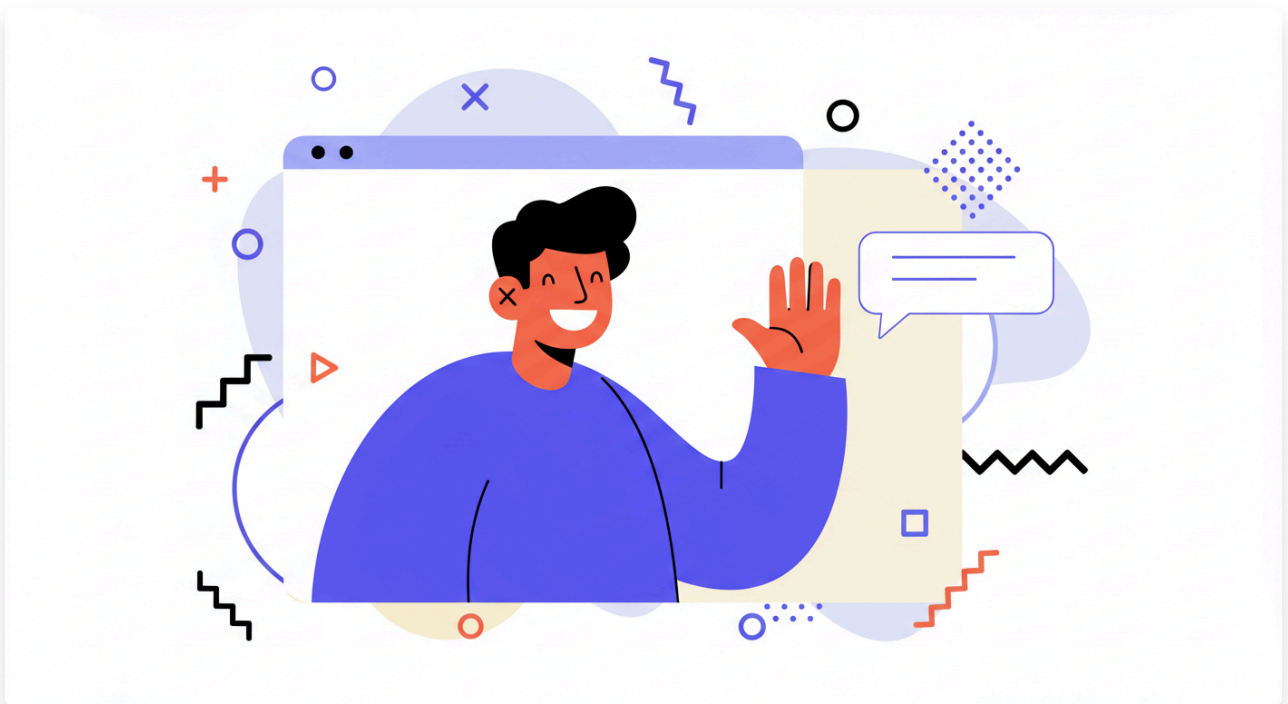


Accelerometer

Textbook

Accelerometer



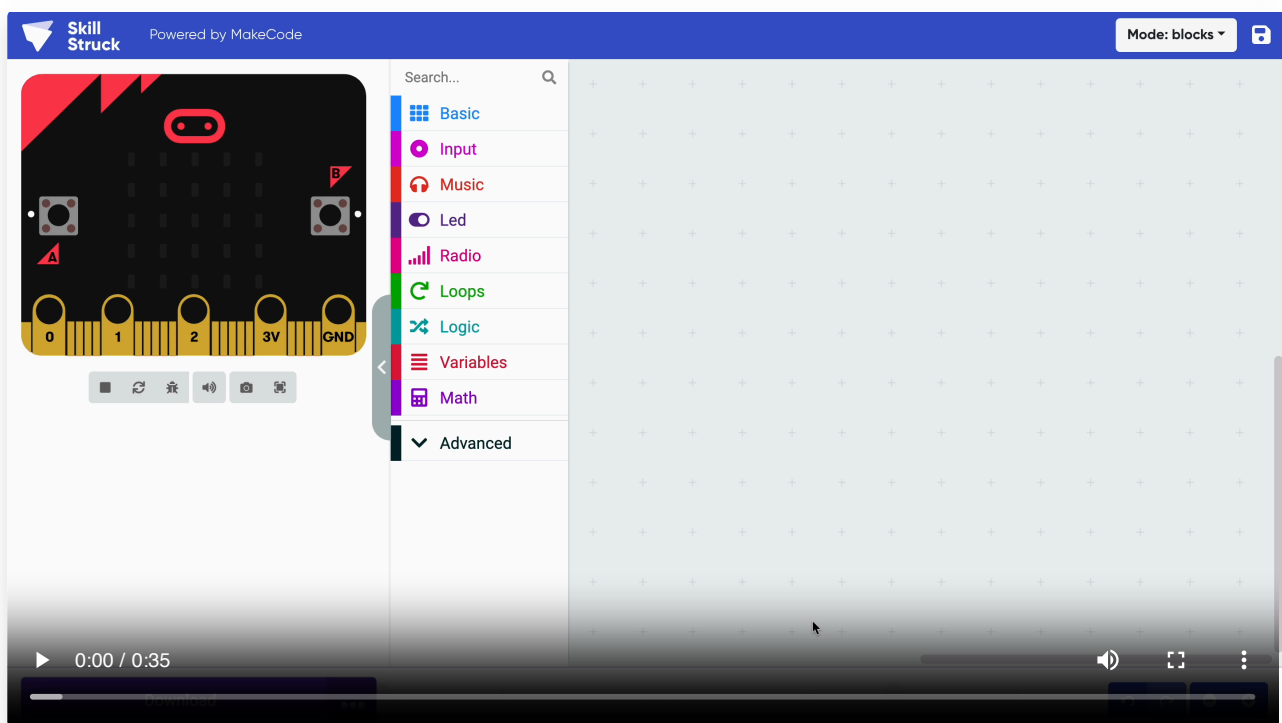
Have you ever wondered how your phone knows when to switch from portrait to landscape mode? Or how a fitness tracker counts your steps? The secret lies in a special sensor called an [accelerometer](#)!

Accelerometers measure movement and are used in all kinds of technology, from video game controllers to airbag sensors in cars. In this lesson, you'll explore how the micro:bit's accelerometer works and use it to program responses to movement, like shaking or tilting.

An accelerometer measures motion. Accelerometers are used all the time in real-life, like when you turn your phone to switch the picture from portrait to landscape, or when a step counter senses your movement to count your steps. Accelerometers are used in several technologies!

The accelerometer in the micro:bit measures when the micro:bit itself moves. For instance, when the micro:bit is shaken, tilted, or flipped upside down, the micro:bit measures these movements.

Watch this video to learn more:



Code It! - Accelerometer

Practice coding the micro:bit to show a silly face when it is shaken.

1. Drag the **on shake** input block into the code editor. This tells the micro:bit to start your code when you shake it, triggering the accelerometer.
2. Drag a **show LEDs** block into the **on shake** block and create a silly face.

Adopted from microbit.org platform

Critical Thinking Questions

1. How does an accelerometer help make devices like smartphones and fitness trackers more useful? Can you think of other ways it could be used?

2. In what situations could an accelerometer be life-saving? How might it be used in safety technology?
3. If you were designing a new gadget using an accelerometer, what would it do? How could it help people in their daily lives?

Questions (5)

1. Why would a micro:bit need an accelerometer?

MULTIPLE CHOICE

Choose the correct answer:

- A. To tell time
- B. To measure sound
- C. To react when it moves
- D. To take pictures

2. Which of these actions would trigger the micro:bit's accelerometer?

MULTIPLE CHOICE

Choose the correct answer:

- A. Saying hello
- B. Shaking the micro:bit
- C. Clicking a button
- D. Changing the lights

3. How do fitness trackers count your steps using an accelerometer?

MULTIPLE CHOICE

Choose the correct answer:

- A. They listen to your heartbeat
- B. They guess based on time
- C. They track the way your body moves
- D. They use a GPS

4. Which of these is NOT something an accelerometer can do?

Choose the correct answer:

- A. Detect a shake
- B. Hear your voice
- C. Sense if something falls
- D. Feel a tilt

