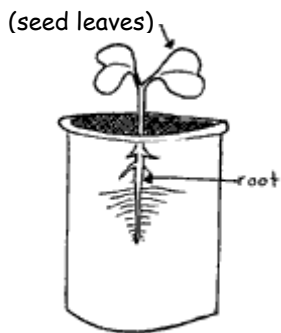
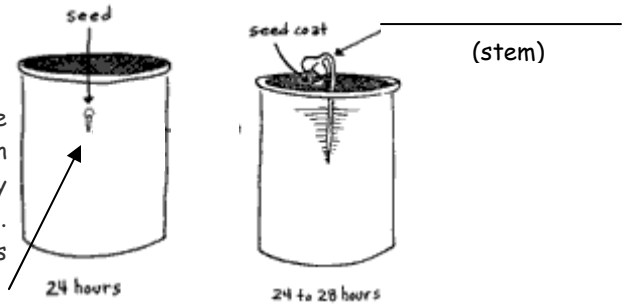


WHAT TO EXPECT FROM YOUR FAST PLANTS: WEEK ONE

Days 0 - 1

Each seed contains a tiny, new plant, called an embryo. The outside of the seed is called the seed coat. A seed can remain quiescent (sleeping) for years, as long as it stays dry and cool.

As the seed germinates during the first 24 hours, what is the name of the embryonic root? _____



48 to 72 hours

Days 2 - 3

A day or two after planting and watering, the tiny seed germinates. During germination, the seed takes up water and swells until its seed coat cracks. The radicle

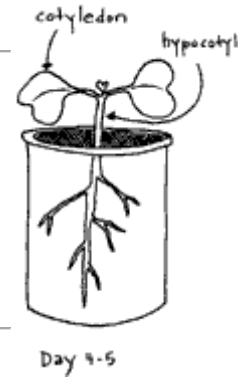
(embryonic root) emerges first, followed by the _____ (stem) and two _____ (seed leaves).

Days 2 - 3

The hypocotyl pushes through the soil, pulling the cotyledons along with it. No longer needed, the seed coat drops from the cotyledons to the soil.

Days 4 - 6

Aboveground, the hypocotyl elongates as the plant reaches upward for light.



Day 4-5

WEEK TWO

Days 7 - 13

Above ground, the true leaves, stems, and flowers originate at a point at the very top of the plant, called the shoot

_____ (growth tip). Each part emerges gradually, then it grows larger — and the growth is measurable from day to day.

Stems elongate at the

_____ , which is the space between the nodes (where the leaves attach). The elongation allows the plant to grow taller and spread out the leaves and flowers so they are in the best position to do their jobs. Stems allow food, water, and minerals to move throughout the plant.

