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.

- 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=V8vejjVgIHg

List the 10 Adaptations of a Cheetah below.

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

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

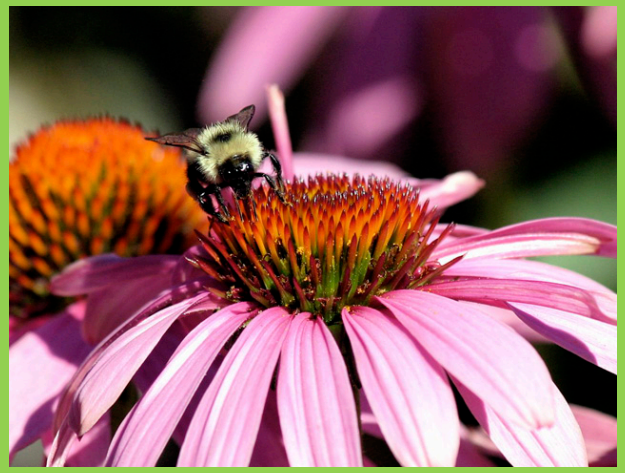
- **SYMBIOSIS is the relationship between two different species in an ecosystem**

- **There are 3 kinds of symbiotic relationships:**

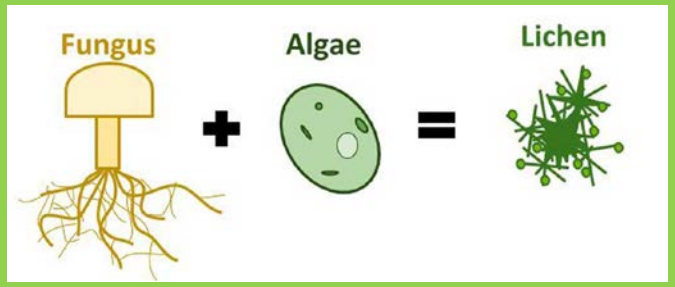
1. mutualism
2. parasitism
3. commensalism

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 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

