

7th Grade SCIENCE FINAL REVIEW
Ecology, Evolution, Classification

ECOLOGY

Students will be able to:

___ Define species, population, community and ecosystem.

species – organisms that can mate and produce fertile offspring

population – organisms of the same species living together in a particular area

community – all the living populations interacting in a particular area

ecosystem – all the biotic (living) and abiotic (nonliving) factors interacting in a particular area

___ Explain the difference between a producer and consumer.

producer – autotroph that makes its own food through the process of photosynthesis

consumer – heterotroph that must find food, eats plants and/or animals

___ Define herbivore, carnivore, omnivore and scavenger.

herbivore – consumer that eats only plants

carnivore – consumer that eats only animals

omnivore – eats both plants and animals

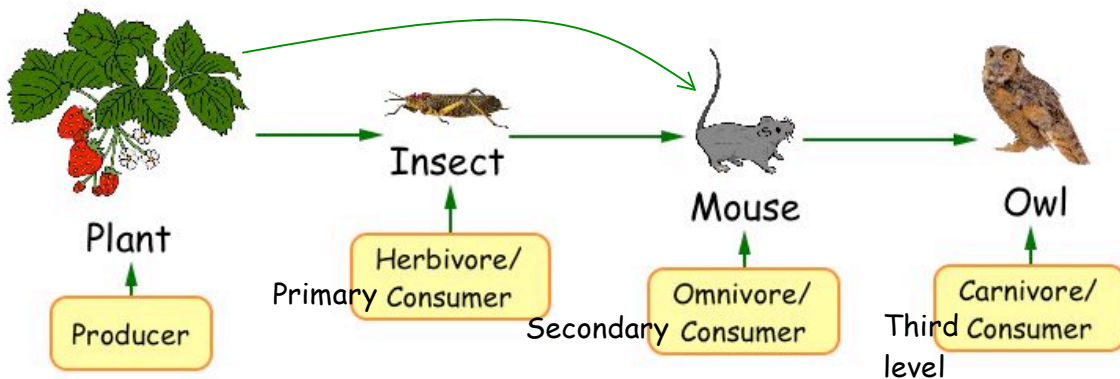
scavenger – eats dead animals but does not kill them

___ Explain how feeding relationships can be shown using a food chain and a food web.

energy from the sun is captured by the producer

energy in the form of food is passed from producer, to consumer, to decomposer

___ Given a food chain or web identify the producers, primary consumers and secondary consumers.



___ Explain how removing one organism from a food chain or food web will affect the other organisms.

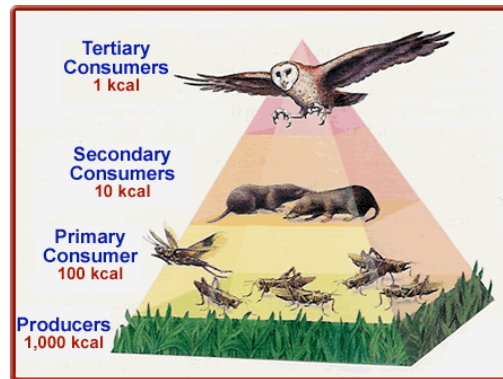
If the plants are removed from the food web, then all the other populations will decrease. Eventually all the populations will die.

___ Analyze an energy pyramid and explain how energy is transferred in an ecosystem.

The energy pyramid shows how energy is transferred from the producer level up to the next level. Organisms at each level use 90% of the energy for their own life processes, so only 10% of the energy is available and passed to the next level.

___ Using an energy pyramid, identify which level has the greatest and least amounts of energy and population size.

least population & energy



most population & energy

___ Identify the main source of energy for all ecosystems

the sun

___ Describe the important role played by decomposers in an ecosystem.

Decomposers break down dead plants and animals and return their nutrients to the soil

___ Define habitat and niche and explain the difference between them.

habitat – where an organism lives and gets the things it needs to survive

niche – the role of an organism in its environment

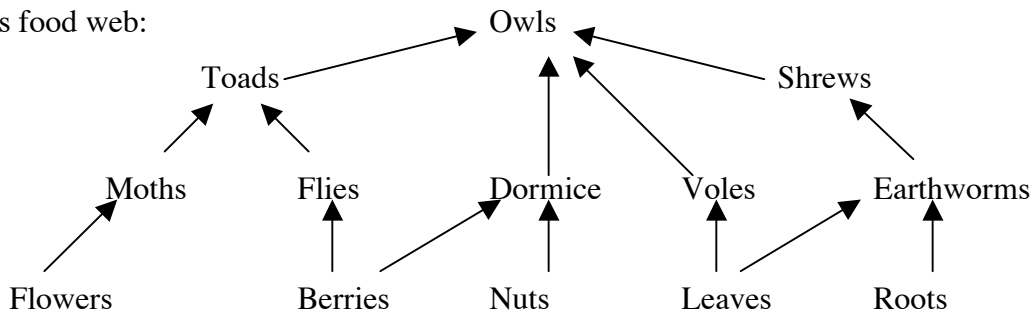
Ecology Questions:

1. Match each of these words with their definition:

- a. All the populations living in an area C niche
- b. The place where an organism lives E ecosystem
- c. The role an organism plays in its ecosystem D population
- d. The number of organisms of the **same species** in an area A community
- e. A system where all the communities interact with each other and the environment B habitat

2. Producers are able to make their own **food**. Producers are fed upon by **herbivores** or primary consumers. These in turn provide food for second **consumers** or carnivores. Dead and decaying material provides food for **decomposers** which break down the dead organism and return the **nutrients** to the soil. Feeding relationships can be shown in a **food chain** which is a sequence of organisms that show the pathway of energy. A more complete picture of how energy flows is in a **food web** which is made up of many food chains.

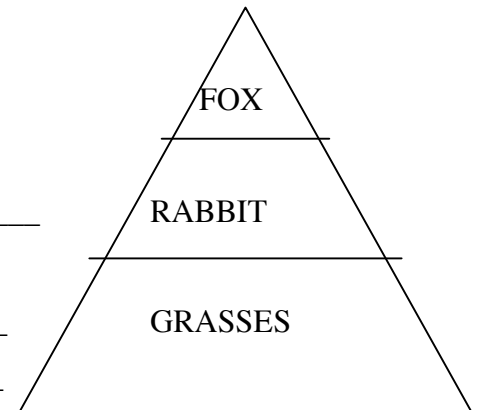
3. Look at this food web:



- a. Name two primary consumers. **moth, flies, dormice, voles, earthworms**
- b. Name one secondary consumer. **toad, owl, shrew**
- c. Construct a food chain with four links.
flowers → moths → toads → owls
- d. Where do the plants get their energy from? **sun**
- e. If the owls were all killed, what would happen to the numbers of:
dormice **increase**
earthworms **decrease**

4. Look at the energy pyramid and answer the questions

- a. Which organism is the producer? **grasses**
- b. Which organism is the primary consumer (herbivore)? **rabbit**
- c. Which organism is the carnivore? **fox**
- d. At which level is the most energy available? **grasses**
- e. At which level is population size greatest? **grasses**



EVOLUTION

Student will be able to:

___ Define adaptation and give several examples.

adaptation – a structure that allows an organism to survive in its environment

for example – narrow beak lets a bird get insects from the ground, wings allow a bird to escape predators, hollow bones allow a bird to fly, claws let a bird hold onto a branch

___ Define mutation.

mutation – a change in the DNA code

___ Describe Darwin's Theory of Natural Selection and explain overproduction, variations, competition and survival of the fittest.

theory of natural selection – organisms with the best adaptations are able to survive and reproduce, and pass their helpful genes to the next generation

overproduction – too many offspring are produced

variation – differences in traits

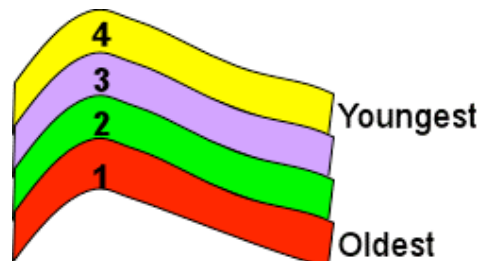
competition – struggle for limited resources

survival of the fittest – only those individuals with the best adaptations will survive and reproduce

___ Explain how fossils form and list the type of rock they are present in.

fossils form when an organism dies, gets buried by sediments, then sediments harden into sedimentary rock