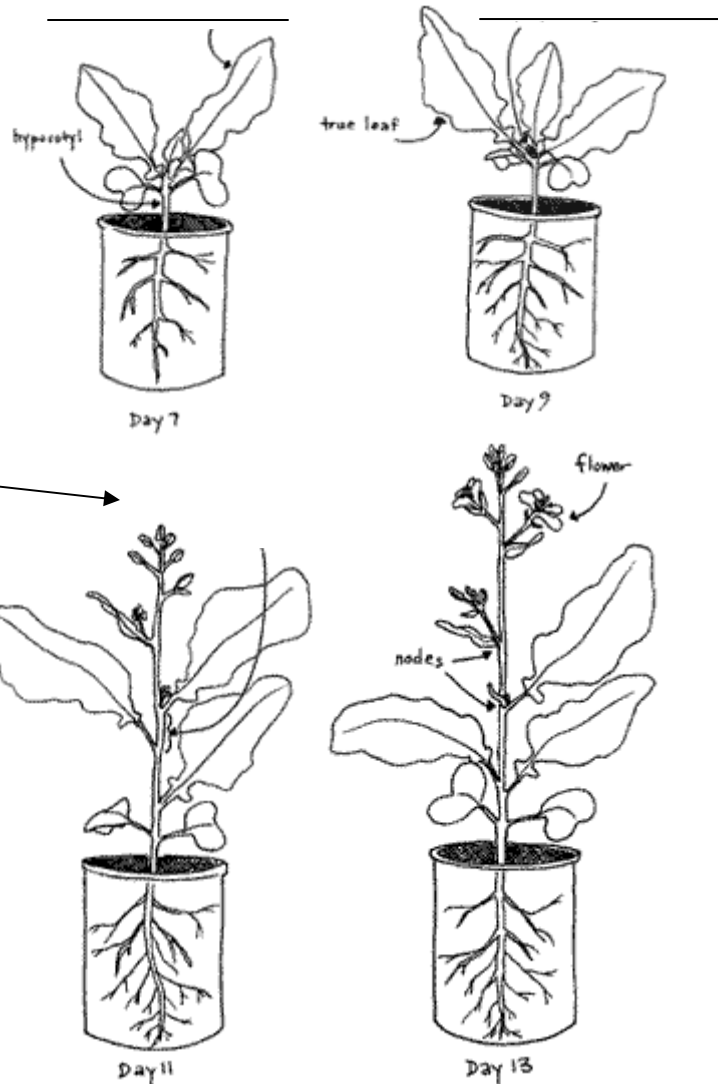
Leaves contain many pores (called _____) on their surfaces that allow the plant to "breathe" by uptaking carbon dioxide (CO_2) from the air, and then expelling oxygen (O_2). A green

pigment, called _____

_____, causes the leaves to appear green and captures energy from light. When CO_2 and water are combined in the presence of light, the plant makes its own food,

called _____ (or sugar). This amazing process is called photosynthesis.

Underground, the roots grow downward. Roots anchor the plants into the soil so they don't blow or wash away. Root hairs absorb water and nutrients from the surrounding soil and bring them to the rest of the plant. Most of the water is not used for photosynthesis, however; water is used to cool the plant as by evaporating from the leaves.



WEEK THREE

Days 14-20

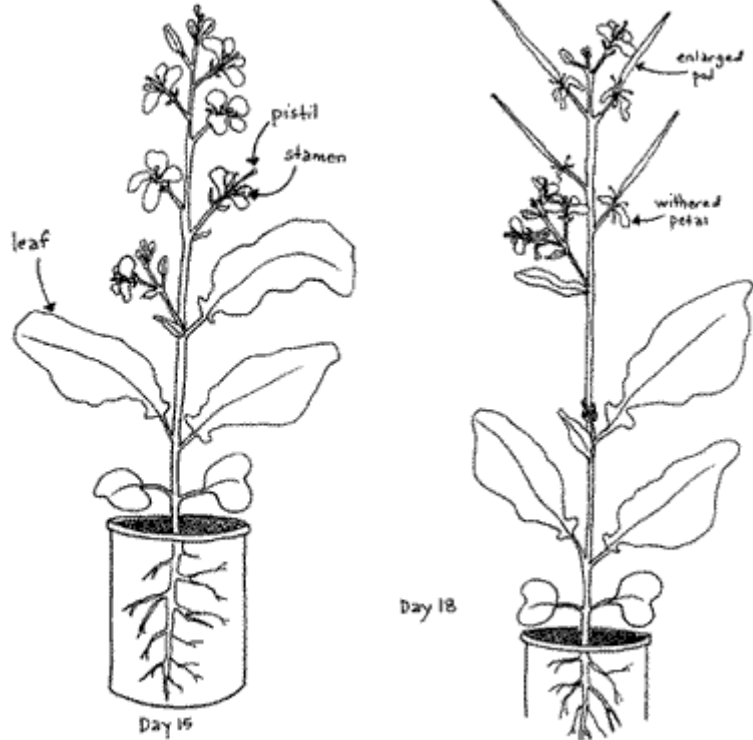
The flowers bloom!

