

# Interactions Within Ecosystems

## Notes Part 1 of 3



# Part 1: The Beginning

- ◆ Looking at the environment around us there are some key terms ...
  - **Ecology**: the study of the relationship between living organisms in an environment
  - **Ecologist**: Someone who studies these relationships
- ◆ So for example...
  - If a certain population of animal (a frog for example) begins to die off **ecologists** would study the **ecology** to determine a cause



# Basic Needs of ALL Living Things

- ◆ food
- ◆ water
- ◆ habitat




- ◆ gas exchange (oxygen or carbon dioxide)
- ◆ Living things need to do all of this for the purpose of surviving in order to reproduce (make babies).

# Part 2: Adaptations

## Why do we need to reproduce?

- ◆ So that a species can continue to survive after the parents die.
- ◆ And because babies are so cool.



- ◆ In order to meet these basic needs, organisms will adapt to the environment.
  - ◆ Adaptations allow an organism to survive in their habitat. If they cannot adapt, then they will die off.
  - ◆ Characteristics that allow an animal to survive and reproduce will allow the animal to pass these traits to their children. Remember, children resemble their parents.
  - ◆ Weak characteristics ensure that the animal dies or fails to find a partner to reproduce with because members of the opposite sex will not be interested in them. The traits of that weak animal will not have a chance to pass on.
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- ◆ Example: a Giraffe has adapted a long neck to eat from tall trees. Those who can reach the food will survive to reproduce. This is only part of the truth though. Males fight each other for females. Those with longer necks will usually win the battle. The shorter neck male will fail to meet a female to reproduce with. On the other hand, the longer/stronger necked male will attract the female and reproduce with her, thereby passing on his long neck genes to his children.

Fighting  
over a  
woman



<https://www.youtube.com/watch?v=VDhNutbXpFE>

- ◆ Watch the video clip and list 10 adaptations that a cheetah is built with.



<https://www.youtube.com/watch?v=V8vejVgIHg>

# ◆ List the 10 Adaptations of a Cheetah below.

❖ \_\_\_\_\_

❖ \_\_\_\_\_

❖ \_\_\_\_\_

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❖ \_\_\_\_\_

❖ \_\_\_\_\_

❖ \_\_\_\_\_

❖ \_\_\_\_\_

❖ \_\_\_\_\_

What would happen if a cheetah was born without even just one of these adaptations?





# Which adaptation allows:

- ◆ Birds to fly?
- ◆ Fish to survive underwater?
- ◆ Cactus to survive in the desert?



# Part 3: Interactions in an Ecosystem

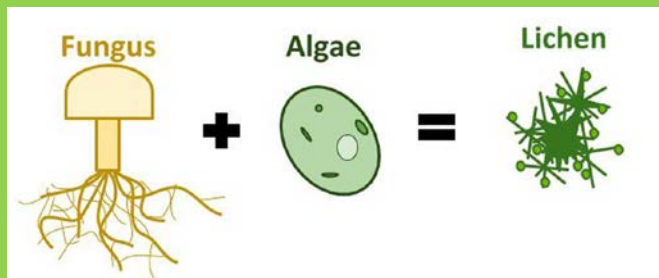
- ◆ **SYMBIOSIS** is the relationship between two different species in an ecosystem
- ◆ There are 3 kinds of symbiotic relationships:
  1. mutualism
  2. parasitism
  3. commensalism

# Mutualism

- ◆ BOTH organisms benefit from the relationship



The bee benefits because it drinks nectar from the flower and turns it into honey so that it can feed its babies. Remember, babies are cool.



Lichens are fungus teaming up with algae. The algae makes food using sunlight and shares it with the fungus. In return the fungus protects the algae with its body...like a very tough bodyguard.

Fungus and Algae are besties.

# Parasitism

- ◆ One organism benefits (parasite) and the other (host) is harmed by the relationship.



Mosquito benefits by drinking blood. You can get sick or even die if it injects a disease like Zika Virus or Malaria into your body.



Tape worm is also a **parasite** that absorbs nutrients from the small intestine  
The human/animal is the **host** and is harmed because it loses those nutrients

# Commensalism

- ◆ One organism benefits and the other is not helped nor harmed

## Example: Orchid Plant and Tall Tree

Orchids grow high up on trees. By being high up near the top, they avoid getting stepped on, and they receive more sunlight.


