

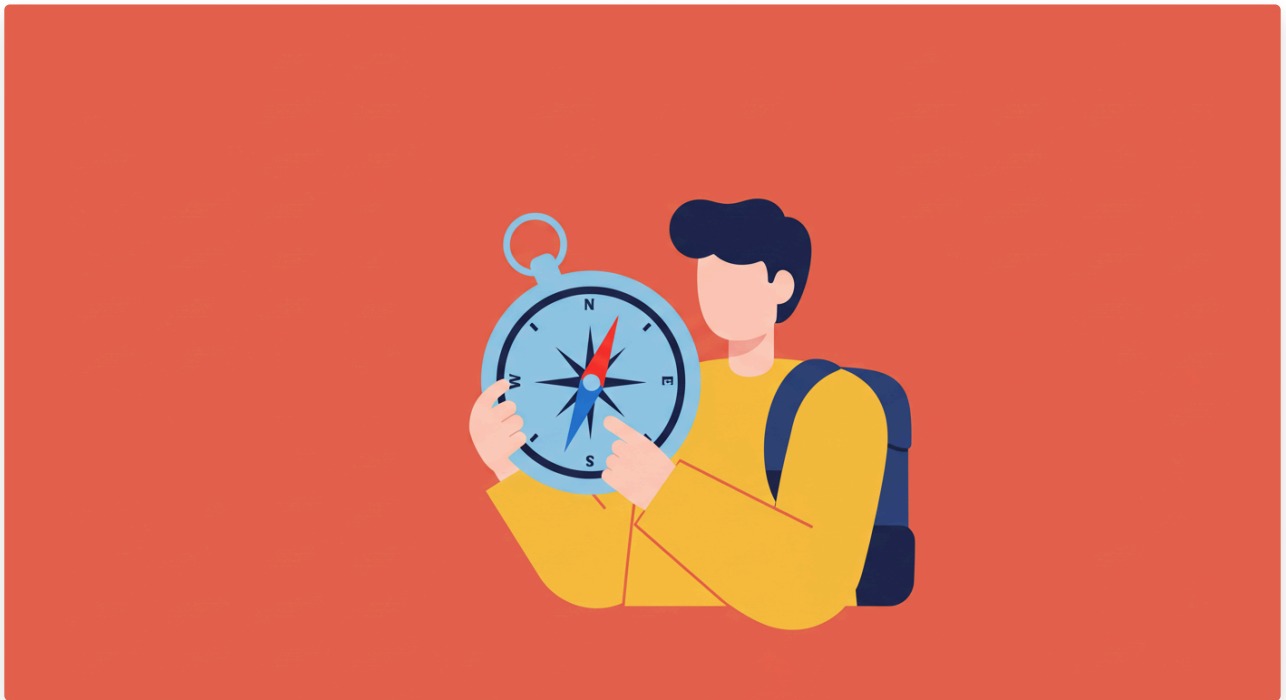
## Compass Beginnings

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### Textbook

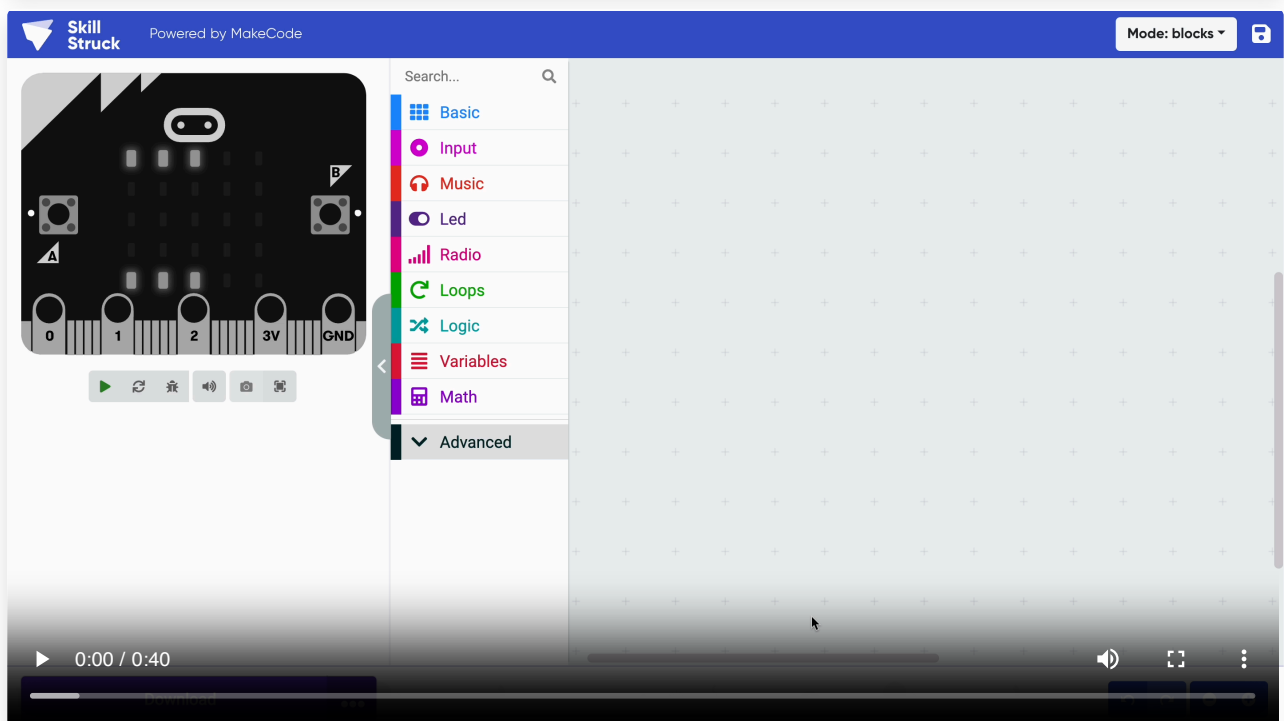
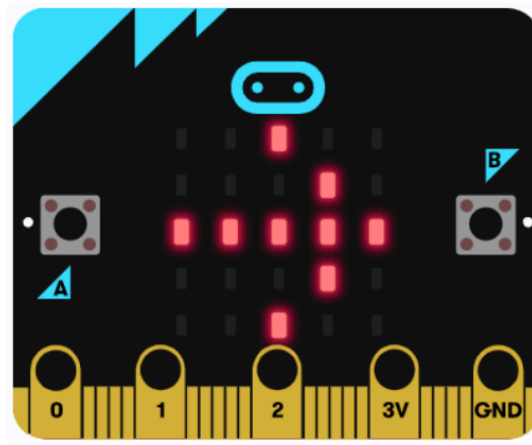
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## Compass Beginnings



