Plants in Space: Investigating the Effects of Gravitational Force on Cress Seed Germination and Growth

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The purpose is to investigate the effects of gravitational force on the germination and growth of plants. 1. Build the arduino clinostat and input the code. 2. Prepare the petri dishes using agar-agar. 3. Mount the petri dish that says clinostat onto the servo horn. Mount the remaining four onto a block of wood. 4. Turn on the motor to a speed of approximately 10-15 RPM. 5. After most of the seeds have developed roots at least 1 cm long, rotate three of the dishes 45°, 90°, 180° respectively. 6. After most have developed roots, stop the motor, remove all petri dishes from the block of wood. 7. Record the data. The data shows that the constant gravity provided the best environment for the plants to sprout and grow. Turning the petri dish 45° did not have any impact on the seed germination or the root length, however, the percent sprouted did decrease slightly by one seed. Turning the petri dish 90° didn't have an impact on seed germination, but it did have an impact on both the root length and the amount of seeds that sprouted. Turning the petri dish 180° affected all three areas. The clinostat petri dish had root length decreased by half from constant gravity, and while more seeds germinated than the 180° petri dish, the percent sprouted was the lowest out of all of the petri dishes. The clinostat showed that gravity was necessary for the seeds sprouting and root length, but not with germination.

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