

6.4.1 Ecosystems

Phenomena: Each group gets cards with animals on them, they need to categorize them as indigenous, endangered or non-indigenous to Utah and why?

Images here

https://www.google.com/search?safe=strict&rlz=1C5CHFA_enUS683US683&q=images+of+animals+native+to+Utah&oq=images+of+animals+native+to+Utah&gs_l=psy-ab.3..33i22i29i30k1l2.38271668.38278846.0.38279055.33.33.0.0.0.197.3169.12j17.29.0...0...1.1.64.psy-ab..4.28.2990.0..0i0i67k1j0i131k1j0i22i30k1j0i8i13i30k1j33i160k1.zwo4eGfk1ds

and here

OR

Phenomena: Why are alligators still around and dodo birds gone?

Class discussion on limiting factors, resources in Utah and adaptations of animals.

Re-arrange the animals if:

1) We got 100 inches of rain (instead of 7)

2) Never had a summer

3) Never had a winter

5) If we didn't have large trees (only ground cover)

TEACH vocabulary

Ecosystems is the interaction of organisms with each other and with the physical environment.

Ecosystems include biotic – living and abiotic – nonliving parts. Examples of biotic-
Examples of abiotic-

Ecology – the study of ecosystems Example of ecosystems are:

Different ecosystems in Utah

Forest - deciduous, coniferous or oftentimes a mixture of both, in which some trees shed their leaves each fall, while others remain evergreen year-round.

Grassland – in temperate regions, although they can exist in colder areas as well, Grasslands share the common climactic characteristic of semi-aridity. Trees are

sparse or nonexistent, but flowers may be interspersed with the grasses. Grasslands provide an ideal environment for **grazing** animals.

Desert - The common defining feature among desert ecosystems is **low precipitation**, generally less than 25 centimeters (**10 inches**) per year. Not all deserts are **hot** -- desert ecosystems can exist from the **tropics** to the **arctic**, but regardless of latitude, deserts are often **windy**. Some deserts contain **sand dunes**, while others feature mostly **rock**. Vegetation is **sparse or nonexistent**, and any animal species, such as insects, reptiles and birds, must be **highly adapted** to the dry conditions.

Freshwater ecosystems - can be found in **streams, rivers, springs, ponds, lakes, bogs and freshwater swamps**. They are subdivided into two classes: those in which the water is **nearly stationary**, such as ponds, and those in which the water **flows**, such as creeks. Freshwater ecosystems are home to more than just fish: algae, plankton, insects, amphibians and underwater plants also inhabit them.

Marine ecosystems- differ from freshwater ecosystems in that they contain **saltwater**, which usually supports different types of species than does **freshwater**. Marine ecosystems are the most **abundant** types of ecosystems in the world. They encompass not only the **ocean floor** and surface but also **tidal zones**, estuaries, salt marshes and saltwater swamps, mangroves and **coral reefs**.

When resources (either biotic or abiotic) are limited, populations **go down**, and the whole **ecosystem** can be affected.

The less diverse an organism's diet the more likely they are to go **extinct**

Limiting factors- resources and environmental factors that limit the growth of organisms

Rearrange the animals based on ecosystems they live in:

Your table should find 1 animal that is indigenous to Utah and have them create an "idiots guide to owning _____ in Utah" where you cover the adaptations, limiting factors, natural habitat, specific ecosystem, OR Steve Irwin Project <https://www.youtube.com/watch?v=Cr8ggrNf68s> start at 20 seconds

Identify CCC? Cause and Effect, Stability and Change Practices? Obtaining evaluating and communicating information

6.4.3 Matter and Energy in Ecosystem

Phenomena: Fact or Crap- If Phytoplankton died life as we know it would end (have them move to right side of room if fact or left of room if crap) then have them do 5 minutes of research and then they can make changes. Discuss

Species that is adapted to the classroom: Each pair gets a card they should use internet as they need. Draw species on the front and on back answer the following questions 2 adaptations for survival, how it obtains food, how much/many it consumes in a week (not if it's a consumer), mating habits, habitat, niche, which 5 other organisms that it has symbiotic relationship with (at least one in each category: predation (not if their species is a consumer), mutualism, commensalism and describe that relationship) and limiting factors.

Have student pair gather around in circle, create a food web based on their species

Teach:

Symbiotic relationships are a special type of interaction between **species**. Sometimes beneficial, sometimes harmful, these **relationships** are essential to many organisms and ecosystems, and they provide a **balance** that can only be achieved by working together.