___ Identify older and younger fossils if given a picture of rock layers.

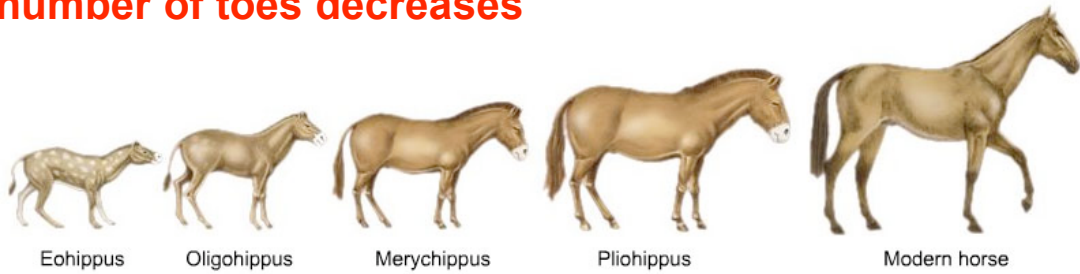


___ Compare absolute (radioactive) and relative dating.

relative dating – older fossils at the bottom of a cliff
absolute dating – the actual age of a fossil determined by measuring the amount of radioactivity in the fossil

___ Use the fossil record of a species to show how organisms evolved over time due to changes in their environment. For example: Fossil record of the horse.

height, length of legs, length of neck increased over time
number of toes decreases

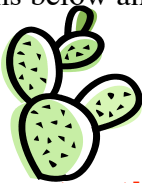


Evolution Questions:

1. Organisms produce large numbers of offspring. Some of these offspring are slightly different from each other. This is called variation. Many of the offspring die due to competition for food. The best adapted individuals are more likely to survive and reproduce. They pass of their genes to the next generation. Charles Darwin suggested how evolution could take place through natural selection. Fossils provide evidence to show that organism have evolved over time. Fossils found lower in the ground are older, whereas fossils that are closer to the surface are younger.

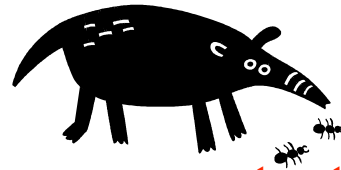
2. Look at the organisms below and describe two adaptations for each.

Barrel Cactus



spikes – protection
thick skin – retain water

Anteater

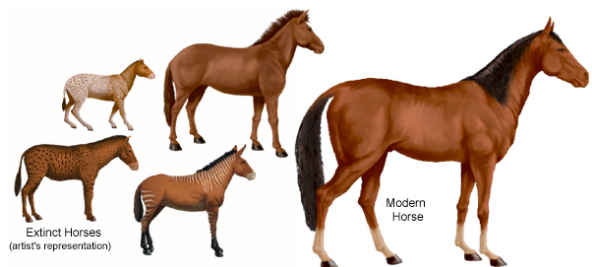


long nose – eat ants
thick skin - protection

3. Fossil evidence has been pieced together to suggest how the modern horse has evolved.

a. What changes can you see?

evolved longer legs
became taller, toes fused,
became more muscular



Sixty million years ago a lot of the environment was marshy and swampy. There were small trees and bushes where early horses could hide from predators. One million years ago the environment changed and grasslands replaced the trees and bushes. There was no place to hide. The faster an animal could run, the better its chance of escaping a predator and surviving.

b. Describe 3 ways the horse changed so that it could survive in the changed environment.

taller – see predators better over the tall grass
one toe – run faster over grassland
more muscular – run faster



CLASSIFICATION:

Students will be able to:

_____ Use a dichotomous key to classify organisms. **(see answer to #1 below)**

_____ Write questions to sort organisms based on their observable structures.

Does the animal have more than two legs?

Does the animal have wings?

Does the animal have a shell?

_____ Discuss how organisms are classified into the 6 kingdoms.

**according to number of cells, how they get their food,
where they have their chromosomes**

_____ Describe the characteristics of Archaeobacteria.

**prokaryote, unicellular, found in extreme environments,
autotroph or heterotroph**

_____ Describe the characteristics of Eubacteria.

**prokaryote, unicellular, found in common environments,
autotroph or heterotroph,
classified by shape: rod, spherical, spiral**

_____ Describe the characteristics of Protists.

**eukaryote, unicellular/multicellular, pond organisms,
classified according to animal-like, plant-like, fungus-like**

_____ Describe the characteristics of Fungi.

**eukaryote, unicellular/multicellular, heterotroph,
decomposers, contain a cell wall,
classified by type of reproduction: budding, sporulation**

