \$40 fee for programs and bus costs

Acting Like A Scientist



A Scientist
is someone who...

observes
and
wonders

shares
their ideas
and
discoveries

listens to
the ideas
of others

explores
the world
around
them

asks
questions

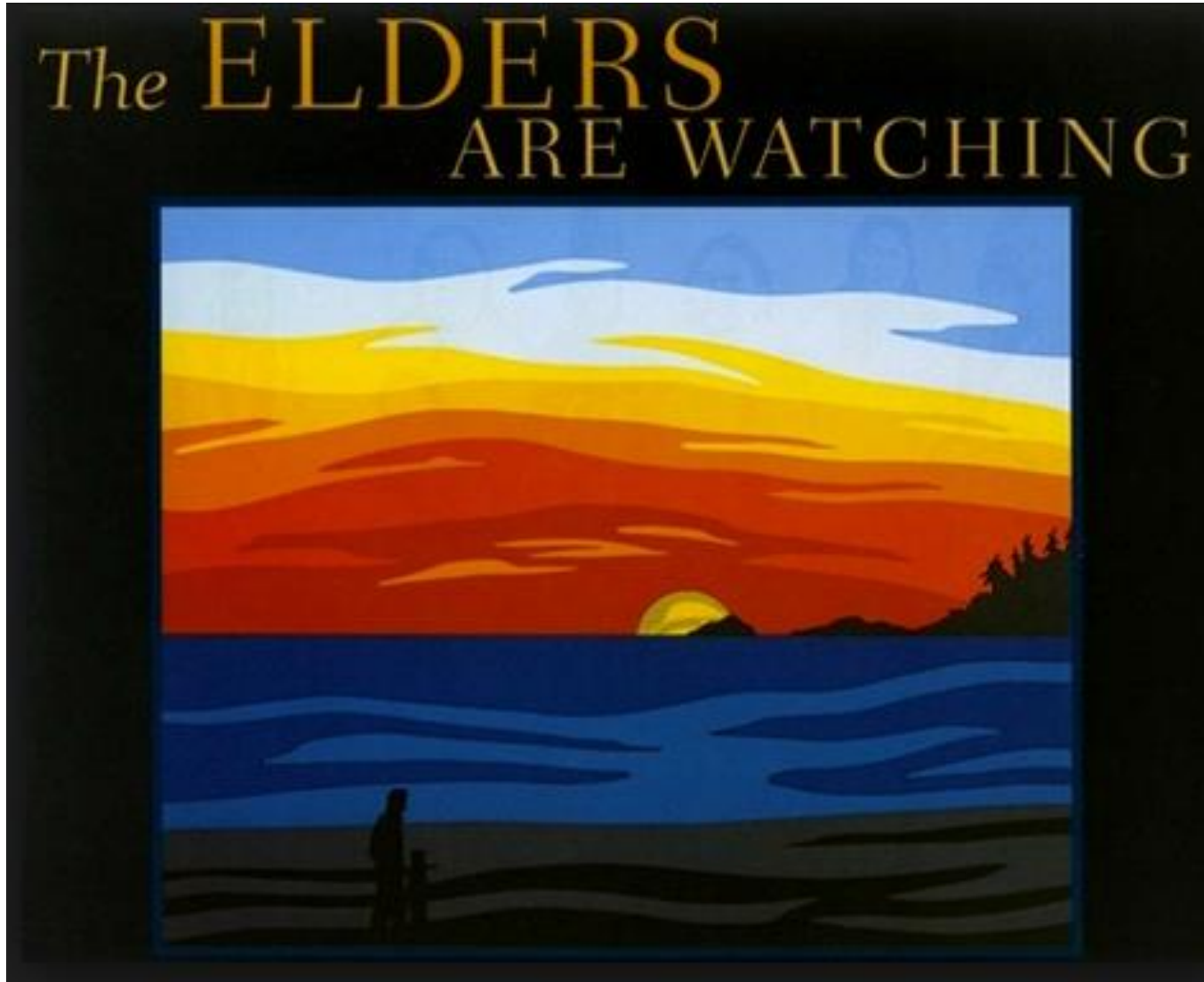
uses
tools to
solve
problems

conducts
experiments

A Scientist
is someone like you!

