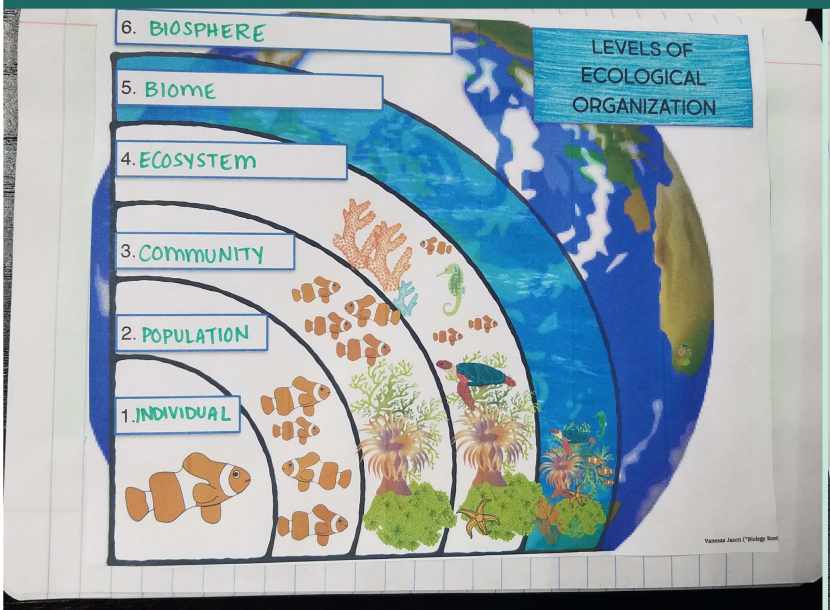
ecology interactive notebook



Primary Succession Timeline- Analysis Questions

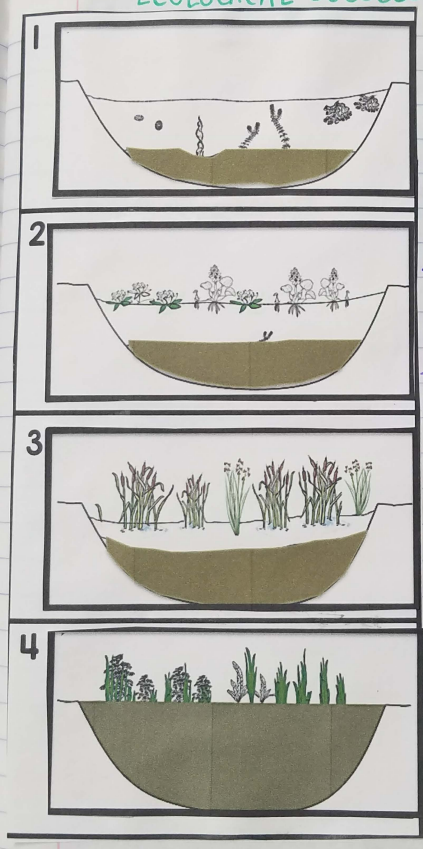
1. Which organism(s) came first on your timeline? Explain the importance of the organism(s) and why you chose to place the organism(s) first on your timeline: Soil builders such as mosses and lichens were the first organisms to appear. They are necessary for plants to grow and thus sustain the ecosystem.

2. What do you suppose attracted insects, rodents, and birds to your ecosystem? (In other words, why did they show up when they did)?
The insects, rodents, and birds are attracted to plant life because it offers food and shelter.

3. On your timeline, what comes BEFORE and what comes AFTER rabbits- explain WHY:
Rabbits were attracted to food and shelter. Bushes, such as blueberry, come before rabbits in this ecosystem. Foxes enter the ecosystem after rabbits because foxes prey on rabbits.

4. Which group of organisms comes last on your timeline? Explain why you chose to place them last. In other words why does it make sense that they would be the last ones to show up? The last group of organisms are higher-order carnivores. This is because the bigger herbivores, such as deer and elk are present and offer a sustainable food source for larger carnivores.

