



# Module F2: PixelBots JS Parameters in Functions

Scope & Sequence

## Overview

In this module, students are introduced to parameters using JavaScript on PixelBots. The lessons begin with coding challenges that focus on reading and calling functions. Students then learn to define and call functions with increasing complexity. Mid-module, students are introduced to parameters, a special kind of variable used in functions that allow customization for a specific need. Students practice writing functions with parameters to create modular and reusable code. By the end of the module, students will be able to define and call a function with a color or length parameter to paint a line of any color or length on PixelBots.

## Goals

Computer Science:

- **3-5.AP.13** Decompose problems into smaller, manageable tasks which may themselves be decomposed. (P3.2)
- **3-5.AP.14** Create programs by incorporating smaller portions of existing programs, to develop something new or add more advanced features. (P4.2, P5.3)
- **6-8.AP.14** Create procedures with parameters to organize code and make it easier to reuse. (P4.1, P4.3)

Problem Solving:

- Abstracting - Declaring Functions.
- Break it down - Decomposition.

Self-Regulated Learning

- Retrospective - Strategies Used.
- Retrospective - Progress Report.

## Understandings

Students will understand that...

- complex problems can be solved by decomposing them into smaller, manageable tasks.
- the complexity of a program can be managed through modular design.
- large programs can be divided into abstract, reusable pieces.
- planning, monitoring, and evaluating are essential parts of the learning process.

## Essential Questions

- How do you solve a complex problem?
- How does writing a modular program improve your process?
- How is abstraction useful?
- How do you become an expert of your own learning?

## Knowledge

## Skills



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Students will know that...

- a parameter customizes a function to make it more reusable.
- other programmers can use your abstraction by calling your function without having to understand the function definition.
- parameters act as placeholders for some value that you plug in when you call a function.

Vocabulary

- **Function**- code you can easily call over and over again that performs a specific task
- **Function Call**- a line of code you add to a program to indicate that the program should run the code inside a defined function at a certain time.
- **Parameter**- a special kind of variable used in a function that allows you to customize it for a specific need
- **Decompose**- to break down a problem or system into components

Students will be able to...

- step through programs that include functions with a single parameter.
- call a user-defined function in a program to solve a problem.
- define functions with a single parameter.
- write programs that include functions with a single parameter.
- monitor learning through a KWL chart.

## Assessments

### Performance Tasks

- [Level Up Challenge](#)

### Other Evidence

- [Lesson 01 Playlist](#)
- [Lesson 02 Playlist](#)
- [Lesson 03 Playlist](#)
- [Lesson 04 Playlist](#)
- [Lesson 05 Playlist](#)
- [Lesson 06 Playlist](#)
- [Lesson 07 Playlist](#)
- [Lesson 08 Playlist](#)
- [Lesson 09 Playlist](#)

Lesson	Objective	Description	Concepts & Strategies
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1	<a href="#">Step into Functions</a>	I can step through a function in JavaScript.	In this lesson, students are introduced to reading functions in JavaScript. Students learn how to step through functions and practice reading functions in a short unplugged activity. Then, students practice stepping through functions on PixelBots.	Function
2	<a href="#">Rover Functions</a>	I can call a function in JavaScript.	In this lesson, students learn how to call functions in JavaScript. Students are provided with a defined function and learn how to call the given function to paint a goal. Students will then design the different parts of a space rover by calling functions in a PixelBots playlist.	Function
3	<a href="#">Define Functions</a>	I can define a function in JavaScript.	In this lesson, students learn how to define functions in JavaScript. The lesson starts with a warm up on the different uses of loops and functions, followed by a model on how to define functions. Students then participate in a check for understanding before practicing defining functions in a PixelBots playlist.	Function
4	<a href="#">Define and Call Functions</a>	I can define and call a function in JavaScript.	In this lesson, students learn how to define and call functions in JavaScript. Students review how to decompose a goal into smaller parts and are introduced to the structure and syntax of functions in JavaScript. Students will then code the different parts of a space satellite by defining and calling functions.	Function Decompose
5	<a href="#">Define and Call II</a>	I can define and call a function in JavaScript.	In this lesson, students continue practicing defining and calling functions in JavaScript. Students review the key steps to defining and calling functions before participating in a check for understanding. Students will then code the different parts of a space satellite by defining and calling functions in a PixelBots playlist.	Function Decompose
6	<a href="#">Functions with One Parameter</a>	I can call a function with a single parameter.	In this lesson, students are introduced to parameters. Students will call code with either a color or length parameter to complete the challenges. For example, a function named shortLine can be called to paint lines of different colors such as shortLine('blue') or shortLine('yellow'). Then, students practice writing programs with functions that have a color or length parameter in a PixelBots playlist.	Parameter Function



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7	<a href="#">Parameter Spaceships</a>	I can define and call a function with a single parameter.	In this lesson, students are introduced to defining and calling functions with a single color parameter. The lesson begins with a warm-up followed by a model. Students then participate in a check for understanding before practicing independently. The lesson closes with a whole class review of a challenge.	Parameter Function
8	<a href="#">Parameter Plants</a>	I can define and call a function with a single parameter.	In this lesson, students are introduced to defining and calling functions with a single length parameter. The lesson begins with a warm-up followed by a model. Students then participate in a check for understanding before practicing independently. The lesson closes with a whole class review of a challenge.	Parameter Function
9	<a href="#">Review</a>	I can write code with functions and parameters to solve a problem.	In this lesson, students complete a review to practice the skills they have learned in this module to show their knowledge of functions and parameters. Students will have the majority of class to work on challenges, and may ask other students or the teacher for guidance.	Parameter Decompose
10	<a href="#">Level Up Challenge</a>	I can write code with functions and parameters to complete a Level Up Challenge.	In this lesson, students complete the Level Up Challenge to show their knowledge of functions and parameters. The lesson starts with a quick review of writing functions with parameters. Students will have the majority of class to work independently, ending with a celebration of student shout outs.	Parameter Decompose