

Optional: Radio

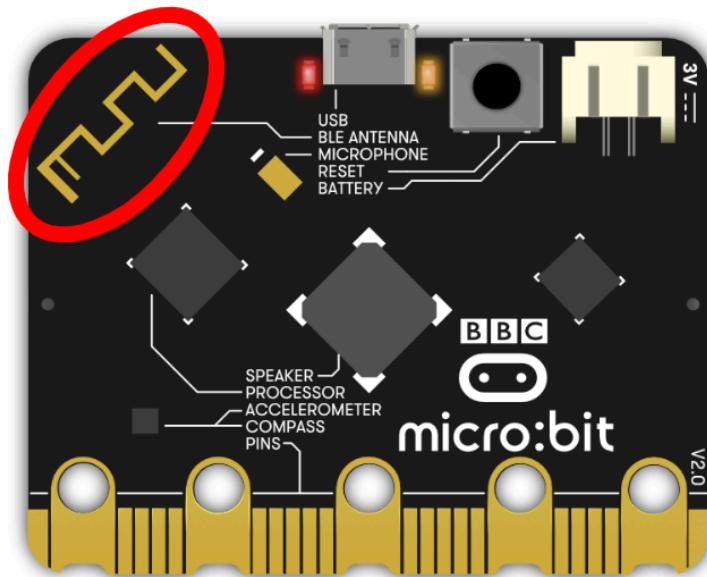
Textbook

Optional: Radio



So many movies, comedy to thrillers, show people on walkie-talkies communicating. It always seems like every word said is the *most important* when it's said using one. That technology relies on [radio waves](#) to send and receive messages. The micro:bit also has a built-in radio feature, allowing it to wirelessly communicate with other micro:bits. This means you can send secret messages, create multiplayer games, or even control robots from afar! In this lesson, you'll learn how to program the micro:bit's radio to send and receive messages.

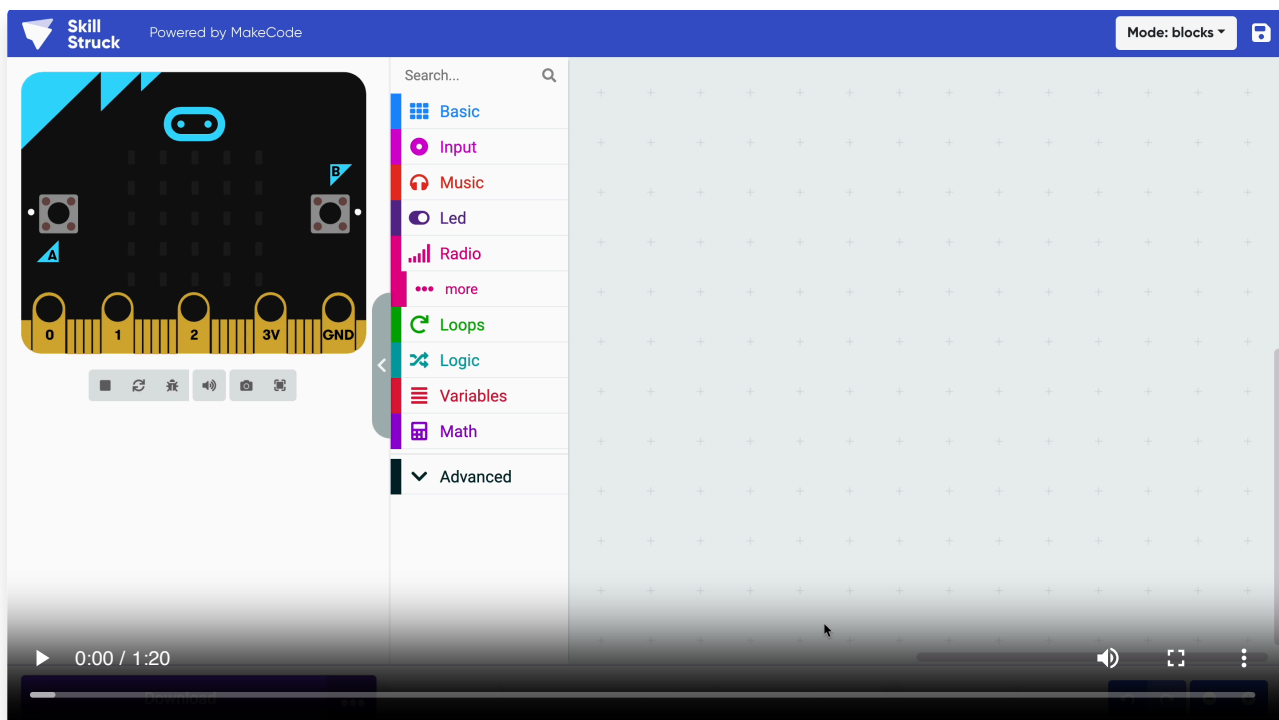
Radio is a way of transmitting and receiving messages over a distance. The micro:bit can be programmed to communicate messages using radio waves through its antenna or radio prong at the top.



One of the micro:bits can create and send a message while the other can receive the message and be programmed to send a message back.

Watch this introductory video on using the micro:bit with radio:





Code It! – Radio

To do this:

1. Drag an input block into the code editor.
2. Drag a **clear screen** block and connect it in the input block first.
3. Drag the **radio send string** block found in the radio category and connect it below the **clear screen** block. Remember, a string is information with quotation marks around it.
4. Type a string, like "heart."
5. Drag the **on radio received receivedString** block into the code editor. This block signals the second micro:bit to do whatever you want when they receive the string.
6. In this case, drag a **show icon** block and connect it. Select the heart icon.

Now when you signal your input on each of the micro:bits it will send a heart back and forth.

Note: if there are many micro:bit robots in the same room, you can program the micro:bit to only send messages to the micro:bit in the same group. Here's how:

1. Drag a **radio set group** block and connect it inside the **on start** block.
2. The users of the two micro:bit robots sending messages to each other should decide on a group number that no one else is using. The group number can range between 1-255.
3. Both users will type their group number in the number space of the **radio set group** block.

Adopted from microbit.org platform

Critical Thinking Questions

1. What are some advantages of using radio waves to send messages instead of wires?
2. How do you think radio communication has impacted emergency response systems around the

world?

3. If you could design a project using the micro:bit's radio feature, what would it do? How would it be useful?

Questions (5)

1. What does the micro:bit use to send messages wirelessly?

MULTIPLE CHOICE

Choose the correct answer:

- A. Bluetooth
- B. Internet cables
- C. Radio waves
- D. Telephone lines

2. What is the purpose of the radio send string block in micro:bit code?

MULTIPLE CHOICE

Choose the correct answer:

- A. It draws pictures
- B. It sends a message using radio
- C. It saves the message
- D. It turns on the speaker

3. What is a "string" in micro:bit coding?

MULTIPLE CHOICE

Choose the correct answer:

- A. A number
- B. A math equation
- C. Text written in quotation marks
- D. A wire

4. What is the use of the "on radio received" block?

Choose the correct answer:

- A. To turn off the device
- B. To charge the battery
- C. To show what happens when a message is received
- D. To play a sound

