Camp Fire

Building Blocks
Engineering Our Community

STEM Challenges and Activity Sheets

for Grades K–2

For your convenience, this document collects all the challenges and activity sheets from the **Building Blocks** program in one downloadable PDF. Use this document to print out the entire K–2 program, complete units, or individual activities and activity sheets. If you want to access the challenges on the tablet, return to www.scholastic.com/sparks and click "View" next to the desired challenge.

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Camp Fire Notebook

Engineer's Notebook

Flip Books 1 & 2

Community Engineering Flip Book

Innovation Flip Book

Challenge 1: What's in My Community?

Get Prepared

Challenge Goal: Understand how the buildings and other structures in a community help the people who live there

Time Needed: One 45-minute session

Before You Begin:

- Print out and make copies of the Engineer's Notebook template, which can be found at **www.scholastic.com/STEMsparks**. Collate and staple the sheets so that each participant has his or her own Engineer's Notebook. Be sure to identify a place to keep these notebooks as participants will use them through all three units of the **Building Blocks** program.
- Go through magazines and tear out pages that show trees, buildings, streetlights, and other items that may be in a community. Have these sheets ready for this challenge's collaging activity.
- If time permits, make your own community collage to show students as an example.
- Before the participants come, set up the tablets so that their browsers are at **www.scholastic.com/sparks**.

Connect With the Home:

As soon as you know that you will be starting the **Building Blocks** program, download and print out the **Council-to-Home Communication: Program Overview for K–2.** Send the Program Overview home with the kids who will participate to let their family members know about the program.

When you actually start the program, download and print out the **Council-to-Home Communication: Unit 1 Overview for K–2** and ask kids to take the communication sheets home to let their family members know what's involved in Unit 1 of the **Building Blocks** program.

What You Will Need:

Printouts	Tablet Flip Book	Materials
• Engineer's Notebook • "Community Needs" sheet (2 or 3 copies per student)	 • Community Engineering Flip Book	• Samsung tablets • scrap paper • 11x17 paper • magazine pages featuring community landscapes (optional) • construction paper • pencils • crayons, markers, or color pencils

What's in My Community?

Pass out 11x17 sheets of paper, copies of the "Community Needs" sheet (last page of Engineer's Notebook), pages from magazines, and scrap paper. Ask kids to make a collage of all the important things in their community. Explain that they can use the drawings on the "Things in a Community" sheet, the pictures from the magazines, or they can draw their own community items on the scrap paper. If you have made your own collage, show it now to provide an example of the activity.

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Challenge 1: What's in My Community?

What's Its Use?

1. When kids have completed their collages, have a few volunteers describe what they included in their collages. Direct kids to click on the Community Engineering Flip Book tab on **www.scholastic.com/sparks**. Ask them what they notice about the community they see on the screen.
2. Explain that everything in a community has a use. Ask for a volunteer to identify one important thing in the community illustration. Challenge kids to explain: ***How do people use this important thing? How does it help people in the community?*** Ask how many kids included that item on their own collages. Continue discussing the items in both the illustration on the tablet and the kids' collages to explore why each item exists and how it helps a community. As kids discuss each item, encourage them to share stories of how they have used that item.

Reflection Time

Distribute the Engineer's Notebooks and have kids write their names on the covers. Ask kids to open their notebooks to the first page and to think about everything they discussed today. Explain that they will choose the two or three items they think are the most important to their community. Have them draw their three favorite community items also known as *structures* on the first page of their Engineer's Notebooks. Encourage kids to share why they chose these structures with the group. Ask: ***Why did you select these? What makes them important to your community? To you or your family?*** When they're finished have them color in their structures.

Challenge 2: Who Built That?

Get Prepared

Challenge Goal: Understand that engineers built the things in their community

Time Needed: One 45-minute session

Before You Begin:

Before the participants come in, set up the tablets so that their browsers are set to **www.scholastic.com/sparks**.

What You Will Need:

Tablet Flip Book

- Community Engineering Flip Book

Materials

- Samsung tablets
- Engineer's Notebook (from Challenge 1)
- pencils
- drawing paper
- pipe cleaners
- colored paper
- tape
- glue

Who Built That?

1. Distribute the Engineer's Notebooks. Have participants revisit their "Important Structures in My Community" page. Ask kids what they remember about why the structures on their page are important to the community. Ask: ***How did the things in your community get there?*** Have volunteers explain their answers.

2. Explain that before a building is constructed, there is a very important person who must create a building plan. That person is an architect. Have participants open the Community Engineering Flip Book on the tablets. Have them tap the number 2. While they look at the picture of the architect, tell them that an architect takes the idea for a community building and draws a plan of what it will look like and how it will work. Explain that architects are people who work very hard to be creative and "big thinkers." They go to special schools to learn how to use art, science, and math to make important drawings that will show builders how to build. The buildings architects draw must be safe and easy for people to use. If time permits, discuss the tools in the architect illustration on the tablet.

3. Ask kids: ***After the architect has made the plans, what is the next step?*** Kids should say that the next step is to build. Have kids tap the number 3 on the tablets. Tell them that after the building plan is complete, the person who builds is an engineer. Explain that engineers are builders and problem solvers. Some engineers build bridges, cars, airplanes, and spaceships. Other engineers work with computers, medicine, people, and the environment. Look around you. Everything you see in the room you're in, from the desks and chairs you're sitting on to the pencils and pens you use, all involved an engineer at one point or another. In a community, engineers build the buildings, bridges, parks, and other things that people rely on every day. If time permits, review the machines and tools used in the engineer's illustration on the tablet.

