


Challenge 2: How are neighborhoods engineered?

Get Prepared

 **Challenge Goal:** Draw a local map to scale and identify local engineering marvels

 **Time Needed:** Two 45-minute sessions

Before You Begin:

- Locate your program or school site neighborhood on the Google Maps website using the site's zip code. Print out multiple copies of the neighborhood map on large-size paper for use later in the activity.
- Make four printouts of **Activity Sheet B: Map It** for each team of two in your group.



What You Will Need:

Printouts

- **Activity Sheet B: Map It**
- Google Maps printouts

Materials

- Samsung tablets
- tape or glue
- rulers
- Completed **Activity Sheet A: Engineering in My Community** (from Activity 1)
- graph paper
- pens or pencils
- poster board

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

SESSION 1

Spark Exploration: STEM Careers 15 mins.



Have kids use their tablets to open the **STEM Career Flip Book**. Point them to the land surveyor in the math section. After kids read the text, ask: *What skills do you need to work as a surveyor? What do surveyors do?* (Answers may include: map the environment

to determine property borders, help architects plan new construction, map crime scenes, survey land under the ocean to look for oil or find dangers to boats.)

Goal Selection:

- *What goals might surveyors set?*

Setting the Strategy: Engineering in the Community 15 mins.

1. Discuss the responses kids wrote on **Activity Sheet A: Engineering in My Community** from the previous activity. Call on volunteers and use a whiteboard or chalkboard to list some of their ideas for engineering projects that could help achieve goals in their community.
2. Explain that nothing is built in a community without the input of engineers called *urban planners*. They decide on the best places to build roads and parks. They design improvements to things like outdated sewage systems. Ask: *What do planners have to think about when they are deciding where to build? (geography, existing buildings, underground water, and sewer lines, etc.)*
3. Explain that urban planners rely on maps to do their job. They need to know the location of existing buildings and streets. They even have maps that show where sewer or electrical cable lines run underground.
4. Give kids a sheet of paper and ask them to draw a map of their community from memory. Maps should include roads, rivers, lakes, buildings, etc.

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Challenge 2: How are neighborhoods engineered? (continued)

Use the Tablets! 15 mins.

1. Ask kids to open the **Google Maps app** on their tablets and use the zip code of your local program or school site to locate their neighborhoods. They can orient themselves by finding familiar locations such as their homes, school, or local library.
2. Guide them through the app's features, such as zooming and Satellite View to see an aerial image of their communities. For even more detail, they can also access the **Google Earth app** with Street View (drag and drop the yellow Pegman icon) for a pedestrian's-eye view.

Wrap-up and Reflection Activity:

3. Have kids compare the maps they drew from memory with the real maps. What kinds of things did kids draw accurately? What was inaccurate?
Ask: If an urban or town planner had used your original map to find a spot for a new skateboard park, what might have happened? Discuss the importance of accurate, detailed maps.
4. Ask kids to discuss within their teams what they discovered in their neighborhood maps.

SESSION 2

Shifting Gears: STEM Challenge! 45 mins.

To Get Started: Remind kids that they discussed maps and blueprints in the last session. They also used Google Maps on their tablets to locate their own neighborhood. Ask them to discuss what landmarks in their community helped orient them while using Google Maps.

1. Have kids separate into teams of two and provide each team with a printout of a map that shows their community. Note: The map can show their entire community or just a section but be sure it is zoomed in enough to show key local features that will help kids orient themselves. Be sure to include the map scale and coordinate numbers on each printout.
2. Ask kids to use pencils and a ruler to create a grid of one-inch squares on top of their Google Map printouts. Label each horizontal column with numbers and each vertical column with letters as shown in the example below.
3. Using your grids, describe the location of key community locations using the letters and numbers. For example, Fort Hamilton High School is located in the northeast corner of B2.
4. Explain that each group will now attempt to create a more accurate hand-drawn map of your community!



Ask teams to separate their Google map printouts into four equal sections. At the end of this activity, teams will reassemble their sections to create one large map. Ask: *If you are going to combine each section into one map later, what is the most important thing to keep in mind?* (Hint: Size!) Remind everyone that an accurate map needs common sizing. This is called

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Shifting Gears: STEM Challenge!

45

mins.

scale. As an example, look at the scale on the Google map printout. Show kids how many feet or miles each 1-inch square of their grid covers.

5. Give each team member a copy of **Activity Sheet B: Map It** and remind kids that their new map drawings will not be the exact same size as the one from **Google Maps** (no tracing allowed!). To make sure the objects they place on the map are all drawn to the same scale, ask them to use the following: 1 inch on the **Google Map** printout = 10 squares on the worksheet (or graph paper). This is a 1:10 ratio. Explain that the ratios show how one thing compares to another. Their new maps will be 10 times larger than the **Google Maps** printout.
6. Have each team member draw a 10x10 grid (labeled) on his or her worksheet.





NAME: _____

Map It

You may know your neighborhood like the back of your hand, but this activity will give you an urban planner's-eye view of your community.

Instructions: Draw your sections of the Google Map on this worksheet and label streets, buildings, rivers, lakes, and other significant features of your community. Allow them to use the zoom feature on Google Maps to better understand the detail, if desired.

When done, each team should piece together its grid squares and attach them to a poster board to make a completed neighborhood map!

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