©2011 Kaitlyn Adams

The Elders Are Watching

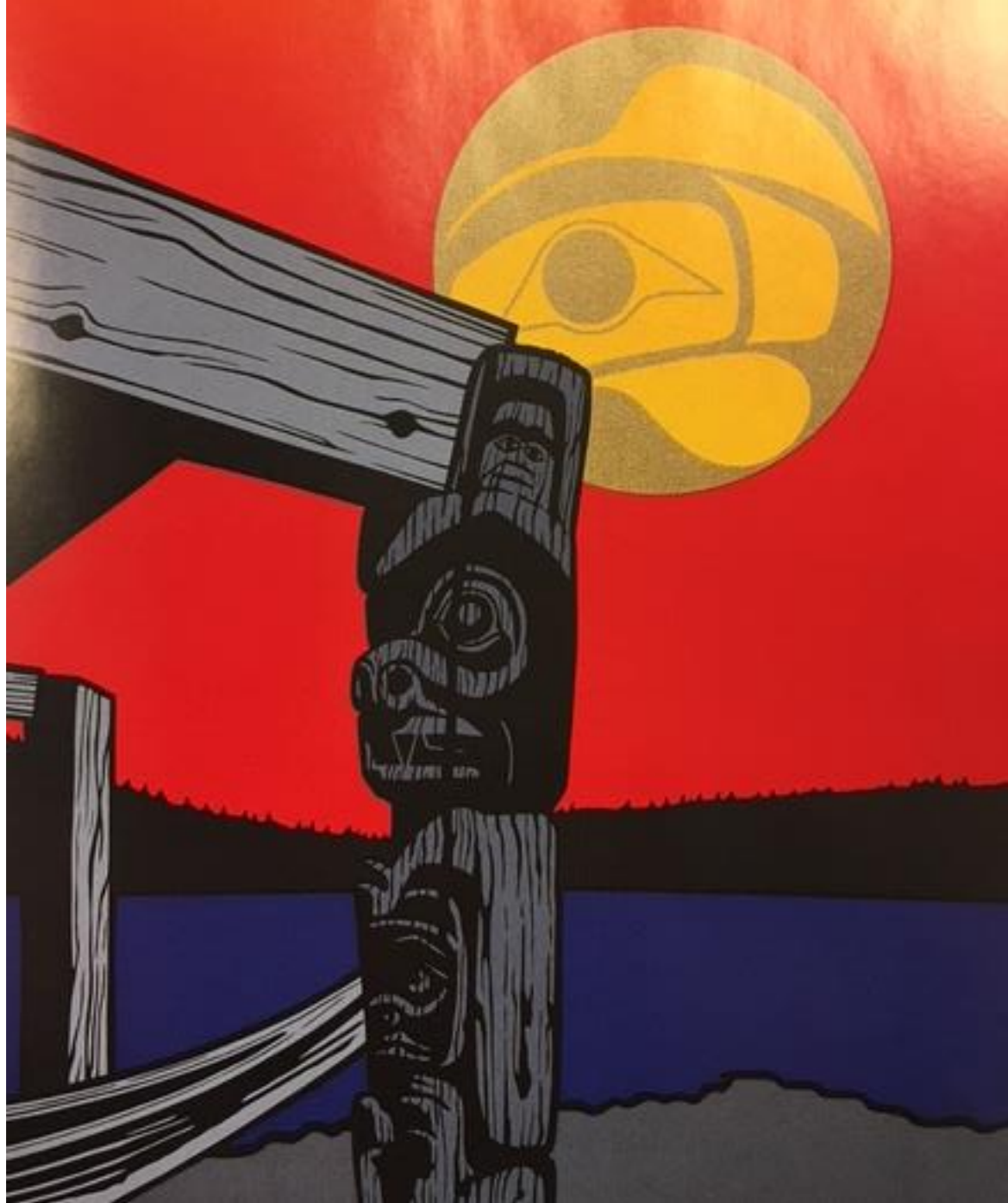


Shoulder Partner Discussion

1. What is the message you heard from this story?
2. What is the most impactful change that humans have caused on our Earth?

