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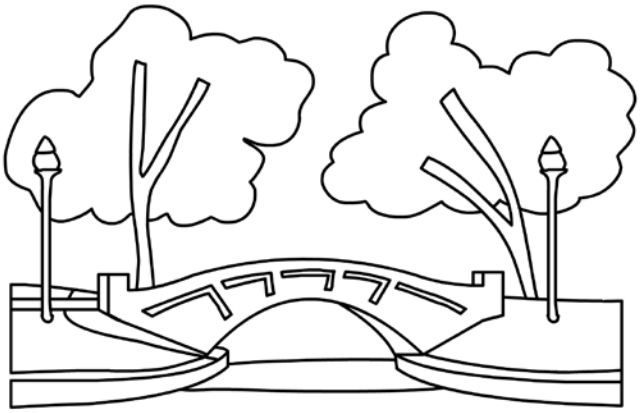
Challenge 2: Who Built That?

It Takes a Team

1. Tell kids they will now team up to build something for their community. Separate kids into groups of two. Explain that each of them has an important job to do. Together they will decide if they will build a bridge or a building. Note: Give kids these two choices, but if they become excited about building something different, allow them to challenge themselves.
2. Once the teams have decided what to build, they will work together as architectural teams and then engineering teams. Pass out blank sheets of paper. Explain that as architects, they will draw the bridge or building that they will build. Then as engineers, they will use craft materials to make their builds. Encourage teams to discuss the best ways to build their designs before they get started. Remind teams to use their imaginations as they draw, but to make sure that it is possible to build their designs. Explain that if the plan needs to change as the engineer builds, the architect should go back and change the drawing so that it matches.



Reflection Time

Pass out the Engineer's Notebooks. Have kids open their notebooks to page 2 "We Build a Community." Ask them to use page 2 to draw or write what an architect and an engineer do. Have them turn to page 3, "Our Building Project," and copy the drawing their team created into their notebooks. If possible, take a photograph of what each team built, print out copies, and then have kids tape or glue them into their Engineer's Notebooks.

Challenge 3: Map It!

Get Prepared

Challenge Goal: Understand that there is an order to how communities are organized

Time Needed: One 45-minute session

Before You Begin:

Before the participants come in, set up the tablets so that their browsers are at **www.scholastic.com/sparks**.

What You Will Need:

Tablet Flip Book

- Community Engineering Flip Book

Materials

- Samsung tablets
- 11x17 sheets of paper with a horizontal line drawn in the middle, splitting the paper in half lengthwise
- pencils
- construction paper
- rulers
- scissors
- glue
- crayons, markers, or color pencils

Everything in Its Place

1. Have participants open the Community Engineering Flip Book on the tablets. Have them tap the number 4 and then 5. Ask them to identify what they see. They should answer that all the pictures are maps. Have one or two volunteers explain what the different maps are for.
2. Explain that maps show where things are placed. Tell students that there are all kinds of maps: there are maps of our world, there are maps of our country, there are maps of our states and cities, and maps of our communities. Tell kids that maps are very important to a community because they show what is there. People can use maps to find their way around. People can also use maps to decide if a community has everything it needs.

What a Community Needs

1. Ask kids to yell out the things they could not live without. Write those things on the board or on a large sheet of paper. Kids should include food, water, and shelter in the list of things they need. When the list is complete, ask kids where they go to get the things they need. As the answers come up—e.g., grocery store—discuss where those things are located. Point out that all the things that people need are placed along streets and sidewalks so that people can reach them.
2. As water comes up, explain that water and other things that people need come into a community belowground. Have kids tap the number 6. Show them the water pipes, electricity wires, and gas lines shown underground on the illustration. Explain that these important parts of the community are buried underneath the sidewalk, but they help keep your water clean, cook your food (gas), and help you see at night (electricity).
3. If no one has mentioned safety, explain that safety is something that is important to all communities. Ask: ***What are some of the things that make communities safe?*** Point out the traffic lights and the lampposts on the illustration. Tell them that architects and engineers have to think of all the things that are important to a community when they build.

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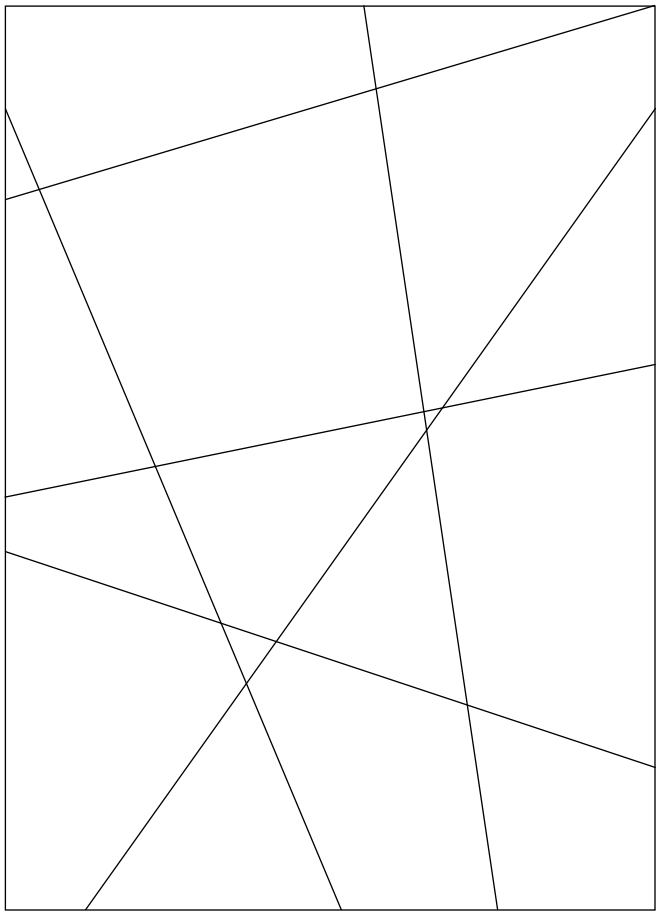
Challenge 3: Map It!

