

Challenge 6: How do engineers create innovative designs?

Get Prepared

Challenge Goal: Reflect on solutions to a community-based engineering problem, then turn ideas into an innovative design

Time Needed: 45 minutes

What You Will Need:

Printouts

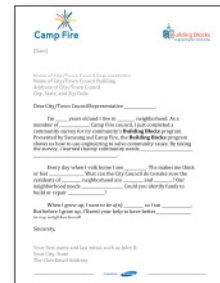
- **Activity Sheet G: Brainstorm!**
- **City/Town Council Letter Template (optional)**

Materials

- Samsung tablets
- pens or pencils
- paper
- completed **Activity Sheet F: Talk About It!** (from Challenge 5)

Note: Kids may use the activity sheet printouts or they may follow along on their tablets at: www.scholastic.com/sparks2.

Connect With the Community (optional):



Once kids have completed Unit 2, they will have invented an innovative design to meet a need in their community. Wrap up the unit by helping them share their great ideas with their city council representative. Have them

research the name and address of their city council representative. Then ask them to use the downloadable **City/Town Council Letter Template** to write a letter that presents their ideas and asks for support for their communities.

Spark Exploration: Introduce Them to STEM Careers

10 mins.

Have kids open the **STEM Career Flip Book** on their tablets and flip to the engineering careers to read about a drafter. Explain that engineering projects take a team of STEM professionals. Ask:

- **When do you think a drafter would be involved in a building project?** (After an architect or engineer has come up with the idea for the project and before it gets built.)

Goal Selection:

- **What do you think a drafter's goal is when working with a team?** (To plan out how an idea will work in real life, identify problems with the design idea, offer alternative solutions, and demonstrate how much space and materials may be needed to build.)



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Challenge 6: How do engineers create innovative designs? (continued)

Setting the Strategy: Engineering the Community 10 mins.

Direct kids to separate into their design teams and **look back over** the responses on **Activity Sheet F: Talk About It!** from the previous activity. Have them debate which community issues are of the greatest importance and why. From the top issues, they'll pick one they'd like to tackle with an innovative engineering project. Encourage teams to clearly define the goals their designs would achieve and what strategies they would integrate to achieve these goals. Explain to kids that a *goal* is the "result or achievement toward which effort is directed."¹ For example, to finish all homework by 6 p.m. is a goal. A *strategy* is a "plan, method, or series of maneuvers for obtaining a specific goal."² For example, starting homework as soon as you get home from school and turning off the television while you work are both strategies.

Shifting Gears: STEM Challenge! 25 mins.



Hand out **Activity Sheet G: Brainstorm!** to each kid. Instruct teams to reflect on a possible idea for an innovation that could help address the goals of their chosen community issue. If there is time, instruct kids to start sketching a draft of their design ideas. They may use the **Picasso app** to sketch out their designs on the tablets or they may use separate sheets of paper. If kids do not have time to sketch their ideas, wrap up the activity by having them write detailed notes. Have them save their sketches and notes for the next activity.

Sources: ^{1,2} www.dictionary.com.

NAME: _____

Brainstorm!

It's not always easy to come up with solutions to a problem. It helps to brainstorm to create a list of possibilities. Use this activity to spark a flood of ideas!

Instructions: Write the important community issue your team would like to fix in the “Problem or Need” square below. Then come up with an innovation that could be a potential solution. Next, consider what it will take for your innovation to work. The diagram below will help you map out your thoughts so you don’t get stuck.

