
SAM
LABS
Into Cyberspace
Lesson 1


Learn

Key Information

What is an algorithm?

An **algorithm** is a set of step-by-step instructions to write and follow, in order to solve a given problem.

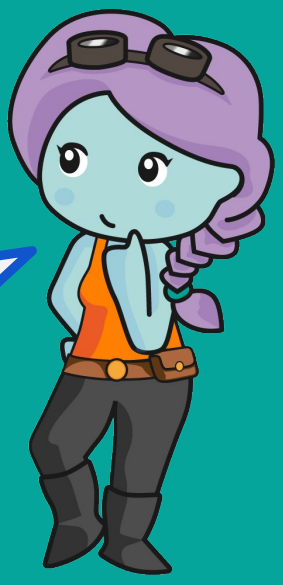
The language in instructions needs to be precise to ensure a task is properly completed.

A **sequence** is a series of algorithmic instructions in a precise order.

Unplugged Activity

- Create a handshake with at least three elements.
- First describe it to a partner. How easily can they follow your description?
- Next write down step-by-step instructions. Is this easier for your partner to follow?

Quick Reflection:
What happens if instructions are not clear enough?



Key Information

What are algorithms designed to do?

Algorithms are designed to complete a task.

In order to design an algorithm, two questions need to be answered:

- What is the problem you want to solve?
- What are the steps to solve it?

Computer programs are a series of processes to solve a need.

Compare and Contrast

Which algorithm would be best to follow to make pizza?

1	2
Lay pizza base on work surface	Add tomato sauce
Add tomato sauce top of pizza base	Add cheese
Add grated cheese on top	Add topping
Add 10 pepperoni slices on top	Cook it
Put in oven for 15 mins on high	

Quick Reflection:
Is there a problem in your school that a computer program could solve?

Checks for Understanding

Q1

Which of the following are algorithms that occur in everyday life?

a. Google Maps directions

b. My morning routine

c. Facebook newsfeed

Q2

Which of the following are characteristics of a well-designed algorithm?

a. Clear and precise instructions

b. Step-by-step instructions

c. Quick instructions

Checks for Understanding

A1

Which of the following are algorithms that occur in everyday life?

a. Google Maps directions

c. Facebook newsfeed

A2

Which of the following are characteristics of a well-designed algorithm?

a. Clear and precise instructions

b. Step-by-step instructions

Keywords

algorithm

Step-by-step instructions to write and follow, in order to solve a given problem.

steps

Each action within an algorithm.

sequence

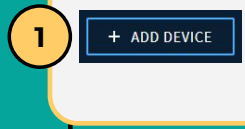
Following an algorithm from start to finish in a specific order.

program

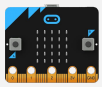
A collection of algorithms executed by a computer to perform a specific task.

Blocks

1. Click ‘ADD DEVICE’
   Select device(s) from list



2. Connect the micro:bit battery

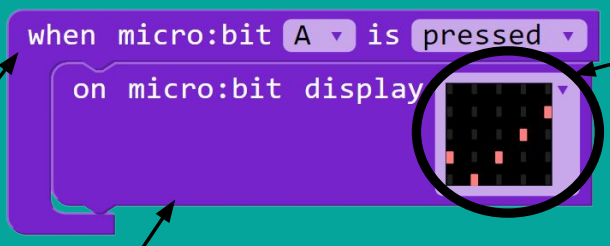


3. Click ‘CONNECT’

4. Select device from list
   Click ‘Pair’

Let’s Build

Code a sequence to display an output on the micro:bit



From ‘micro:bit’ ‘Events’

‘Yes’ from drop-down

From ‘micro:bit’ ‘Actions’

Click ‘RUN’ and test!

This program is the **micro:bit test** and will help me in the future!

Quick Reflection:
What happens if another option is selected from the drop-down?

My story so far!

START **Chapter 1**

One day, during a routine check of the network at Cyber Security...

Sam went to investigate and found it was a trap!

Sam detected suspicious activity coming from deep within Cyberspace.

To make matters worse, the Cyber Scanner, her tool for detecting malware and spyware, was damaged.

MISSION JOURNAL

I need to code a start-up sequence for my Cyber Scanner.

Can you help me use images and sound?

How can I write the steps for my program to work?