Map It!

1. Pass out the 11x17 sheets of paper. Have kids look at the palms of their hands. Ask them if they notice the lines marking their palms. Tell them that they will use their own hands as a guide to draw six curved or straight lines on their paper. Tell them that their lines can be however they want them to be, but they should go from one edge of the paper to another. It may help for you to draw six random lines to demonstrate, as shown in the illustration to the right.
2. Next, tell kids that they will now make their own maps of whatever they want. Tell them to take a few seconds to stare at the lines and let their imaginations go wild. Do the lines look like streets? Highways? Mountains? Rivers? Forest trails? Explain that they will choose a location for their map, then fill in some important things that belong in the community they're drawing. Share the following brainstorming ideas as they work:
   - *What important things will you show on your map?*
   - *Who lives in the place shown on your map? People? Animals? Aliens?*
   - *How can you move around the place on your map? Streets? Footpaths? Highways? Rivers?*



Reflection Time

If time permits, have students reflect on community needs. Do their maps include places for people in the community to buy food, go to school, get exercise, move from place to place? If not, allow kids time to draw things or places that the community needs on a separate sheet of paper, cut them out, and glue them to the map. If their maps are complete, allow them to make notes on page 4, of their Engineers' Notebook, "What a Community Needs."

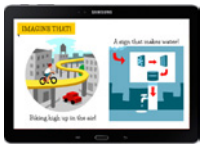
Challenge 4: What Is Innovation?

Get Prepared

Challenge Goal: Learn about new types of community designs and make their own designs

Time Needed: One 45-minute session

What You Will Need:

Tablet Flip Book	Materials	
• Innovation Flip Book	• Samsung tablets	• scrap paper
	• Engineer's Notebook (from Challenge 1)	• crayons, markers, or color pencils
	• pencils	
	• highlighters	

Before You Begin:

- Before the participants come in for the afternoon, set the browsers on their tablets to **www.scholastic.com/sparks**.

Connect With the Home:

Download and print out the **Council-to-Home Communication: Unit 2 Overview** for K–2 and ask kids to take the communication sheets home to share with their family members.

Imagine That!

1. Ask participants:
   - ***Can you ride a bike in the sky?***
   - ***Do schools float?***
   - ***Can you get water from a sign?***
   - ***Can a car drive itself? Why not?***

   Explain that engineers have created new things for communities by using their imagination.

2. Have participants tap the Innovation Flip Book on their tablets. Show them the billboard drawing. Explain that in a desert town in South America where there isn't a lot of water, there is a billboard that has a fan inside. The fan draws in the air, the air runs over very cold pipes, and water in the air drips out. The water runs down the pole of the sign and when people turn on the faucet, they get water.

3. Show them the image of the Sky London bike lane. Ask a volunteer to explain what they see. Ask another volunteer to explain why this bike lane would be in the sky. If they don't come to it on their own, guide them to think about the safety of the bikers, and how traffic would flow more quickly on both the bike lane and the streets if the cars and bikes were not traveling together. Note that engineers are building this bike lane in London, England.

4. Have kids tap the number 2 on their tablets. Show them the floating school. Explain that in this particular African country, there is a community that lives on the water in houses built just above a lake. Because the water makes it difficult for children to travel to school and it is difficult to build large structures such as a school, an architect designed this floating school. Ask a volunteer to explain why this is important.

5. The final design is a car that drives itself, which engineers in the United States are building. The car uses computer hardware to sense when it is near other objects and to navigate where to go.

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Challenge 4: What Is Innovation?

Innovation Everywhere

1. Tell kids that all of these things are innovations. Explain that an innovation is something new that's never been created before. Tell them that the most important innovations help communities thrive.
2. Have kids select the Community Engineering Flip Book tab on the K–2 landing page and tap the number 5. Ask them to think back to the conversation they had about community and then discuss what it needs. Make sure that a place to get food, water, things

that help safety (such as stop signs and stoplights), buildings for shelter, and a place to play are included in the conversation.

Challenge Time!

1. Ask: ***What would you like to have more of in your community? Do you need more safety in your community? Do you need more places to get food and water? Do you think everyone needs a place to play—even grown-ups?*** Pass out the Engineer's Notebooks and have kids flip to page 5, "What My Community Needs." Ask them to write or draw their community's needs.
2. When they have completed this task, have a few volunteers share their answers. Then ask: ***If you could choose one thing on your list to change, what would it be?*** Have everyone choose one thing they want more of in their community and write it on the "Goal" line on page 5, "Making My Community Safer," of their Engineer's Notebooks.
3. Pass out scrap paper. Tell kids that they will now put on their thinking caps. ***Can they think of an innovation, or something new, they could build to meet their goals in their community? Would they build a machine? A building? Something that floats? Something that flies? Would it be big? Would it be small? What would it do?*** Ask as many questions as possible to rev up their imaginations.
4. Have kids draw their innovations on scrap paper while leaders circulate asking questions and giving advice.

Wrap-up:

Once kids feel comfortable with their drawings, have them copy their sketches into their Engineer's Notebooks in the "My Innovation: Sketch" box on page 6. Encourage kids to share their innovations and why they chose them.

Reflection Time!

