

# Seeds



and

## How they Grow



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# What is inside a seed?



- Turn and Talk: Explore this question with others in your group. Select one person to share the group's ideas.
- We are going to examine soaked bean seeds to see what is on the outside and inside.
- Let's begin the Seed Dissection Lab.



# Seed Dissection Lab



**You will receive:**

- a plate with lima and kidney beans that have been soaked in water,
- one of each bean type that has not been soaked,
- a toothpick,
- a hand lens, and
- a science notebook or handout for labeling and notes.

**Observe seeds on the outside. How are the soaked seeds alike and different than the dry ones?**

# Seed Dissection Lab



What do you observe on the outside of your seed?  
What does it look and feel like?

- This is the **seed coat**.

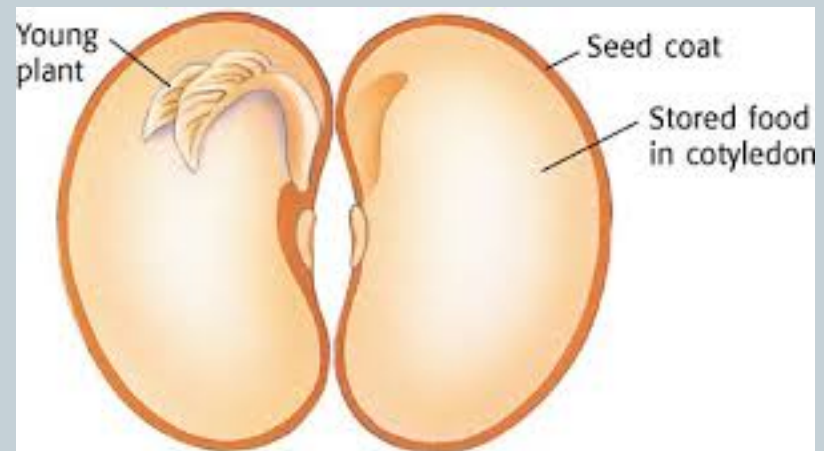
Its job is to cover and protect the seed from insects, disease, and damage.



