

My Seed Study

Lab 13G



Botanist: _____

homeroom or Class Period: _____

Station Number: _____

Background Information

Seeds differ in sizes, shapes, and colors. They may have different parts depending upon the type of seed. A corn seed, a monocotyledon (monocot), has a tiny embryo inside it. However, the seed will not separate into two parts when the seed coat is removed. The endosperm food is stored around the embryo. There is only one seed leaf (the cotyledon) which is quite thick and not packed with food. A bean seed, a dicotyledon (dicot), has a tiny embryo tucked between two halves of the seed. These two halves of a bean seed are cotyledons or seed leaves. The cotyledons are filled with stored food. The seed leaves are usually quite different in form from the leaves that develop later.

All angiosperms can be divided into one of two classes, monocots or dicots, based on a variety of anatomical features. Most of these features can be identified with the naked eye including, the number of seed leaves, root form, vein arrangement in the leaf and the number of floral parts. While monocots and dicots are composed of the same tissues (ground, vascular and dermal tissues) the organization or arrangement of these tissues differs.

Research

Define the following terms (include the function):

1. epicotyl (plumule) _____

2. hypocotyl _____

3. radicle _____

4. hilum _____

5. cotyledon _____

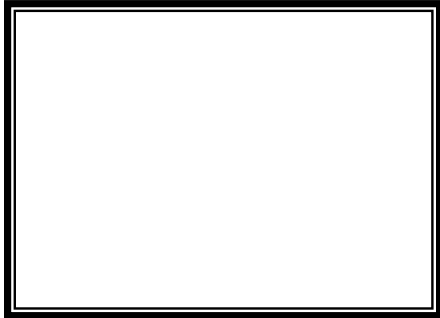
Procedure

Take a paper towel and fold it so it will fit into a plastic sandwich bag. Wet the paper towel and place it in the plastic sandwich bag so it is lying flat and fills up the bag. With the zipper part at the top find the middle of the plastic sandwich bag and staple across the middle of the bag, making a horizontal line. Place the corn seed on the right and the lima bean on the left, both resting on the staple line. Zip the bag closed and tape the bag (zipper up) in the front of your greenhouse. Glue rulers (one on each side) with the zero mark in line with the staples. Decorate. Take the folder home and make your observations.

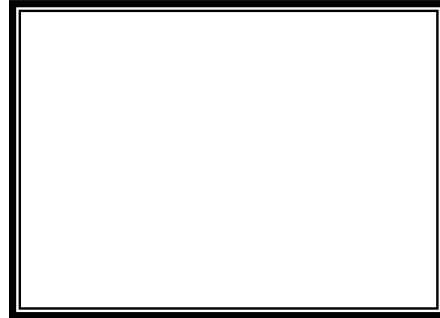
Comparison

Draw a picture of each dry seed. Use stereomicroscopes.

lima bean seed



corn seed



6. How are the seeds alike?

7. How are the seeds different?

Predictions

8. Which seed will sprout first? _____

9. How many days will it take to sprout? _____

10. Will the root or stem sprout first? _____

Making Observations

My Seed Log

Every day follow these steps:

1. Make an observation.
2. Measure the root and stem growth.
3. Record the growth in this log in centimeters.



My experiment began on _____.

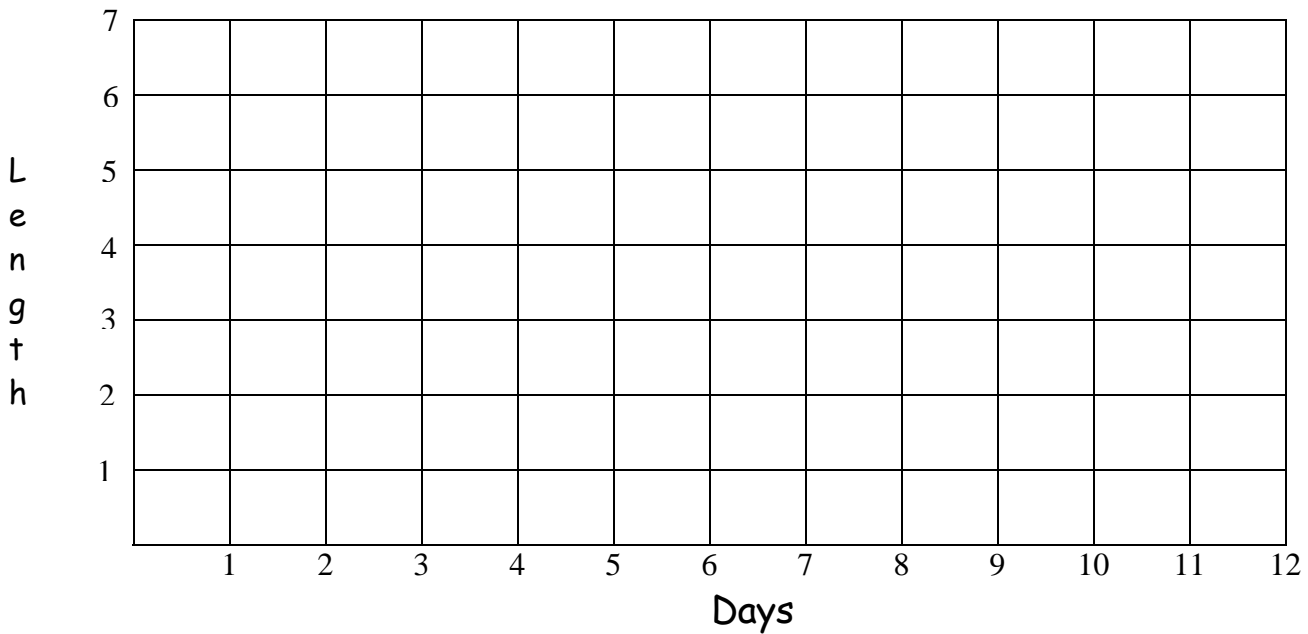
date	lima bean		corn	
	root length	stem length	root length	stem length