ECOLOGICAL SUCCESSION OF A POND



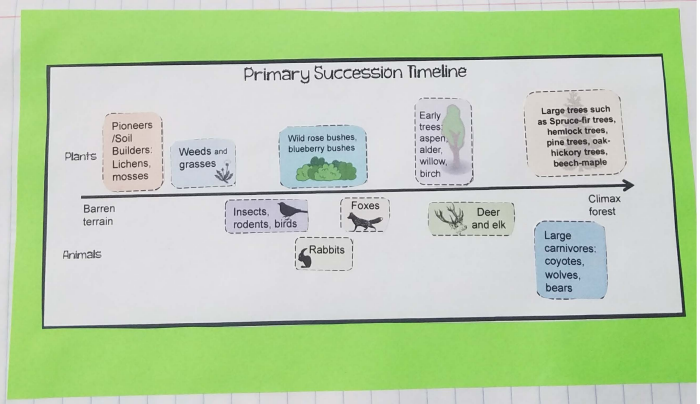
- This is an example of secondary succession, because there was previous life where the succession takes place.

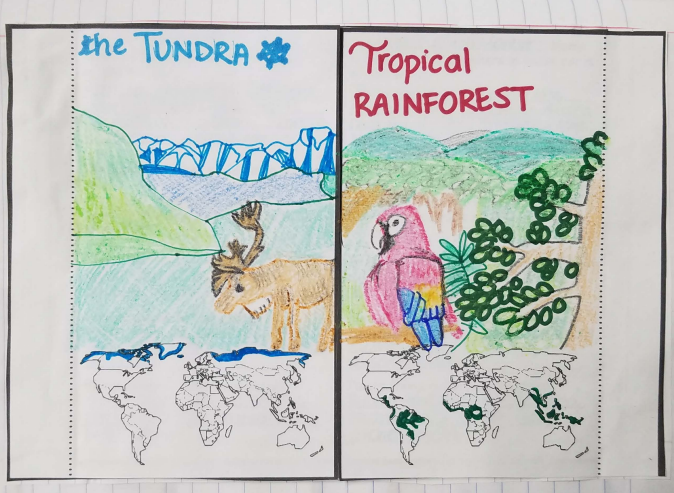
← Frogs may be attracted to this habitat during the succession due to the plant life + lily pads.

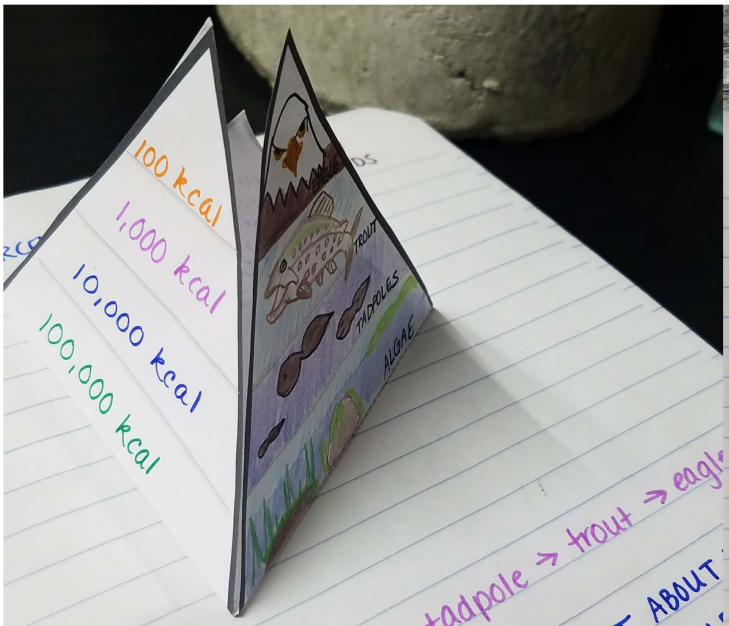
← Ducks may be attracted to the habitat at this stage due to sheltering plants and ample food sources.

← The next step to follow this one may be larger plants such as shrubs and bushes.

* As new life enters an ecosystem, a series of changes occur, which leads to succession.

