


Activity 2: How are neighborhoods engineered?

Get Prepared

 **What kids will do:** Study maps and blueprints to draw a neighborhood map to scale

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

Before you begin:

- Locate your BGCA 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
- pens or pencils
- poster board
- Completed **Activity Sheet A: Engineering in My Community** (from Activity 1)
- graph paper
- pens or pencils
- rulers

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

Introduce Them to New Careers 15 minutes



Session 1

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?*

More discussion questions

- 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.)

- How does this career connect with STEM fields?* Have kids reread the text and discuss what STEM skills are needed to be a surveyor.

Engineering in the Community 15 minutes

- 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 their community.
- Explain that nothing is built in a neighborhood without the input of engineers called *urban planners*. They decide on the best places to build roads and build parks. They design improvements

to things like outdated sewage systems. Get kids thinking about the role of an urban planner by asking: *What are some other parts of neighborhoods that are engineered?*

- Explain that urban planners rely on maps to do their job. They need to know the location of buildings and streets. They even have maps that show where sewer or electrical cable lines run underground.

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Activity 2: How are neighborhoods engineered? (continued)

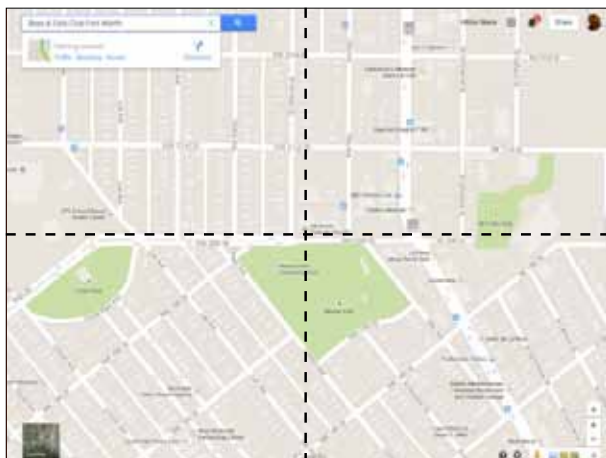
Use the Tablets! 15 minutes

1. Have kids use the tablets to search for images of maps and *blueprints* (or design plans) of their city.
2. Then ask kids to open the **Google Maps app** on their tablets and use the zip code of your local Boys & Girls Club site to locate their neighborhood. They can orient themselves by finding familiar locations such as their homes, school, or local Club site.
3. Guide them through the app's features, such as Satellite View to see an aerial image of their neighborhood. 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.
4. At the end of session 1, have kids team up into groups of two. Explain that kids will remain on these teams for the remainder of the **Building Blocks** program. Ask the kids to choose a team name and let them know that in the next session they will be working with their teams to create a neighborhood map.

STEM Challenge! 45 minutes

Session 2

1. Have kids separate into their teams and provide each team with four copies of the **Activity Sheet B: Map It** or four sheets of graph paper. They will also need a printout of the map showing the neighborhood surrounding your local Club site.
2. Instruct kids to divide the map printout into fourths by measuring a vertical line and a horizontal line down the middle of the printout. Be sure to discuss how kids should measure the total length and width, then divide both in half to find the measurements that will create grid lines that separate the map into equal parts.



3. Explain that each team will draw the map grid-by-grid on its **Activity Sheet B: Map It** activity sheets or on grid paper. Each grid square on the map will correspond to one activity sheet or one sheet of graph paper.
4. Before kids begin drawing, discuss the idea that all maps need scale. Remind kids that their drawings will not be the exact same size as the map from Google Maps. To make sure the objects they place on the map are all drawn to the same scale, have them use rulers to measure the width of each grid square on the Google Maps printout. Then measure the width of the map area on the activity sheet. If kids are using graph paper, they will measure the width of the sheet of graph paper.
5. Explain that they will use the measurements to create a *ratio*, which shows how one thing compares to another. As calculated in the example that follows, the simplified ratio shows that the objects on a map with the below referenced measurements would be two times the size of the ones on Google Maps.

Example:
$$\frac{\text{Drawn Map Width}}{\text{Google Maps' Width}} = \frac{6 \text{ inches}}{3 \text{ inches}} = \frac{2}{1} \text{ or } 2:1$$

Instruct kids to use scale to calculate the size of map objects such as streets or buildings. Then give them time to draw.

6. When done, teams will piece together their grid squares and attach them to poster board to make a completed neighborhood map.



NAME: _____

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: Use the map printout of the neighborhood where your Boys & Girls Club is located to draw the map one grid at a time. As you work, don't forget to draw everything to scale. This will ensure that each grid aligns with the other sections of the map.

When done, tape together each map grid to make a completed neighborhood map. Do the streets match up? Did you and your teammate use the same scale?

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.