



## Background Information

A germination test can be made on any kind of seed. Beans, corn, sorghum, and most average size garden seed will work best.

Germination is the process in which a seed first sprouts. A seed cannot germinate unless it has an adequate amount of moisture. After a seed is planted it may take as little as 3 days, or as many as 18 days for it to germinate. This depends on the species (or type) of seed. Once a seed germinates, it starts to put down a root, and the top part of the seed will push above the ground in a few days. Then it will start to grow as a new plant.

It is important for farmers to know what the germination rate is when planting any seed. Seed that is to be planted must have a tag on the bag which tells the percent of seeds that are expected to germinate, and other information. Many farmers call the germination percent the "germ" for short. All farm seed comes with this seed tag attached to help aid the farmer in planting.

Germination percent is determined by doing a test. The germ percent is based on the number of seeds that sprout out of 100 seeds tested. For example: If only 4 seeds do not sprout from 100 seeds tested, the germ would be 96%.

If the farmer is planting corn with a germ of 82%, he will have to plant more seeds per acre in order to have a correct plant population in the field. On the other hand if he is planting corn seed with a 98% germ, the farmer would plant less seeds per acre.

Temperature extremes, as well as rough handling can greatly effect the germ rate of many farm seeds. Grain sorghum, corn, and wheat are hardy and can take more handling. Seeds such as soybeans have a thin coat and can be damaged very easily.

As you can see the germ rate of seed is important to the farmer. By knowing the germ rate the farmer can plant the desired number of seed to get the proper yield from the crop.

# Will It Sprout?

## Seed Germination Test

### Lesson Plan

1. Introduce new vocabulary:

Grades 1-3  
Sprout

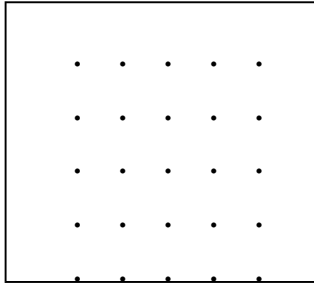
Grades 5-6  
Germination  
Germination percent  
"germ"

2. Obtain seeds from feed store. Wheat, oats, corn, beans, grain sorghum will work. Since children will be handling the seeds DO NOT get treated seeds.
3. Start by wetting one paper towel and placing it flat on a table. Any kind of paper towel will do, but industrial brands are tougher and will work better.
4. Place seeds on wet paper towel. It may be impractical for each student to use 100 seeds. Students can use 50 or even 25 seeds, and an accurate germ can still be calculated from 100%. Place the seeds in rows with the same number in each row. This makes it easier to count the seeds.
5. Wet another paper towel and place it on top of the first making the corners match. With the palms of your hands, push down on the paper towels, and push all the air out that is between them. Be careful not to move the seeds around while you do this. You should now have a sandwich of two paper towels.
6. Start on one side and fold the paper towels the way a letter is folded. Fold it twice. Now place towels and seeds in a plastic bag and fold the top over so moisture will not escape. It is probably not necessary to fasten top of bag if there is enough to fold down. Bags need to be placed in a warm place, 72 to 86 degrees is best. Standing the bags up will make all the sprouts face the same way. Seeds can be checked after 3 to 5 days and then in 7 to 10 days. Allow enough time for all seeds to germinate that are going to.
7. There will probably be some seeds that will not sprout. Paper towels can be re-wetted if need be. When you fold them up the first time, water does not have to be running out of the towels. Towels could be wetted by using a spray bottle or dipping into a pan or sink of water. If water accumulates in the bottom of the bag, the towels were too wet, and the water needs to be poured out of the bag.

\*\*\*\*SEE ENCLOSED DIAGRAM

# Will It Sprout?

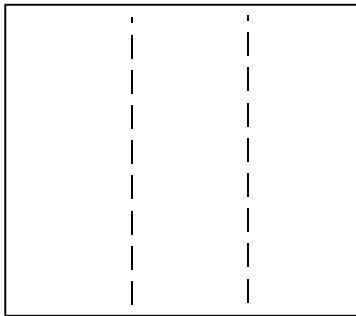
**Step 1 - Wet paper**  
Towel with seeds.



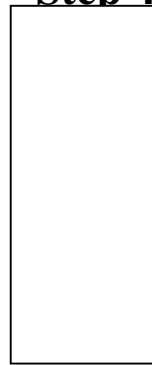
**Step 2 - Place second**  
Towel on top of first.



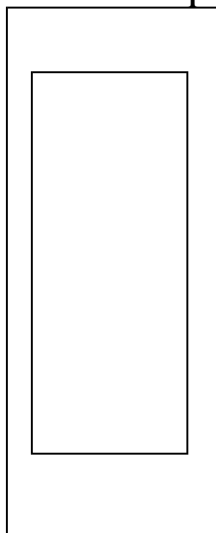
**Step 3 - Fold towels**  
On dashed lines.



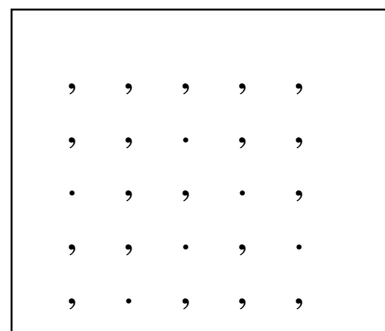
**Step 4 - Folded**  
Towels



**Step 5 - Place towels**  
Inside plastic bag.



**Step 6 - Sprouted**  
Seeds.



## Extension Activity

### Calculating Germ Rate

When a farmer buys a bag of seed for planting there is a tag attached showing Germ Rate. This is the percentage of seed in the bag that can be expected to germinate and produce a plant. From your seed germination activity calculate the germ rate.

Example 1:

1. Number of seeds used -----25  
Number of seeds that germinated ----20

$$20 \div 25 = .8$$
$$.8 \times 100 = 80\% \text{ germ rate}$$

Example 2:

2. Number of seeds used -----50  
Number of seeds germinated -----45

$$45 \div 50 = .9$$
$$.9 \times 100 = 90\% \text{ germ rate}$$

The fewer the number of seeds used, the less accurate the germ test.