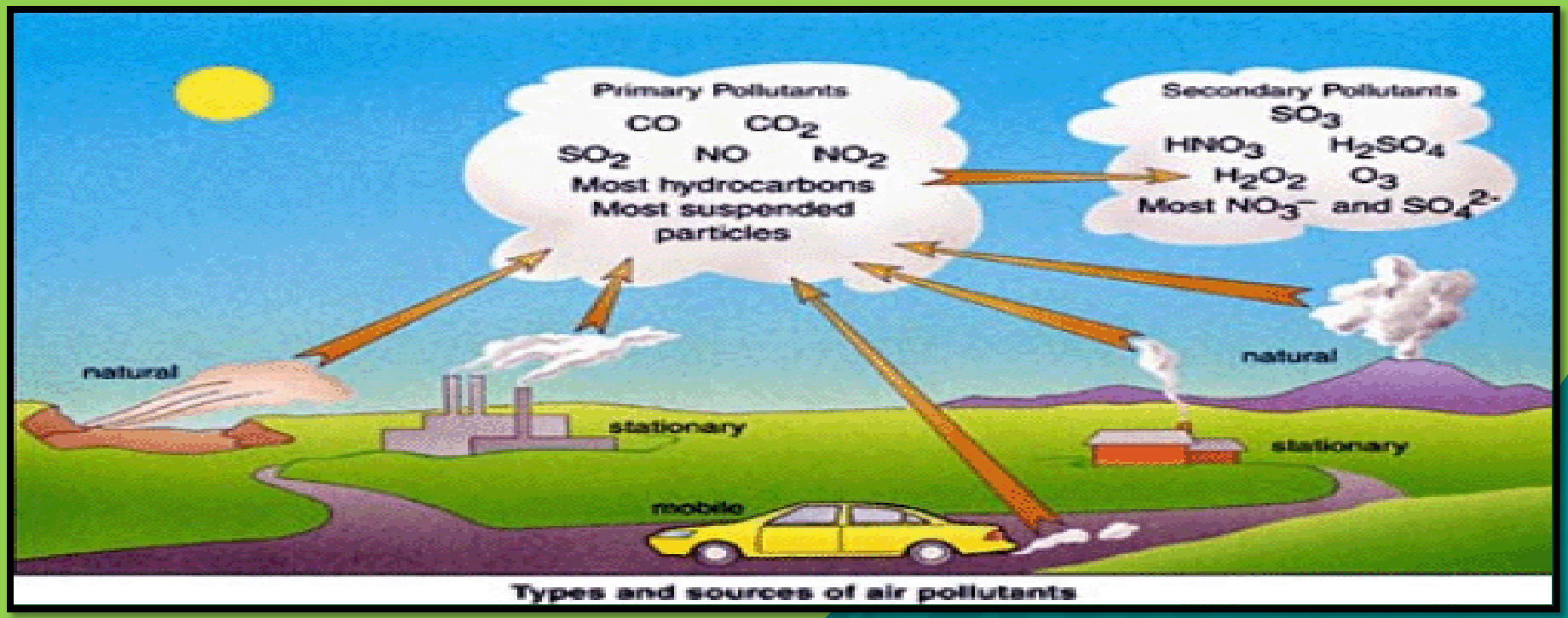
Human Impact

- 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?



Types and sources of air pollutants

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

Edmonton

Edmonton

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.

Winnipeg

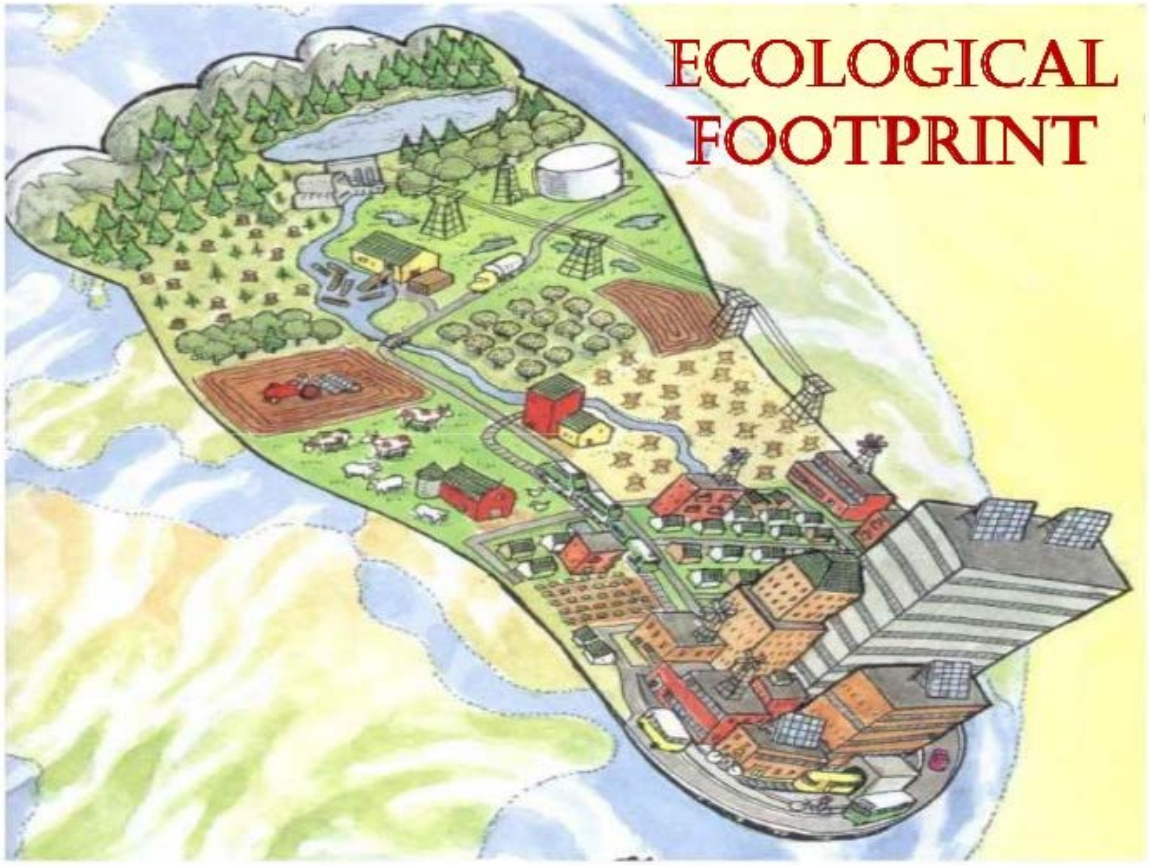
Water rushed into the river way to fast causing it to flood a bridge.