The tree is not harmed from this relationship.

The tree does not benefit either.

The only thing that benefits is the orchid.



# Learning Check

- ◆ Is each of these an example of mutualism, parasitism, or commensalism?
  - ◆ A remora fish gets a free ride while eating bacteria on a shark's skin
  - ◆ Aphids suck nutrients from a rosebush to survive
  - ◆ Flowering orchids live in trees that seem unaffected by the orchids
- 

# Part 4: Environmental Impacts

- ◆ Sometimes even small things to us are actually a large scale impact
- ◆ Beaver Dams
  - A beaver builds a dam
  - Water rises on one side and drops on the other
  - This changes the ecosystems on both sides
  - How?



# Fort Saskatchewan





# Fort Saskatchewan



# Human Impact

- ◆ What are Natural Resources?
  - Materials & products – found in nature to meet our basic needs



# Human Impact

## ◆ Examples?

- Trees
- Water
- Oil
- Minerals

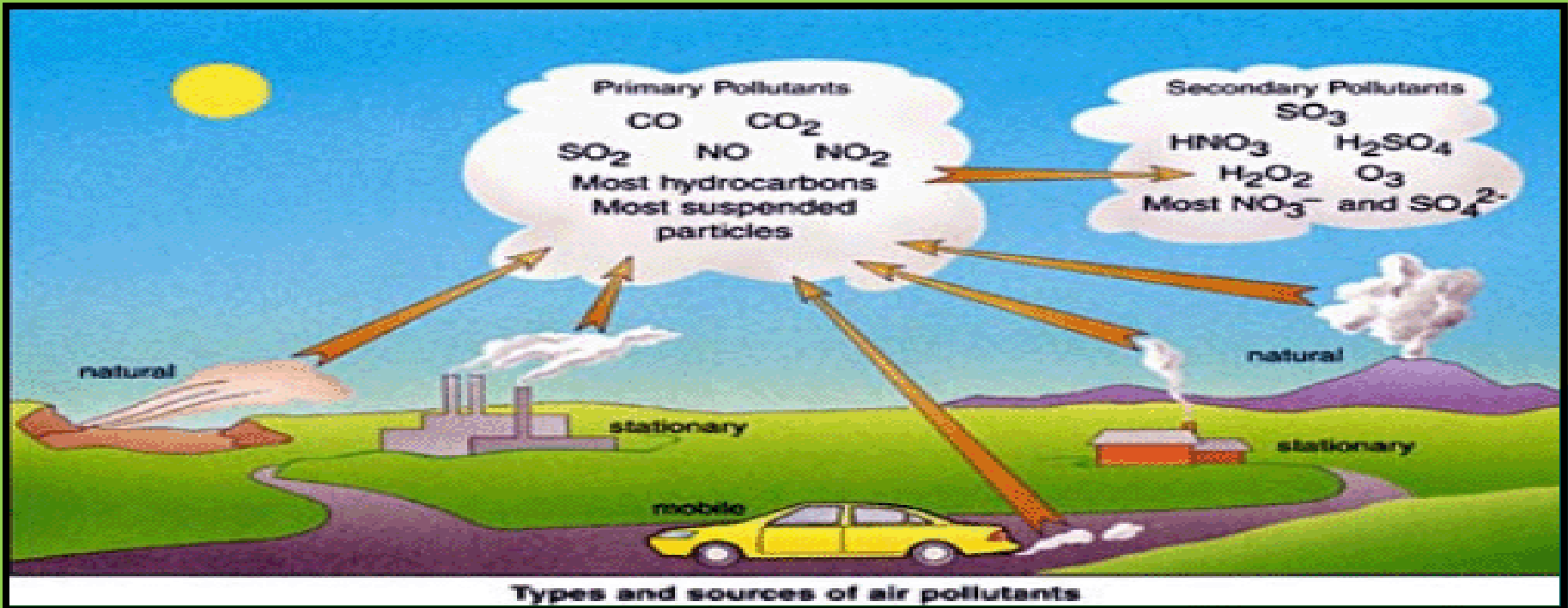


# Increasing Populations

- ◆ Increasing human populations put ...
  - More strain on the natural sources
  - More pollutants into the environment
  - More land is taken up



- ◆ How do you think this has effected us? How has it effected other life forms?



