

<p>Class: Middle School Life Science, 7th grade, 44-minute periods</p> <p>Big Picture/Focus Questions: How are plants adapted for reproduction and the spreading of seeds?</p> <p>Instructional Objectives: -Student will be able to (SWBAT) understand specialized plant structures that increase the likelihood of reproduction -SWBAT design a means of transporting a lentil seed the farthest</p>	
<p>NYS Standards: <u>MS-LS1-4 From Molecules to Organisms: Structures and Processes</u> <i>Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.</i></p>	
<p>Content:</p> <p>Scientific principles:</p> <ul style="list-style-type: none"> • Plants compete for resources, therefore, when plants reproduce they want space between them so there is less competition • Plants reproduce sexually or asexually • Plants have specific designs/structures that allow for traveling and dispersal <p>Design process:</p> <ul style="list-style-type: none"> • Students will have to collaborate with a partner • Students will create a blueprint. During the blueprint time, they can look at the materials that will be available to them, but cannot touch them. • Students will have time to test their model with the fan and can improve upon the changes that are made. • Students will utilize the NASA design process to guide them 	
Time	
6 min	Students will view various pictures around the room and note how they contribute to plant reproduction. (Pictures = burrs, wind, and

s	propeller (maple seed pods) plants)
4 min s	Students will sit in their seats and we will have a class discussion to debrief the photos and patterns students observed. <i>Key discussion points: wind, burrs, and aerodynamic structures (ex: maple seed pods) help move seeds to new areas</i>
3 min s	I will introduce the STEM Challenge: Students will work in pairs with 1 dried lentil. They will have to design a means to transport their lentil the farthest when dropped in front of the fan to simulate plants transporting seeds in nature. Wherever the model lands, students will place a piece of tape with their initials. Whoever's model goes the farthest "wins" the challenge.
3 min s	I will review the NASA Design process that students will be using for the experiment. Students will have to ask "how can we move the lentil the farthest?", imagine/plan by creating a blueprint, create by building their model. They can experiment by testing their model as many times as needed until the time runs out. Then, we will do the final drop test and measure. Students will have a packet for their blueprint, reminding them of the NASA design process, notes for where they improved their original design, and their exit ticket questions.
8 min s	Students work with their seat partner and create their design. Students may look at the materials on the back table for inspiration, but they are not allowed to touch/assemble anything until their blueprint is done and the time is up.
10 min s	Students may utilize the materials to build the model they designed. If students finish in time, they can do their own test in front of the fan. They can adjust and fix any necessary materials for their design.
5 min s	When the timer stops, students must end their build. Students will be called alphabetically to do the "official" drop test for their design. Wherever the lentil lands, I will place a piece of tape with student initials. When all students have gone, whoever's design went the farthest will win a piece of candy.
5 min s	Quick class discussion to debrief: Whose went the farthest? Why? What patterns existed between models that were successful? What types of patterns existed between models that weren't successful?

	<p>Students will complete an exit slip on their own before leaving class. Exit slip: What made your design successful? What would you change about your design? What were you limited by in this experiment?</p>
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<p>Informal and/or Formal Diagnostic and/or Formative Assessment: Blueprint, student's ability to drop test and re-evaluate and improve, exit ticket</p>

<p>Instructional Resources Needed: Lentils, Tissue paper, popsicle sticks, construction paper, toilet paper/paper towels, felt, stapler, tape, scissors, markers.</p>
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<p>Homework Assignment: Finish the plant reading and questions from earlier in the week.</p>