MISSION JOURNAL

1

2

3

4

5

Blocks

1. + ADD DEVICE
   Click ‘ADD DEVICE’
   Select device(s) from list
2. 
   Turn on the Buzzer
3. CONNECT
   Click ‘CONNECT’
4. Pair
   Select device from list
   Click ‘Pair’

Challenge

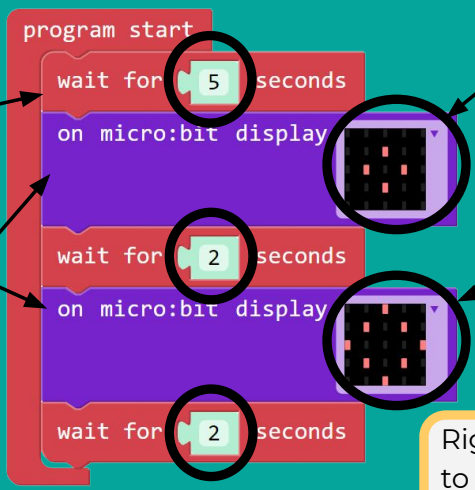
Code a start-up sequence on Sam’s Cyber Scanner

Keep the Let’s Build program on the workspace. Set this up alongside.

1

From ‘General’

From ‘micro:bit’ ‘Actions’



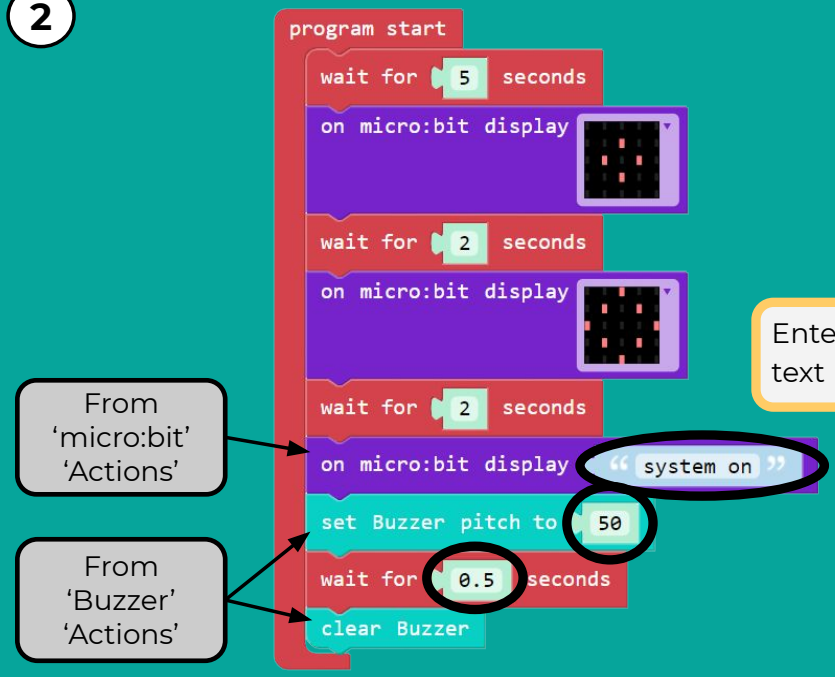
‘Small diamond’

‘diamond’

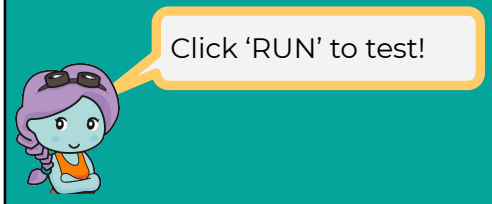
Right-click to duplicate blocks!

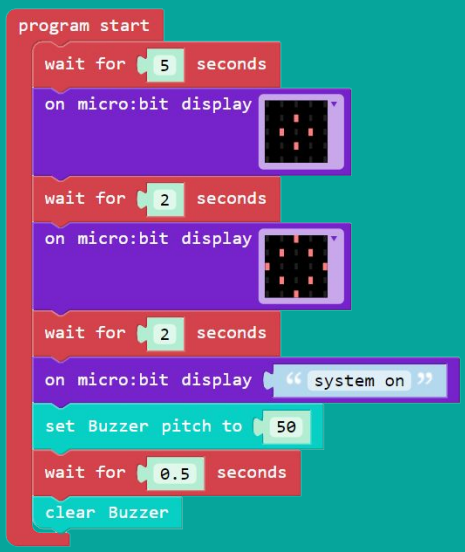
Challenge

2

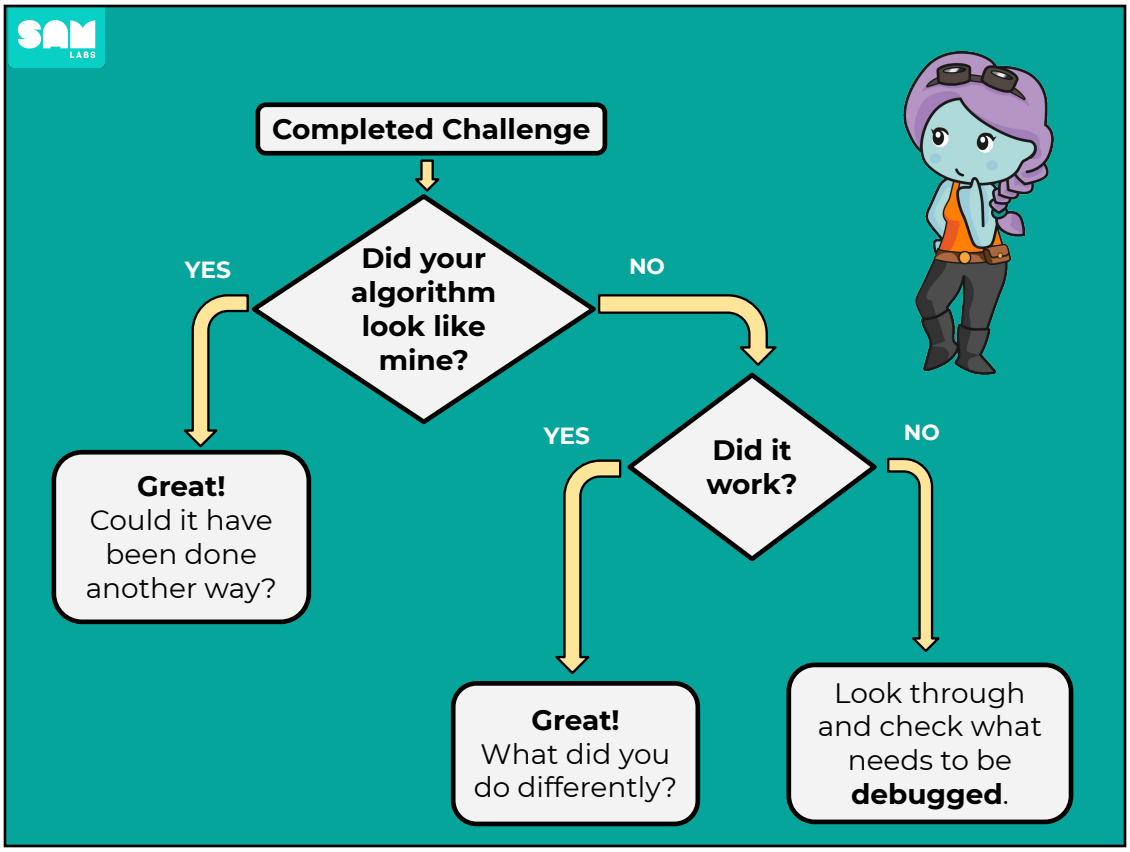


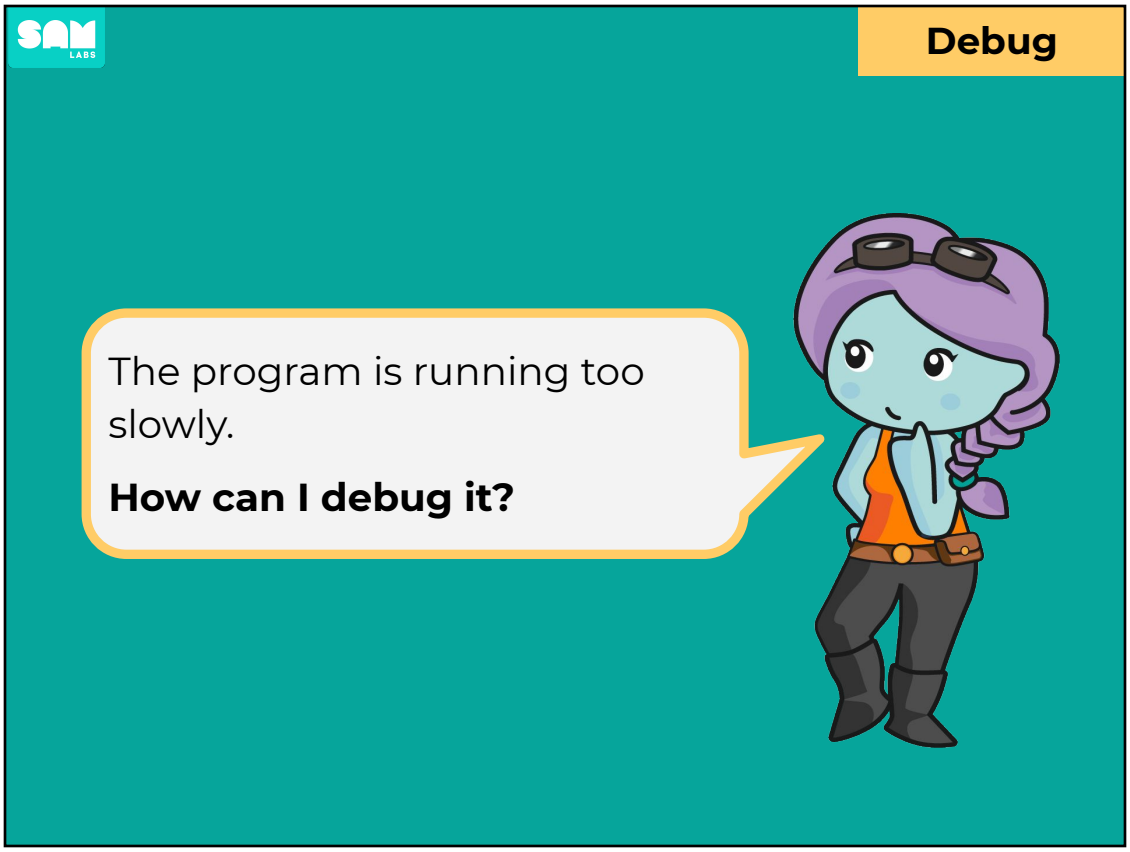
Challenge: Test your program



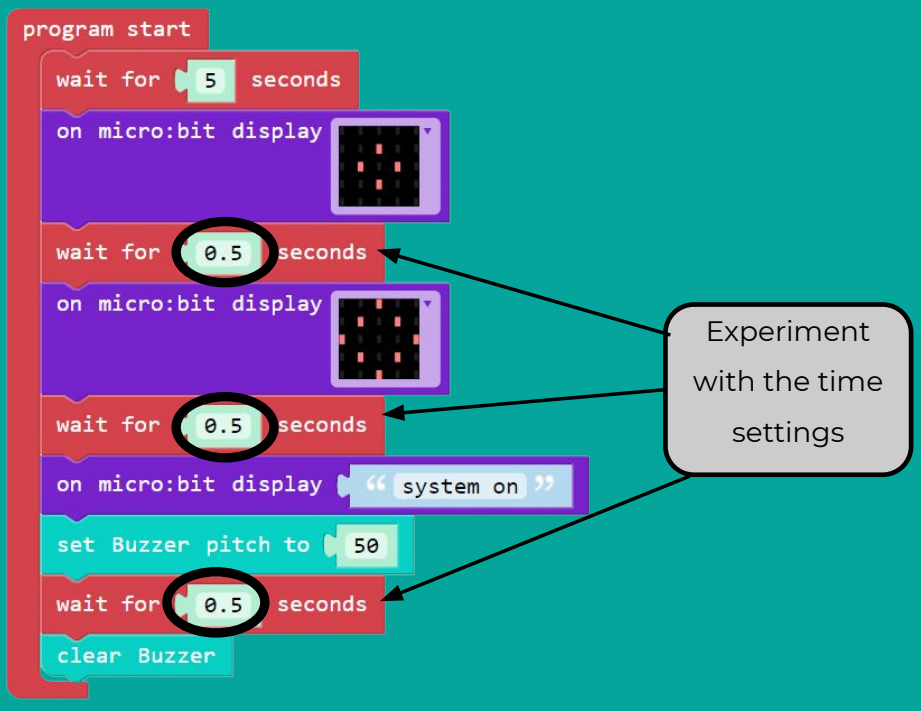


Quick Reflection: Does your algorithm look the same as mine? Follow the flowchart on the next slide!


Completed Challenge
Did your algorithm look like mine?
YES
NO
Great! Could it have been done another way?
Did it work?
YES
NO
Great! What did you do differently?
Look through and check what needs to be debugged.


Debug
The program is running too slowly.
How can I debug it?

Debug



Quick Reflection:

What did you find out from experimenting with the time settings? What was the impact on the program?

Checks for Understanding

Q1

Which of the below describes the start-up sequence you coded?

a. Small diamond, large diamond, text, Buzzer.
b. Large diamond, small diamond, text, Buzzer.
c. Text, small diamond, large diamond, Buzzer.