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?

How Else Do We Impact The Environment?

- With our Ecological Footprint!



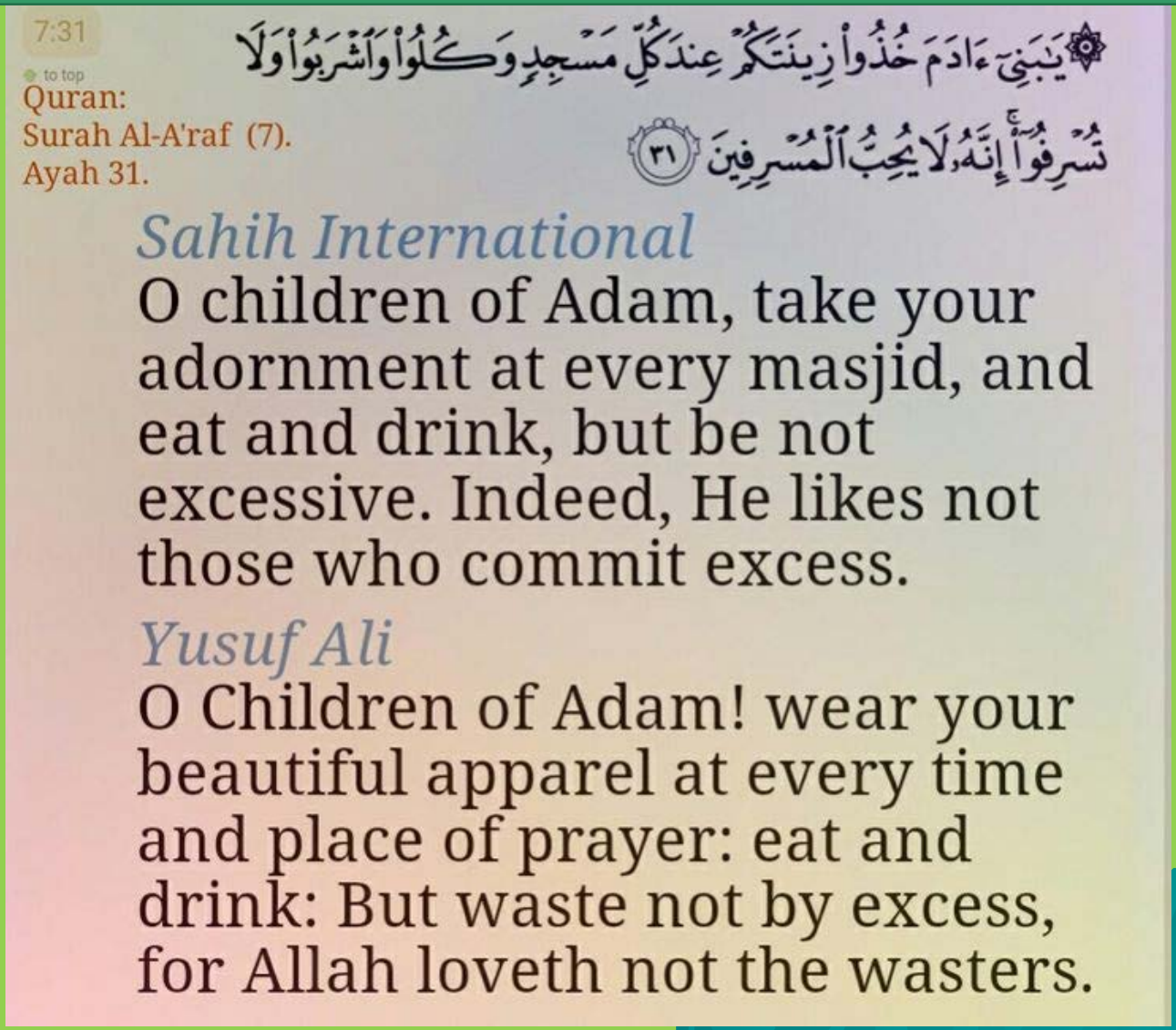
Ecological Footprint

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

