



Module B2: PixelBots Loops

Scope & Sequence

Overview

In this module, students are introduced to loops in PixelBots as they learn skills and strategies to write repeating patterns of code with a loop. Throughout the module, students will identify patterns, like AB and ABB, in their code. Recognizing these patterns is the first step in the Say It, Loop It, Count It strategy. In this strategy, students will say the code to solve a challenge, then put the repeating part inside of a loop, then count how many times the loop should repeat. Students will have many opportunities to use this strategy to code animal-themed challenges with loops. By the end of this module, students will have a foundational knowledge of writing code with loops.

Goals

Computer Science

- **K-2.AP.12** Create programs with sequences of commands and simple loops, to express ideas or address a problem.
- **K-2.AP.16** Debug errors in an algorithm or program that includes sequences and simple loops.

Problem Solving Strategy

- Pattern Recognition
- Abstraction- Using Loops

Self-regulated Learning

- With guidance, monitor learning through verbal reflection.

Understandings

Students will understand that...

- pattern recognition can be used to reduce code.
- debugging is an essential part of writing code.

Essential Questions

- Why do we look for patterns in code?
- How can we refactor a program?
- How do you fix a mistake in your code?

Knowledge

Students will know that...

- loops can be used to repeat directions given to a computer.
- patterns in code allow for opportunities to refactor with loops.
- the core of a pattern is what repeats.

Vocabulary

- **Pattern**- a sequence that repeats

Skills

Students will be able to...

- identify a pattern and its core.
- step through code with loops.
- write code with loops.
- monitor their learning through verbal reflection.



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- **Loop**- a block of code that repeats a sequence
- **Bug**- a mistake in code
- **Debug**- find and fix mistakes in code

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](#)



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Lesson	Objective	Description	Concepts & Strategies
1 What is a Loop?	I can describe what a loop does and why it is helpful.	In this lesson, students are introduced to loops. A loop is a block of code that repeats a sequence. Students will learn how a loop works and how it can be a helpful tool for repeating sequences. Then, they will practice in a PixelBots playlist to determine how many times different sequences of code should be repeated in a loop.	Loop
2 Step into Loops	I can step through a loop to understand what it does.	In this lesson, students learn how to read a loop by stepping through a sequence of code blocks and repeating it a specific number of times. Students will learn to use their fingers to keep count of how many times they stepped through the loop. Then, students will practice reading and stepping through code with a loop in a PixelBots playlist.	Loop
3 Repeat	I can identify the repeating part of a sequence.	In this lesson, students learn how to write and identify the repeating part of a sequence in code. They will unpack challenges to identify patterns in code and practice writing repeating sequences in a PixelBots playlist in order to prepare for writing code with loops in the upcoming lessons.	Loop Pattern Recognition
4 Using Loops	I can use a loop to repeat code.	In this lesson, students learn how to write code inside of a loop by identifying the repeating part of a pattern. They will unpack challenges to identify what goes inside the loop and how many times it repeats. Then, students will practice using a loop in a PixelBots playlist.	Loop Pattern Recognition
5 In The Loop	I can use a loop to repeat code.	In this lesson, students will practice writing code inside of a loop. They will unpack challenges by thinking about the pattern that the PixelBot needs to repeat and determining how many times it will repeat. Then, they will practice writing code inside of a loop in a PixelBots playlist.	Loop Pattern Recognition
6 Write Loops	I can use a loop to repeat code.	In this lesson, students continue to practice writing code inside of a loop. They unpack challenges by thinking about the pattern that the PixelBot needs to repeat and determining how many times it will repeat. They also review how to debug code. Then they will practice	Loop Debug



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			writing code inside of a loop in a PixelBots playlist.	
7	Write More Loops	I can use a loop to repeat code.	In this lesson, students will practice writing code using a loop and adding code outside of the loop to complete a challenge. Students will continue to use the Say It, Loop It, Count It strategy to help them write code with a loop. Then, they will practice writing code using a loop in a PixelBots playlist.	Loop Debug
8	Loop Practice	I can write code with a loop to solve a problem.	In this lesson, students will code solutions with code either before the loop or after the loop. Students will continue to use the Say It, Loop It, Count It strategy to help them write code with a loop. Then, they will practice writing code using a loop in a PixelBots playlist.	Loop Debug
9	Loop Experts	I can step through a loop. I can write code with a loop to solve a problem.	In this lesson, students review all of the skills they have learned throughout the module in order to prepare for the Level Up Challenge. They will review the strategies they have learned, such as Say it! Loop it! Count it! and the debugging process: Compare, Find, Try. Then, they will practice reading and writing code with loops.	Loop Debug
10	Level Up	I can step through a loop. I can write code with a loop to solve a problem.	In this lesson, students show what they have learned about loops in an activity called the Level Up Challenge. The Level Up Challenge is a cumulative assessment of all of the skills covered in this module.	Loop Debug