# Human Impact on Wetlands (ex. Swamps, marshes, bogs)

- ◆ Wetlands filter the water that trickles into it from the roads and sidewalks nearby. Things like oil and antifreeze from our cars get washed by the rain.
- ◆ The plants in the wetland suck up the rest of the poisons and slow down the movement of water.
- ◆ After that's done, the water will often flow slowly back into the river crystal clear and fresh.
- ◆ Wetlands also prevent rivers from flooding because they trap so much water that would have otherwise washed into the rivers.

# Wetlands Trap Tons of Water that otherwise would have ended up flooding a river.



**Plants found in wetlands suck up poisonous chemicals and help clean the water naturally**

# Many Animals Make Wetlands Their Home



# Humans Have Been Destroying Wetlands!



## Why are we destroying Wetlands?

Ans: So that we can create farmland, shopping centers, roads, and houses. In the process of doing so, millions of animals become homeless and end up dying if they cannot adapt in time.





# Removing Wetlands Causes More Floods




When bad storms happen, there are no wetlands to absorb all of that extra water, so it all ends up jamming our sewer system and causing floods to occur in our streets and homes. Rivers also end up filling up very quickly. Remember, wetlands also slow down the water as it trickles back into the rivers, which prevents rivers from filling up too fast.



Water rushed into the river way to fast causing it to flood a bridge.

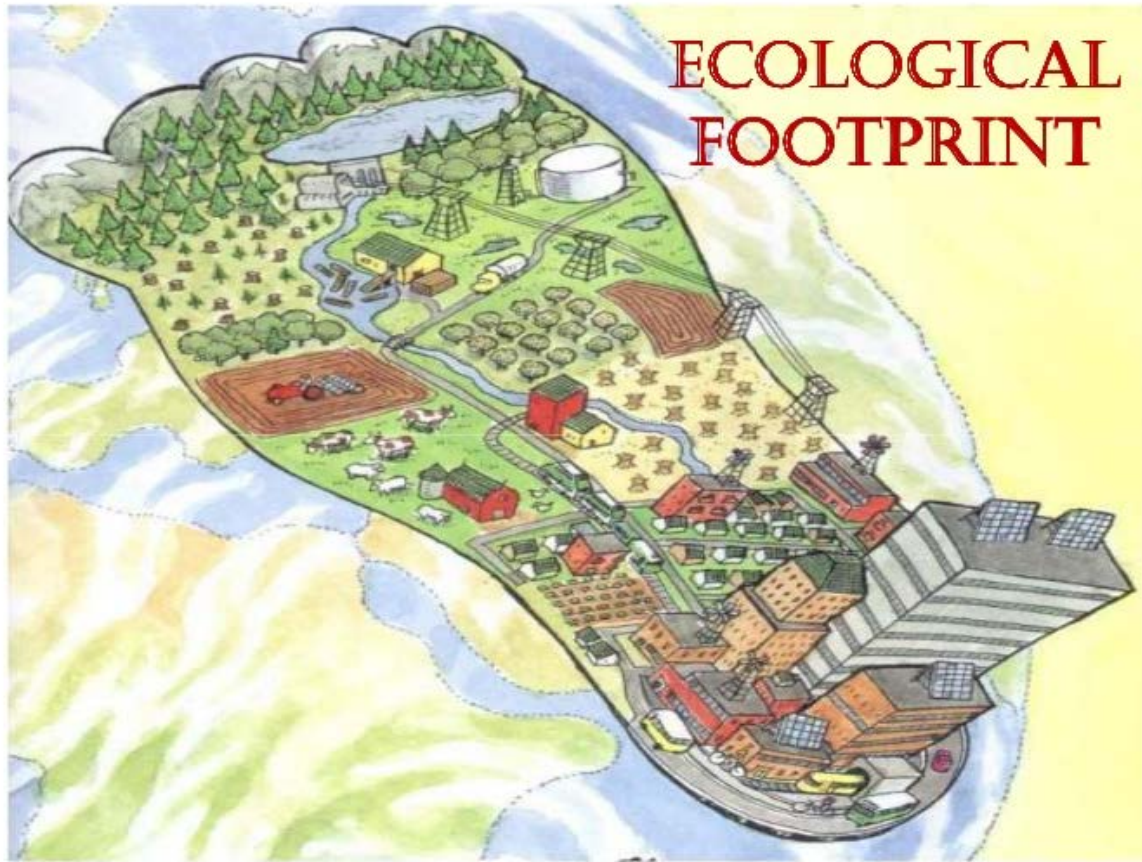
# Let's See How much You've Learned.