How My Sees Grew

The Stem

Lima bean stem (color used on line graph) _____

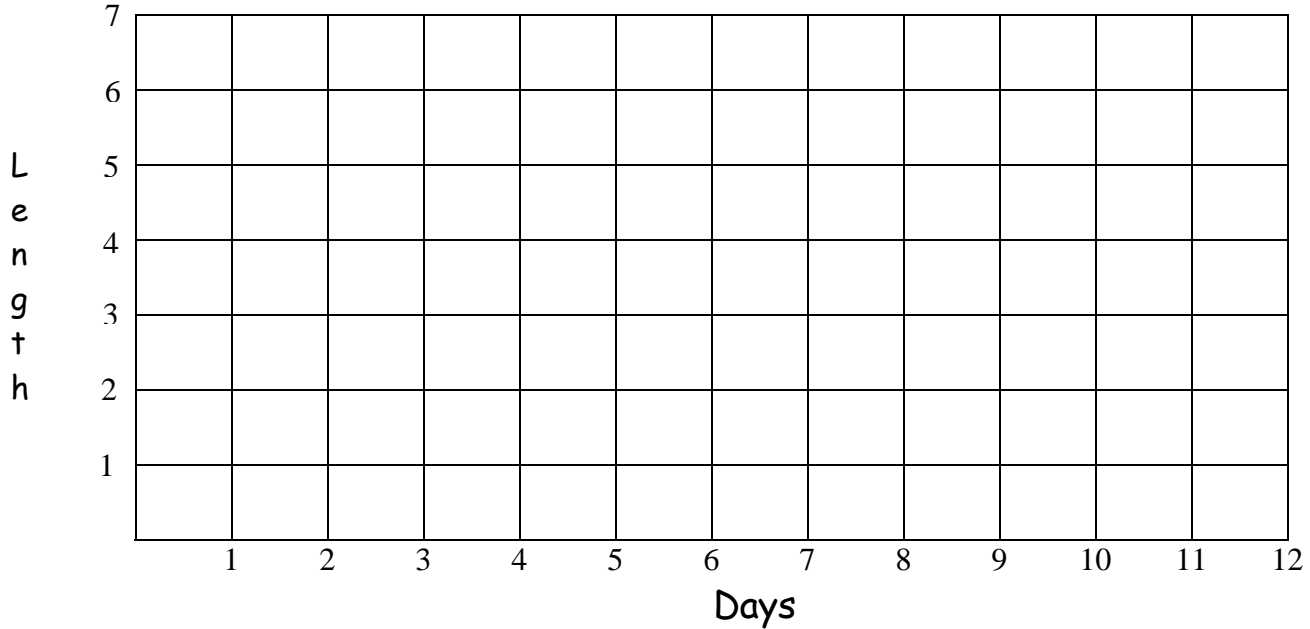
Corn stem (color used on line graph) _____



The Root

Lima bean root (color used on line graph) _____

Corn root (color used on line graph) _____



Conclusions

11. Which seed sprouted first? _____
12. Did the root or stem sprout first? _____
13. How many days did it take for the first leaves to appear on the lima bean seed? _____
14. How many days did it take for the first leaves to appear on the corn seed? _____
15. What did the seeds need to grow? _____
16. How was the growth in both seeds alike? _____

17. How was their growth different? _____

18. What else did you observe about your seeds? _____

Dissecting Seeds

What Are Seeds?

