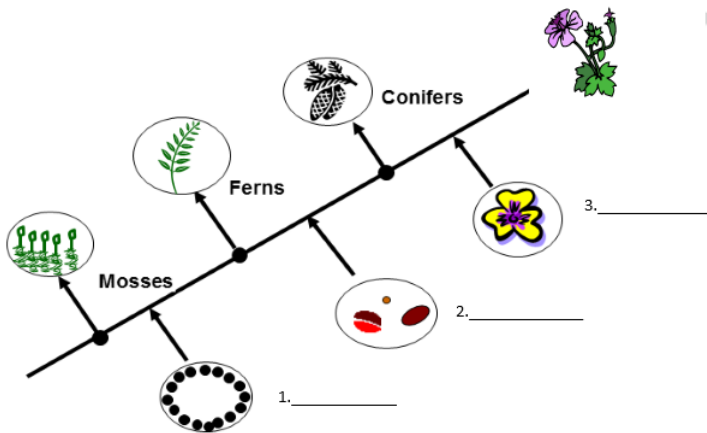


EVOLUTIONARY ADVANCES OF PLANTS

Plants share many characteristics with green algae, including DNA, which confirms that they are closely related. Fossil evidence suggests that the first true plants were dependent on water to complete their life cycles. Over time, the demands of life on land favored plants that were not as dependent on water. Plants had to find ways to conserve water, reproduce without water, and obtain minerals. Botanists divide the plant kingdom into four groups based on three important features: water-conducting tissues, seeds and flowers. These four groups are mosses, ferns, cone-bearing plants and flowering plants. As plants evolved they derived three basic traits that help us categorize them: **vascular tissue**, **seeds**, and **flowers**

- Use the information above to complete the cladogram by adding the derived characteristic (trait) in the appropriate spot.













- What trait(s) separates mosses from ferns, conifers, and flowering plants?
- What is the advantage that conifers and flowering plants have over ferns?
- Why would flowers be considered an evolutionary advantage?

- What is the primary function of vascular tissue and what are the two types of vascular tissues?
- Xylem conducts _____ from _____ to _____.
Phloem conducts _____ from _____ to _____.
- Since non-vascular plants have no phloem and xylem what cell process would they have to rely on to move molecules within the plant?
- Why would having vascular tissues allow a plant to live away from a direct water source?

Angiosperms (flowering plants) – Two types

Flowering plants are divided into two basic groups, monocotyledons (monocots) and dicotyledons (dicots). A quick visual inspection of a plant can reveal whether you have a monocot or dicot.

Seed leaves	Leaf veins	Stems	Flowers	Roots
MONOCOTS				
 One cotyledon	 Veins usually parallel	 Vascular bundles in complex arrangement	 Floral parts usually in multiples of three	 Fibrous root system
DICOTS				
 Two cotyledons	 Veins usually branched	 Vascular bundles arranged in ring	 Floral parts usually in multiples of four or five	 Taproot usually present

Observe the specimens at your station. Identify them as a monocot or a dicot. Then identify the characteristic that makes the specimen a monocot or dicot.

Specimen	Monocot or Dicot	Characteristic
#1		
#2		
#3		
#4		
#5		
#6		

Amazing Adaptations

(All videos are on the class website)

Plants have adapted to live in almost every ecosystem on earth, both terrestrial and aquatic. Below are some of the more extreme adaptations that plants have evolved to have in order to survive.

Are plants really carnivorous?

<https://youtu.be/ktIGVtKdgwo>

<https://vimeo.com/42703337>

1. Sundews, pitcher plants and venus fly traps are not really heterotrophs; explain why they are “eating” other organisms?

Do plants feel pain?

<https://youtu.be/fGLABm7jj-Y>

2. Explain how plants can respond to touch stimulation even though they do not have a nervous system.

Did you know plants are super competitive?

<https://youtu.be/H9MV5CgPgIQ>

3. What is the advantage of aggressive growth that was exhibited by the vines?

Just because they are cool....

<http://themysteriousworld.com/top-10-most-mysterious-desert-plants/>

<http://www.whercoolthingshappen.com/18-flowers-that-look-like-something-else/>

<http://themysteriousworld.com/most-deadliest-plants-in-the-world/>