CHARACTERISTICS OF LIFE

All living things change to fit their environment

ADAPTATIONS!!!!!!!

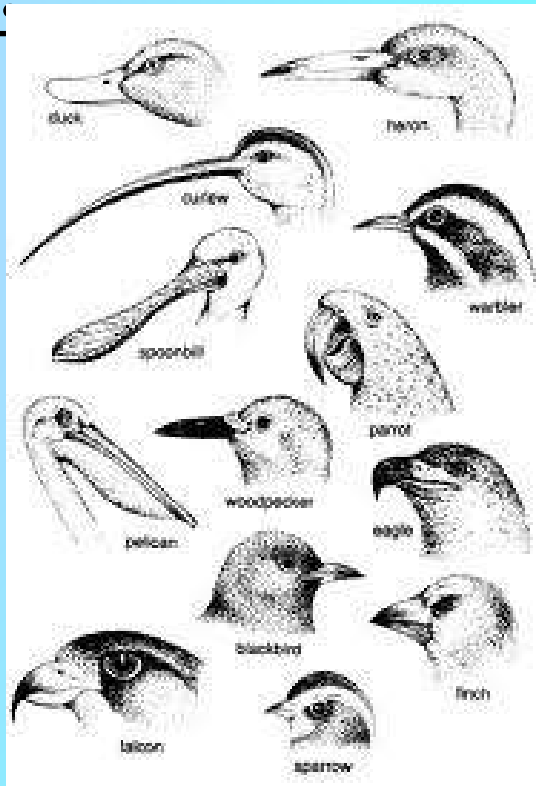
Inherited Characteristics

Why do tigers have stripes?
Why are bullfrogs green on the back and white on the belly?
Why do giraffes have such a long neck?
Why do geese fly south for the winter?
Why do waterlilies float?
Why do some plants bear fruit?

All of these questions deal with adaptations!!!

What are adaptations?

Adaptations – an inherited characteristic that helps an organism to *survive* long enough to *reproduce* more successfully in its changing environment and can either be structural or behavioral.



If red touches yellow, deadly fellow. If red touches black, friendly jack.

Structural Adaptations

Definition: Actual body parts or coloration that help an organism survive in their environment.

EX: camouflage, mimicry, bent hind legs, sharp teeth and claws, body structures.

Behavioral Adaptations

- Definition: Ways an organism act to help them survive in their environment.
- EX: Migration, hibernation, warning calls, mating dances, hunting in packs.

Types of Structural Adaptations

CAMOUFLAGE/COLORATION: blending in with the environment for protection from predators or to help sneak up on prey.

Use: Obtaining food and protection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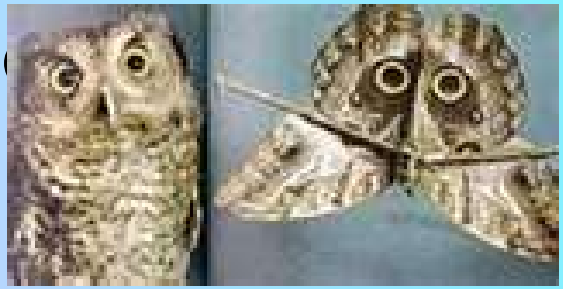
Types of Structural Adaptations

MIMICRY: copying a behavior or appearance.

Used for pre[illegible]n or [illegible] food and p[illegible]on.



Monarch Butterfly (poisonous)

Viceroy Butterfly (non- poisonous)