5. What part of the micro:bit is used to send and receive radio signals?

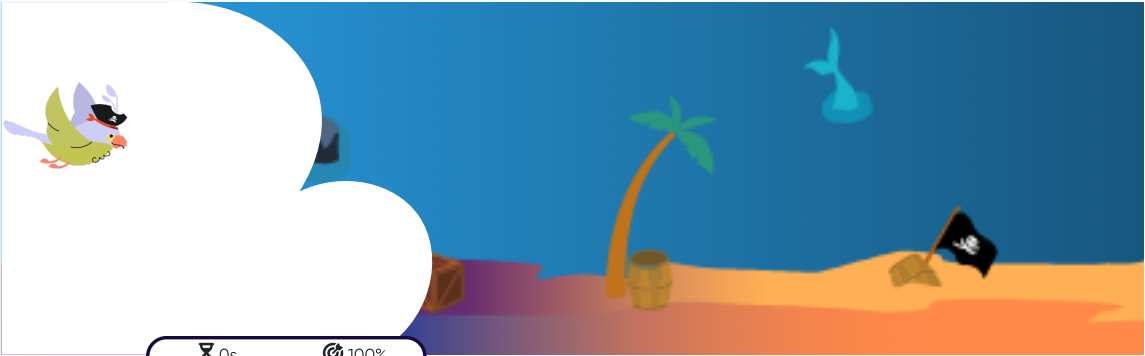
Choose the correct answer:

- A. The battery
- B. The screen
- C. The antenna or radio prong
- D. The buttons

Games (2)

1. Radio Typing

Full Screen Audio Instructions Restart Pause



0s 100%

The micro:bit also has a |

2. Radio Matching

Full Screen

Audio

Instructions

Answer Key

Pause

Clear All

Check Matches

Attempts: 0

Radio Waves

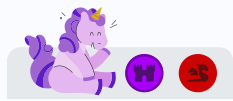
Antenna

Radio Prong

Computer part that senses radio waves

How radios communicate

Another word for antenna



Robotics Challenges (4)

1. Send a Smile

Challenge

Textbook

Send a Smile

Code the micro:bit to send a smile from one robot to another using the micro:bit's radio feature.

If there are several of the micro:bit robots being used in the same area, you will need to program the micro:bits sending and receiving messages to be in the same group. This means they are communicating on the same radio channel so to speak. Every pair should have its own unique group number, something between 0-255.

Adapted from micro:bit.org projects

Requirements

- ☐ Use the Button A input to send a string on robot 1
- ☐ Program robot 1 to send a string that says "smile"
- ☐ Include a clear screen block in your code

Step 1

Drag an **on Button A pressed** block into the code editor.

Send a Smile Step 1 of 9

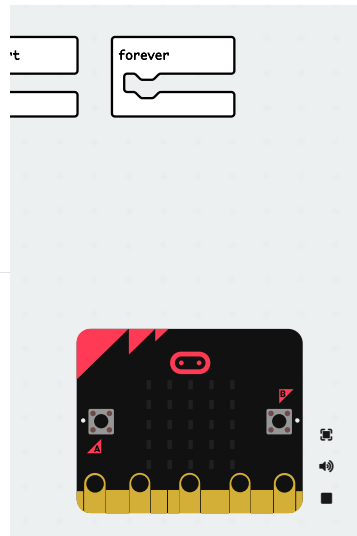


1



Toolbox

- Search...
- Basic
 - Input
 - Music
 - Led
 - Radio
 - Loops
 - Logic
 - Variables
 - Math
 - Extensions
- Advanced



Download

2. Hello From Afar

Challenge

Textbook

Hello From Afar

Code the micro:bit to send a 'Hello!' message from one robot to another using the micro:bit's radio feature.

If there are several of the micro:bit robots being used in the same area, you will need to program the micro:bits sending and receiving messages to be in the same group. This means they are communicating on the same radio channel so to speak. Every pair should have its own unique group number, something between 0-255.

Requirements

- ☐ Use the Button A input to send a string on robot 1
- ☐ Include a clear screen block in your code
- ☐ Program robot 1 to send a string that says "hello"

Step 1

Code the micro:bit to clear the screen and send a radio string when Button A is pressed.