At the growth tip, new flower buds begin to appear. Each bud is protected by four green sepals. Once a flower opens, the sepals are hidden beneath four bright yellow petals. The flower's center

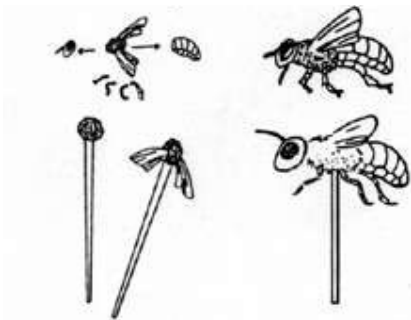
boasts a single _____, which is the female part of the flower. The pistil is surrounded

by six yellow _____, which are the male parts of the flower. Each stamen is covered with millions of powdery, yellow pollen grains.

The bright yellow petals may catch your eye — and the eye of insects. The petals form a beacon that lets insects know that there is food available. Hidden deep inside the flower are nectaries, which produce nectar. Nectar is a sweet, sugar-rich substance that insects love to eat. That's why bees and butterflies are attracted to flowers — they're hungry!



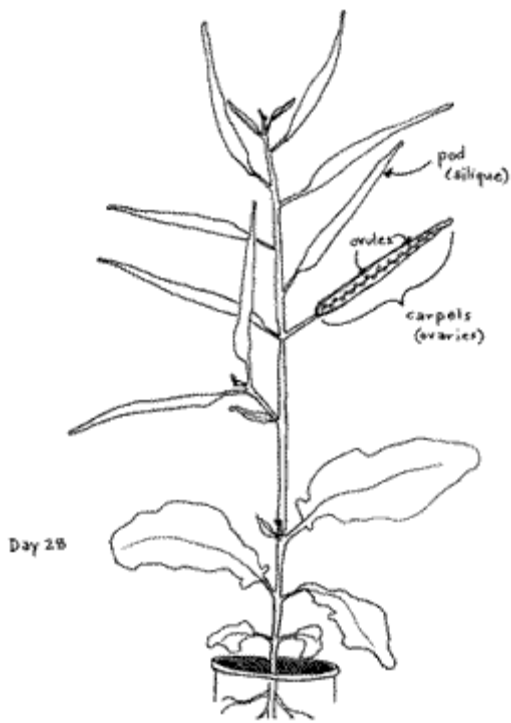
POLLINATION and FERTILIZATION



In exchange for food, insects pollinate flowers. When an insect moves from flower to flower looking for nectar, pollen from each flower gets caught in the insect's body hairs and is transferred to other flowers. After pollen has landed on the tip of another flower's pistil, it grows a tube down into the pistil, where the eggs are housed.

Sperm (from inside the pollen) are then able to move down the tube until they reach the eggs and fertilize them. The fertilized eggs then become the embryos of new seeds through a process called embryogenesis.

We will make our own "bee sticks" in class. Bees have coevolved with flowering plants to pick up pollen. There are specific structures throughout a bee's anatomy that make it a perfect pollen receptacle. For pollination in class it is most important that the thorax (or mid-section) of the bee is attached to the toothpick.



Days 21-40

As the seeds mature and ripen, the outside of the pistil swells to become the seed pod (or fruit) that encases several seeds. The leaves and flowers slowly wilt and fall off, one by one.

After the seeds have dried out completely, they are ready to be planted or stored. Inside each seed is a tiny embryo, waiting for water and warmth so it can germinate into a new plant, and another life cycle can begin.

At the end of the experiment...

Each of you should have several seed pods on your plant. You **must** harvest the contents of at least one pod to determine the ratio of offspring (we will cover this during third quarter).

In this space or directly in your lab notebook, you should take notes on "Requirements and Directions for Growing"

Four Requirements for Growth:

Planting Materials:

Planting Instructions:

