Challenge 7: How can we improve innovative designs?

Get Prepared

Challenge Goal: Learn about the role of revision in the design process

Time Needed: 45 minutes

What You Will Need:

Printouts	Materials
• Activity Sheet H: Troubleshooting	• Samsung tablets • paper • pens or pencils • team notes and sketches on their innovation ideas (*from Activity 6*)

Connect With the Home:

Now that you've begun Unit 3, send home the **Council-to-Home Communication: Unit 3 Overview** so family members can read about the activities for the final unit of **Building Blocks**.

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

Engineering in Action 10 mins.

Goal Selection:

1. Ask two or three teams to share their experiences with creating their own innovations. Ask: ***What community need does your innovation meet? What goals did you set for your innovation?***

Setting the Strategy:

2. Explain that the idea for an innovation is just the first step in creating a community solution. Finished designs don't get built right after the idea is created. Designs go through many revisions. Engineers create a plan and come up with strategies to achieve set goals. They put their designs through a design development process to make sure their innovations work in the best possible way and offer the best solution to a problem.

3. Ask kids: ***Reflect on how engineers might determine what improvements to make to a design?*** (They look for any flaws in the design and make sure it meets all the identified community needs; they develop models of their designs and test them; they get feedback from consumers and other engineers.)

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Challenge 7: How can we improve innovative designs? (continued)

Shifting Gears: STEM Challenge! 25 mins.

1. Tell kids that, like real engineers, they need to evaluate their design ideas before settling on a final design. They'll test and revise their ideas with the help of a role-playing activity.
2. Have teams partner with one other team to complete **Activity Sheet H: Troubleshooting**. The testing groups will take turns acting out how each team's innovations will work.
3. Hand out **Activity Sheet H: Troubleshooting**. Give teams five minutes to choose characters based on the roles described on the chart on the activity sheet. Ask them to think carefully about their innovation ideas. Their role-playing should demonstrate:
   - What their innovations will do
   - What goals their innovations will meet
   - Who will use their innovations
   - Who will operate their innovations
   - Where the innovations will be located in the community
   - Who will be impacted by the innovations
4. Now that teams have developed their ideas, explain that it's time to role-play. Make sure that each of the four group members has a specific role to play. Group members will play the following roles:
   - **Role #1:** The person who will ***use*** and ***benefit*** from the innovation
   - **Role #2:** The person who will ***operate*** the innovation
   - **Role #3:** The person who will be ***affected*** by the innovation's location and/or presence in their neighborhood
   - **Role #4:** The person who will be ***critical*** of the innovation
5. Give groups five minutes to act out a short scene involving the first team's innovation. After five minutes, have the kids stop and take notes on what worked and what didn't. Then have the groups start a new role-play to test out the other team's innovation so that both teams get feedback on their design ideas.

Use the Tablets! 10 mins.

Have kids separate into their teams and review the issues they discovered during the role-play activity. Tell them to use this information to revise their innovation's design in the **Picasso app** on their tablets. Teams may also choose to draw their solutions on paper.

NAME: _____

Troubleshooting

Will your innovation work as expected? You won't know until you test it in a real-life scenario. Use this role-play activity to look for possible problems with your design.

Get Ready

Think of some characters for your role-play activity. These will be specific people who will interact with your innovation.

Role	Character Description
Role #1: The User **Who will use the innovation? Who will the innovation help?** Choose a character who will use the innovation and be helped by it.	
Role #2: The Operator **Who will operate the innovation?** Choose a character who will make the innovation work.	
Role #3: The Neighbor **What size will the innovation be and where will it be located?** Is the innovation large or small? Will the size and location of the innovation impact someone in the neighborhood? Choose a character who has to get used to the innovation in his or her neighborhood.	
Role #4: The Critic **Will someone in the neighborhood dislike the innovation?** Think of a character who might not like the innovation and might complain about it. This character's criticisms can help you come up with design solutions!	

Act It Out

Now that you have your characters, act out a short scene involving your innovation. All team members should be involved and pretend to interact with the innovation. As you're acting it out, notice what works the way you think it will and what doesn't.

Reflect and Shift Gears

On the back of this sheet, write down any issues that arose during the role-playing activity. Then brainstorm solutions to address these issues so your innovation better meets your community's needs.