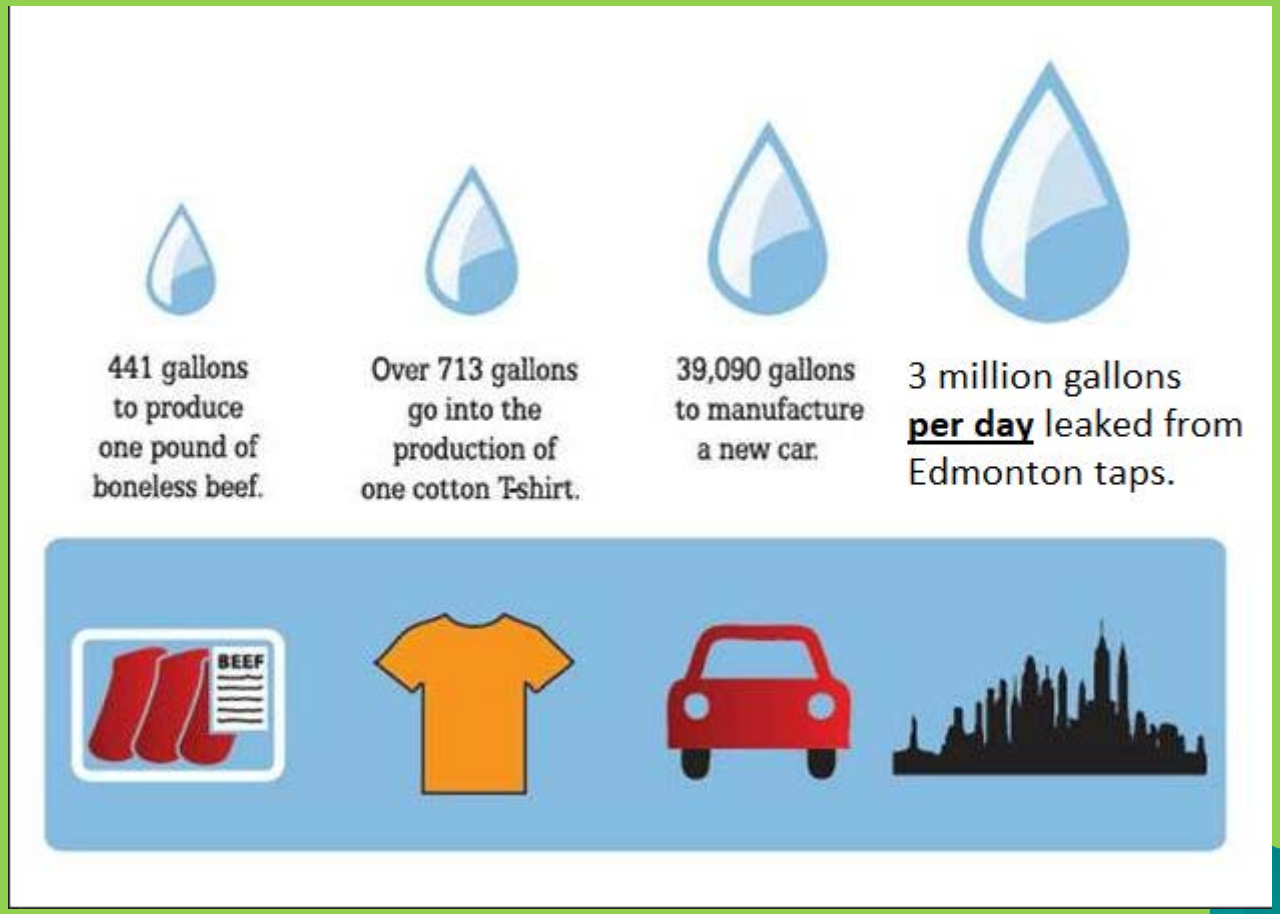
What kind of resources do we use from the Earth?

- 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.

Allah Discusses Ecological Footprints



The more you use, the more everybody will lose.