_____ Describe the characteristics of Plants.

**eukaryote, multicellular, autotroph, classified as vascular
(having a tube system) or nonvascular**

_____ Describe the characteristics of Animals.

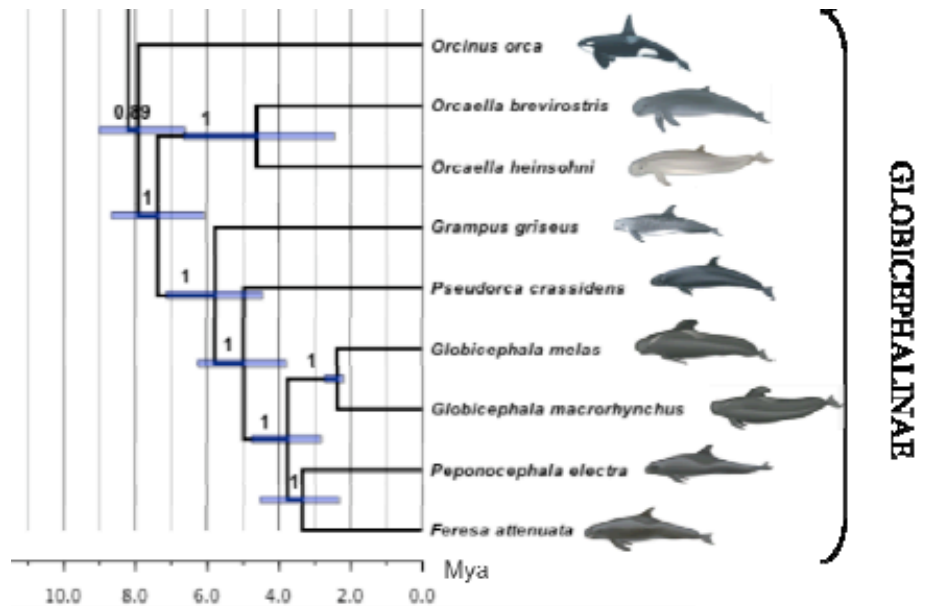
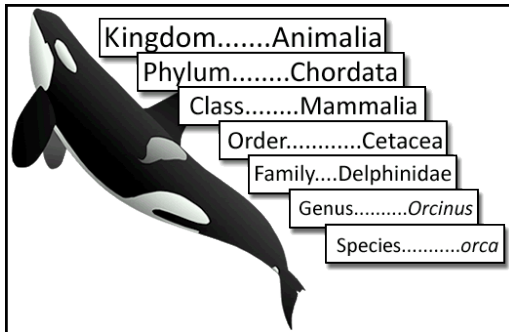
**eukaryote, multicellular, heterotroph, classified as
vertebrate (having an internal skeleton) or invertebrate**

_____ Write the scientific name of an organism.

**scientific name of an organism is its genus and species
Felis domesticus – house cat**

_____ Explain how modern scientists classify organisms.

organisms are classified into kingdom, phylum, class, order, family, genus, and species based on their body structures, DNA and protein sequences, and evolutionary history



_____ Use a taxonomic chart to identify similarities and differences among organisms.

(see answer to #2 below)

Classification Questions:

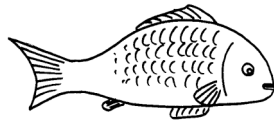
1. Use the dichotomous key to name the organisms:

House mouse



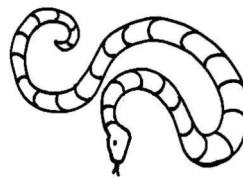
Mus musculus

Brook trout



Salvelinus fontinalis

Corn snake



Elaphe guttata

Green frog



Rana clamitans

1A: Has scaly skin
1B: Does not have scaly skin

2A: Has hair or fur
2B: Does not have hair or fur

3A: Has gills
3B: Does not have gills

Go to 3
Go to 2

Mus musculus
Rana clamitans

Salvelinus fontinalis
Elaphe guttata

2. Use the taxonomic chart to answer the following questions.

Classification level	Chimpanzee	Human	Baboon
Kingdom	Animalia	Animalia	Animalia
Phylum	Chordata	Chordata	Chordata
Class	Mammalia	Mammalia	Mammalia
Order	Primates	Primates	Primates
Family	Hominidae	Hominidae	Cercopithecidae
Genus	Pan	Homo	Papio
Species	trogodytes	sapiens	anubis

a. Which two organisms are the most closely related?

Chimpanzee and Human – 5 levels in common

b. Which level of classification contains the most diverse (different) organisms?

kingdom

c. Which levels of classification make up the scientific name of an organism?

Genus and species

d. What is the scientific name of a baboon?

Papio anubis

3. Complete the chart about the Six Kingdoms of Life:

Characteristic	The Six Kingdoms					
	Archaeobacteria	Eubacteria	Protists	Fungi	Plants	Animals
How it gets its food (Autotroph/Heterotroph)	A / H	A / H	A / H	H	A	H
Where it has its genetic material (Prokaryote/Eukaryote)	P	P	E	E	E	E
Number of cells (Unicellular/Multicellular)	U	U	U / M	M / U	M	M