Types of Structural Adaptations

Bent hind legs – prey run fast to escape & predators run fast to catch prey

Used for: protection, locomotion

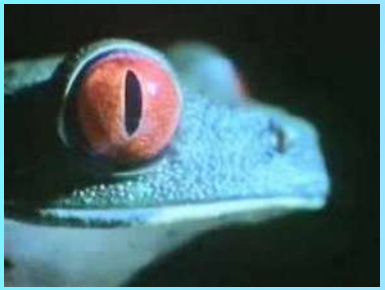
Types of Structural Adaptations

Teeth – flat teeth grinding for plant eaters

Sharp teeth cutting for meat eaters

Types of Structural Adaptations
Body Structures

Prey – Eyes on the side of the head



Predator – Eyes facing forward to find

flippers

wings

Bent legs

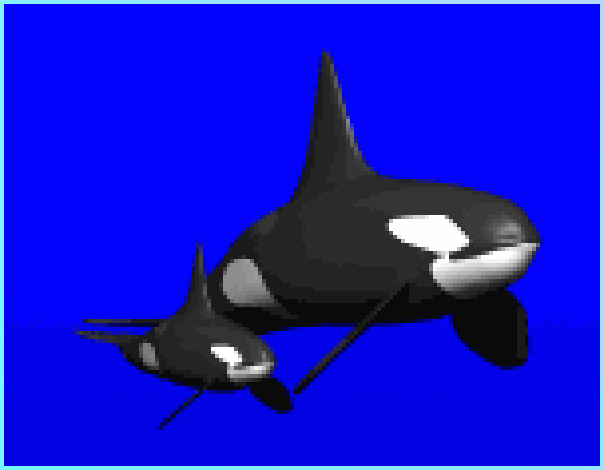
We have been looking at structural adaptations of animals. ADAPTATIONS ON THE BODY, but animals can also have behavioral adaptations. This type of adaptation cannot be seen on the body. It is the way an animal reacts or behaves in certain situations. In other words: INSTINCTS

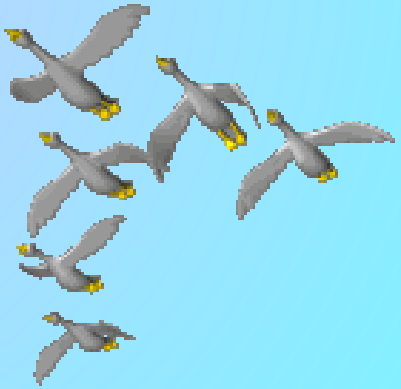
In simple animals, behavior is governed almost entirely by instinct, meaning that it is pre-programmed by an animal's genes. In more complex animals, instinctive behavior is often modified by learning, producing more-flexible responses to the outside world.

Behavioral Adaptations

Migration - seasonal or periodic movement of animals in response to changes in climate or food availability, or to ensure reproduction.

Migration most commonly involves movement from one area to another and then back again.





Examples: geese, whales, salmon, Monarch butterflies

Behavioral Adaptations

<u>Hibernation</u> – adaptive winter survival technique where animal becomes inactive and all body processes slow down.

In cold weather most animals must eat large quantities of food to obtain the energy needed to carry on normal body activities.

Examples: bears, chipmunks, squirrels, bats,

Behavioral Adaptations

3. **<u>Living in a Group</u> – more eyes in a group to watch out for prey or predator, protection**

Examples: fish, wildebeest, walruses, lions

Behavioral Adaptations

4. **Tool Use - any object manipulated by an animal in order to perform a specific task.** (monkeys, otters, birds)

5. **Playing Dead - By pretending that they are dead, some animals escape bodily harm. (snakes, possums)**

Behavioral Adaptations

6. Calling – communication between animals

7. Threatening Gestures – scares off potential predators

PLANT ADAPTATIONS

All living things adapt is a characteristic of life. All 6 kingdoms adapt. Animals are not the only organisms to adapt.

Structural Plant Adaptations

1. Structures - adaptations on the body:

holdfasts, empty space for water storage, catch animals for minerals, tallness, heartiness, thorns, flexibility, floatation devices

2. Seeds – all seeds have adaptation to better enable it to survive long enough to plant itself and grow.

Plant Adaptations

Protection – thorns, bad taste, poison, coloration, spikes

Obtaining Food – All plants do photosynthesis and make glucose in their leaves. The larger the leaves the more Sun they can capture.

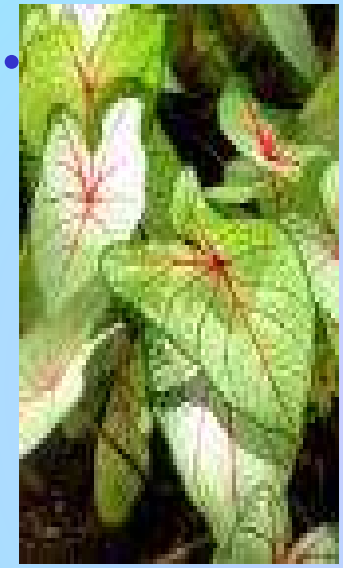
Plant Adaptations

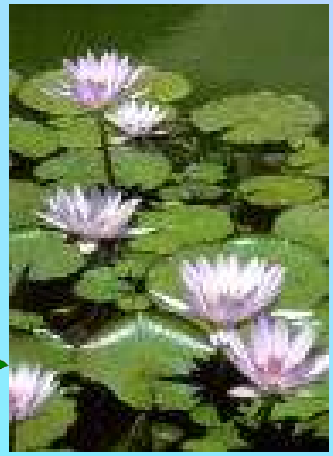
SEEDS

Seeds are the baby plants!!! They are formed when the pollen fertilizes the egg. Fruit protects the seed.