Lead kids in a discussion to reflect on Challenge 4. Ask the following questions: ***Was it easy to come up with an idea? Was it hard or easy to draw that idea? What would you change about your drawing? Do you think engineers and architects spend a lot of time coming up with ideas? Why or why not?*** The goal of this discussion is to help kids reflect on their process to better understand the role of engineers and others who help design things in their communities.

Challenge 5: Will It Work?

Get Prepared

Challenge Goal: Understand that engineers revise their designs to make them better before they build

Time Needed: One 45-minute session

Before You Begin: Before the participants come in for the afternoon, set up the tablets so that their browsers are at **www.scholastic.com/sparks**.

What You Will Need:

Tablet Flip Book	Materials
• Innovation Flip Book 	• Samsung tablets • Engineer's Notebook (from Challenge 1) • pencils

Will It Work?

1. Ask if anyone would like to share the innovation they drew. Allow two or three volunteers to share. Then explain that engineers don't build an innovation after just one drawing. Explain that there are a lot of steps that engineers go through before they build. That's how they decide if their innovation will work.
2. Distribute the Engineer's Notebooks and have students flip to page 6. Tell them there are steps they can follow to find out how they can make their innovation better. Read the "Steps to Make Innovations Better" out loud. Have kids check off the steps they have completed.
3. Explain that engineers use many types of drawings to show others what their idea is and how it will work. Have kids click on the Innovation Flip Book tab on the K–2 landing page on their tablets and tap the number 3. Have them look at three examples of design blueprints, diagrams, and 3D drawings. Explain that drawings help an engineer demonstrate how his or her invention will work. They also help everyone think about what problems may arise when it's built.

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Challenge 5: Will It Work? (continued)

Challenge Time!

Separate kids into groups of three or four. Younger participants will need a leader or assistant leader in each group. Have kids explain their design and share their drawings with their groups. Guide them to interview group members about their designs by asking the following questions: ***What did you like the most about their idea? What was confusing about their idea? What would you add to their idea?*** Remind students that they should respect everyone's ideas the way they would like their own ideas to be respected.

Reflection Time

1. After the interviews, groups should come back together as a class. Ask: ***What did you learn? What are you most proud of in your design? Do you have ideas to make your design even better? Each of you received and provided ideas from others (called feedback). Was this challenging or not? Why?***
2. Explain that engineers, architects, and other builders revise, or change, their plans to make them better. For example, an architect would have to redesign a building plan to make sure that someone in a wheelchair has easy access to every room: bigger doorways, elevators and ramps wherever there are stairs, etc. Explain that revising means fixing a few parts to make the whole better.
3. Have kids go to page 6, "My Innovation: Revision," and make a new drawing of their innovation. Explain that this new drawing should be a revised version, or different, from their first drawing. They should change at least one thing to make their innovation even better.

Challenge 6: How Does It Work?

Get Prepared

Challenge Goal: Practice sequential thinking and apply it to their own innovations

Time Needed: One 45-minute session

Before You Begin: Before the participants come in for the afternoon, set up the tablets so that their browsers are at **www.scholastic.com/sparks**.

What You Will Need:

Tablet Flip Book	Materials
• Innovation Flip Book 	• Samsung tablets • Engineer's Notebook (from Challenge 1) • pencils

How Does It Work?

1. Now that you have revised, or changed, your innovations to make them better, it's time for you to explain how they work. Have students tap the Innovation Flip Book on the tablets, then tap the numbers 4 and 5. Walk them through the steps of operating an elevator: *push the button; doors open; get in the elevator; push the button for your floor; doors close; elevator takes you to the floor; doors open; get out of the elevator.*
2. Explain that engineers don't only decide how the things they build will look, they also figure out how they will work. Have kids open their Engineer's Notebooks and flip to pages 7 and 8, "This Is How It Works." Point out the blank spaces where they will draw or write the steps of how their innovations work.
3. Ask: ***What's the very first thing people will do when they use your innovation?*** Have younger kids draw a picture of the first step using their innovation in the "Step 1" box. Have older kids write a description of the first step.

4. Move on to walk younger students through each step. Ask: ***What is the next thing a person will do when they use your innovation?*** Younger kids should identify at least a beginning, middle, and end. For those kids who can identify more stages, allow them to draw them in. After introducing the first step in using the innovation, allow older kids to work on their own while the leaders provide frequent check-ins and consistent verbal cues to consider each step carefully.

Reflection Time

After participants have completed their steps, have a class discussion. Ask: ***Do you think about your innovation differently now? Did you change your mind about how it works or how it might work? Is there anything you need to add to your drawing?***

Challenge 7: Present Your Ideas

Get Prepared

Challenge Goal: Develop a presentation that shows their innovation

Time Needed: One 45-minute session

Connect With the Home:
Download and print out the **Council-to-Home Communication: Unit 3 Overview for Grades K–2** and ask kids to take the communication sheets home to share with their family members.

What You Will Need:

Printouts	Materials
• Innovation template sheet ▪ 1 per student ▪ 10 extra copies in case anyone wants to start over • Innovation Steps template sheet ▪ 4 per student for younger kids ▪ 6 per student for older kids ▪ extra copies for all age groups in case they want to start over	• Engineer's Notebook (from Challenge 1) • pencils • crayons, markers, or color pencils

Present Your Ideas

1. Pass out the Engineer's Notebooks and copies of the Innovation template sheet. (Be sure to have extra copies as kids may want to start over if they make a mistake.) Explain that they are now ready to create final drawings to show others their innovations.
2. Tell kids that they will draw their innovation as clearly and neatly as possible in the box on the Innovation template sheet. Instruct them to look at their revised drawings on page 6 and review their "This Is How It Works" steps on pages 7 and 8 so that they can be sure they are including all their ideas in the final drawing. As kids draw, walk around the room to check their progress. When they are finished with their drawings, have them get approval from a council leader.
3. Once kids have approval, instruct them to color their innovation and decorate the sheet as they would like.
4. If students complete this stage before the end of the session, allow them to move on to Challenge 8, drawing the steps of how their innovation works on the Innovation Steps template sheet.