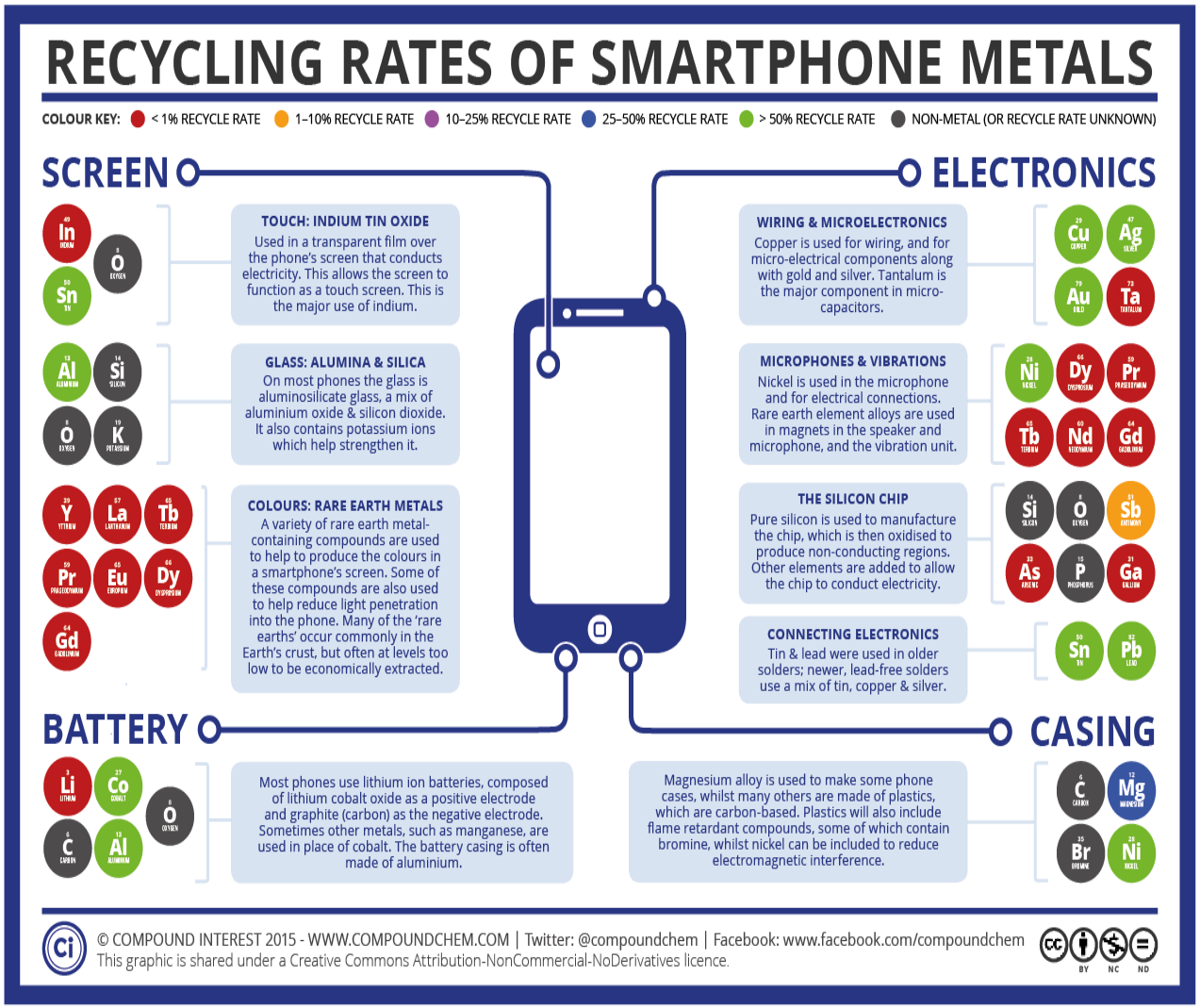


The more you use, the more everybody will lose.

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.	

Just for that tiny little piece of meat.

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



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

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

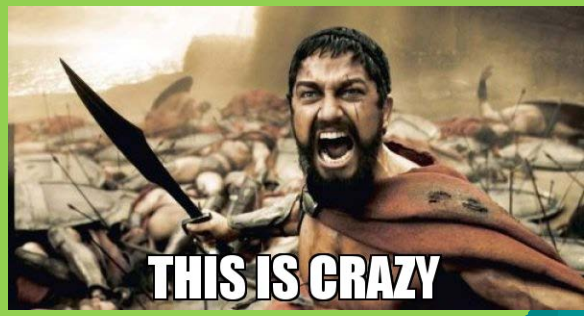
Locally Grown vs Imported Foods

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.

Bananas being loaded onto an airplane

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.

_____ _____

_____ _____

_____ _____

_____ _____

Remember, Education is Important!