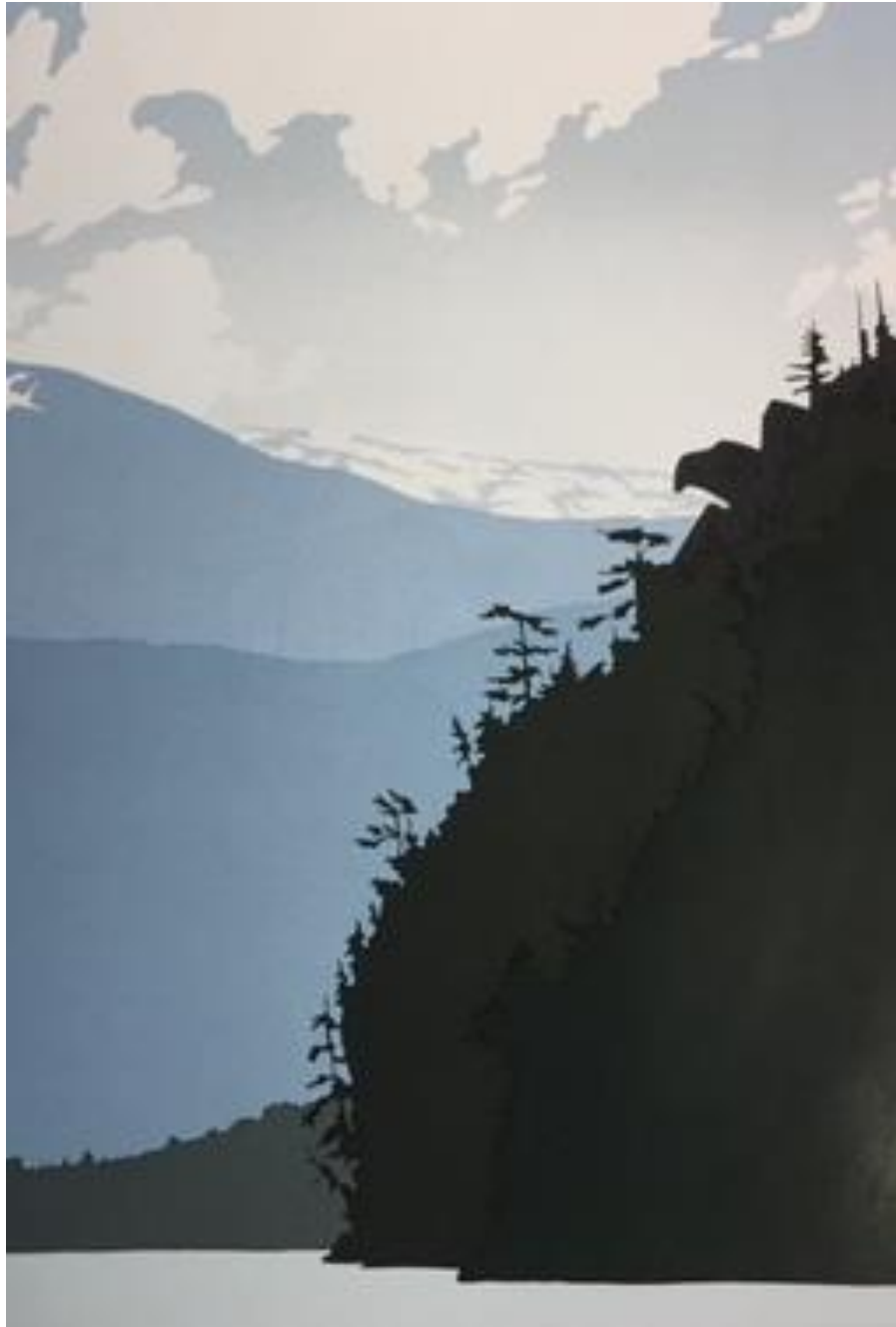
















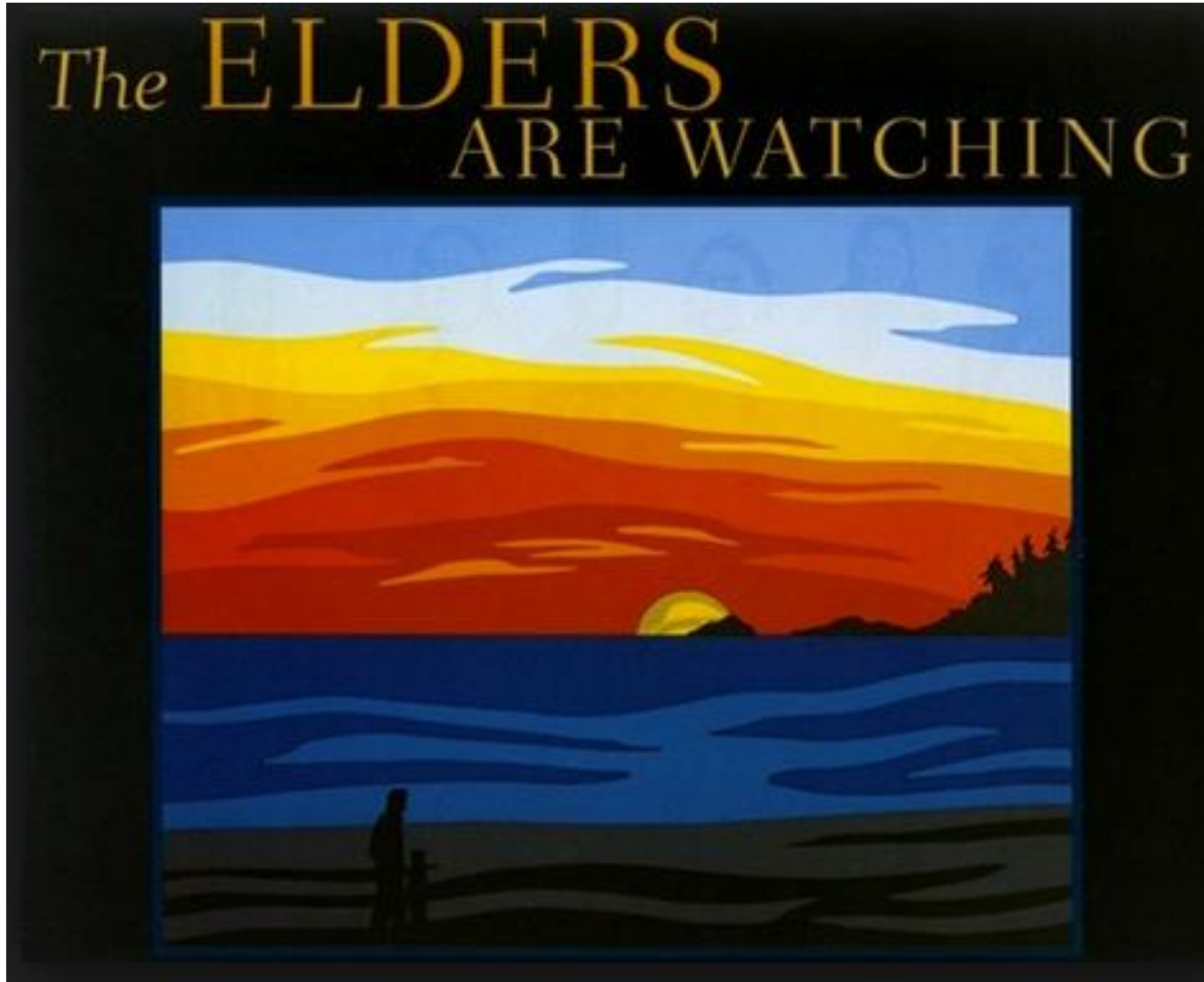








The Elders Are Watching

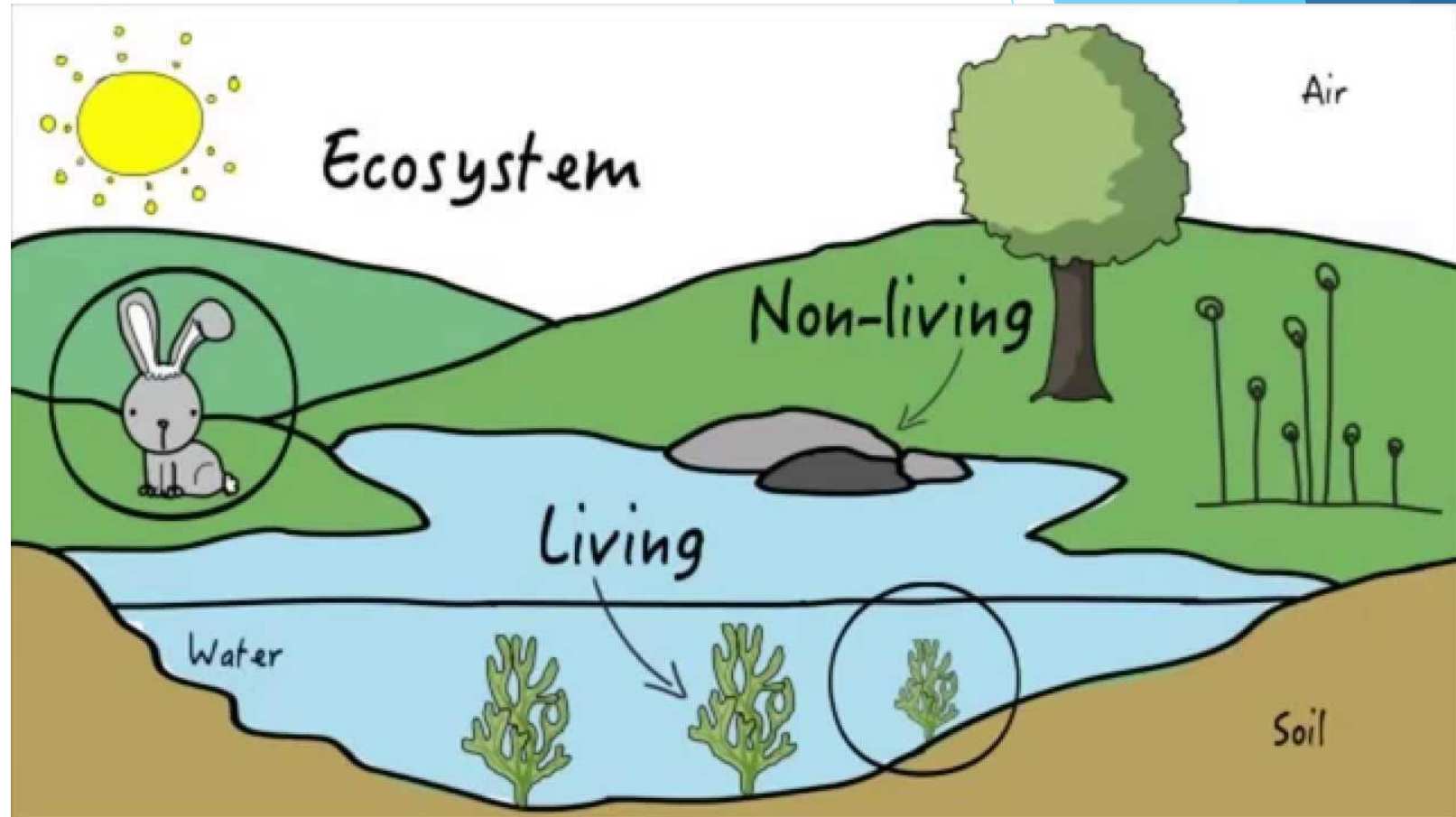


Shoulder Partner Discussion

1. What is the message you heard from this story?
2. What is the most impactful change that humans have caused on our Earth?