PLANT STRUCTURE ADAPTATIONS

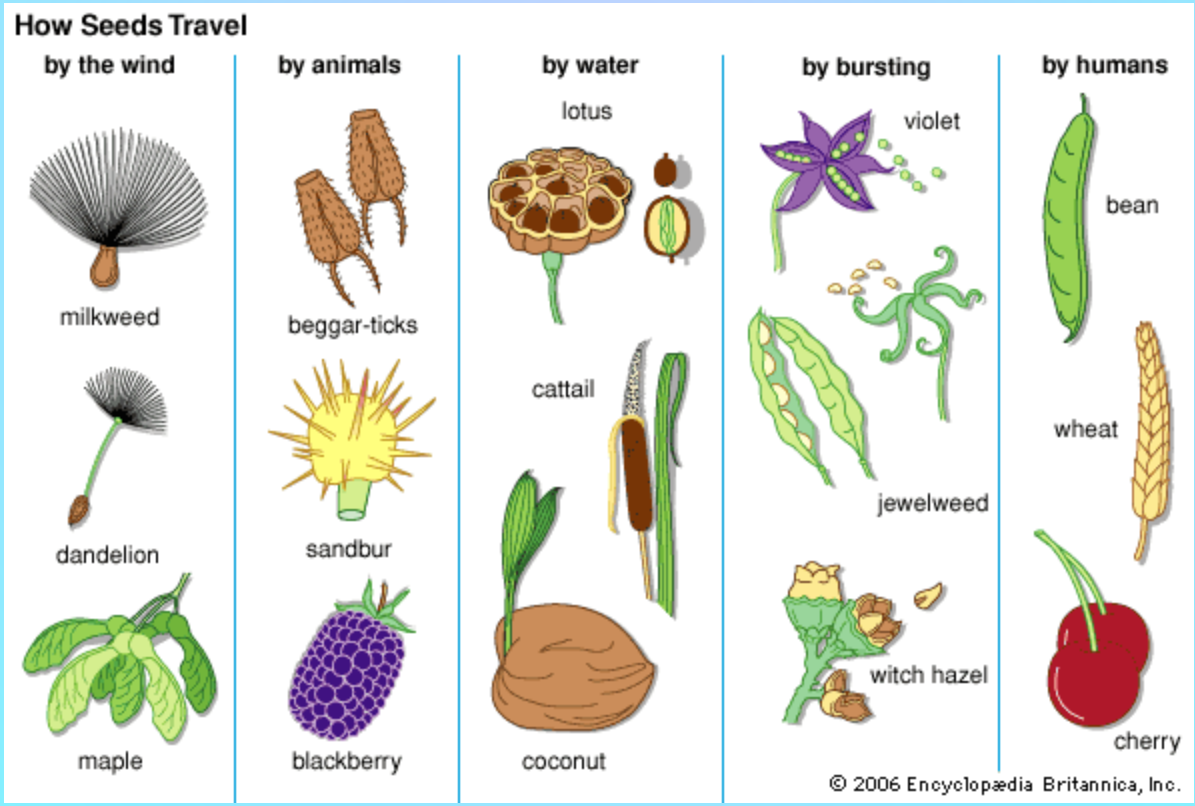
Below are pictures of plants. Pick out their adaptations.





SEED ADAPTATIONS

For plants to survive, seeds have to be dispersed away from the parent plant.

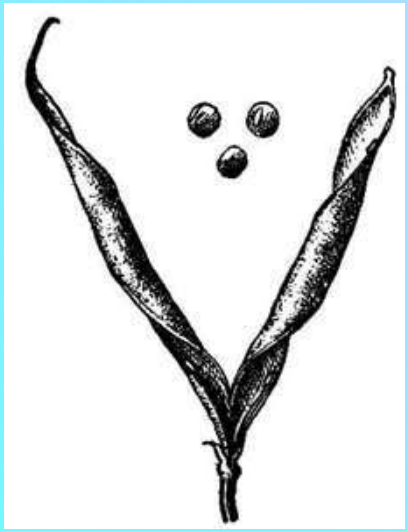


Types of seed dispersal:

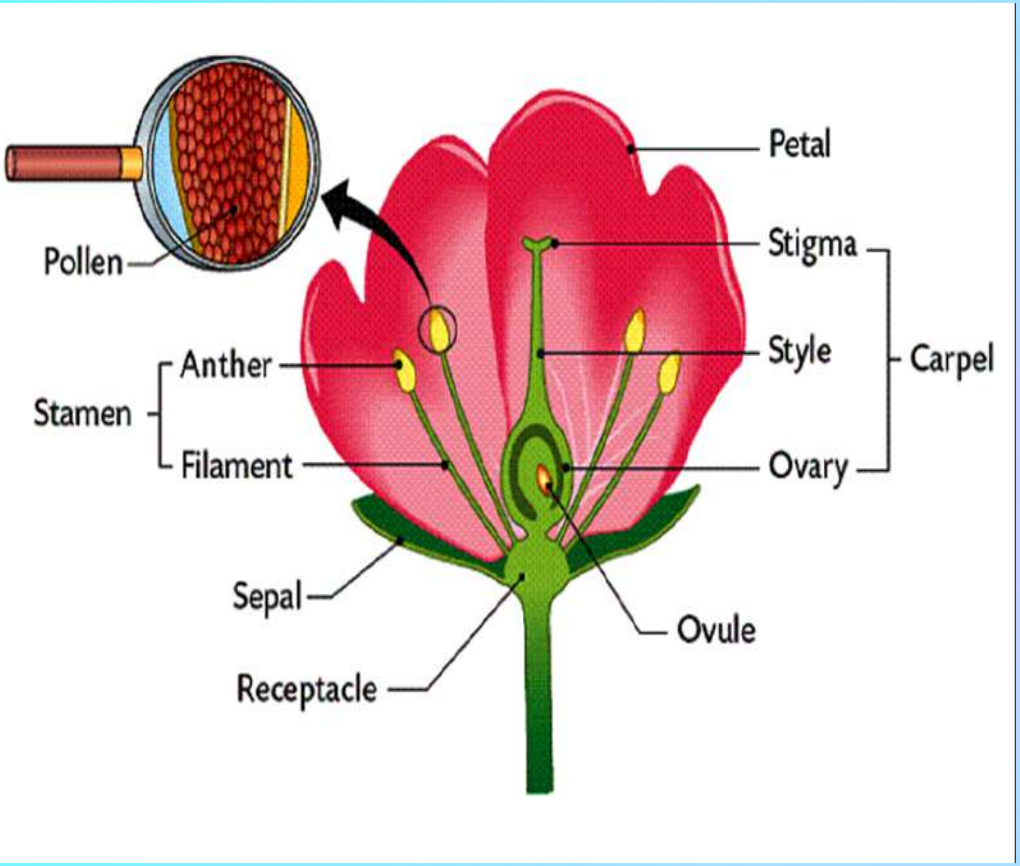
1.Carried by wind (parachutes, wings)
2.Carried on animal's fur or feathers
3.Carried by water (float)
4.Eaten by animals –Eat the seed and comes out in the feces. (fruit)
5. Mechanically propelled-The plant throws the seed. (shoot the seeds)

SEED DISPERSAL

Look at the seeds below and name how they are dispersed.



Plant REPRODUCTION (Pollination)



