

Design a Seeding Machine to Counteract Deforestation

Name: _____

Date: _____

Student worksheet

1. Below, write down at least three reasons why forests are essential to the world.
2. In your own words, describe or make an illustration of how deforestation is connected to climate change.
3. In your own words, describe or make an illustration of how deforestation is connected to biodiversity loss.

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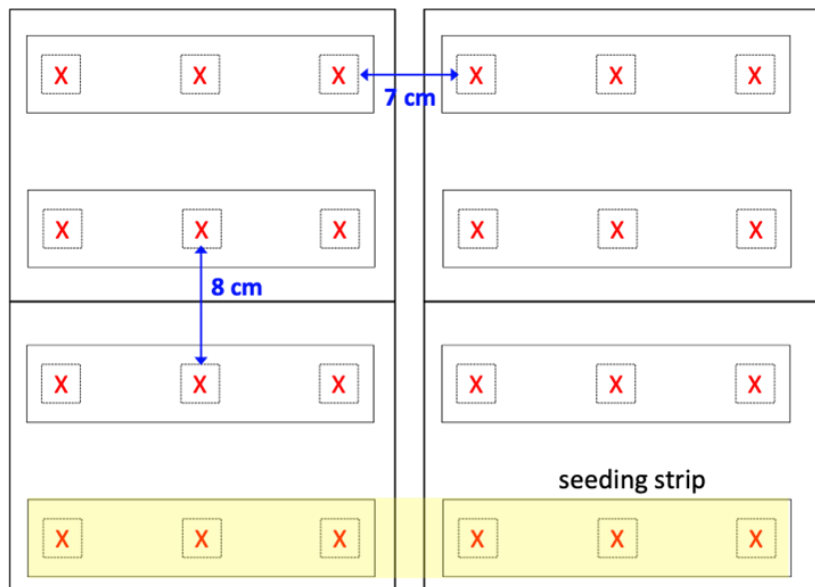
Name: _____

Seeding Machine Design Challenge

You will use the Engineering Design Process to reach the challenge goal described below.

Challenge goal: Build a seeding machine that disperses seeds at precise locations on a seeding grid as quickly as possible.

1. **Specify the requirements:** Write down the design criteria that your class agreed on for your seeding machine and the seeding process.
2. **Set up the seeding grid:** Place the 4 sheets of the seeding template on the ground as shown in the figure below. Make sure the distance between the dashed squares is the same throughout (7 cm horizontally and 8 cm vertically). Then tape the sheets to the ground.



Cover the seeding strip with double-sided tape. This way the seeds stick to the ground rather than rolling away.

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Name: _____

5. Build and test your prototype: Build and test your chosen design with your group. Follow the testing procedure you agreed on as a class. If you use the seeding precision and time as your performance criteria, you will have to time your seeding process. Start the stopwatch. Then load the seeds into your seeding machine and maneuver it through the grid, keeping the design criteria in mind. Measure the time it takes for your machine to plant all 24 seeds. The seeding process should end after a maximum of 5 minutes. The total time includes the time needed for loading the seeds and dispersing them on the grid. Then, count all the dashed squares on the grid that contain at least one seed. Record your results in Table 1.
6. Redesign: Based on your results, improve your design or choose a totally different design. Go through at least two design iterations. Record your results and the changes you made to improve your design in Table 1.

Table 1: Data table to record the test results of each design.			
Design #	Number of dashed squares that contain at least one seed	Time needed to load and plant all 24 seeds	Notes about design changes
1			
2			
3			

How many seeds did your final seeding machine plant correctly? _____

How long did it take for your final seeding machine to load and plant all 24 seeds? _____

7. Communicate your results: As a group, prepare yourself to give a brief presentation of your final design and its performance to your class.