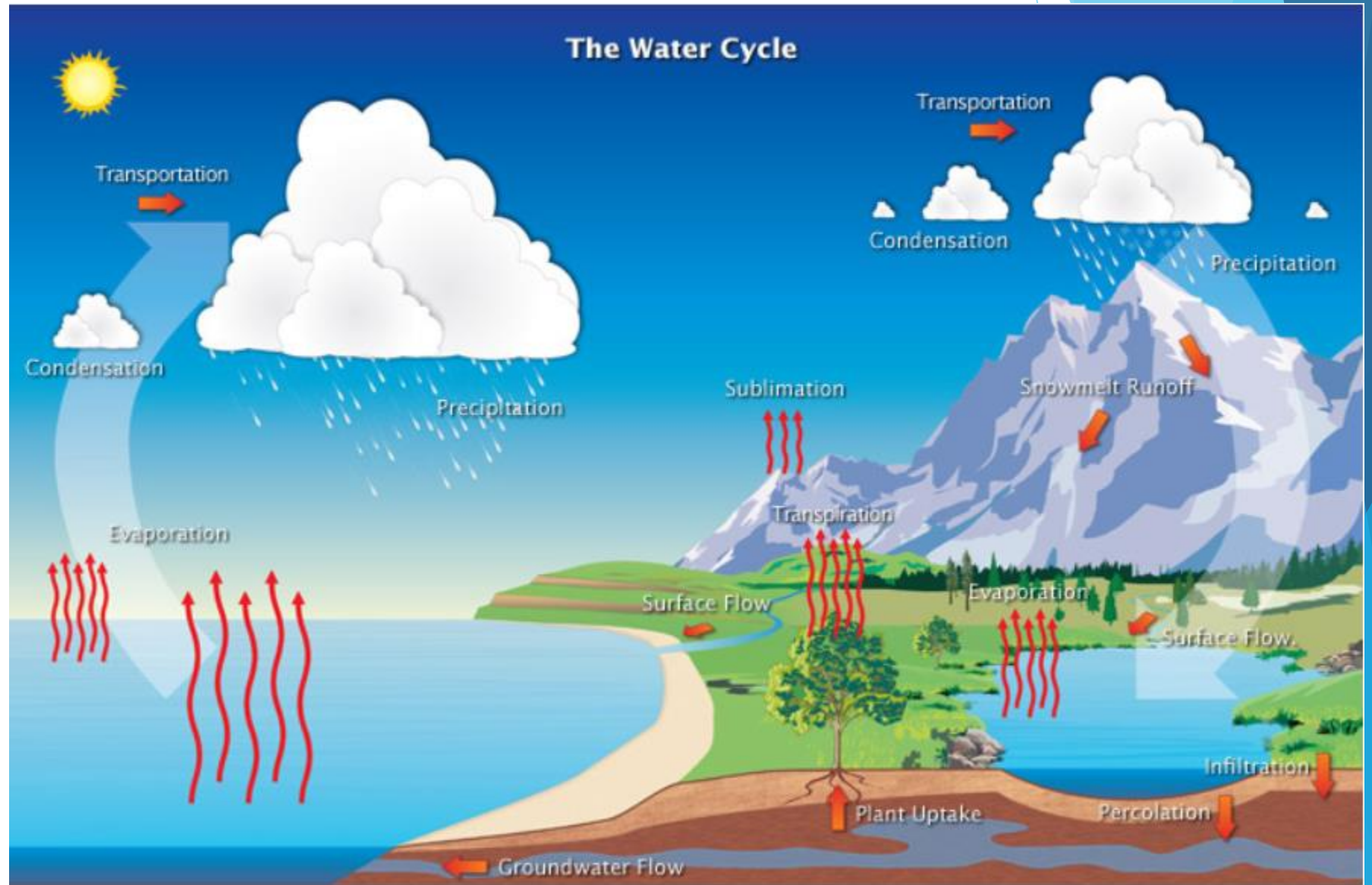
What is an Ecosystem?

- ▶ An **ecosystem** is a large community of living organisms (plants, animals and microbes) in a particular area
- ▶ **Biotic** and **abiotic** components are linked together through nutrient cycles and energy flows.