Reflection Time

Ask kids the following questions: ***Was it challenging to redraw your innovation? Did you make any additional changes? How do you feel about your new innovation? If you were giving advice to other kids working on this same activity, what would you say?***

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Innovation Template Sheet

My Innovation

Camp Fire

Innovation Steps Template Sheet

How It Works

STEP: _____

Challenge 8: Demonstrate How It Works

Get Prepared

Challenge Goal: Develop a presentation that shows kids the steps involved in using their innovation

Time Needed: One 45-minute session

What You Will Need:

Printouts	Materials
• Innovation Steps template sheets ▪ 4 per student for younger kids ▪ 6 per student for older kids ▪ extra copies for all age groups in case they want to start over	• Engineer's Notebook (from Challenge 1) • poster board • glue or tape • pencils • crayons, markers, or color pencils

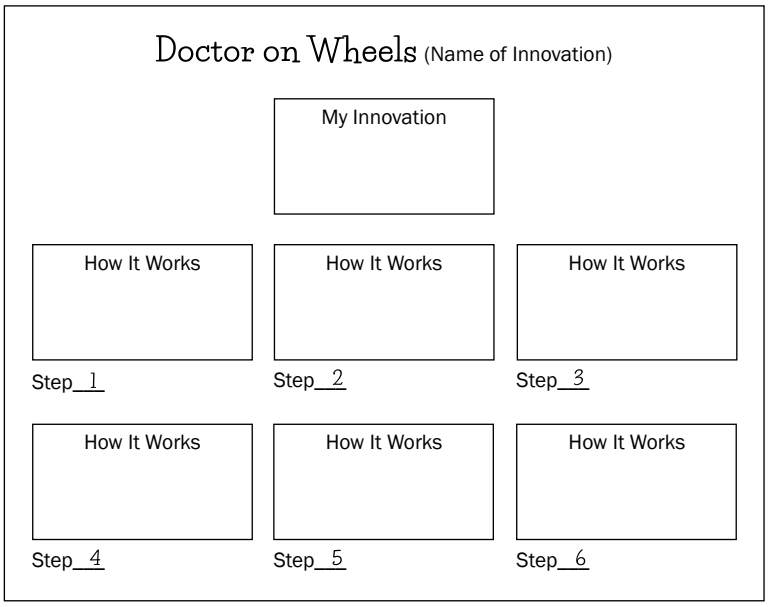
Demonstrate How It Works

1. Pass out the Engineer's Notebooks and copies of the Innovation Steps template sheet. Kids who have done a beginning, middle, and end sequence should have three sheets. Kids who have done the full six steps should have six sheets. (Be sure to have extra copies as kids may want to start over if they make a mistake.) Explain that they will include drawings of the steps for using their innovations in their presentations.
2. Ask kids to look at their "This Is How It Works" steps on pages 8 and 9 of their Engineer's Notebooks. For the first step, they should write "1" on the blank line at the bottom of the Innovation Steps template sheet. They should then draw Step 1 in the space on the template. Older kids should write the sentence that explains Step 1 of using their innovation on the Innovation Steps template sheet.
3. Have kids follow this process to draw and describe three (beginning, middle, and end) to six steps (multiple steps) that show how to use their innovations. Once kids have completed their drawings, review them for clarity. After you have approved their drawings, allow students to color and decorate them.
4. When the Innovation drawing, as well as the Innovation Steps drawings are complete, pass out one poster board to each child.
5. If time permits, allow your students to name their innovations and write the name of the innovation in bold letters across the top of the poster board. Instruct kids to place their Innovation drawing in the center toward the top of the poster board. Then have them place their Innovation Steps drawings in numerical order across the bottom half of the poster.

Challenge 8: Demonstrate How It Works

Demonstrate How It Works (continued)

6. Once everyone has organized their sheets on their poster board, pass out glue or tape so that they can attach the sheets. Make sure everyone puts their name on their poster board.



Reflection Time

Have kids review their presentation posters. Ask the following questions:

- ***Did you think you could put together this idea when you started? Why or why not?***
- ***What was challenging and how did you overcome that challenge?***
- ***Does seeing your innovation come together get you excited about coming up with more ideas? Why or why not?***
- ***How do you think an engineer or architect feels when they present an idea?***
- ***Do you think it is easy or challenging for them to share their ideas?***
- ***What might they do to be prepared to share their ideas?***

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Innovation Steps Template Sheet

How It Works

STEP: _____

Challenge 9: Build It in 3D

Get Prepared

Challenge Goal: Create a 3D model of an innovation

Time Needed: Two to three 45-minute sessions

Before You Begin:

- Before the participants come in for the afternoon, set up the tablets so that their browsers are at **www.scholastic.com/sparks**.
- Separate the materials they will need to build their models into shoe boxes or some other containers, so that each table has its own set of materials.

What You Will Need:

Tablet Flip Book	Materials
• Innovation Flip Book 	• Samsung tablets • Engineer's Notebook (from Challenge 1) • Presentation Guide (attached to Challenge 9) • toothpicks • small marshmallows, gumdrops, or balls of clay • chopsticks or wooden dowels • card stock • shoe boxes or other containers to hold the supplies

SESSION 1

Experiment With Shapes

1. Congratulations! You have led your group through the stages of creating an innovation. Students have used innovative thinking to create something new in response to a need in their community. Now it's time for them to build their innovation in 3D!
2. Have them tap the Innovation Flip Book icon on the tablets. Then have them tap the number 6. Discuss the images of engineering and design models shown on the screen. Have them tap the number 7 and look at another image of a model.