Male – Stamen

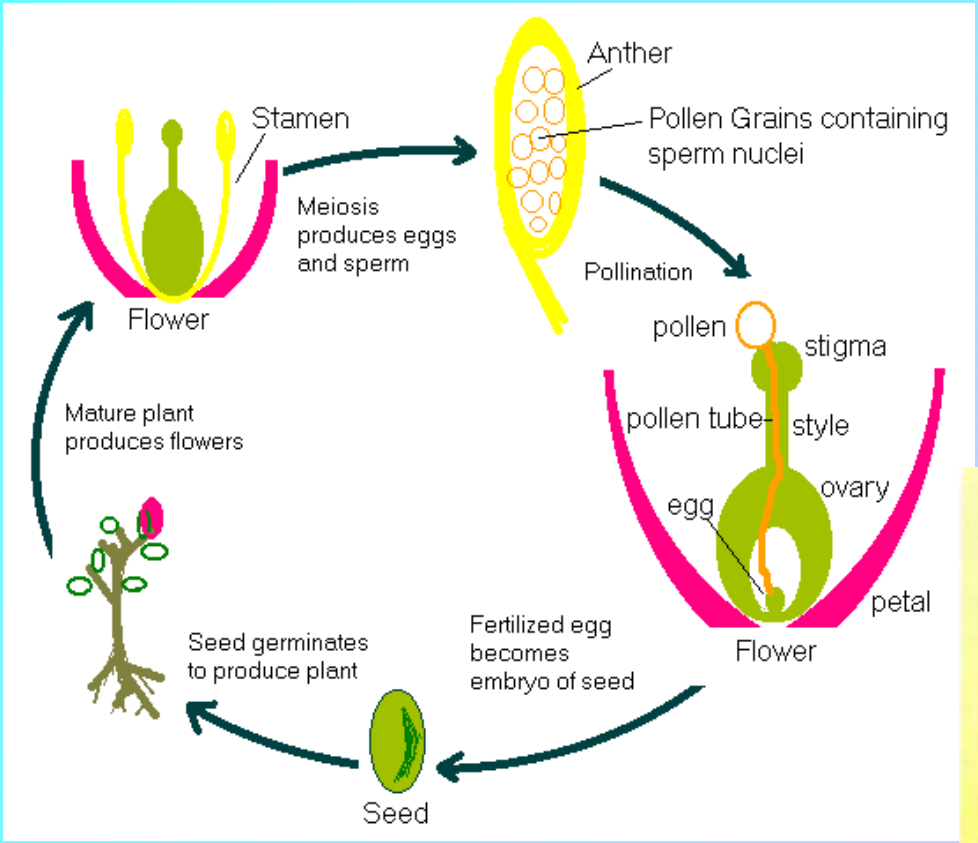
Top of stamen is the anther, pollen made in the anther.

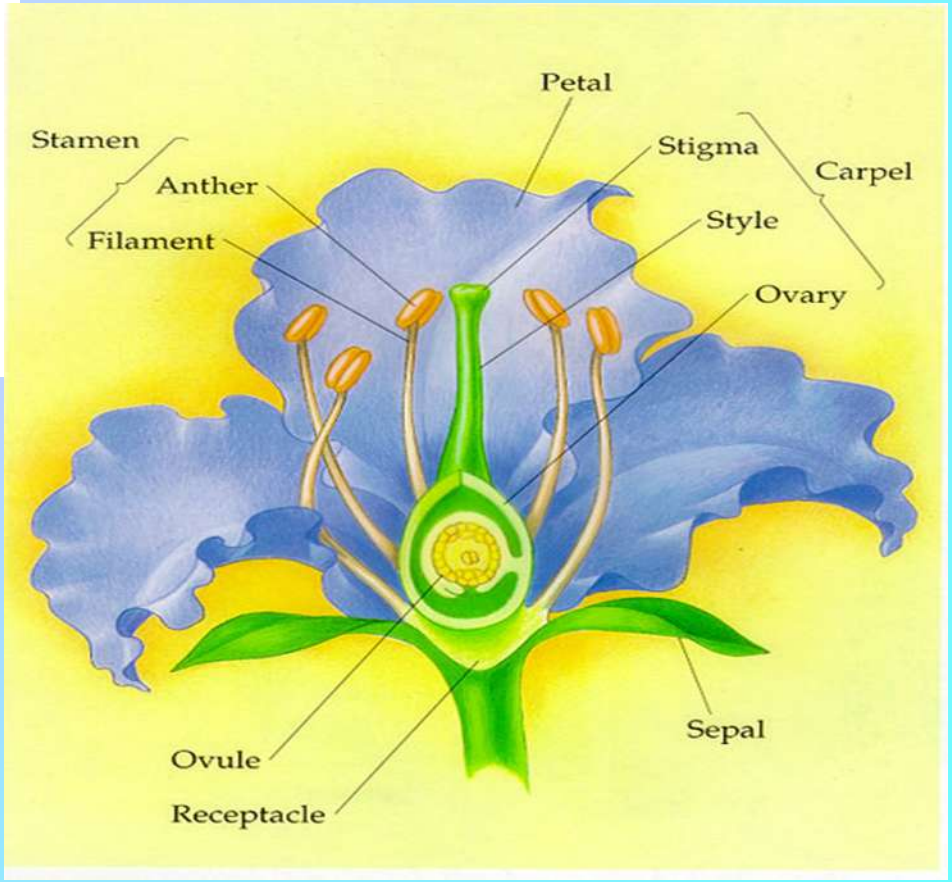
Female – Pistil

Ovule (egg) – becomes a seed.