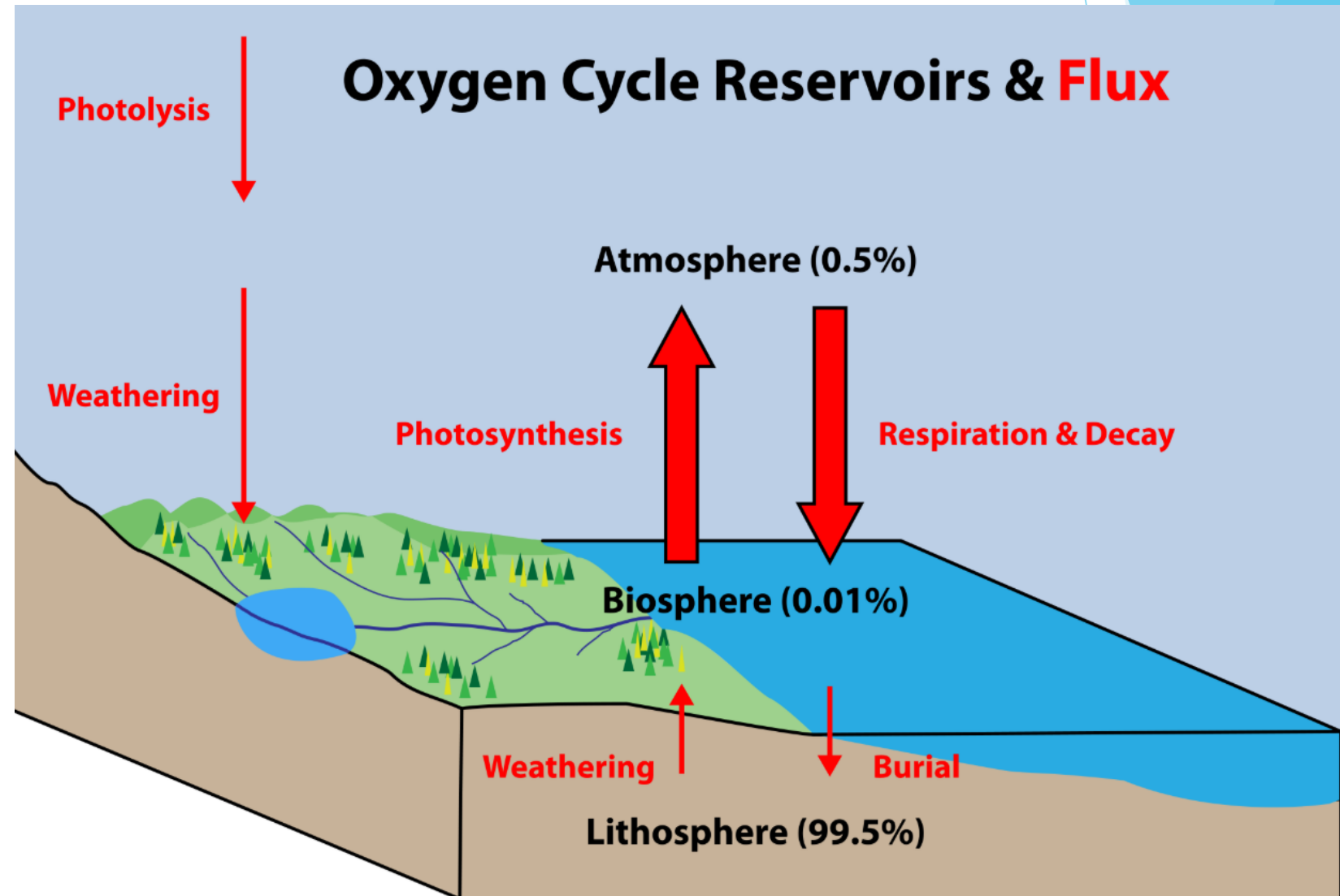
Abiotic Factor Cycles - Water Cycle

- ▶ Precipitation
- ▶ Evaporation
- ▶ Condensation
- ▶ Sublimation
- ▶ Transpiration