- ◆ Give an example of how an animal could change the environment.
  - ◆ How have humans negatively impacted Fort McMurrayJ?
  - ◆ List 2 ways wetlands help the environment.
  - ◆ Why are humans destroying wetlands?
  - ◆ How does destroying a wetland harm the environment?
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# How Else Do We Impact The Environment?

## Environment?


- ◆ With our Ecological Footprint!



### Ecological Footprint

The amount of LAND that a person needs to get all of the resources that they will need AND to dump their wastes in.

# What kind of resources do we use from the Earth?

- ◆ Farmland(Food)
  - ◆ Trees to build homes and furniture.
  - ◆ Metal to build cars, buildings, rail tracks.
  - ◆ Oil and gas to power vehicles.
  - ◆ Water to drink, bathe, and to give to animals that we will end up eating.
  - ◆ Plants for food.
  - ◆ Plants for clothing. Ex. Cotton plants
  - ◆ Land to build sewage treatment.
  - ◆ Land to dump our garbage in.
  - ◆ In Alberta, coal is dug up and burned to create electricity. The more electricity you need, the more coal they will have to dig up for you.
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# Allah Discusses Ecological Footprints

7:31

to top

Quran:

Surah Al-A'raf (7).

Ayah 31.

يٰۤاَيُّهَاۤ اٰدَمَۃُ خُذُوۤا زِيۡنَتَكُمْ عِنۡدَ كُلِّ مَسْجِدٍ وَكُلُوۡا وَاَشْرَبُوۡا وَلَا

تُسْرِفُوۡا اِنَّهٗ لَا يُحِبُّ الْمُسْرِفِيۡنَ ﴿۳۱﴾

*Sahih International*

O children of Adam, take your adornment at every masjid, and eat and drink, but be not excessive. Indeed, He likes not those who commit excess.

*Yusuf Ali*

O Children of Adam! wear your beautiful apparel at every time and place of prayer: eat and drink: But waste not by excess, for Allah loveth not the wasters.

# The more you use, the more everybody will lose.



441 gallons  
to produce  
one pound of  
boneless beef.



Over 713 gallons  
go into the  
production of  
one cotton T-shirt.



39,090 gallons  
to manufacture  
a new car.



3 million gallons  
**per day** leaked from  
Edmonton taps.



# The more you use, the more everybody will lose.



Just for that tiny little piece of meat.

feed

**6.7**

Pounds of grains and forage



water

**52.8**

Gallons for drinking water and irrigating feed crops



land

**74.5**

Square feet for grazing and growing feed crops



fossil fuel energy

**1,036**

Btus for feed production and transport. That's enough to power a typical microwave for 18 minutes.



# The more you use, the more everybody loses. (Do not memorize these metals)

## RECYCLING RATES OF SMARTPHONE METALS

COLOUR KEY: ● < 1% RECYCLE RATE ● 1-10% RECYCLE RATE ● 10-25% RECYCLE RATE ● 25-50% RECYCLE RATE ● > 50% RECYCLE RATE ● NON-METAL (OR RECYCLE RATE UNKNOWN)

### SCREEN ○



### BATTERY ○



### ○ ELECTRONICS

**WIRING & MICROELECTRONICS**  
Copper is used for wiring, and for micro-electrical components along with gold and silver. Tantalum is the major component in micro-capacitors.

**Cu** (COPPER) ● **Ag** (SILVER) ●  
**Au** (GOLD) ● **Ta** (TANTALUM) ●

**MICROPHONES & VIBRATIONS**  
Nickel is used in the microphone and for electrical connections. Rare earth element alloys are used in magnets in the speaker and microphone, and the vibration unit.