Q2

Which is an example of an everyday start-up sequence?

a. Reading the introduction of a book.
b. Watching a film trailer.
c. Turning on a car.

Checks for Understanding

A1

Which of the below describes the start-up sequence you coded?

a. Small diamond, large diamond, text, Buzzer

A2

Which is an example of an everyday start-up sequence?

c. Turning on a car.

Extend: Chilli Challenges

Experiment further with the ‘wait’ blocks and the ‘on micro:bit display (“word”)’ block.
Can you perfect the Cyber Scanner start-up sequence?

Experiment with other inputs, such as button ‘B’ on the micro:bit. Can you code a start-up sequence that is activated ‘when micro:bit (B) is pressed’?

Experiment with ‘Loops’.
Can you code a program that runs continuously?

Great work explorers!

Reflect

SAM LABS

MISSION JOURNAL

Reflect

Amazing work! Now I can turn on my Cyber Scanner and it displays a start-up sequence.

This will help me start investigating the suspicious activity I noticed coming from the middle of Cyberspace.

But first, can you help me complete my Mission Journal and report back to Mission Control?

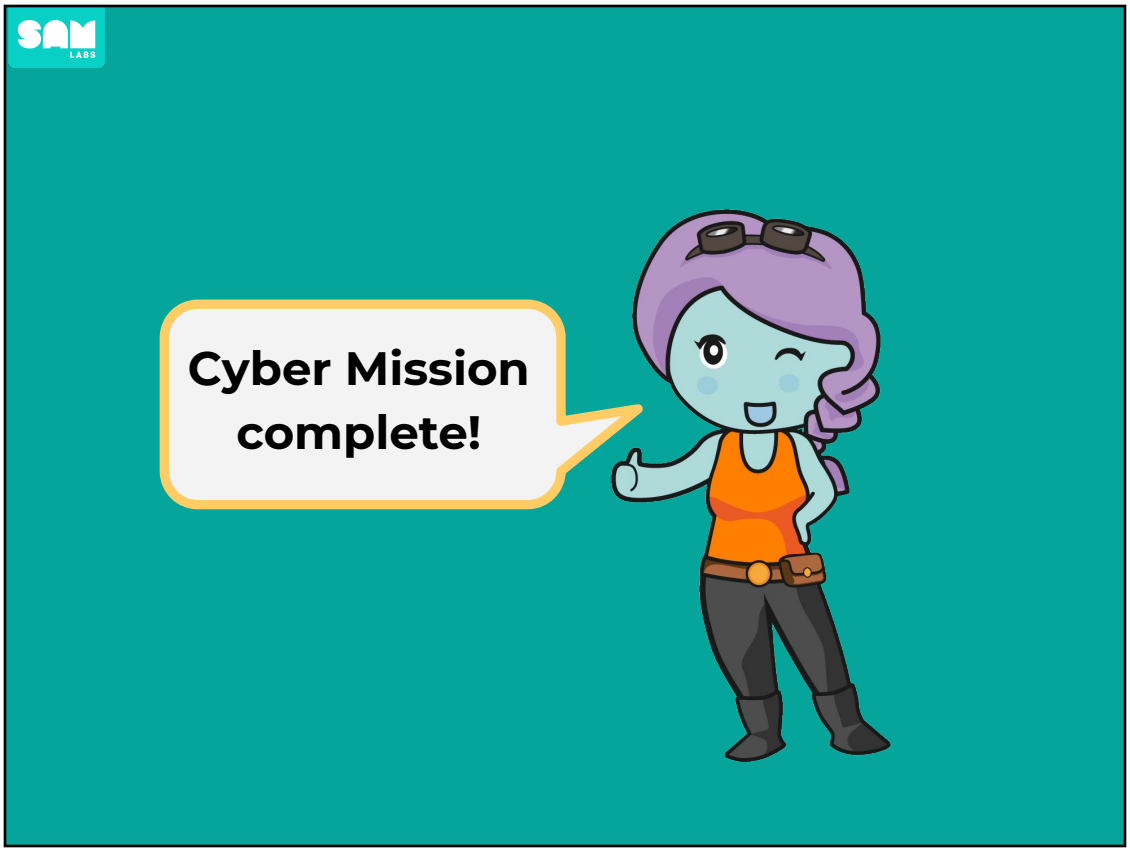
SAM LABS

Reflect

How are you doing?

MISSION JOURNAL

I can describe what an algorithm is.	○	○	○
I can describe what an algorithm is designed to do.	○	○	○
I can plan and code a program to display a start-up sequence with images and text.	○	○	○


SAM
LABS
Cyber Mission complete!