All seeds contain a little plant called an embryo. Seeds also contain a small amount of food to nourish the little plant. Seeds are like a spaceship. The seed cover protects the embryo until it finds an appropriate place to grow, while the seed leaves, or cotyledons provide the necessary food energy until roots and true leaves form. The most common seeds come from flowering plants. There are two kinds of these seeds: Monocotyledons and Dicotyledons. (monocots and dicots)

Dicots are familiar to you as food seeds. Some of those are peas, beans, peanuts, apples and tomatoes. The seed has two halves. These are called seed leaves, or cotyledons. There is ample food stored in the fleshy seed leaves to nourish the new plant until its roots and true leaves are established. Usually, the first two seed leaves look quite different from the adult leaves, which will develop later.



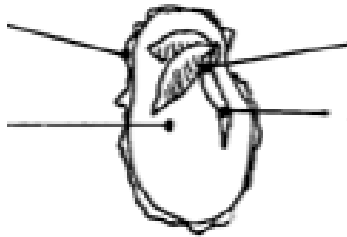
Dicot Seed

Monocot seeds will not separate into two Halves. Instead, the food is stored around the embryo. Monocots have one seed leaf, which is generally long and thin, like grass. Some monocot seeds are, rice, wheat, Corn, coconuts and grasses.



Monocot Seed

Label the parts of a lima bean seed.
(cotyledon, plumule, radicle, seed coat)

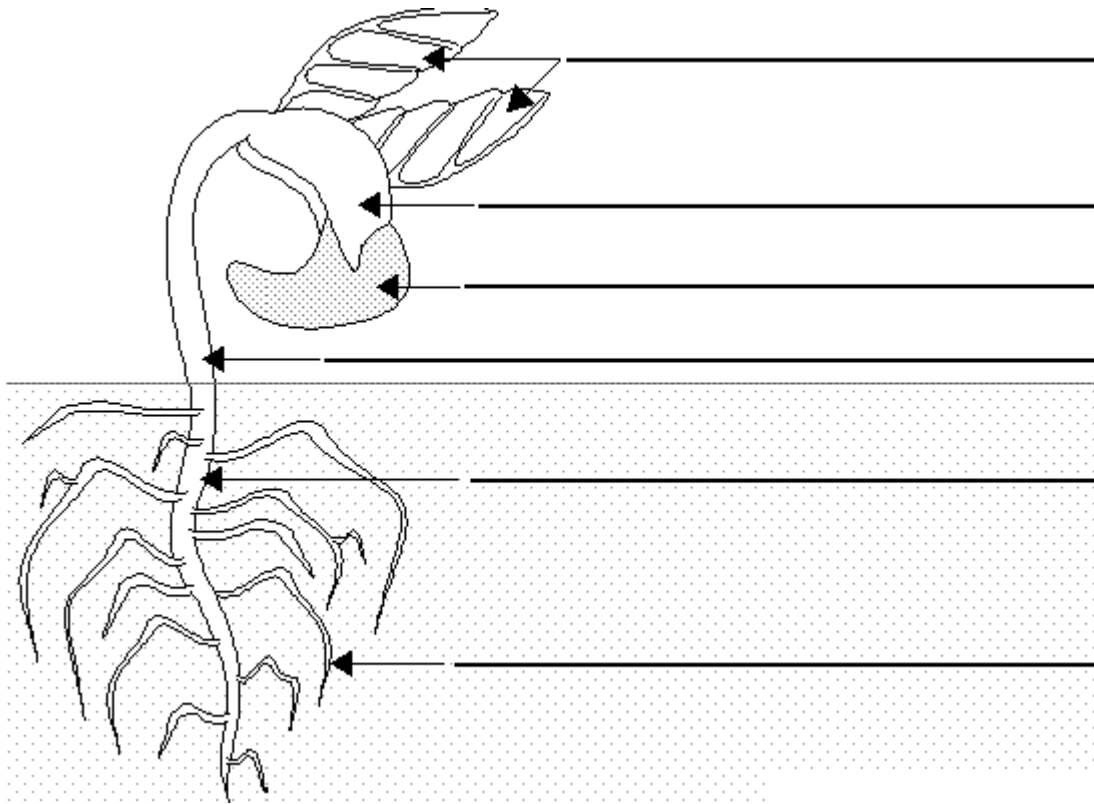


Label the parts of a corn seed.
(coleoptile, cotyledon, plumule, radicle, seed coat)



Lima Bean Plant

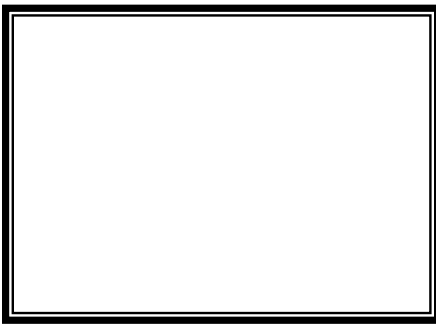
Label the diagram of a bean plant using the following terms: cotyledon, first true leaves, hypocotyl, primary root, secondary root, seed coat.