Everyone loves the scene in Moana, right before she meets Maui, where she's using her hand to guide her journey on the open ocean. That's navigating, before the use of a [compass](#). Before GPS, explorers and travelers relied on compasses to navigate the world. Now, with technology, we can even program a digital compass using the micro:bit! In this lesson, we'll learn how to make arrows point in different directions and explore how technology can solve real-world problems.

There are four main directions we follow - North, South, East and West. A compass is a tool that points North. Compasses have helped guide people for hundreds of years! We can program the micro:bit to act as a compass using the `show arrow` block and choosing the direction we want the arrow to point.



## Code It! - Compass Arrows

Practice coding an arrow that points East on the micro:bit.

1. Drag the **on start** block into the code editor.
2. Drag the **show arrow** block into the **on start** block.
3. Click the dropdown button, and select *East*.

Now what if you wanted arrows to first point East, then North, then North West?

1. Drag a separate block for each arrow and click the direction you want for each.

*Adopted from microbit.org platform*

## Critical Thinking Questions

1. How do digital compasses, like the ones on our phones, work differently from traditional compasses?
2. If people didn't use compass directions any longer, do you think they could still get around? Why or why not?

### Questions (5)

#### 1. What does a compass always point to?

MULTIPLE CHOICE

Choose the correct answer:

- A. South
- B. East
- C. North
- D. West

#### 2. What is one way you can use a micro:bit like a compass?

MULTIPLE CHOICE

Choose the correct answer:

- A. Use it to play music
- B. Use it to make phone calls
- C. Use the show arrow block to point in a direction
- D. Use the micro:bit to make popcorn

#### 3. How many main directions are on a compass?

MULTIPLE CHOICE

Choose the correct answer:

- A. 2
- B. 4
- C. 6
- D. 8

#### 4. True or False: Compasses have only been used since GPS was invented.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

5. In which country was the magnetic compass invented over 2,000 years ago?

Choose the correct answer:

- A. Brazil
- B. France
- C. China
- D. Australia

## Games (2)

### 1. Compass Beginnings Typing

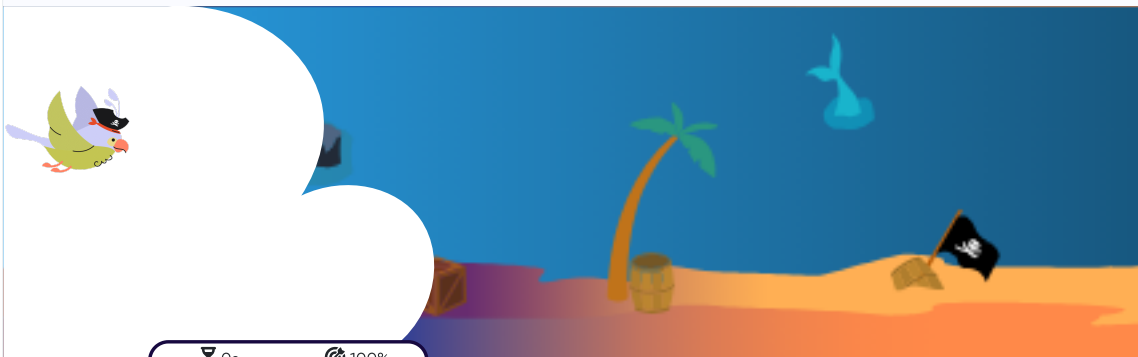
Full Screen

Audio

Instructions

Restart

Pause



0s

100%

A compass is a tool that

2. Compass Beginnings Memory

Full Screen

Audio

Instructions

Answer Key

Pause

Flips: 0

1East

2North

3South




4East

5North

6West

7West

8South



## Robotics Challenges (6)

## 1. North

Challenge

Textbook

North

Code the micro:bit to show an arrow pointing north.

Requirements

- Use a forever block
- Show an arrow pointing North

Answer Key

Submit

The code editor shows a script with a 'forever' loop. Inside the loop is a 'show arrow pointing North' block. The background of the code editor is a micro:bit board with an arrow pointing North.

Download

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## 2. From East to West

Challenge
 Textbook

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## From East to West

Code the robot to show an arrow pointing East. Then show an arrow pointing West.

**Requirements**

- Show an arrow pointing East
  
- Show an arrow pointing West

[Answer Key](#)

Submit

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

Download

### 3. All Directions

Challenge

Textbook

#### All Directions

Code your robot to show the following directions: North, East, South, West.

Requirements

Show an arrow pointing North

Show an arrow pointing East

Show an arrow pointing South

Show an arrow pointing West

Answer Key

Submit

Step 1

Begin with the **on start** or **forever** block.

All Directions Step 1 of 2

1 Next

Toolbox

Search...

Basic

Input

Music

Led

Radio

Loops

Logic

Variables

Math

Extensions

Advanced

Download

### 4. From Door to Desk

Challenge

Textbook

#### From Door to Desk

Imagine you are standing at your classroom door. Code the micro:bit to show the directions you would walk to get to where you are sitting now.

Requirements

Show the arrows pointing from the door to where you are now sitting

Answer Key

Submit

Download

## 5. Patterned Arrows

Challenge

Textbook

### Patterned Arrows

Code the micro:bit to show a pattern of 4 arrows.

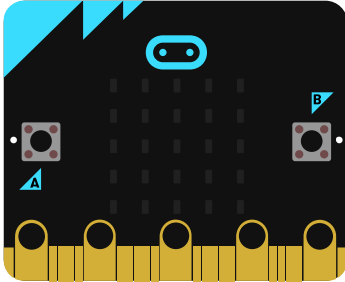
Requirements

Use a forever block

Show 4 arrows that repeat

Answer Key

Submit



Search...

Basic  
Input  
Music  
Led  
Radio  
Loops  
Logic  
Variables  
Math  
Extensions  
Advanced

forever

Download

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## 6. Three Arrows

Challenge

Textbook

### Three Arrows

Use a **forever** block to create a repeating pattern of 3 arrows.

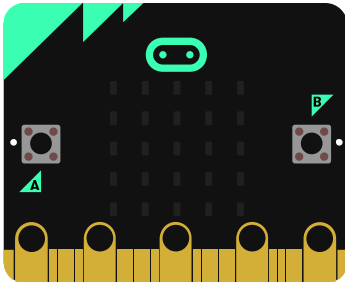
Requirements

Use a forever block

Code 3 arrows to make a pattern

Answer Key

Submit



Search...

Basic  
Input  
Music  
Led  
Radio  
Loops  
Logic  
Variables  
Math  
Extensions  
Advanced

forever

Download

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## Answer Keys & Solutions

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### Questions

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#### 1. What does a compass always point to?

MULTIPLE CHOICE

Correct Answer:

- A. South ✗ Incorrect
- B. East ✗ Incorrect
- C. North ✓ Correct
- D. West ✗ Incorrect

#### Explanation:

Compasses help you find your direction by always pointing this way.

#### 2. What is one way you can use a micro:bit like a compass?

MULTIPLE CHOICE

Correct Answer:

- A. Use it to play music ✗ Incorrect
- B. Use it to make phone calls ✗ Incorrect
- C. Use the show arrow block to point in a direction ✓ Correct
- D. Use the micro:bit to make popcorn ✗ Incorrect

#### Explanation:

Use the show arrow block to point in a direction

#### 3. How many main directions are on a compass?

MULTIPLE CHOICE

Correct Answer:

- A. 2 ✗ Incorrect

B. 4

✓ Correct

C. 6

✗ Incorrect

D. 8

✗ Incorrect

#### 4. True or False: Compasses have only been used since GPS was invented.

MULTIPLE CHOICE

Correct Answer:

A. True

✗ Incorrect

B. False

✓ Correct

##### Explanation:

People have used compasses for hundreds—even thousands—of years!

#### 5. In which country was the magnetic compass invented over 2,000 years ago?

MULTIPLE CHOICE

Correct Answer:

A. Brazil

✗ Incorrect

B. France

✗ Incorrect

C. China

✓ Correct

D. Australia

✗ Incorrect

##### Explanation:

It revolutionized trade and exploration.

## Games

### 1. Compass Beginnings Typing

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

## 2. Compass Beginnings Memory

### Memory Game Pairs:

1. ↔
2. ↔
3. ↔
4. ↔

*Students must find all matching pairs by flipping cards and remembering their positions.*