BOTANY BASICS

or

"Aren't plants absolutely amazing?"

Plant

characteristics

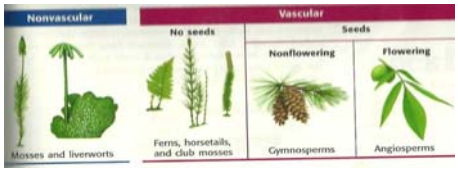
All Plants

- Many celled – not microscopic
- Cell walls surround cells
- Reproduce with spores or sex cells

Most Plants

- Have roots
- Contain chlorophyll which allows them to make their own food
  - A few plants are parasitic and live off other plants ex: Indian Pipe
  - Have a cuticle which is a waxy outer layer to keep them from drying out

Classification of Plants



- Nonvascular plants – Mosses and Liverworts
  - No "plumbing " to transport food and water
  - Must be small
  - Absorb water directly into cells
  - Does photosynthesis in all parts
  - No true roots

Seedless Plants

Ferns, Horsetails and Club Mosses

Fern life cycle includes 2 plant forms. One is small and insignificant looking. The second form is large and what we think of as a fern.

Ferns reproduce with spore cases.

Different ferns can be identified by the shape, location and pattern of spore cases.

Spore containers called “sori” can look like a disease to the homeowner

Maidenhair fern is one of our natives

Leaves of ferns called “fronds” unfurl such as on this native sword fern. This stage is called fiddlehead. Some are edible and sold in grocery stores.

Horsetails also have spores--many gardeners complain about them because they are difficult to control

Club mosses & *Selaginella* live on the moist forest floor – you may get an inquiry from a curious gardener

Liverworts usually inhabit moist forest spots but recently one kind has become a pest in container nurseries. You may get inquiries from the public about their potted plants.

Visual tour of the plant world

Mosses



Sphagnum moss is used to add organic matter, acidity and increased moisture capacity to soil but its use may deplete natural bogs--substitutes are compost and cocoa fiber

Visual tour of the plant world

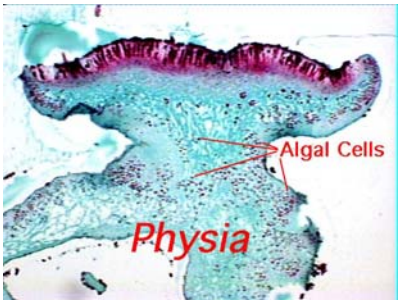
Lichens: a special case

What is a lichen anyway?

A lichen is a symbiotic relationship made up of one species of fungus and one of algae. When combined, the lichen resembles neither and functions as a unit

How many kinds can you see on this rock?

Inside a lichen



Lichens grow on many surfaces, including rocks, and trees

?

Do lichens harm trees and shrubs?

Answer: Not usually. Some lichens "fix" atmospheric nitrogen--check with your local agent or the PNW books

Seed Plants

Two types

Nonflowering – Gymnosperms

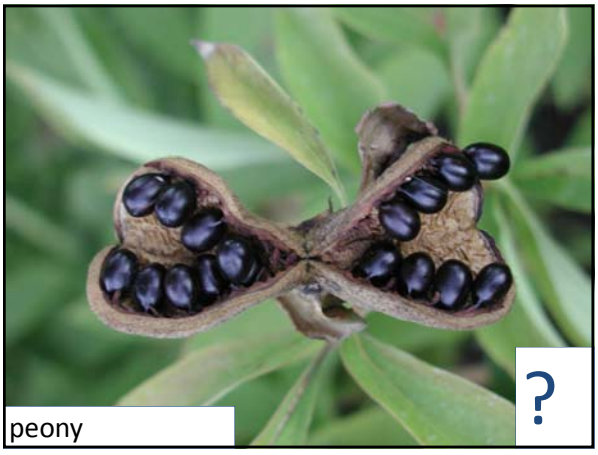
- •Conifers – cones, needle shaped leaves

  male & female cones

- •Ginko - fleshy structures on stems
- •Cycads – cones, tropical, houseplants ex: Sago palm
- •Gnetophytes – desert plants, cones

Douglas fir--flowering plant or conifer?

?



peony

?


pine
?


monkey-flower
?


false Solomon's seal
?


larch
?


ginkgo
?


juniper
?

Flowering Plants

Angiosperms – two types

- Monocots
- One seed leaf
- Flower parts in threes
- Leaves have parallel veins
- Examples: corn, onions, garlic, orchids, tulips, grass and palms
- Dicots
- Two seed leaves
- Flower parts in fours or fives
- Leaves with branching veins
- Examples: peas, squash, tomatoes, roses

To use the correct herbicide you need to know if the plants are monocots or dicots. Roundup kills all types. Weed Be Gone kills only dicots.

Plant Structures

- Xylem – vessels that carry water up from the roots to the rest of the plant
- Phloem – vessels that carry food throughout the plant
- Root types – tap roots and fibrous roots
  - Examples: carrot and grass
- Stems – can store food and water
  - Cuttings of stems for propagation are using stored food and water plus chlorophyll to grow new roots and leaves.

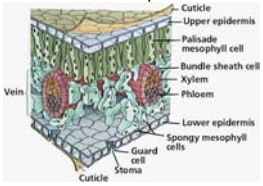
Leaf Structures

•Stomata are openings in leaves to allow gas exchange (O_2,CO_2,H_2,O)

•Guard cells open and close stomata which can help conserve water. They open and close using hydraulic pressure

•Using some leaf cleaners can cause plant to suffocate.

•Some leaves are modified into spines such as on a cactus



PHOTOSYNTHESIS

The process of turning the sun's energy into food for the plant.

carbon dioxide + water + sunlight = glucose + oxygen

Respiration – all living things must do this.

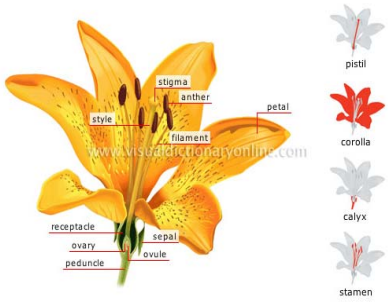
glucose + oxygen = energy + carbon dioxide + water

Flowers

- Reproductive organs of plant
- Sepals – bottom ring of flower parts, often green.
- Petals – Usually very small if plant is wind pollinated ex: willow
- Stamen – male part of flower,
  - anthers hold pollen grains which hold sperm cells.
- Pistil – female part of flower

Pistil continued:

- Stigma – tip of pistil, often sticky to hold pollen.
- Ovary – base of pistil, holds egg cells which may develop into seeds.



Reproduction

- Sexual – pollen lands on stigma which causes a pollen tube to grow down to the ovary.
  - Sperm then travels down and fertilizes eggs. If it is not the correct pollen no pollen tube will grow.
- Asexual – new plants are clones of parent
  - No diversity
  - Examples: runners on strawberries, "eyes" on potatoes, and plantlets on spider plants.
- Some plants have perfect flowers meaning they have both male and female parts.

Reproduction continued

- Plants with perfect flowers can usually reproduce without other plants.
- Plants that have only flowers of one sex need another plant in order to produce fruit.
  - Examples: Holly and Kiwi
- Some plants have both male and female flowers on the same plant.
  - Examples: Zuchinni

Day Length

- A plants flowering can be dependant on day length.
- Short day plants include primroses, poinsettias and mums.
- Long day plants include spinach, cilantro, lettuce and many annuals. Spinach and others will flower when the days get long. Which means unwanted bolting.