Challenge Time!

1. Explain that they will now make a 3D model of their innovation. Pass out the containers holding the supplies that kids will use to make their model. Take out four toothpicks and four marshmallows (or gumdrops). If you are using clay, show kids how to roll small balls of clay. Have them follow along as you demonstrate how to make a square, a hexagon, a wheel, and a cube (next page).
2. After you have experimented with the shapes, practice cutting out card stock to make surfaces cover the shapes.

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Challenge 9: Build It in 3D

Challenge Time! (continued)

3. Explain that in the next session, kids will use these basic shapes to build models of their innovations.

■ **Square:** Attach two marshmallows (or gumdrops or balls of clay) to each end of a toothpick. Set it down on the table and put two toothpicks into the marshmallows sticking straight up. Add a marshmallow to the end of each new toothpick and join them with a final toothpick.

⬣ **Hexagon:** Attach two marshmallows (or gumdrops or balls of clay) to each end of a toothpick. Set it on the table and put two toothpicks in the marshmallows sticking out at an angle. Add a marshmallow to the end of each new toothpick. Add a toothpick sticking straight up from each new marshmallow. Repeat the steps one more time to add a marshmallow to the end of each of the newly added toothpicks. Add a toothpick tilted inward to each of the marshmallows. Join them with a final toothpick.

⊛ **Wheel:** Attach six toothpicks to a marshmallow. The toothpicks should be equally spaced and create a circle. Cut a strip of card stock long enough to go around the ends of the toothpick. Glue or tape it in place.

❒ **Cube:** Make two squares following the between directions for making a square. Align the two squares and connect them with a toothpick placed horizontally between each of the four marshmallows.

SESSION 2

Build and Present!

To Get Started: Remind kids that they discussed and practiced building basic shapes in the last session.

1. Pass out the Engineer's Notebooks. Have kids look at their drawings on page 3, "Our Building Project," and consider what shapes they'll need to build to make a model of their innovation in 3D. Have group leaders move around the room to help them through any challenges in representing their ideas in 3D. Explain that it's important for them to be able to interpret the shape of their model, however, it does not have to be perfect.

2. After their shapes are reasonably close to their drawings, help them cut and attach card stock to form the surfaces of their inventions. Use an additional session if needed to allow kids to complete their models.

continued on next page ➥

Challenge 9: Build It in 3D

Build and Present! (continued)

3. (Optional) Decide if you would like to hold a Presentation Day in which all kids show their models to the class. If you decide to hold one, dedicate a session toward using the Presentation Guide to help kids plan their presentations. After kids have filled in all the blanks on their Presentation Guide, separate them into groups so they can practice making their presentations to small groups before they present to the entire group of students. You may choose to invite family members to attend Presentation Day.

Reflection Time

Thinking about the project as a whole, ask kids to discuss the following questions as a group: ***What step did you like the most? Why? What step or steps were the most challenging? Why? What makes being an engineer or architect difficult? What other ideas came to mind when you were brainstorming?***

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Camp Fire

Presentation Guide

Step 1: Introduce Yourself

1. My name is: _____

2. The name of my innovation is: _____

Step 2: Show Your Presentation Poster

1. Point to your poster and show the drawing of your innovation.

2. The way my innovation works is:

_____

_____

_____

3. Point to your poster and show the steps for using your innovation. Explain each step.

Step 3: Explain How Your Innovation Helps Your Community

1. The people who will use my innovation are: _____

2. My innovation helps my community because:

_____

_____

_____

Name _____

Engineer's Notebook

Important Structures in My Community

We Build a Community

What does an architect do?

What does an engineer do?

Our Building Project

The building plan:

The final product:

What a Community Needs

What My Community Needs

Making My Community Safer

Goal: _____

Steps to Make Innovations Better

- ☐ Step 1: Think of an idea
- ☐ Step 2: Draw your idea
- ☐ Step 3: Test your idea
- ☐ Step 4: Make a new drawing showing what you learned during testing

My Innovation

Sketch	Revision

What did I make better? _____

_____

_____

This Is How It Works

Step 1:

Step 2:

Step 3:

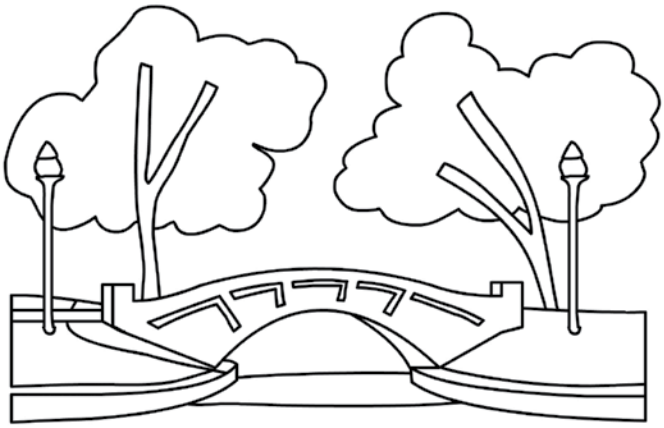
This Is How It Works

Step 4:

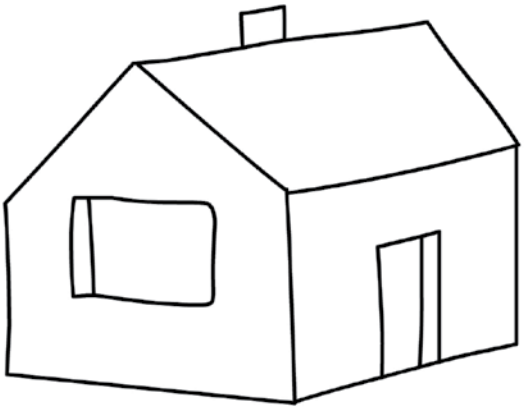
Step 5:

Step 6:

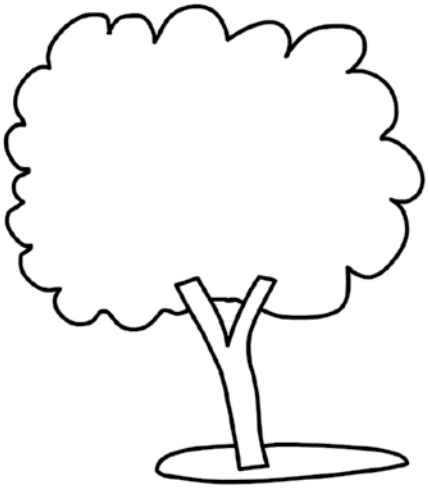
Community Needs



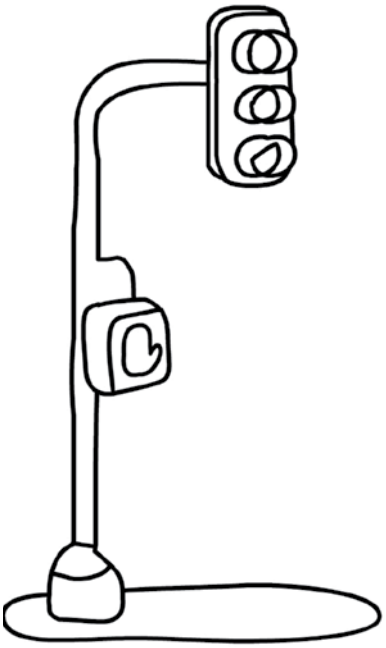
Bridge



House



Tree



Traffic light


SAMSUNG
WHAT'S IN A COMMUNITY


SAMSUNG
WHO BUILDS A COMMUNITY
Architect

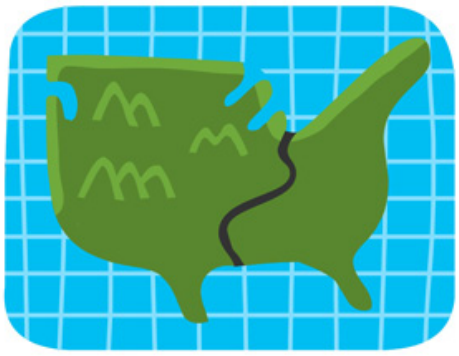
SAMSUNG

WHO BUILDS A COMMUNITY

SAMSUNG

MAPS! MAPS! MAPS!

World Map



US Map

SAMSUNG

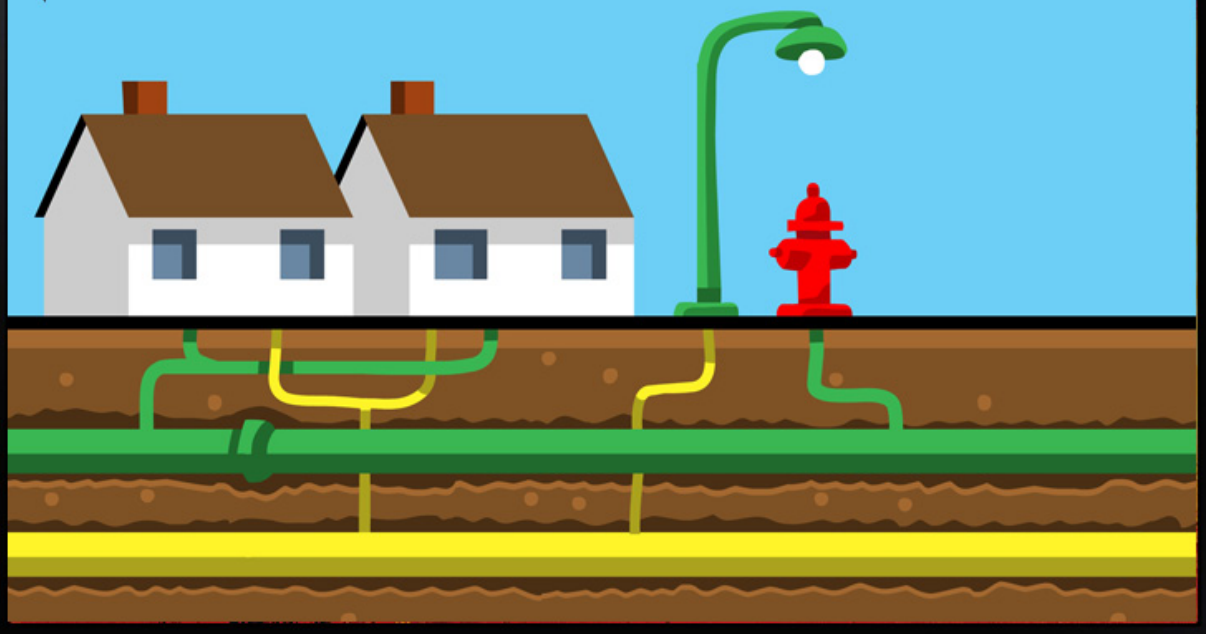
MAPS! MAPS! MAPS!