**Ni** (NICKEL) ● **Dy** (DYSPROSIUM) ● **Pr** (PRASEODYMIUM) ●  
**Tb** (TERBIUM) ● **Nd** (NEODYMIUM) ● **Gd** (GADOLINIUM) ●

**THE SILICON CHIP**  
Pure silicon is used to manufacture the chip, which is then oxidised to produce non-conducting regions. Other elements are added to allow the chip to conduct electricity.

**Si** (SILICON) ● **O** (OXYGEN) ● **Sb** (ANTIMONY) ●  
**As** (ARSENIC) ● **P** (PHOSPHORUS) ● **Ga** (GALLIUM) ●

**CONNECTING ELECTRONICS**  
Tin & lead were used in older solders; newer, lead-free solders use a mix of tin, copper & silver.

**Sn** (TIN) ● **Pb** (LEAD) ●

### ○ CASING

Magnesium alloy is used to make some phone cases, whilst many others are made of plastics, which are carbon-based. Plastics will also include flame retardant compounds, some of which contain bromine, whilst nickel can be included to reduce electromagnetic interference.

**C** (CARBON) ● **Mg** (MAGNESIUM) ●  
**Br** (BROMINE) ● **Ni** (NICKEL) ●

All of these minerals are dug up from the earth for YOU!

The more computers you buy, the more they have to dig.



# Locally Grown vs Imported Foods

Bananas being loaded onto an airplane



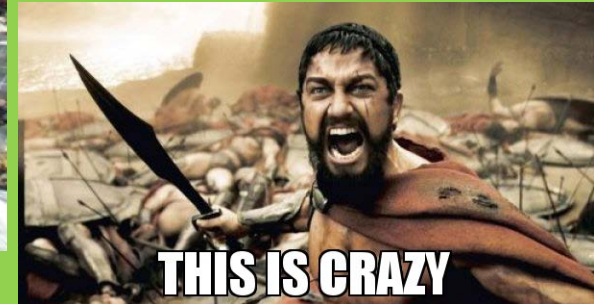
When you buy food that was grown in your area, you save on all of the gasoline and jet fuel that would have been needed to import that item.

Ex. Buying apples grown in Mexico requires a tremendous amount of jet fuel to transport it to your grocery store. Apples grown in Edmonton require perhaps only a small truck.

SUPPORT LOCAL FARMERS



# Landfill Space Also Counts Towards Your Ecological Footprint



How much of this landfill belongs to YOU?

What can you do to reduce your ecological footprint when it comes to your wasteland space?

**If everybody lived the way we do here in Canada, we would need 4 planets to provide for everybody.**



80% of the people in the world live off of very few resources.



← Canadians and Americans are among the 20% that indulge in too much of our planet's resources.

# What kind of Ecological Footprint Does DJ Khaled Have? Don't be judging.



# Let's See How Much You Have Learned.

- ◆ What is an Ecological Footprint?
  
- ◆ List 8 things you can do to reduce your ecological footprint.

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# Remember, Education is Important!



**Maylina Gillespie**

20 billion people in the world trying to fit in, so imma try to stand out ♡

Like · Comment · Share · 6 minutes ago · 🌐

👍 10 people like this.



**Sean Patrick Blaise O'Connell** theres only 7 billion people in the world though

4 minutes ago · Like · 🔄 3



**Maylina Gillespie** Like you counted all of them ! [REDACTED] I'm estimatingg

3 minutes ago · Like

Write a comment...



[REDACTED] was just trapped on the escalator for hours.....power went out!!!

about an hour ago · Comment · Like



[REDACTED] at 1:22pm April 10

y didnt u just walk dwn the escalator thn lol xx



[REDACTED] at 1:23pm April 10

coz it stoped workin



[REDACTED] at 1:24pm April 10

an escalator is just movin steps lol



[REDACTED] at 1:25pm April 10

oh yeah so it is lol



[REDACTED] at 1:26pm April 10

lol did u mean elevator? xx



[REDACTED] at 1:27pm April 10

no an escalator