Cards with food web

Predation- one **gains**, one **loses** (usually dies)

Mutualism – (think win win) both **gain**

Commensalism- one **gains** the other isn't **affected**

Most food webs don't include the **sun** (it's understood, unless at the bottom of the ocean). Most food webs don't include **recyclers** (like fungi) which makes the food web more like a cycle of energy.

Niche- the role an organism **fills** in its **habitat**

Describe your niche at home

Habitat- where an organism **lives**

Describe your habitat

Every ecosystem needs to have an organism that **produces** food and **recycles** dead stuff

Producers- organism that use the sun to **produce** food

Competition- when different organisms **compete** for the same **resource** (like tall trees trying to reach the sunlight) List two other examples:

Consumer- an organism that **consumes** another organism for **energy**

Secondary Consumers – consumers that eat consumers

Tertiary Consumers- carnivore at the top of the food chain

Recycler- an organism that recycles dead stuff back into the ecosystem

When competition is fierce, organisms die, relocate, or populations go down.

Food Web – always starts with a producer and ends with a consumer. (even though a recycler would bring it all back to a cycle). It includes multiple lines of energy transfer.

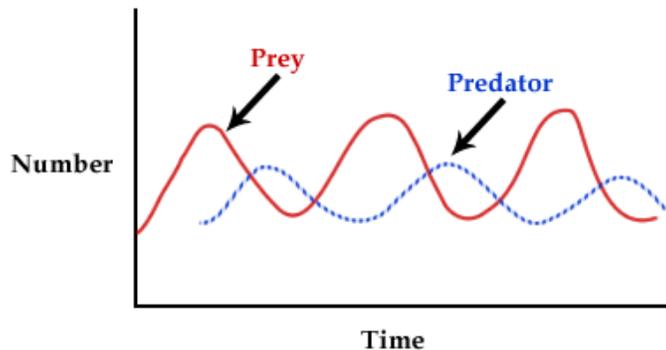
Arrow ALWAYS points to where energy is GOING

Identify CCC: Cause and Effect

Identify Practices: Modeling

6.4.2 Interactions among organisms

Phenomena: What is this graph showing and based off of this picture why do populations change?



Go back to species adapted to the classroom cards: and string:

Disaster Strikes

Discuss and complete string food web model if

1) fire in 1 location (and secondary consumer habitat burns)

2) Lots of “food” for producers

3) someone introduces new and invasive species

Revisit Phenomena

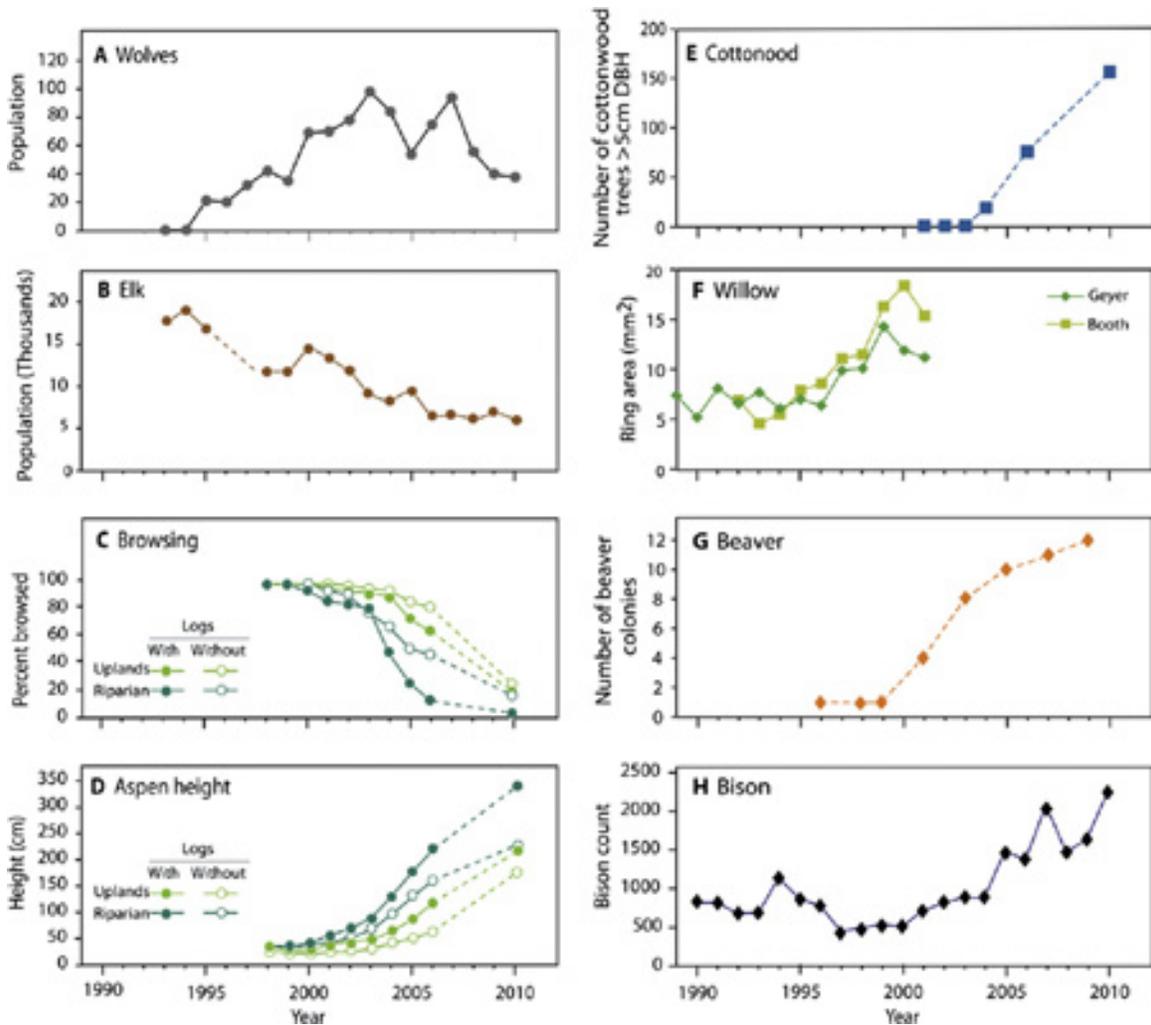
Have students draw an Utah ecosystem card. They will need to use the internet to research 15 different species in that ecosystem, and they all need to be linked by a symbiotic relationship