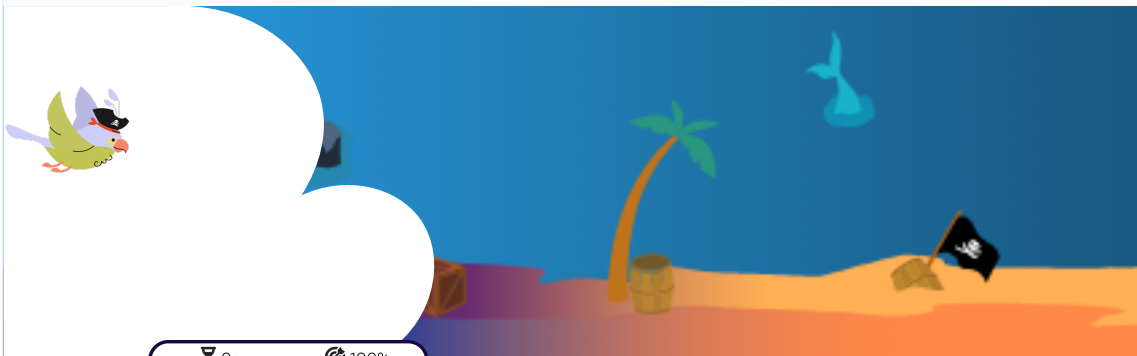
5. How could an accelerometer help during an earthquake?

Choose the correct answer:

- A. It could warn people by sensing shaking early
- B. It could change the weather
- C. It could stop the shaking
- D. It could make the ground soft

Games (2)

1. Accelerometer Typing

[Full Screen](#)[Audio](#)[Instructions](#)[Restart](#)[Pause](#)

⌚ 0s

🎯 100%

An accelerometer measu

2. Accelerometer Category

Full Screen

Audio

Instructions

Answer Key

Pause

Clear All

Check Order

Attempts: 0

Dim Light

Loud Sounds

Bright Light

Movement

Flipping Upside Down




Shaking

Quiet Sounds

Tilting

Things the accelerometer can sense

Things the accelerometer cannot sense



Robotics Challenges (7)

1. Shake It Up

Challenge

Textbook

Shake It Up

Code the micro:bit to play a melody when you shake the robot.

Requirements

Add the input on shake block.

When the micro:bit shakes, play a melody.

Answer Key

Submit

Step 1

Drag the **on shake** block into the code editor.

Shake It Up Step 1 of 4

1

Next

Toolbox

Search...

Basic

Input

Music

Led

Radio

Loops

Logic

Variables

Math

Extensions

Advanced

Download

...

2. Tilt It

Challenge

Textbook

Tilt It

Code the micro:bit to count up from 1 to 10 when you tilt it to the left.

Requirements

Add the input on shake block. Change it to tilt left.

When the micro:bit is tilted left, count from 1 to 10. Use the show number blocks.

Answer Key

Submit

Download

...

3. Shake a Pattern

Challenge

Textbook

Shake a Pattern

Code the micro:bit to show a pattern of 4 icons when you shake the micro:bit.

Requirements

Add the input on shake block.

When the micro:bit shakes, show 4 icons.

Answer Key

Submit

Step 1

Code the micro:bit to show a pattern of 4 icons when you shake the micro:bit.

Shake a Pattern Step 1 of 1

1 Done

Toolbox

Search...

Basic

Input

Music

Led

Radio

Loops

Logic

Variables

Math

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4. All Your Favorites

Challenge

Textbook

All Your Favorites

Code the micro:bit to do the following:

When you shake the micro:bit, your favorite icon appears.

When you tilt the micro:bit to the right, your favorite number appears.

When you press Button A, name your favorite animal.

When you press Button B, your favorite nickname shows.

Note: Use the On shake and On button A pressed blocks for this challenge

Requirements

When you shake the micro:bit, your favorite icon appears.

When you tilt the micro:bit, to the right your favorite number appears. Use the show number block.

Search...

Basic

Input

Music

Led

Radio

Loops

Logic

Variables

Math

Extensions

Advanced

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5. Press A to Stop

Challenge

Textbook

Press A to Stop

Use a logic block and code the micro:bit to play a ring tone. If the micro:bit shakes, it will play a melody. If Button A is pressed, it will stop all sounds.

Requirements

- Use a forever block as part of your code
- Play a ring tone
- Use the IF block and code the micro:bit to play a melody when you shake the micro:bit.
- Code the micro:bit to stop all sounds when you press Button A.

