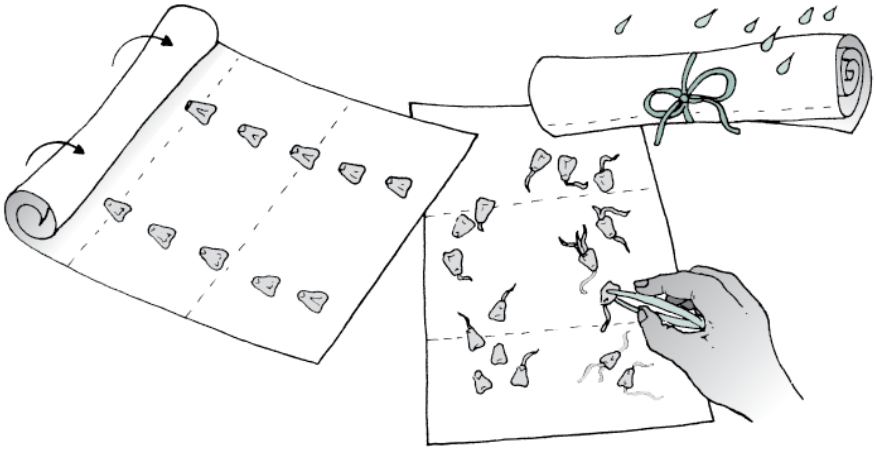
LEVEL 1 LESSON 1 - IT STARTS WITH A SEED!
HANDS-ON ACTIVITY 2 - SEED GERMINATION



Seeds sprout and grow when they are placed in a warm, moist place. Moisture is absorbed through the seed coat of the soybean and the corn kernel, the seeds swell, and the seedlings begin to develop. It is important to know how well seeds will germinate, since this affects how many plants will grow in the field, after being planted. Not all seeds produce strong seedlings, so how can you tell if a seed will produce a plant or not? If growing a maximum number of seeds in a field is important, how might you design an experiment to test for how many seeds will grow? This activity will help you do just that!

LEARNING OBJECTIVES

- Observe seed germination
- Calculate percent germination of a batch of seeds

MATERIALS PER GROUP

- Paper towels
- Water
- Plastic container with transparent lid
- 25 of the same type of seed, preferably seed that is not chemically treated. Seed packages say if it is treated or not and treated seed is usually a bright pink, blue or green. If using treated seeds, wear gloves and wash hands after.
- A journal to write down observation and ideas

DIRECTIONS

The activity needs to be set up several days ahead of when you plan to collect data. If it works for your schedule, it is nice to have youth choose the type of seed, number to test, set up the experiment, and determine what days to take data. You may also want to have different groups test different types of seeds or different experimental methods (number to test, when to collect data). If you don't have time for letting youth set up the experiment or have only one class period to collect data, 25 seeds checked after 7 days works well.

1. Place two paper towels together and lay them on the bottom of a plastic container that has a transparent lid.
2. Sprinkle water on them lightly, but do not soak them.
3. Get a sample of seeds to test.
4. Put 25 seeds (number decided by the youth) on top of the moist towels without letting the seeds touch each other.
5. Place the lid on the container and store it in a warm place.
6. Sprinkle the paper towels with water daily to keep them damp.
7. After 5 days (or a time decided by the youth), count the number of seeds that have germinated. In your journal describe what the seeds look like. How have they changed? In your journal record the number that have grown.
8. Throw away the seeds that have germinated.
9. Spray the remaining seeds with water and place the lid back on the container. Again, store the container in a warm place.
10. After 5 more days (or a time decided by the youth), count how many seeds germinated and record the number in your journal.

CALCULATE PERCENT GERMINATED

Add the number of seeds that grew after the time period to the number that grew after the second time period.

Total: _____

Divide this total by the total number of seeds tested. Then multiply the result by 100 to get the total percentage of seeds that grew. When seeds grow after being in a dark, moist place, it is called *germination*.

Percent germinated: _____

Here is an example: If I started with 25 seeds and 12 seeds germinated in the first five days, and 8 more seeds germinated in the last seven days, then altogether, 20 seeds germinated. Divide 20 by 25, to get 0.80. Multiplying 0.80 by 100 gives a result of 80.
Answer: In this example, 80 percent of the seeds germinated.

DISCUSSION QUESTIONS

Write down your answers to these questions in your journal. Discuss them with your lab partner or teacher.

1. Why do you think it is important to know the germination rate?
2. Who might need to know germination rates?
3. How else could you determine germination rate?
4. Too many weak seedlings in a field lead to a poor stand of live plants. Fewer live plants result in lower yields. When seeds are tested for germination, the seed analyst also counts the number of weak seedlings. The number of weak seedlings is subtracted from the number of seeds that germinated. Based on your germination results of your plants, what percent of healthy seedlings would you expect from 100 seeds of each plant type?