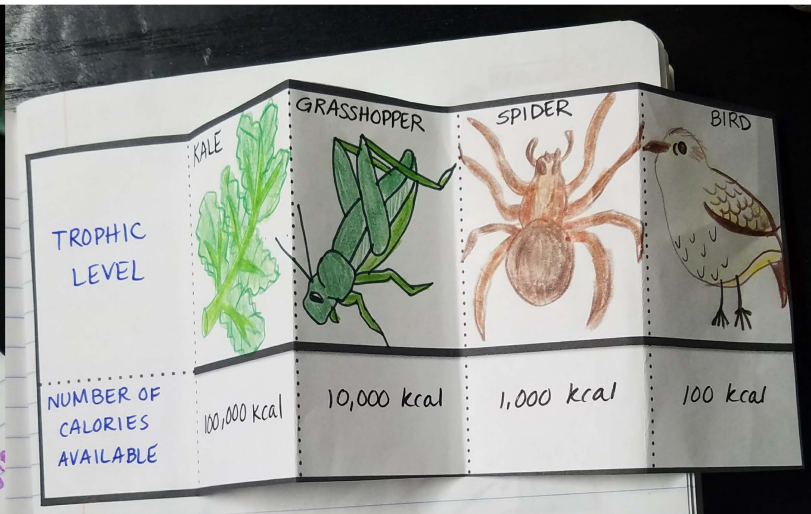






Food Chain: algae → tadpole → trout → eagle

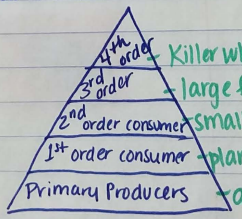
THE TEN PERCENT LAW STATES THAT ABOUT 10% OF ENERGY IS PASSED ON FROM TROPHIC LEVEL TO TROPHIC LEVEL.



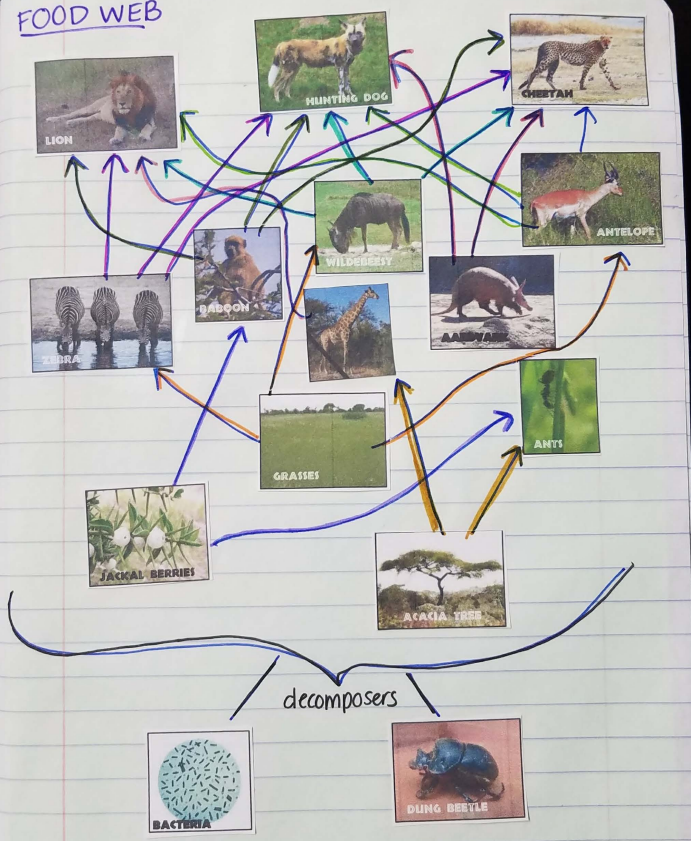
Trophic levels tend not to exceed 4 or 5 due to the ten-percent law - as you reach the higher trophic levels there is fewer energy available.

BIOMASS - total amount of organic matter within an ecosystem.

* Most of the biomass is found in the producers; lots of biomass is required to support higher-order carnivores.



FOOD WEB



A FOOD WEB IS MULTIPLE CONNECTED FOOD CHAINS THAT DEPICTS THE COMPLEX INTERACTIONS OF ENERGY FLOW.