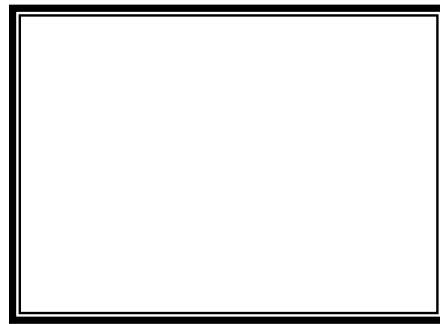
Dissecting a Dicotyledon (Dicot) Seed Lima Bean

Look at the exterior of the dry and soaked bean seed. Draw what you see.

dry lima bean seed



soaked lima bean seed



Carefully remove the seed coat of the soaked bean.

19. Why do you think the seed needs a seed coat? _____

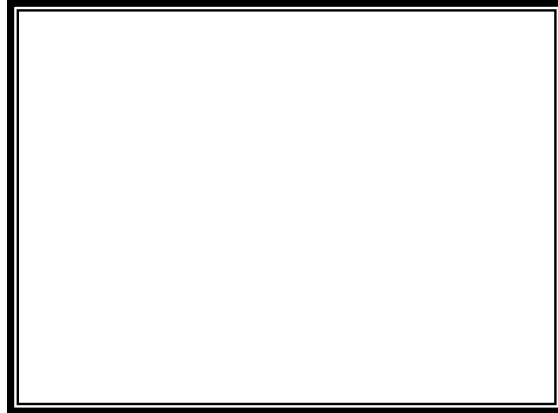
Try to remove the seed coat from the dry bean seed.

20. Describe how the dry seed differs from the wet? _____

Use your thumb nail to split the seed carefully.

21. Does the seed split naturally into parts? _____
22. How many parts? _____

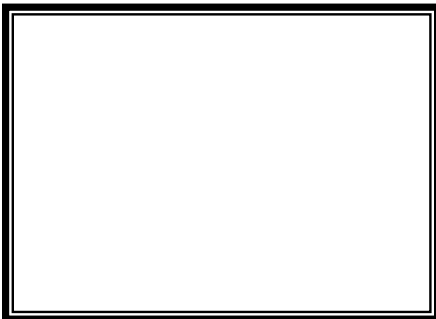
Use a magnifying lens to try to locate the embryo inside the seed. Also look for the two **cotyledons**, the embryonic shoot (**plumule**), the embryonic root (**radicle**), the embryonic stem (**hypocotyl**). Draw the inside of the seed labeling (used scientific terms) these parts.



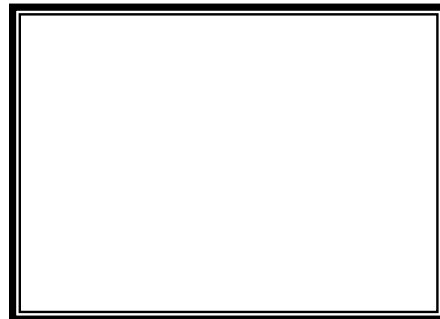
Dissecting a Monocotyledon (Monocot) Seed Corn

Look at the exterior of the dry and soaked corn seed. Draw what you see.

dry corn seed



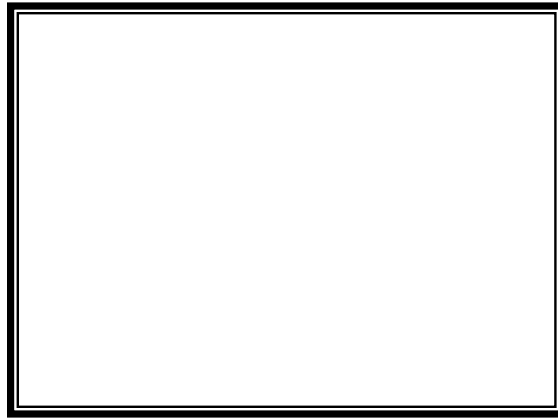
soaked corn seed



Carefully remove the seed coat of the soaked corn seed and try to split the seed into two parts.

23. Does the corn seed split easily into two parts? _____

Use a magnifying lens and or stereomicroscope to try to locate the embryo inside the seed. Also look for the cotyledon, epicotyl, hypocotyl, radicle, and endosperm. Draw the inside of the seed labeling these parts.



Observations

24. Explain the difference between a dicot and a monocot seed.

25. What do both seeds have in common?

26. Why is there an embryo in every seed?

27. What is the economic importance of seeds?