Hello From Afar Step 1 of 3

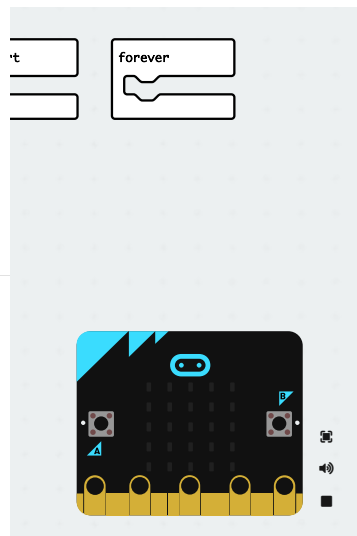


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3. A Secret Message

Challenge

Textbook

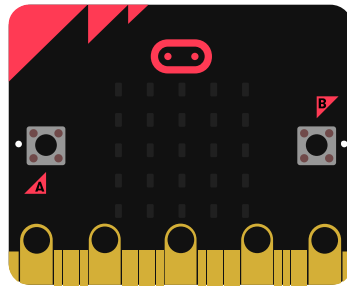
A Secret Message

Code the micro:bit to send a secret message from one robot to another using the micro:bit's radio feature. The code should start when you press Button B.

If there are several of the micro:bit robots being used in the same area, you will need to program the micro:bits sending and receiving messages to be in the same group. This means they are communicating on the same radio channel so to speak. Every pair should have its own unique group number, something between 0-255.

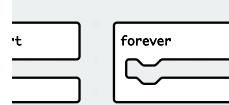
Requirements

- Use the Button B input to send a string on robot 1
- Include a clear screen block in your code
- Program robot 1 to send a string to robot 2



Search...

- Basic
- Input
- Music
- Led
- Radio
- Loops
- Logic
- Variables
- Math
- Extensions
- Advanced



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4. Animal Tracker

Challenge

Textbook

Animal Tracker

Code the micro:bit to act as a prototype tracking the movements of an animal using the micro:bit's radio feature. Imagine one of the micro:bit's being attached to the animal and the micro:bit in your possession being used by a scientist as a receiver.

If there are several of the micro:bit robots being used in the same area, you will need to program the micro:bits sending and receiving messages to be in the same group. This means they are communicating on the same radio channel so to speak. Every pair should have its own unique group number, something between 0-255.

Adopted from micro:bit.org projects

Requirements

- Use the Button A input to send the acceleration number
- Include a clear screen block in your code

creating new project...



Answer Keys & Solutions

Questions

1. What does the micro:bit use to send messages wirelessly?

MULTIPLE CHOICE

Correct Answer:

- A. Bluetooth ✗ Incorrect
- B. Internet cables ✗ Incorrect
- C. Radio waves ✓ Correct
- D. Telephone lines ✗ Incorrect

Explanation:

This invisible form of energy is used in both walkie-talkies and micro:bits.

2. What is the purpose of the radio send string block in micro:bit code?

MULTIPLE CHOICE

Correct Answer:

- A. It draws pictures ✗ Incorrect
- B. It sends a message using radio ✓ Correct
- C. It saves the message ✗ Incorrect
- D. It turns on the speaker ✗ Incorrect

Explanation:

It's the command that actually sends your message from one device to another.

3. What is a "string" in micro:bit coding?

MULTIPLE CHOICE

Correct Answer:

- A. A number ✗ Incorrect

B. A math equation

✗ Incorrect

C. Text written in quotation marks

✓ Correct

D. A wire

✗ Incorrect

Explanation:

It's a set of letters, words, or symbols inside quotation marks.

4. What is the use of the "on radio received" block?

MULTIPLE CHOICE

Correct Answer:

A. To turn off the device

✗ Incorrect

B. To charge the battery

✗ Incorrect

C. To show what happens when a message is received

✓ Correct

D. To play a sound

✗ Incorrect

Explanation:

It tells the micro:bit what to do when it gets a message.

5. What part of the micro:bit is used to send and receive radio signals?

MULTIPLE CHOICE

Correct Answer:

A. The battery

✗ Incorrect

B. The screen

✗ Incorrect

C. The antenna or radio prong

✓ Correct

D. The buttons

✗ Incorrect

Explanation:

It's a small part located at the top of the device.

1. Radio Typing

Typing game - no answer key needed. Students practice typing the provided content.

2. Radio Matching

Matching Game Solutions:

1. →
2. →
3. →

Students must drag items from the left to match with corresponding items on the right.