

Lesson 4.2: Building Blocks

Objectives

In this lesson, students will:

- ❖ Learn to identify repeating patterns.
- ❖ Identify and create building blocks to create composite objects
- ❖ Practice creating Scratch blocks (procedures)
- ❖ Learn about abstraction experientially by creating composite objects from building blocks.

Agenda

- | | |
|---|---------|
| 1. Identify the Repeating Patterns and Student Activity | 15 mins |
| 2. Create Building Blocks | 25 mins |
| 3. Wrap Up and Reflections | 10 mins |

Preparation

- Projector for code demonstration
- Print student activity worksheet (one per student or per student pair)

Resources & Links

- Building a Neighborhood - Starter Project:
<https://scratch.mit.edu/projects/301763405>
- Building a Neighborhood - Demo Project:
<https://scratch.mit.edu/projects/288845721>

1. Identify the Repeating Patterns

In this lesson students will create building blocks: basic shapes that will be used to build composite objects such as houses and a neighborhood in the second lesson.



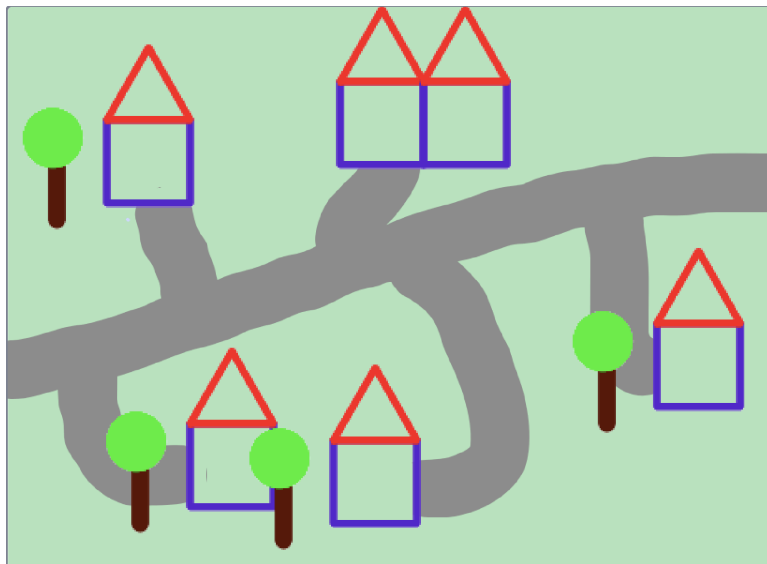
Explain to students what they will be creating over the course of the next two lessons.

Demo the Building Blocks Demo project:

<https://scratch.mit.edu/projects/288845721>

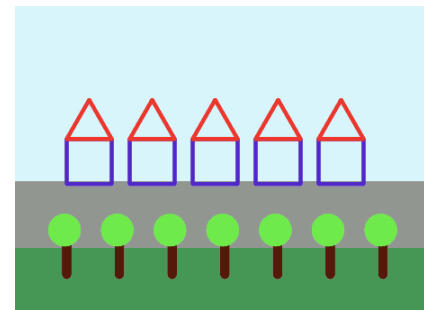
Click the green flag, then click the **c** key to draw the neighborhood (c for curvy street). Leave the final drawing on the screen. (The backdrop is hand drawn, simply large grey lines on a green background)

Engage students in an interactive discussion about identifying the smallest repeating shapes, by calling on volunteers to point them out. As they are being called out, it could be helpful to have another volunteer draw each on the board.



Repeating shapes we are looking for:

- Square
- Triangle
- Dot
- Line



What other things could we build using these basic shapes? What other basic shapes could we add to build more things? Examples: a rectangle for a door, a small square for a window, small red dots to make an apple tree, or small pink and white dots to add flowers to the tree.

Student Activity: Drawing with Building Blocks



In this activity students will draw things using the basic shapes in **the handout**. (no coding) Students will also add their own shapes to draw more things. Students can arrange the building blocks in all types of configurations. Explain the activity to students and distribute the activity worksheet.

Continue your demonstration of the demo project:

Click on the s key, this draws a different configuration. This is to spark ideas for students. Point out the double house telling them they could also draw a larger house, or a double story house. They could also create a rectangle by combining 2 squares or create a new script for a rectangle.

2. Student Activity: Create Building Blocks



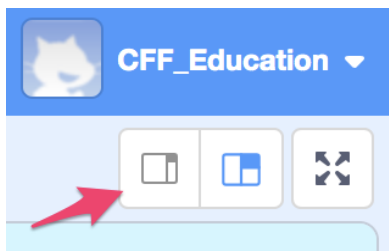
In this activity students remix a starter project that has building blocks for a triangle, a square and dot.

Tell students they are a city architect and their task is to build a neighborhood with houses and plants. They will use a program that will draw their ideas so they can get feedback from the mayor.

Distribute the activity worksheet and tell students to get started with their city planning. Once they finish the activity, they can move on to the extended activity or explore creating any other building blocks.



There is a lot of code in this project which can make it difficult to manage. One recommendation is to continue to add code below existing code and scroll down. The coding area can also be expanded somewhat by clicking on the icon indicated by the red arrow:



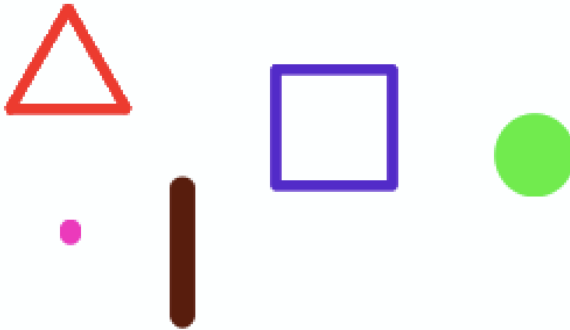
3. Wrap Up and Reflections



Reflection Points:

- What did you like about today's activity?
- What was challenging about today's activity?
- What are building blocks?
- Why are building blocks useful?
- Which shapes did you create using building blocks?

Student Activity: Drawing with Building Blocks






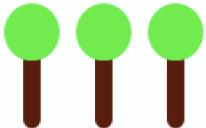
□ What to do:

1. Using these basic shapes, draw things made by combining these shapes. You can use different colors.

2. Add one or two more basic shapes so you can draw something else by combining the new shape with the other ones.

Student Activity: Creating Building Blocks

You are a city architect and your task is to build a neighborhood with houses and plants. You decide to use a program that will draw your ideas so you can get feedback from the mayor.

What to do:	Using/Details:
Remix and save	301763405
Explore the existing code and blocks. What do you notice? Fill in any observations.	_____ _____
Create a new block that draws a tree with flowers. You can use the existing Tree and Flower blocks in your new block.	
Add a block to create a rectangle. What could you build with it?	This way  or that way  hmm?
Create a new script that draws a line of trees.	
Add code to the main script to draw a tree and house or any other thing using your building blocks.	

Extended Activity:

What other building blocks can you come up with? What about a different backdrop?
What other things can you build with the existing building blocks?