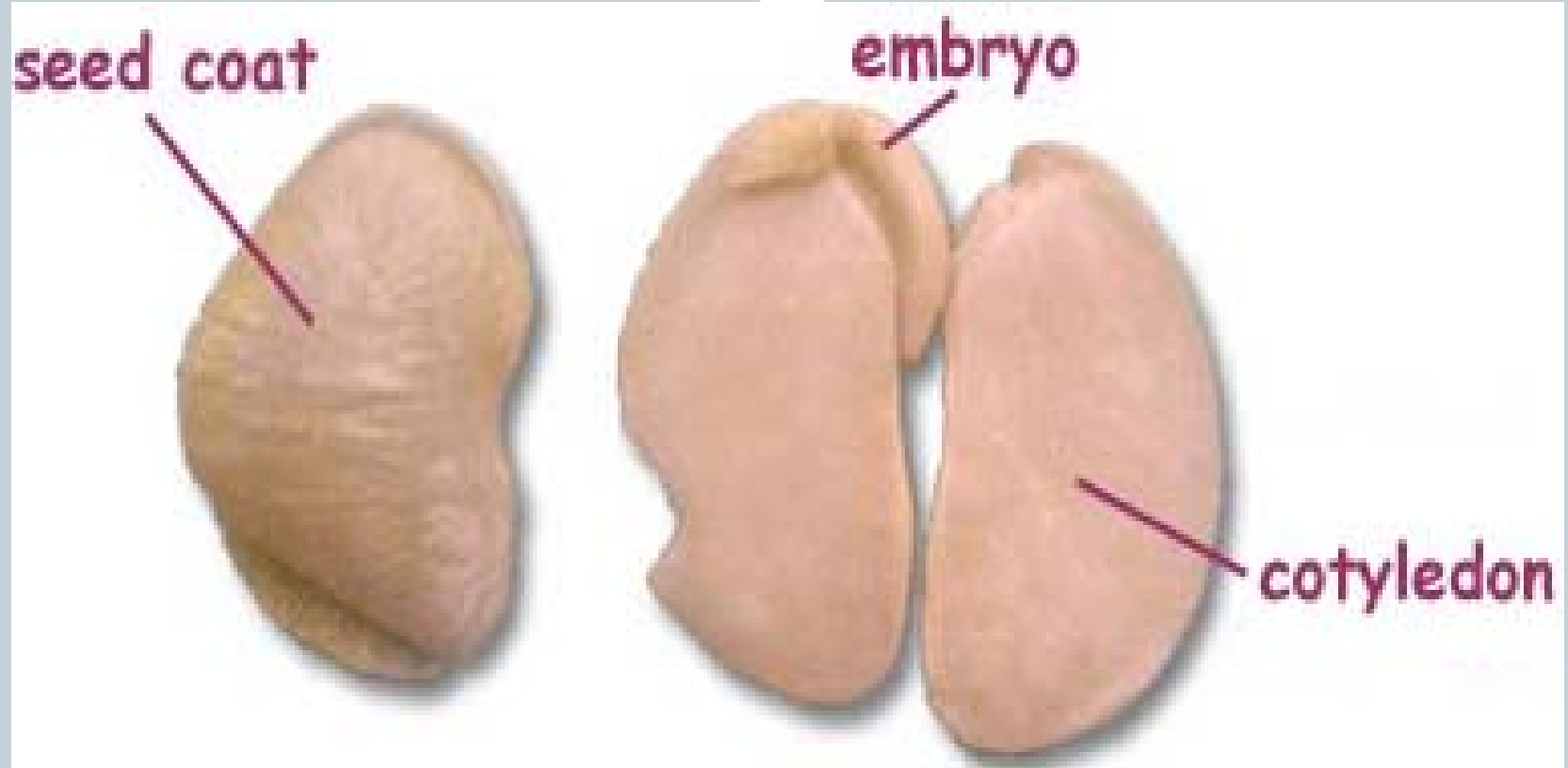
# Seed Dissection Lab



- Take one soaked seed and your toothpick and probe along the outer, curved seam between the two halves.
- Carefully open the seed like a book.
- Put it flat on the plate with the two halves open wide. Do the same with the other seeds.

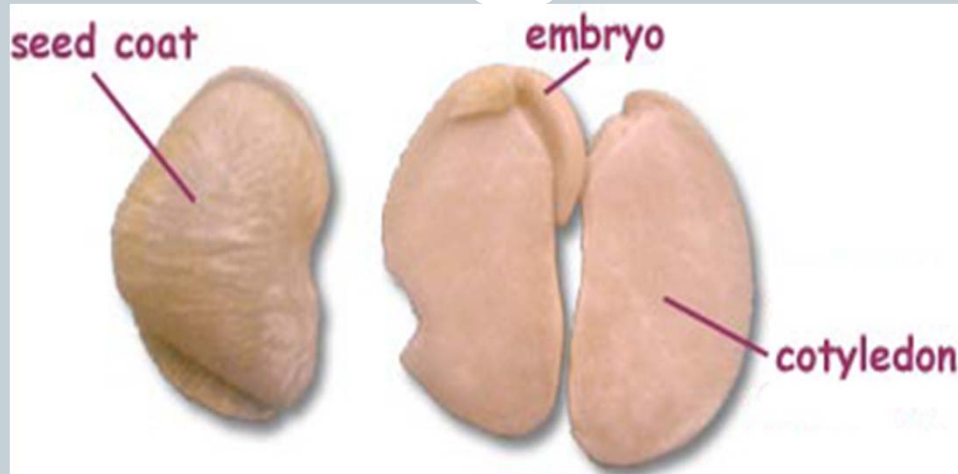


# Seed Dissection Lab



Use your hand lens to find the **embryo** – the baby plant

# Seed Dissection Lab



- The **embryo** has a leaf part called the **shoot** (two leaves overlapping, and a **root**).
- Find them both and point to them with your toothpick.

Which part will grow up to the light? \_\_\_\_\_

Which part will grow down into the soil? \_\_\_\_\_

# Seed Dissection Lab

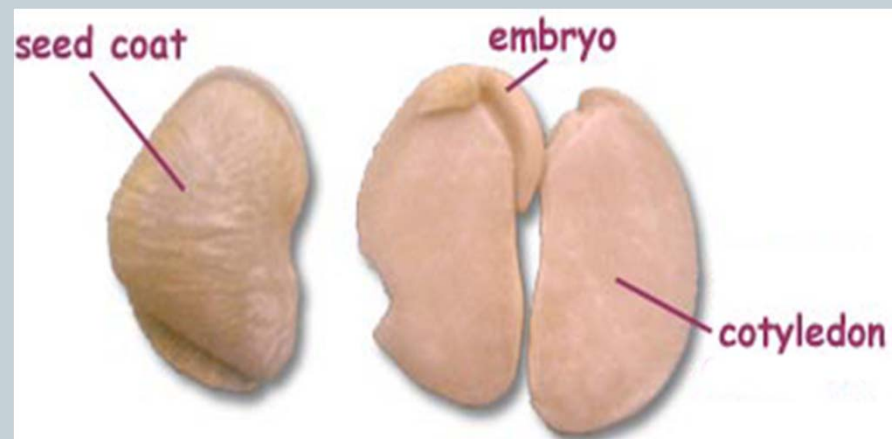


Now look at the solid interior of the seed.

- This is the **food source** for the embryo (cotyledon)
- It has nutrition the embryo needs to get energy to grow.

But the seed has to get wet first to soften the food source.


- How does this happen in nature?
- What would happen if a seed did not get enough water to soften the food source? Explain.





# Seeds and Germination



- Now that you have seen the inside of a seed, with the **embryo shoot with leaves** and the **embryo root**, how do you think the plant will grow?
  - What does a seed need to grow?
  - What does a plant need to grow?
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- The illustration shows a mound of dark brown soil. Several dark brown, oval-shaped seeds are scattered on the surface. One seedling has already sprouted, showing a green stem with two small green leaves. Another seedling is partially visible, showing a green stem and a small green leaf. The soil is depicted with some texture and shading.
- Do you think we can grow seeds in water without soil?
  - Let's try to grow seeds with only water and see.