

Germination

Activity Mission 2

Objectives

Determine what conditions seeds need in order to germinate

Observe the effects on seeds and seedlings when the best conditions are not present for germination and growth

Initial Questions

Materials

- 35mm film canisters (use the gray canisters, not the translucent ones)
- radish seeds
- tape
- single hole punch
- refrigerator
- window or light source (light box would work)
- 2.5cm square paper towels
- pipette or dropper
- pennies
- water

Procedure

You will be making 5 different chambers and comparing the seed germination in each.

Chamber #1: Control

1. Punch three holes in the film canister, all approximately the same distance from the open end.
2. Tape clear plastic over each hole using clear tape. Cover the holes completely to maintain humidity in the canister.
3. Place the canister lid on the table. On the inside of the lid, place a square of paper toweling and wet the square.
4. Place 3 radish seeds on the wet paper towel square.
5. Leaving the lid on the table, snap the canister down onto the lid. Leave the canister upside down.
6. Place the chamber under bright (but not hot) light. All three holes should receive about the same amount of light.
7. After 3 days, open the chamber and observe the orientation of your plants.

Chamber #2: Light

1. Do not punch holes in the canister. Place the canister lid on the table. On the inside of the lid, place a square of paper toweling and wet the square.
2. Place 3 radish seeds on the wet paper towel square.
3. Leaving the lid on the table, snap the canister down onto the lid. Leave the canister upside down.
4. After 3 days, open the chamber and observe the orientation of your plants.

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Chamber #3: Temperature

1. Punch three holes in the film canister, all approximately the same distance from the open end.
2. Tape clear plastic over each hole using clear tape. Cover the holes completely to maintain humidity in the canister.
3. Place the canister lid on the table. On the inside of the lid, place a square of paper toweling and wet the square.
4. Place 3 radish seeds on the wet paper towel square.
5. Leaving the lid on the table, snap the canister down onto the lid. Leave the canister upside down.
6. Place the chamber in the refrigerator.
7. After 3 days, open the chamber and observe the orientation of your plants.

Chamber #4: Gravity

1. Take a canister and tape a penny to the side of the canister. This will help balance the canister on its side. Do not punch holes in the canister.
2. Place the canister lid on the table. On the inside of the lid, place a square of paper toweling and wet the square.
3. Place 3 radish seeds on the wet paper towel square.
4. Leaving the lid on the table, snap the canister down onto the lid. Turn the canister on its side so that it balances on the penny.
5. After 3 days, open the chamber and observe the orientation of your plants.

Chamber #5: Water

1. Punch three holes in the film canister, all approximately the same distance from the open end.
2. Tape clear plastic over each hole using clear tape. Cover the holes completely to maintain humidity in the canister.
3. Place the canister lid on the table. On the inside of the lid, place a square of paper toweling. Do not wet it.
4. Place 3 radish seeds on the paper towel square.
5. Leaving the lid on the table, snap the canister down onto the lid. Leave the canister upside down.
6. Place the chamber under bright (but not hot) light. All three holes should receive about the same amount of light.
7. After 3 days, open the chamber and observe the orientation of your plants.

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Questions

Canister #	Observations after 3 days	Conclusions
1		
2		
3		
4		
5		

Why is it important to have a control in an experiment?

Why do you think we punched holes in some canisters and not in others?

What do your results teach us about growing plants in space?

Can you think of other germination experiments you would like to try with your canisters?

In canister #2, pay special attention to the color and shape of the seedlings when you first open the canister. Now, transplant the seedlings from Canister #2 into a canister with holes on a windowsill. What do you notice the next day? What is the relationship between plants, light and food production?