Ovary – becomes fruit.

Fertilization – occurs when the pollen from the anther is carried to the pistil by animals. The sperm(pollen) falls down the style to the egg and fertilizes the egg.

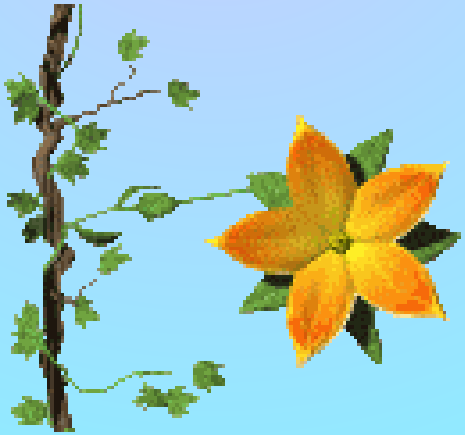

Anther
Stamen
Pollen Grains containing sperm nuclei
Meiosis produces eggs and sperm
Pollination
Flower
pollen
stigma
pollen tube
style
ovary
egg
petal
Flower
Mature plant produces flowers
Seed germinates to produce plant
Fertilized egg becomes embryo of seed
Seed


Petal
Stamen
Stigma
Carpel
Anther
Style
Filament
Ovary
Sepal
Ovule
Receptacle

PLANT BEHAVIORS

Plants not only have structural adaptations; they have behaviors that help them to survive in their environment.

Tropism: movement of a plant toward or away from a stimulus. Toward is called positive, away is called negative.



Example 1-Phototropism

- When the plant senses light and the shoots (stems & leaves) grow toward the light source.
- This is a positive tropism because the plant is growing toward the stimulus.

Example 2-Gravitropism

- When growth of a plant changes in response to direction of gravity.

Shoots (stems & leaves) have a negative Gravitropism because they grow in the opposite direction of the force of gravity.

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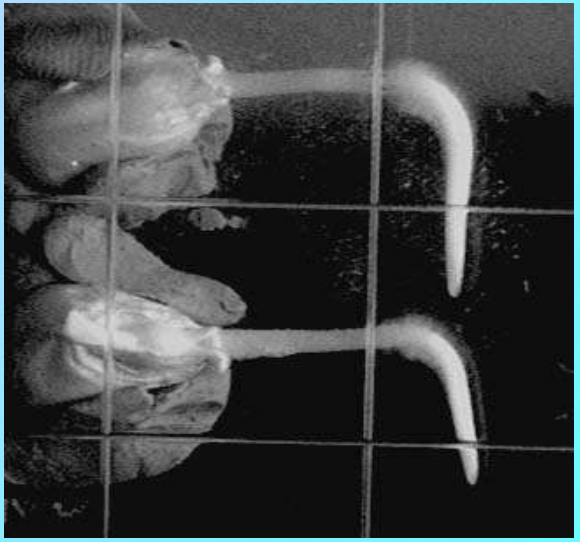
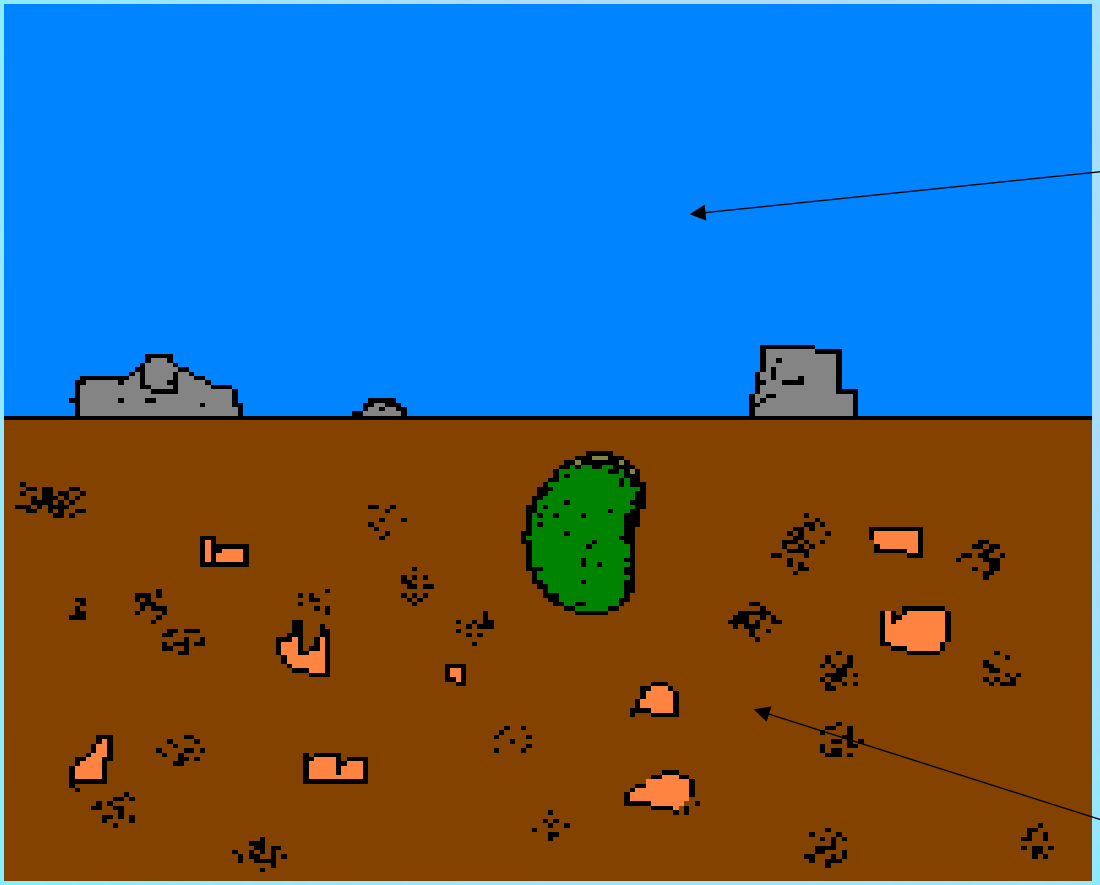


