Flower Dissection Lab

Materials you will need

- Fresh flowers, of at least three different species (for orchids and composite flowers like daisies or sunflowers – see special instructions on last page)
- Dissecting microscope
- Small scalpel or other cutting device
- Flower diagram as a guide

Lab activity

Before dissecting your flowers, hold them and look at them closely. Answer the following questions for each of your three flowers:

1. Count how many sepals and petals your flower has. If you cannot distinguish **petals** from **sepals**, then your flower has what are called **tepals**. Count them.
   Flower 1 _____
   Flower 2 _____
   Flower 3 _____
2. Find the **androecium** (male flower parts); count how many **stamens** you see. If your flower is tubular, you may have to cut it open to do this. If there are more than 10 stamens, simply write "many."
   Flower 1 _____
   Flower 2 _____
   Flower 3 _____
3. Find the **gynoecium** (female flower parts); count how many **carpels** you see. This may be tricky. Flowers may have only one carpel, two to numerous distinct carpels, or fused carpels. When in doubt, you can determine the number of carpels a flower has by counting the lobes of the stigma or by cutting a cross section of an ovary and counting the chambers inside.
   Flower 1 _____
   Flower 2 _____
   Flower 3 _____

Now we will look more closely at the flowers parts:

4. Look at a stamen under the dissecting microscope (detach it from the flower if you wish). Draw one stamen, including the **filament** and **anther**, from each flower.

Flower 1 Flower 2 Flower 3

5. Scrape some pollen off of the anther and put it on the dissecting microscope. Examine it as closely as you can. Do this with your other two flowers and compare the difference in the appearance of the pollen. Is it exactly the same or not? If you see a difference in color, texture, size or shape, describe the difference.

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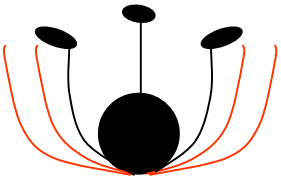
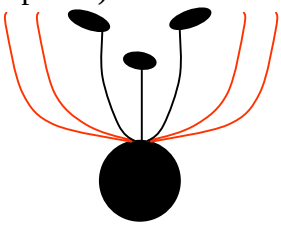
6. Look at the gynoecium of each flower. Find the **ovary**, which will be a swollen part at the base of the carpel. Is the ovary below where the petals attach to the stem (inferior) or above where the petals attach (superior)?



Superior Ovary



Inferior Ovary

Flower 1 _____
Flower 2 _____
Flower 3 _____

7. Cut open the ovary in a transverse section (meaning longitudinal or long ways) or cross section. Look at the inside of the ovary. Do you see **ovules**? Remember that the ovary is the part of the flower that will become the fruit. The number of ovules will correspond to the number of seeds in the fruit that develops. Draw the transverse and/or cross sections of each ovary:

Flower 1 Flower 2 Flower 3

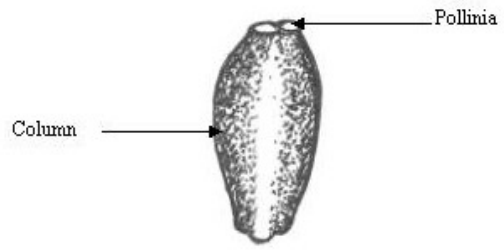
Special instructions for orchid dissection:

Orchids are unique because the do not have loose pollen attached to anthers as most plants have. Instead they have what are called *pollinia*. Pollinia are little packets of pollen. Bees or other insects will get this little pollen package stuck to their bodies, and hopefully will drop the pollen package on another orchid of the same species. The orchid, which receives the pollinia, will thus get a whole lot of pollen all at once, rather than a few grains here and there.

Orchids also have their male and female parts fused together in what is called a column, so it is difficult to separate the stamen from the carpels.

Dissecting orchids:

1. Find the column with pollinia on the end. It looks more or less like this:



[1]

2. Look at the pollinia under the dissecting scope
3. Extract the column from the orchid. Look at it under the dissecting scope. Cut it in a transverse section and look at it again.

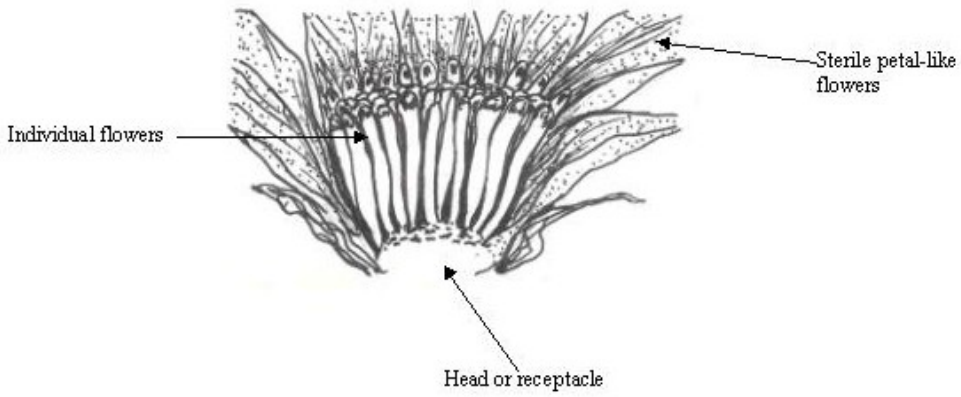
Special instructions for composite flower dissection:

Daisies, sunflowers and many backyard weeds like dandelions belong to a family called *Asteraceae* (or *Compositae*), and are commonly referred to as "composite" flowers. The part that we think of as the daisy flower is actually a composite of many smaller flowers, each with its own stamen, carpel and ovary, attached to a "head," which is the receptacle. Look closely at your composite flower and you will begin to see this. The parts that look like petals around the outside of the head of flowers (the ones you pull off when you say "he/she loves me, loves me not") are also individual flowers, but they are sterile and only serve the purpose of attracting attention from pollinators.

Dissecting composite flowers:

1. Cut the daisy head in a cross section. Notice how you can see the base of each little flower where it attaches to the head:

[1] Drawings by artist and FTG volunteer Betty Packler



2. Pull off one of the central flowers and try to open it under the dissection microscope. See if you can see the stamen and the carpel.