Population Size and Growth rate

THE TOTAL NUMBER OF INDIVIDUALS IN A POPULATION

(r) = birth rate - death rate per year

Population Density

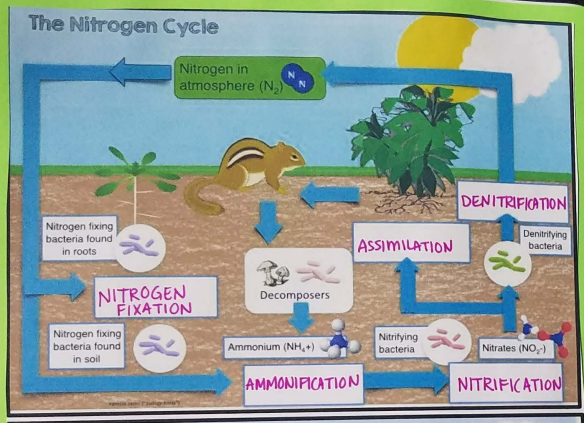
THE NUMBER OF INDIVIDUALS WITHIN A GIVEN AREA

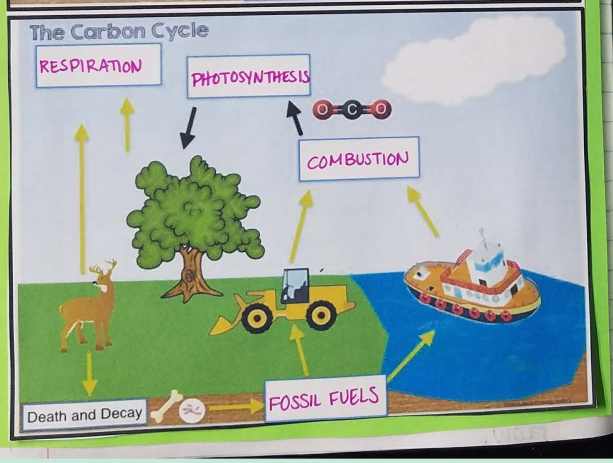
Density Independent Factors

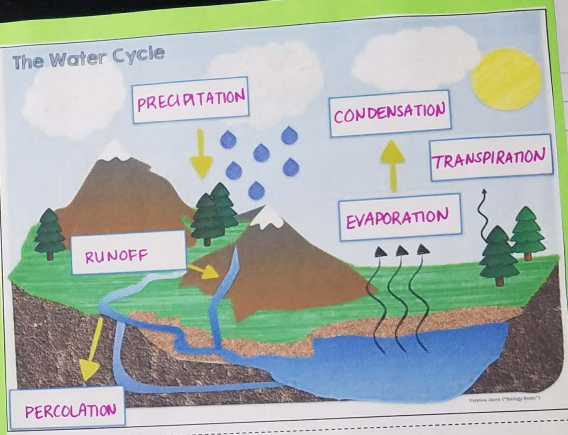
FACTORS THAT CAN AFFECT A POPULATION, REGARDLESS OF ITS SIZE, OR ITS DENSITY.

Density Dependent Factors

FACTORS THAT CAN AFFECT A POPULATION SIZE AND ARE DIRECTLY INFLUENCED BY ITS DENSITY.







Analysis Questions

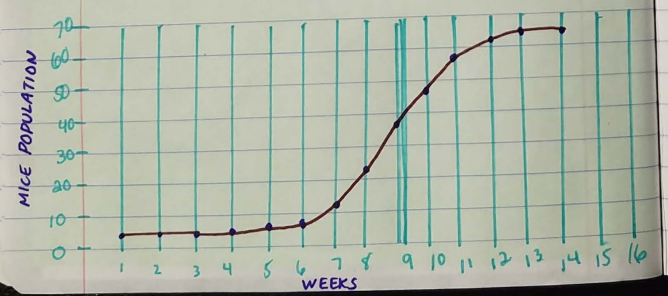
1. Water can be returned to the atmosphere by a process known as EVAPORATION.
2. Water evaporates from plants by a process known as TRANSPIRATION.
3. When too much water has accumulated in the soil it surfaces and is known as RUNOFF.
4. The carbon-containing molecule found in the atmosphere that is often released by respiration is CO_2.
5. COMBUSTION occurs when carbon is returned to the atmosphere from the burning of FOSSIL FUELS.
6. When marine animals die, their shells decay into limestone. When the limestone is exposed, CO_2 is released. This is a process known as EROSION.
7. Ammonia (NH3) can be produced by bacteria in the soil by two processes: AMMONIFICATION and NITRIFICATION.
8. When plants absorb and incorporate nitrogen into the soil, it is called ASSIMILATION.
9. Nitrates are converted into NITROGEN GAS (which is simply released into the atmosphere) during a process known as DENITRIFICATION
10. As plants and animals decompose, bacteria breaks down the dead matter into AMMONIA during a process known as AMMONIFICATION

