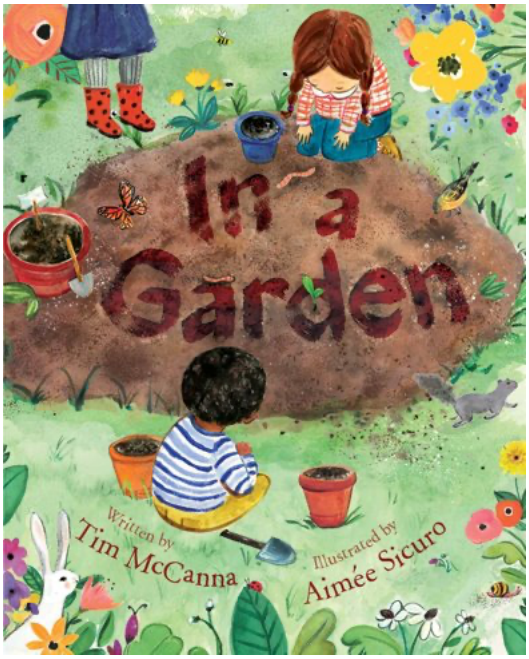
PORT ABLE LAB
Education That Moves

Sprout Scouts (Grades K-2)



+ OVERVIEW In this activity, students will hear the story *In a Garden* by Tim McCanna. They will then build their own seed gardens and learn about the life cycle of plants from seed to harvest. Students will understand how they can take their sprouts from their seed gardens and plant them in their own homes.

+ 2021 Science TEKS covered in this design challenge

Kinder TEKS: K.1.A, K.1.E, K.1.G, K.6.A,

Grade 1 TEKS: 1.1.B, 1.1.E, 1.1.G, 1.6.A, 1.6.C

Grade 2 TEKS: 2.1.B, 2.1.E, 2.1.G, 2.6.A, 2.6.B, 2.6.C

+ ELAR TEKS covered in this design challenge

Kinder TEKS: K.1.D, K.8.E

Grade 1 TEKS: 1.1.D, 1.8.C, 1.9.C, 1.9.E

Grade 2 TEKS: 2.1.D, 2.9.D, 2.9.E

+ The students will be able to:

- Read *In a Garden*.
- Observe the growth and development of seeds.
- Describe seed and seedling structure.
- Understand conditions necessary for seeds to germinate
- Identify and communicate a problem or task and break down (decompose) multiple solutions into sequential steps.
- Demonstrate personal skills and behaviors, including effective communication, following directions, and mental agility, needed to implement a design process successfully.
- Recognize characteristics of persuasive text with adult assistance and state what the author is trying to persuade the reader to think or do.
- Describe ploy elements, including the main events, the problem, and the resolution, for texts read aloud with adult assistance or independently.
- Work collaboratively as a team by following agreed-upon rules for discussion, including listening to others, speaking when recognized, making appropriate contributions, and building on the ideas of others.

+ Students will use the following STEM fluency skills:

- Communication
- Collaboration
- Creativity
- Critical Thinking
- Resilience
- Time/Resource Management
- Innovation
- Adaptability

+ Materials needed for this design challenge

- Seed House activity sheet, 1 per student
- Seeds/Beans, 3 per student (Kidney beans and pinto beans work best)
- Ziploc bags, 1 per student
- Cotton balls
- Gardening soil
- Aquarium rocks
- Spray bottle with water, 2-3 per table
- Markers
- Stapler (for instructors)

+ Prep needed by the facilitator:

> Cut out the window on the seed house worksheet on the dotted lines
  - This is easiest to do a few at a time with an x-acto knife

+ FACILITATION GUIDE

PROCEDURE

Slide 1: Sprout Scouts

Slide 2: Read Aloud

> Read *In a Garden?* By Tim McCanna
> Summarize what happens on each page.

Slide 3: Engineering Design

> Ask students the question: what is engineering?
  - Explain to students that engineering is when engineers take what they know and apply it to solve problems by designing a product or process.
  - For example, phones could only be used at home or in specific locations. Why is this a problem? (Needing to make a call outside the home). What solution did engineers design to fix that problem? (Cell phones).
    - *Teacher's Note: Any example can be used here but focus on examples that students are familiar with.*

Slide 4: Engineering Design

> Ask students the question: What do you think engineers build or create?
  - *Teacher's Note: If students have trouble giving examples, ask students who makes the things they use. Ask them to observe the classroom space, what are some items in the space that people have created or built? Who makes refrigerators? Cars? Helmets? Cell phones? Sneakers?*

Slides 5-7: Engineering Jobs

> Show students pictures related to engineering jobs connected to the story.
> Civil Engineering
  - Ask students what they see in the pictures.
  - Explain to students what they are seeing in the pictures is called civil engineering. Civil engineers use math and a type of science called physics to build buildings that help people. Civil engineers will build many structures like bridges, highways, towers, and water systems!
  - Ask students which they have ever seen a bridge, or thought about how it was made. Civil engineers design bridges that are safe for us to use every day, along with the highways or roads we travel on. When

designing bridges do you think that civil engineers have to think about vessels?

- Environmental Engineering
  - Ask students what they see in the pictures.
  - Explain to students that engineers who study the environment are called environmental engineers. They use science to help the Earth! Some of the work they do can help make plants grow bigger and healthier or check our water to make sure it is safe for us and animals that live in the water.
  - Ask students what would happen if we didn't' have environmental engineers?

Slide 8: Engineering Design

- Ask students the question. Who can be an engineer?
  - Anyone!

Slide 9: What do seeds need to grow?

- Ask what things do all seeds need to grow?
  - Oxygen, water, light, proper temperature
- Complete the what helps/hurts seeds activity
  - Ask the students to vote on whether something helps or hurts the seed
    - Ex. Bird = hurt
    - *Teacher note: students in the past have not known what a weed is. Explain what a weed is and how they function before having them vote.*
  - Ask students why don't seeds/beans grow in the packets when you buy them in the grocery store?
    - They are not getting some of the things they need to grow: light, water

Slide 10: How do seeds grow?

- Discuss the following concepts:
  - Each seed has a seed coat that protects them
  - Seeds cannot grow into plants until the conditions are right for them
  - When seeds start to grow into plants, the roots come out of the seed coat first, followed by the shoot, which contains the stem and leaves

Slide 11: Building a Seed House Activity

- Give every student a Seed House worksheet
- Review what seeds need to grow
  - Oxygen, water, light
- Review what materials are available
  - Make sure the students understand they cannot use every material
- Give students a few minutes to discuss at their tables what might help their seeds grow the best
- Walk around and provide students with their materials
  - *Teacher's note: A budget can be added for more of a challenge*
- Once the students are done adding the materials to their bags, have an adult staple their bag to their seed house

Slide 12: **What to Expect to Happen in Your Seed House**

- Explain that they will not see much change in their Seed House for a few days
  - Suggest taking a picture or drawing what they see each day to better track changes
- Explain what they see in the picture
  - 4 of the seeds has sprouted, 1 has leaves

Slide 13: Review

- Review what seeds need to grow: oxygen, water, light
  - Ask if there is anything they need to do when they take their Seed House home?
    - Give it light
  - Ask where would the best place be to give their Seed House light?

Slide 14: What now?

- Explain that once their seeds are far enough in the germination process, they can plant them in an area with more room
  - Ask where good places to plant their sprouts would be