

Seed Dispersal

Design Challenge Learning

Students will design, create, and test a structure for a wind dispersed seed. As they iterate through this design challenge, they gain firsthand experience in the design process.

Grades: 3-8

Estimated time: 45 minutes

Student Outcomes:

1. Students will be able to design and build a structure for a wind dispersed seed.
2. Students will be able to discuss design considerations based on their knowledge of the complementary nature of structure and function.
3. Students will be able to utilize the three-step design process to meet an engineering challenge.

Next Generation Science Standards

Grade 3-5: *Engineering Design* 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3

Grade 3: *Life Science* 3-LS1-1

Grade 4: *Life Science* 4-LS1-1

Grade 6-8: *Engineering Design* MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4

Grade 6: *Life Science* MS-LS1-4

Common Core Language Arts-Speaking and Listening

Grade 3: SL.3.1b-d, SL.3.3, SL.3.4a

Grade 4: SL.4.1b-d, SL.4.4a

Grade 5: SL.5.1b-d, SL.5.4

Grade 6: SL.6.1b-d

Grade 7: SL.7.1b-d

Grade 8: SL.8.1b-d

Design Challenge Process:

The Design Challenge Process is designed so students reinforce their science, mathematics, social studies, and language arts content knowledge, through an open-ended process that results in an original, team-driven solution. Students are expected to take responsibility for assessing their own progress and incorporate peer feedback as they conceptualize and redesign their projects.

The process consists of three interconnected steps:

Conceptualize

- Identify problem, materials, and constraints
- Brainstorm ideas and possible solutions

Construct and Test

- Select a solution
- Design and construct
- Prototype

- Redesign or modify

- Retest

Acquire Knowledge

- Research
- Share solutions
- Reflect and discuss

Through the try, fail, learn approach, students develop the skills and habits of mind of Silicon Valley innovators: creativity, problem solving, design, collaboration, leadership, risk-taking, perseverance, and learning from failure.

Materials:

Team Materials (2-3 Engineers):

- Various types of paper products (newspaper, copy, tissue, etc.)
- Assorted building materials
- Various types of adhesive tape
- String, yarn, twine
- Scissors
- Dried Beans or seeds
- Data collection sheet

Testing Supplies:

- Box or Window Fan
- Meter stick or measuring tape (measuring distance)
- Blue or masking tape for marking off test area