City map

Community Map

SAMSUNG

THINGS ABOVE, THINGS BELOW

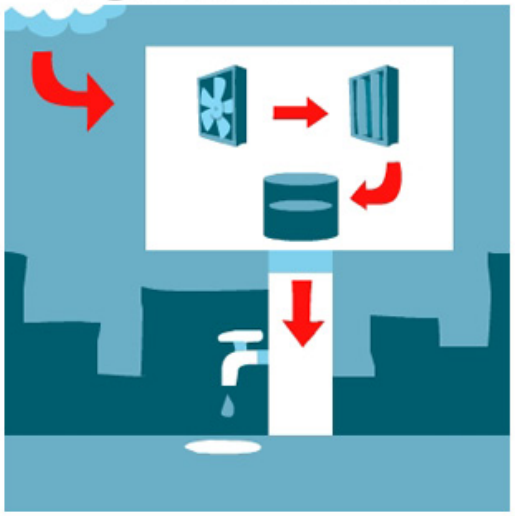


SAMSUNG

IMAGINE THAT!

Biking high up in the air!

A sign that makes water!



SAMSUNG

IMAGINE THAT!

A school that floats!

A car that drives itself!

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IDEAS START WITH DREAMING

Diagram

Blueprint

3D rendering

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HOW DOES IT WORK?

1 Push the button

2 Doors open

3 Get in the elevator

4 Push the button for your floor

SAMSUNG

HOW DOES IT WORK?

5 Doors close

6 Elevator takes you to your floor

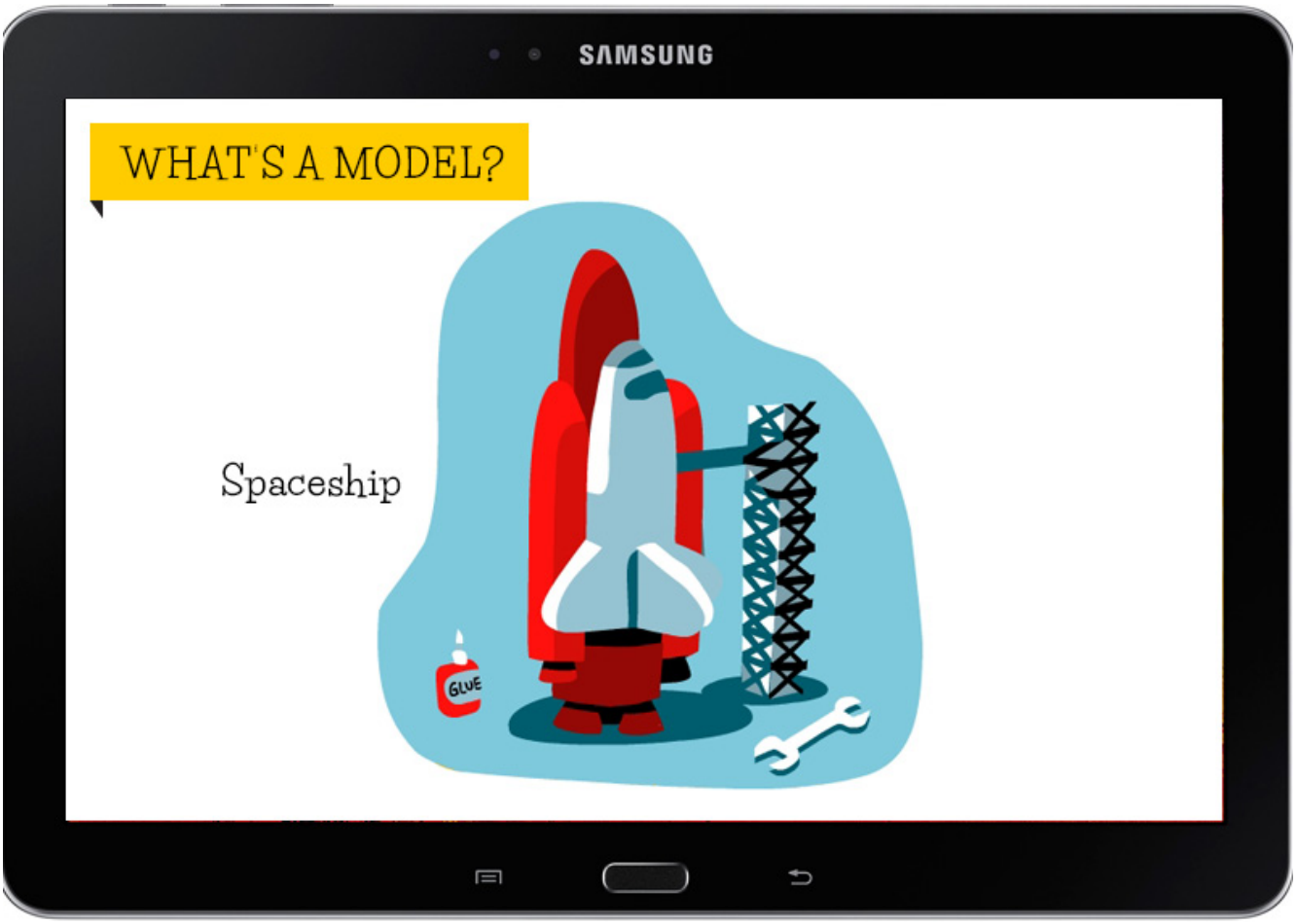
7 Doors open

8 Get out of the elevator

SAMSUNG

WHAT'S A MODEL?

Building


SAMSUNG
WHAT'S A MODEL?
Spaceship
GLUE