

Challenge 9: How do we create a model of our innovative design?

Get Prepared



Challenge Goal: Kids will build models of their innovations



Time Needed: 45 minutes (with an additional 45-minute session if more time is needed to complete the models)



What You Will Need:

Printouts

- **Activity Sheet J: Model Construction**
- **Activity Sheet K: Presentation Guide (optional)**
- **Letter to the Mayor Template (optional)**

Materials

- Samsung tablets
- Building materials, such as:
 - cardboard
 - clean, disposable plastic containers
 - egg cartons
 - straws
 - pipe cleaners
 - caps
 - tinfoil
 - markers
 - paint
 - scissors
 - glue
 - tape

Note: Kids may use the activity sheet printouts or they may follow along on their tablets at: www.scholastic.com/sparks3.

Connect With the Community (optional):



Since kids have completed the **Building Blocks** program, have them write a letter to the city's mayor using the provided **Letter to the Mayor Template**. The template will help them find the words to explain their innovations and invite the mayor to come take a look at their hard work.

Engineering in Action 15 mins.

1. Now that kids have their goals and have planned their models, it's finally time for them to build. So dive right in! Ask kids if they can recall why models are important to engineers. (Remind them that they learned about this in Challenge 3 when building their model 3D cities.) Models help engineers show others how an engineering project will look, function, and interact with the real world.
2. Explain that engineers call a model of a design a prototype. Ask:
 - **Why is it important to build a prototype before producing the actual design?**

- **Why do designs need to be tested?**
 - **What happens if a design fails?**
3. Explain that building a prototype is one part of the design development process. Ask kids to identify other design stages they have learned so far. Make sure they include the following stages: define the problem; set goals; brainstorm solutions; choose the best solution; come up with strategies; draft your design; test and troubleshoot your design; improve your design. (If you'd like to test their sequencing skills, you can write these steps randomly on your whiteboard or chalkboard and have kids put them in the correct order.)

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Challenge 9: How do we create a model of our innovative designs? (continued)

Shifting Gears: STEM Challenge! 30 mins.

1. Hand out **Activity Sheet J: Model Construction**. It will walk teams through the steps to plan how to build a model of their innovations. Before they begin, have them look over the building materials provided so they can determine what is available and will work best for their models. Encourage kids to come up with building strategies in advance.
2. Once kids have completed their activity sheets, give them about 30 minutes to work on building their models. Remind them to look back as needed at the design they drew on their tablets, as well as the flowcharts they created in the previous activity.
3. Circulate among the teams as they work on their innovation models. Evaluate whether kids are on track and provide feedback. Answer any questions

teams may have if they become stuck. Extend this activity to an additional session if kids need additional time to complete the models of their innovations. Remind kids to make revisions as necessary.



Final Presentation (optional)

Congratulations! You and your kids have come to the end of your journey of learning about STEM and innovation. Give yourselves a round of applause for your hard work. Now that they've completed this challenge, your kids should have plenty to be proud of. So help them share their hard work with the community!

Prepare for the Presentation

If your council has the time and space, organize an event where kids can present their ideas to peers, families, and community members. You may also invite government officials. Find a place where kids can display their 3D

models and the models of their innovations. If you did not complete the optional **Activity Sheet I: Set the Scene** during Challenge 8, consider going back to complete it so teams will have storyboards to accompany their 3D models. As a final component to the presentation, use **Activity Sheet K: Presentation Guide** to help kids prepare a public presentation of their innovations. Public speaking and communication are important educational, job, and life skills. Give your kids a head start in learning how to effectively share their thoughts and ideas. Good luck!

TEAM NAME: _____

Model Construction

You've worked long and hard setting goals and strategies to develop a design idea to benefit your community. Now it's time to show others what your innovation will look like in real life. So just like a real engineer, you're going to build a model of your innovation.

Instructions: Make sure your model building goes smoothly. Before you begin, use the checklist below to outline the building process. Check off each step as you complete it. Remember to make changes to your model as needed.

Construction Checklist

☐ Choose Your Materials

- Of the materials provided, which will work best for your model? List them here:

- What will each type of material be used for?

☐ Plan Your Building Method

How do you plan to construct your model? List the steps here:

Step 1 _____

Step 2 _____

Step 3 _____

Step 4 _____

☐ Label It!

When you are done building, use strips of paper to label the key parts or features of your model to show how it will function. Write down what you plan to label here:

Part/Feature 1 _____

Part/Feature 2 _____

Part/Feature 3 _____

Part/Feature 4 _____

☐ Building in Real Life

- What materials and other resources would you need to create your actual innovation?

- What strategies would you use to build your actual innovation in your community?

Presentation Guide

Sharing your ideas in front of a group can sometimes be intimidating. But don't worry! This guide will help you increase your presentation skills.

Instructions: Complete the steps below on a separate sheet of paper to learn what important information to include in your presentation. Make sure you know which team member will present which part of the presentation. Then read the "Helpful Talking Points" section below to assist your team in preparing the presentation speech.

1. Introduce Your Design Team

- Share your team name and the names of its members.
- Give the name of your innovation and a brief overview of what it does.

2. Describe Your Innovation

- Discuss the problem or need in your community that your innovation addresses. Make sure to state the goals that you have set.
- Explain how you think your community will benefit from your innovation.

3. Discuss Your Model or Storyboard

- Use your model or storyboard to explain the details behind how your innovation will work.
- Explain how you came up with the design for your innovation. Describe the strategies and revisions you came up with along the way.

4. Describe Real-Life Construction

- Explain how you would go about building your innovation in real life, including the materials and resources you would use.
- What professionals would you need to bring the various parts of your innovation to life? For more information, conduct research on your tablet to find out. Then list the necessary professionals' titles, roles, and responsibilities.

Helpful Talking Points

- **Write It Down:** It can be easy to forget what you are supposed to say when presenting. Beat stage fright by writing down a few helpful notes as a reminder of the key points you want to make.
- **Rehearse:** Don't wing it! Practice what you're going to say before the day of your presentation. This will help you relax and stay focused as you speak.
- **Know Your Stuff:** People may have questions, so come prepared to answer them. It's okay if you can't answer every question, but everyone on your team should be able to explain the main ideas behind your project and how it works.