Identify CCC: Patterns, cause and effect

Identify Practices: Models, Analyzing Data

6.4.4 Stability of Populations

Phenomena: Look at the graphs and explain how they are related



watch video on wolves in Yellowstone:

Start at 20 second (1-20 is about the big bang)
<https://www.youtube.com/watch?v=5Iddy0CVILg>

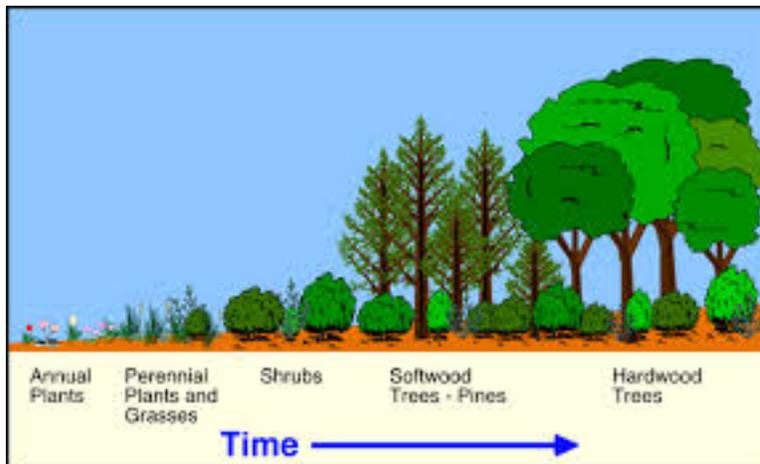
Teach

Stability- a population/ecosystem has reached a **climax community** and will remain **nearly the same** until a **disaster strikes**.

What are the clues of a climax community.

What are pioneer species?

Natural cycles of a climax community.



Have them use the ecosystem card (with an ecosystem in Utah on it) and a 2nd card with a disaster and have them take their page and fold it into fourths.

First block: Disaster Day

2nd: Year after

3rd: 10 years after

4th 100 years after

Watch this video while they are working

Yellowstone fire and rebirth

<https://www.youtube.com/watch?v=jJ0zqo1opv8>

Identify CCC: Cause and Effect, Patterns, Stability and Change, Model

Identify Practices Model, and Argument (maybe)

6.4.5 Stability and Change

Phenomena: Show old pictures and new pictures of Utah Lake... explain the changes?

Show Tamarisk on Colorado River Video (explain Tamarisks first)

<https://www.youtube.com/watch?v=Uby86bJpgik>

Kudzu

<https://www.youtube.com/watch?v=q7-QXvj6kU8>

Have them grab a card and put it up on the timeline of Utah Lake's demise.

Give them time to research what can be done to restore Utah Lake and present ideas/proposals

Identify CCC: cause and effect, systems and stability and change

Identify Practices: Analyzing/Interpreting Data, Obtaining, evaluating and communicating information, Argument