Roots mostly have positive gravi-tropism because they grow toward the force of gravity (downward).

→

Ex: gravitropism – responding to gravity



Stems grow up (negative)

Roots grow down (positive)

PLANT BEHAVIORAL ADAPTATIONS

DORMANCY - A state of rest or inactivity.

Many plants go dormant in the winter. Fall is the time of year when plants are preparing for dormancy.

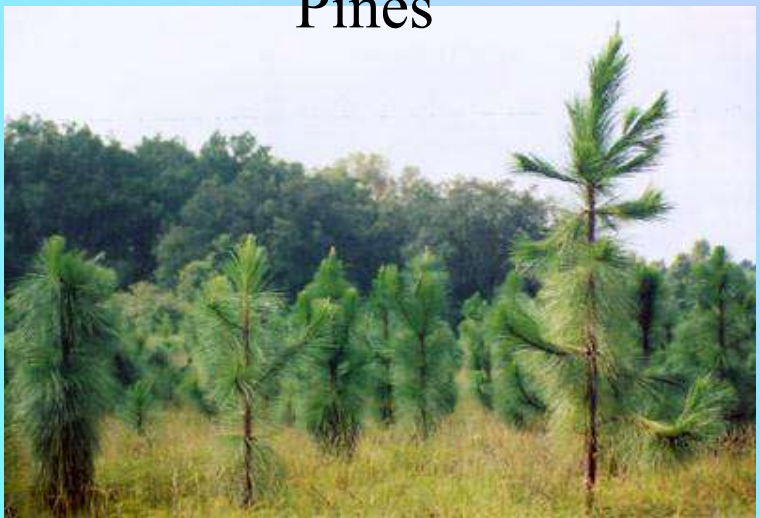
Why do trees loose their leaves in the fall?

What other types of plants go dormant in the winter?

DORMANCY

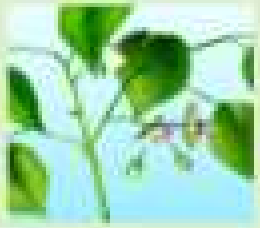
- Seasonal Changes in Trees to survive winter. All trees lose their leaves at some point. Stop taking in water so the xylem will not freeze.
- Trees like pines and holly lose their leaves all through out the year. They are called evergreens.

Pines



Holly

The Life Cycle of a Plant



LIFE CYCLE OF A PLANT

Reproduction is the process by which a plant produces seeds to make a new plant. This life cycle shows the different stages in plant reproduction.

Life Cycle of a Plant

bean plant

apple tree