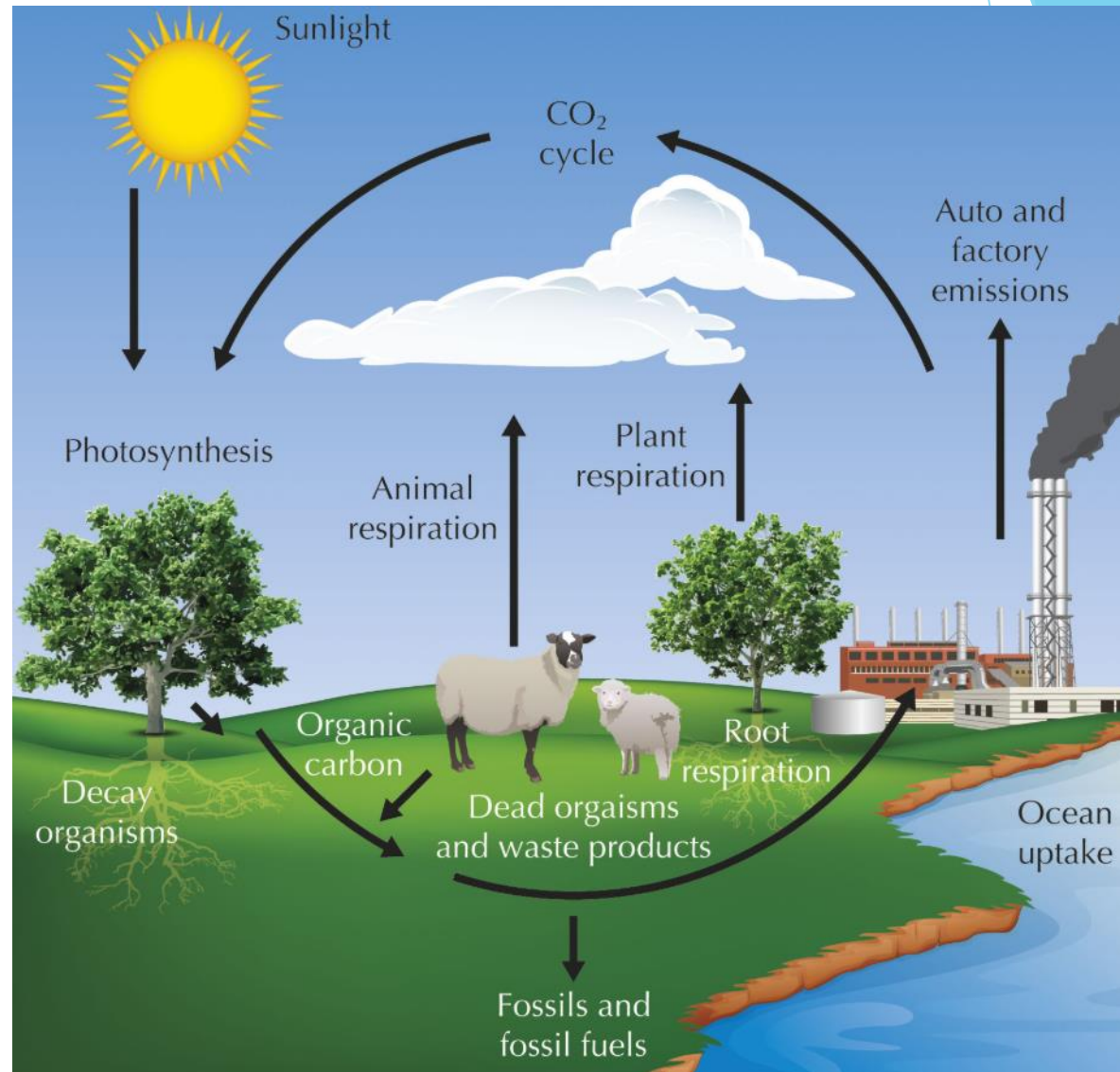
Abiotic Factor Cycles - Oxygen Cycle

- ▶ Photosynthesis
- ▶ Respiration
- ▶ Weathering
- ▶ Photolysis



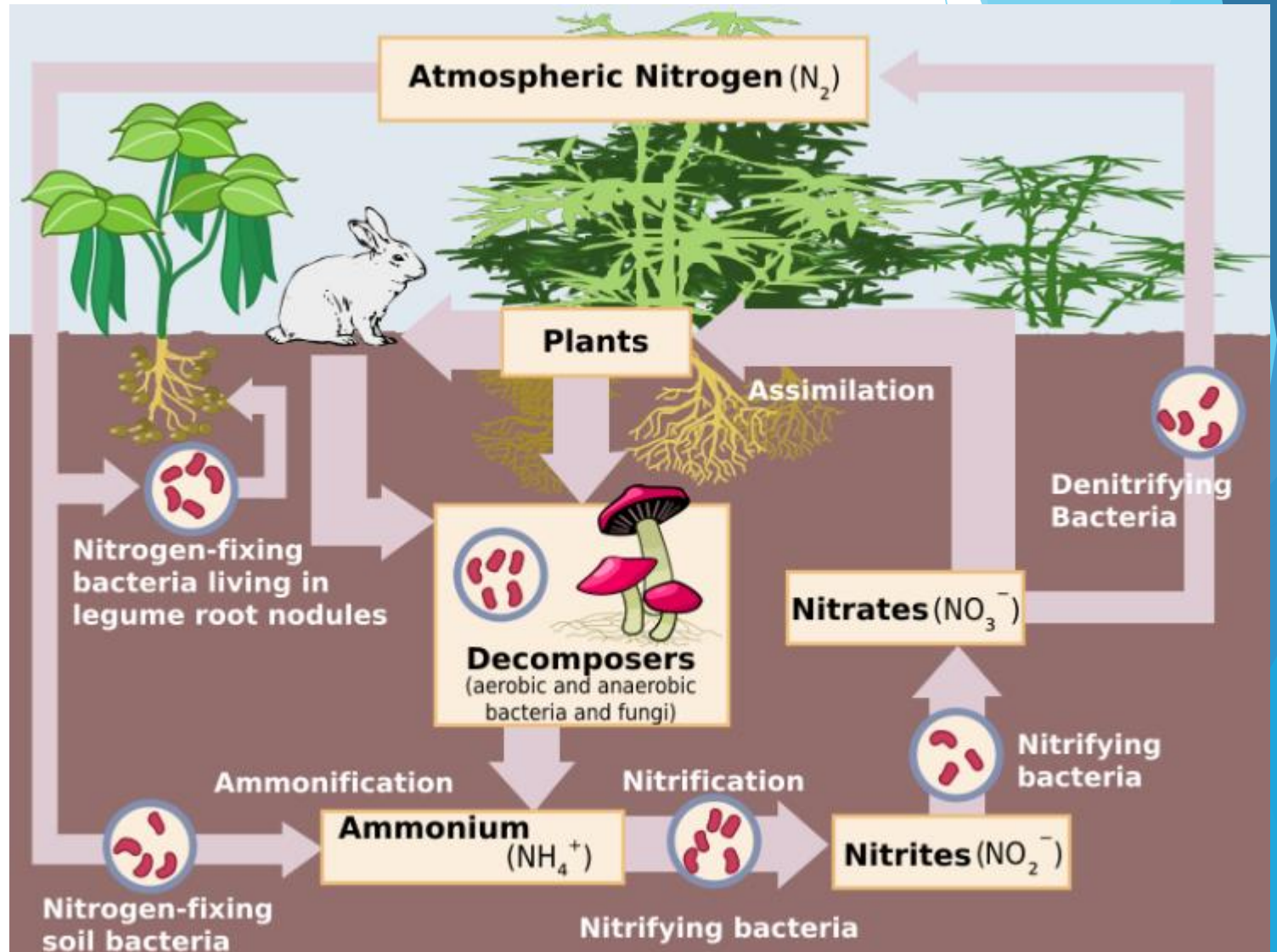
Abiotic Factor Cycles - Carbon Cycle

- ▶ Decay
- ▶ Animal & Plant Respiration
- ▶ Photosynthesis
- ▶ Emissions
- ▶ Ocean Uptake
- ▶ Carbon Sink



Abiotic Factor Cycles - Nitrogen Cycle

- ▶ Decomposers
- ▶ Nitrification (break down of ammonium)
- ▶ Nitrogen Fixing (atmospheric nitrogen put into useable forms)
- ▶ Denitrification (release of N_2)