Interpreting Ecological Data

Mouse Population	Number of weeks	Mouse Population	Number of weeks
4	1	23	8
4	2	38	9
4	3	48	10
5	4	58	11
6	5	63	12
7	6	65	13
12	7	65	14

Graph 1) Mouse Population over Time- Using the chart above, create a graph in your notebook and answer the following questions:
a. Which type of growth does the graph reflect?
b. What is the carrying capacity for this specific mouse population?
c. During which weeks was the mouse population growing exponentially?

A. THE GRAPH REPRESENTS LOGISTIC GROWTH
B. THE CARRYING CAPACITY IS APPROXIMATELY 65 MICE.
C. THE MOUSE POPULATION WAS GROWING EXPONENTIALLY BETWEEN WEEKS 7-12.



Year	# Lynxes	# Hares born	# Hares died
1980	3	54	10
1985	6	46	16
1990	9	35	22
1995	10	28	33
2000	8	34	25
2005	9	38	18

1. During which year was the hare population not growing? What is the carrying capacity for lynxes? What is the carrying capacity for hares?
2. What was the growth rate for hares in 1980?
3. What was the growth rate for hares in 2005?
4. Explain how the lynx population affected the hare population.
5. What happened to the lynx population in 2000? Offer a possible explanation for this.

1. The hare population was not growing in 1995.
2. The carrying capacity for the lynx population is roughly 9 or 10.
3. The carrying capacity for the hare population is approx. 111; the growth rate in 1980 was +44.
4. During the most drastic growth rate among the hare population in 1980, the lynx population was at its lowest. As the lynx population grew, the hare population declined.
5. In 2000, the lynx population began to decline for the first time in 20 years. This may have been because there were not enough hares to support the population since the hares had negative growth that year.

BOTH SPECIES BENEFIT

{BOTH ARE HELPED}



The red-billed ox pecker obtains a steady food supply by constantly picking ticks off the bodies of large animals, such as giraffe, zebra, and rhinoceros. This helps the animals get rid of the parasites.



Remora sharks have suckers on the top of their head, and can attach themselves to sharks, rays, large fish and whales. They hitch a ride and feed off the leftovers scattered from their host. The host is unaffected by this behavior.

ONE SPECIE BENEFITS, THE OTHER IS NEITHER HELPED NOR HARMED

PARASITISM

PREDATION

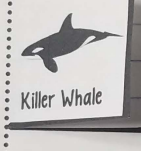
WANTED



A herd of aphids is wanted to feed on nearby plants. As they feast on the plants in my community, they produce a delicious, tasty, sweet honeydew. This honeydew I simply cannot live without this liquid sugar! It provides me with a tasty treat. In return, I will protect the family of aphids from predators or threatening animals. Together, we can partake in mutualism: a relationship in which we can both benefit.

Sincerely,
Anthony the Ant

BIOMASS - THE TOTAL AMOUNT OF ORGANIC DRY WEIGHT FOUND IN AN ECOSYSTEM.



Killer Whale



Tuna

A large amount of producers is re to sustain high ord carniv

Low level carnivores/
secondary consumers
10,000 kg biomass

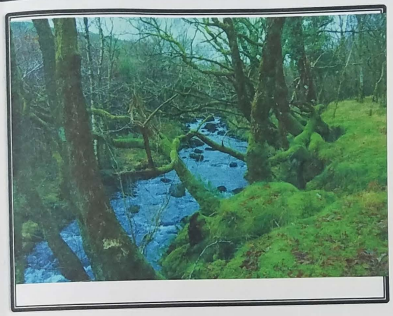


Zooplankton



Algae and Phytoplankton

biomes file book



TEMPERATE DECIDUOUS RAINFOREST

Climate:	Mild temperatures; rarely freezes. Very rich soil. Rainfall reaches 80+ inches per year
Fauna:	Deer, elk, mountain lions, foxes, chipmunks, bears
Flora:	Mosses, ferns, cedars, ferns, maple, birch, magnolia

GRASS-LANDS

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