BOYS & GIRLS CLUBS OF AMERICA

Building Blocks
Engineering Our Community

PROGRAM GUIDE

Welcome to Building Blocks, a STEM-enrichment program that helps kids ages 10–13 use today's technology to create new innovations for a better tomorrow.

Science, technology, engineering, and mathematics (STEM) are all around us, yet many kids don't know what types of jobs STEM professionals do. Help prepare kids for bright futures with exciting hands-on projects that use Samsung tablets to expose Club kids to STEM careers. By the end of the **Building Blocks** program, kids will even create their own technological or architectural innovations!

WHAT'S IN THE TOOL KIT

The **Building Blocks** Tool Kit is set up to provide you with step-by-step support as you take kids ages 10–13 through this STEM-engagement program. The **Building Blocks** materials include:

- **Step-by-step activity guides** that walk Club leaders through program implementation
- **Kids' activity sheets** for hands-on learning
- **A Career Flip Book** describing interesting STEM careers and profiling Boys & Girls Club graduates who work in STEM fields
- **Club-to-home communications** providing parents and caregivers with program and activity overviews
- **Templates for writing letters** to the editor, city council, and the mayor so kids can spread the word about their amazing ideas

THE U.S. MAY BE SHORT AS MANY AS

3 million

high-skills workers by 2018.*

HOW TO USE THE TOOL KIT

Before you begin the **Building Blocks** program, use the following Activity Framework to plan out the activities. Each activity is intended to take 45 minutes to complete; however, a number of them require additional sessions for completion.

Depending on the composition, interest, and attention span of your group, you may decide to present each activity in parts. As an alternative, you may decide to move through the units as quickly as possible, so Club kids may spend more time on the building phase of the project. Regardless of your approach, it is important to plan for program activities to last a minimum of 14–16 weeks.

Once you have planned how you would like to time the activities, print out all the materials, making multiple copies of the Activity Sheets and Club-to-Home Communication Sheets. Be sure to use the materials list at the end of the Activity Framework to collect all the items you will need for the program. As an alternative you may choose to view the instructions on the tablet rather than use the PDF printouts.

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*Source: National Math + Science Initiative.

ACTIVITY FRAMEWORK

The core challenge of **Building Blocks** is for kids to create a concept for an innovative design that could improve their communities.

The nine activities are broken into three units: Inquiry and Exploration; Collaboration and Planning; and Project Design and Development. Each unit contains three separate activities that take kids one step further in the engineering and design process. The activities begin by exposing kids to the products of engineering and civic innovation through their tablets. Kids then experiment with the skills that engineers use to build and plan. After finishing the **Building Blocks** program, kids will have the option to create a presentation to show what they have learned.

Unit 1: Inquiry and Exploration

In Activity 1 (45 minutes), kids will:

- Learn about STEM careers
- Create STEM storyboards
- Reflect on the needs of their community

In Activity 2 (two 45-minute sessions), kids will:

- Learn about civil engineering
- Practice mapping their neighborhoods

In Activity 3 (three to four 45-minute sessions), kids will:

- Build 3D models of their neighborhoods
- Write letters to the editor about what they learned (optional)

Unit 2: Collaboration and Planning

In Activity 4 (three 45-minute sessions), kids will:

- Learn about innovative designs around the world
- Practice building a strong engineering structure

In Activity 5 (45 minutes), kids will:

- Make connections between innovative design and community needs
- Identify community needs in their neighborhood

In Activity 6 (45 minutes), kids will:

- Create innovations to address community problems
- Write letters to the city council outlining their ideas for improving their communities (optional)

Unit 3: Project Design and Development

In Activity 7 (45 minutes), kids will:

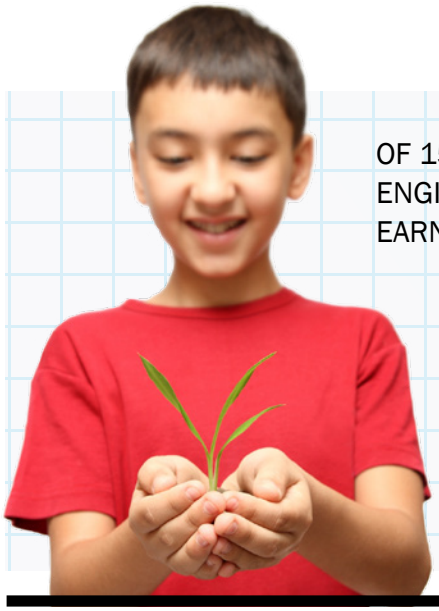
- Troubleshoot their innovations and create solutions for design problems

In Activity 8 (one to two 45-minute sessions), kids will:

- Create flowcharts that detail how their innovation will work
- Develop storyboards that show their innovations in action (optional)

In Activity 9 (one to two 45-minute sessions), kids will:

- Build models of their innovations
- Develop a presentation to introduce their innovations to others (optional)
- Write letters to the mayor about their projects (optional)



OF 15 MAJOR CAREER CATEGORIES, ENGINEERING HAS THE HIGHEST MEDIAN EARNINGS, YET LESS THAN

20%

of students choose a STEM path.*

ACTIVITY MATERIALS

- ☐ Books
- ☐ Bottle caps
- ☐ Cardboard
- ☐ Colored pencils
- ☐ Construction paper
- ☐ Egg cartons
- ☐ Glue
- ☐ Graph paper (optional)
- ☐ Index cards
- ☐ Markers
- ☐ Paint
- ☐ Pencils and pens
- ☐ Pennies
- ☐ Pipe cleaners
- ☐ Plastic containers
- ☐ Poster board (optional)
- ☐ Rulers
- ☐ Scissors
- ☐ Straws
- ☐ String
- ☐ Tape
- ☐ Tinfoil

Apps

- ☐ Cartoon Maker
- ☐ Google Maps
- ☐ Google Earth
- ☐ Picasso
- ☐ Simple Flowchart
- ☐ YouTube

*Source: National Math + Science Initiative.