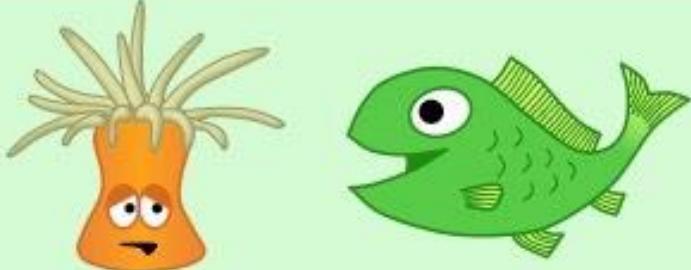



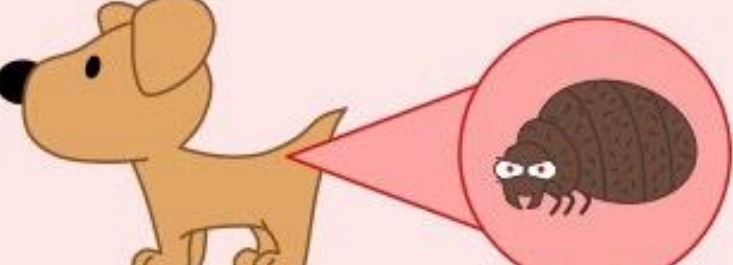


Biotic Factor Relationships

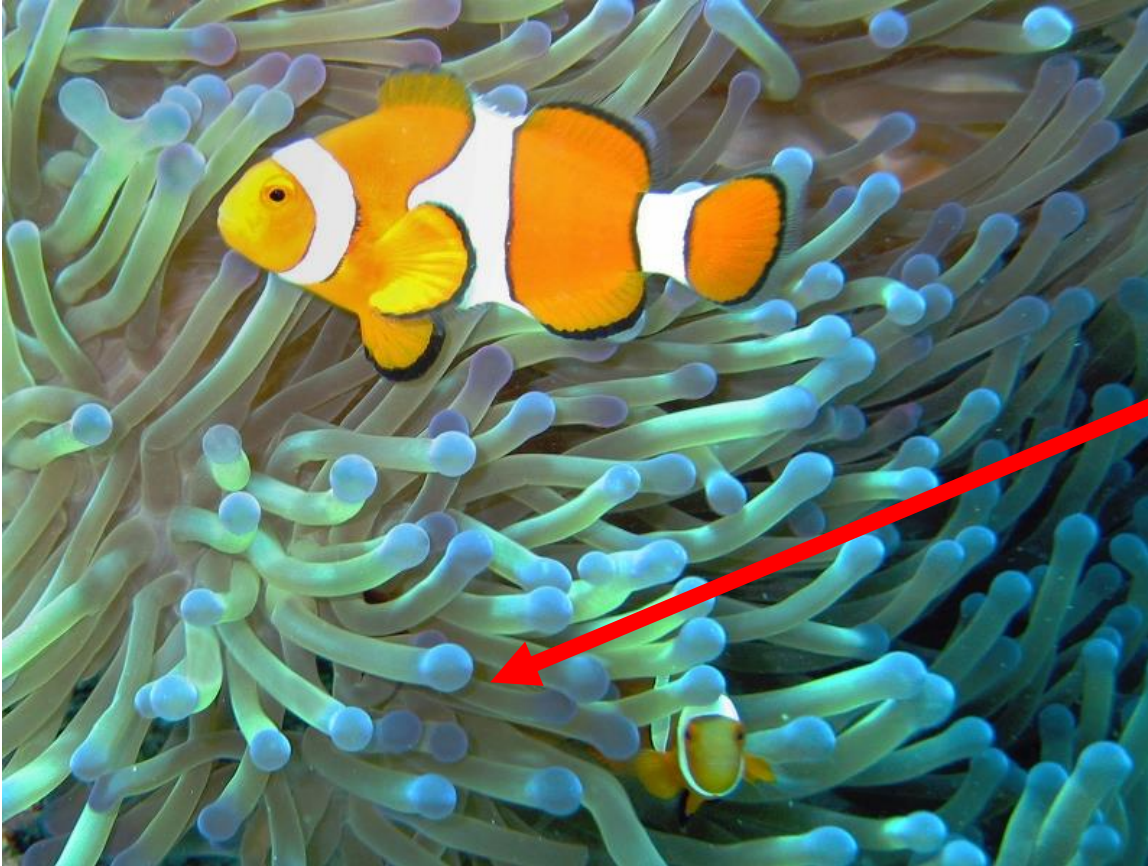
Symbiosis

- ▶ Symbiosis is when two organisms live and interact very closely together
- ▶ There are three types of symbolism:
 - ▶ Mutualism
 - ▶ Parasitism
 - ▶ Commensalism



INTERACTION	TYPE OF SYMBIOSIS	EXAMPLE
 <p data-bbox="234 488 387 522">Benefits</p> <p data-bbox="560 488 713 522">Benefits</p>	<p data-bbox="963 268 1177 302">Mutualism</p> <p data-bbox="912 331 1228 365">Species A benefits</p> <p data-bbox="912 388 1228 422">Species B benefits</p>	 <p data-bbox="1406 488 1625 522">Sea anemone</p> <p data-bbox="1803 488 1967 522">Clown fish</p>
 <p data-bbox="234 885 387 919">Benefits</p> <p data-bbox="535 885 738 919">Unaffected</p>	<p data-bbox="912 665 1228 699">Commensalism</p> <p data-bbox="912 728 1228 762">Species A benefits</p> <p data-bbox="891 785 1248 819">Species B unaffected</p>	 <p data-bbox="1447 893 1549 928">Whale</p> <p data-bbox="1880 893 2018 928">Barnacle</p>
 <p data-bbox="234 1279 387 1313">Benefits</p> <p data-bbox="565 1279 708 1313">Harmed</p>	<p data-bbox="963 1059 1177 1093">Parasitism</p> <p data-bbox="912 1122 1228 1156">Species A benefits</p> <p data-bbox="912 1179 1228 1213">Species B harmed</p>	 <p data-bbox="1533 1293 1610 1328">Dog</p> <p data-bbox="1916 1293 1992 1328">Tick</p>

Symbiosis in the Ocean



- ▶ Click on the photo to watch the video about symbiosis of the ocean

Symbiosis with Mycorrhizae

- ▶ Mycorrhizae are a type of fungi that live in close proximity to tree roots
- ▶ Becomes a network for the trees to learn about water amounts, upcoming droughts, heat, e



The Biggest Little Farm

- ▶ As we watch documentary, write notes on:
 - ▶ What type of biotic and abiotic factors do they try to set up?
 - ▶ How does this concept of ecological relationship lead to a healthy balanced ecosystem?