Step 1

Code the micro:bit to do the following using a logic block:

Press A to Stop Step 1 of 4



1

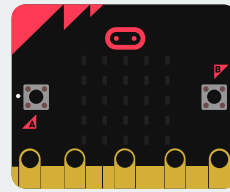
Next

Toolbox

Search...

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

forever



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6. Dice

Challenge

Textbook

Dice

Code the micro:bit to act as a dice when you shake it.

Add an **On Shake** input block.

Use the **show number** block and **pick random** block from the math category. Remember to set your minimum and maximum correctly. There are normally numbers 1-6 on a dice.

Note: Use the second 'pick random 0 to 10' block in the math category.

Adopted from [microbit.org projects](https://microbit.org/projects)

Requirements

- Add an On Shake input block.
- When the micro:bit shakes, display a random number from 1-6

Step 1

Code the micro:bit to act as a dice when you shake it.

Note: You will need to use the second **pick random 0 to 10** block in the math category.

Dice Step 1 of 2



1

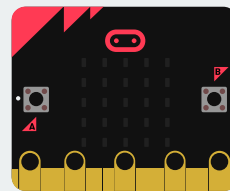
Next

Toolbox

Search...

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

forever



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7. Graphical Dice

Challenge

Textbook

Graphical Dice

Similar to the Dice project, code the micro:bit to act as a dice when you shake it and show a random number between 1–6.

This time, show the **dots of a dice** to represent the numbers. Make the dots look like they do on a real dice and how the numbers appear on the dice's faces.

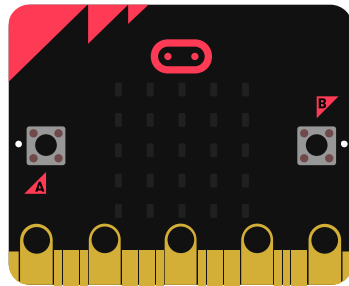
To complete this challenge you will need to create a variable called "number".

Note: Use the second 'pick random 0 to 10' block in the math category.

Adopted from [micro.bit.org](https://micro.bit.org/projects) projects

Requirements

- Code the program to start when the micro:bit shakes
- First, clear the screen so your micro:bit starts blank



Search...

Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Extensions
Advanced



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Answer Keys & Solutions

Questions

1. Why would a micro:bit need an accelerometer?

MULTIPLE CHOICE

Correct Answer:

- A. To tell time ✗ Incorrect
- B. To measure sound ✗ Incorrect
- C. To react when it moves ✓ Correct
- D. To take pictures ✗ Incorrect

Explanation:

Accelerometers help the micro:bit feel shaking or tilting.

2. Which of these actions would trigger the micro:bit's accelerometer?

MULTIPLE CHOICE

Correct Answer:

- A. Saying hello ✗ Incorrect
- B. Shaking the micro:bit ✓ Correct
- C. Clicking a button ✗ Incorrect
- D. Changing the lights ✗ Incorrect

Explanation:

The accelerometer senses movement like shakes and tilts.

3. How do fitness trackers count your steps using an accelerometer?

MULTIPLE CHOICE

Correct Answer:

A. They listen to your heartbeat

✗ Incorrect

B. They guess based on time

✗ Incorrect

C. They track the way your body moves

✓ Correct

D. They use a GPS

✗ Incorrect

Explanation:

Every step causes motion that the accelerometer can feel.

4. Which of these is NOT something an accelerometer can do?

MULTIPLE CHOICE

Correct Answer:

A. Detect a shake

✗ Incorrect

B. Hear your voice

✓ Correct

C. Sense if something falls

✗ Incorrect

D. Feel a tilt

✗ Incorrect

Explanation:

Accelerometers measure motion, not sound.

5. How could an accelerometer help during an earthquake?

MULTIPLE CHOICE

Correct Answer:

A. It could warn people by sensing shaking early

✓ Correct

B. It could change the weather

✗ Incorrect

C. It could stop the shaking

✗ Incorrect

D. It could make the ground soft

✗ Incorrect

Explanation:

Early motion can be detected and used for alerts.

1. Accelerometer Typing

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

2. Accelerometer Category

Category Solutions:

Category 1: Things the accelerometer can sense

- Movement
- Shaking
- Tilting
- Flipping Upside Down

Category 2: Things the accelerometer cannot sense

- Dim Light
- Bright Light
- Quiet Sounds
- Loud Sounds

Students must sort items into their correct categories.