

Strings

Textbook

Strings



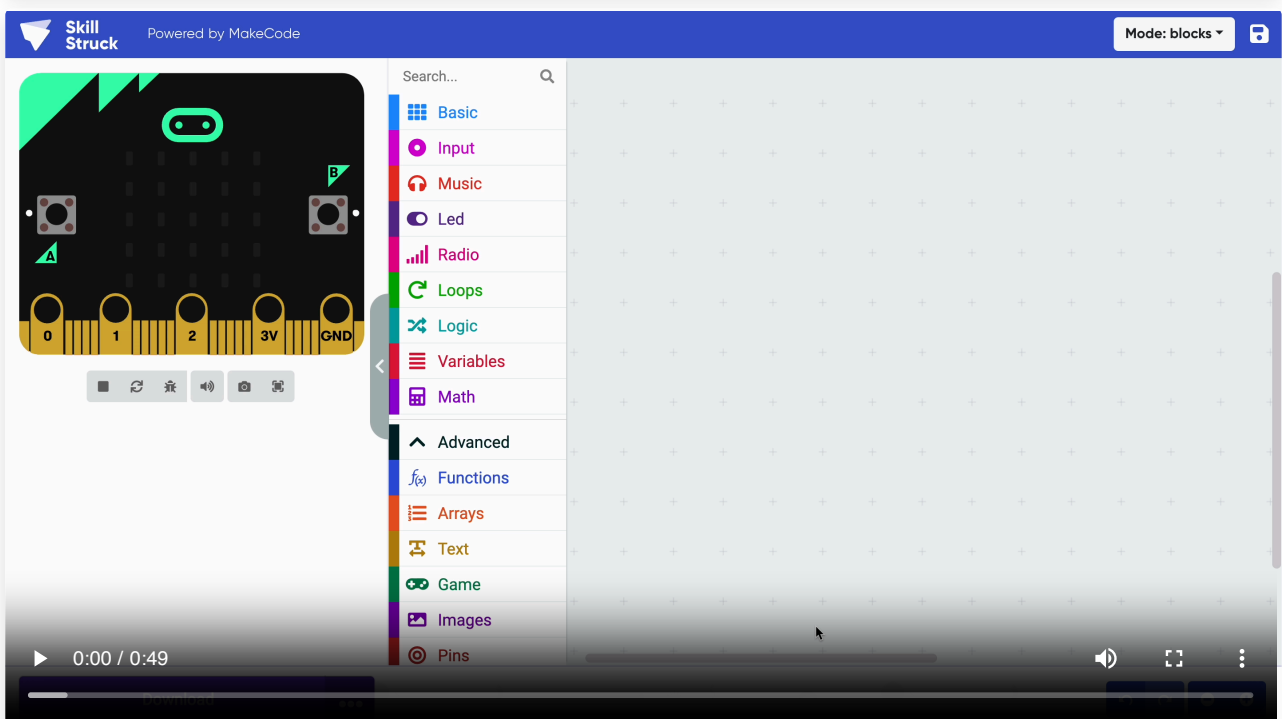
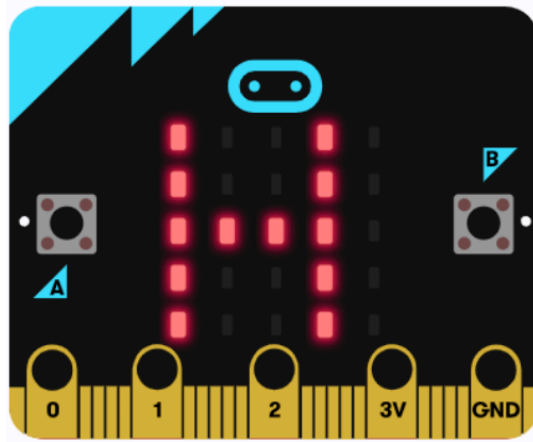
It's great to be able to send someone a text, whether it's words, gifs or emojis; and have them understand exactly what we are trying to say. The words and sentences you enter are called strings in computer science. A [string](#) is a sequence of characters—letters, numbers, symbols, or spaces—grouped together. Computers use strings to store and display information, from your name on a website to the lyrics of your favorite song on a music app!

Strings

What is a string? A [string](#) is information with quotation marks around it. For example:

- "Dog"
- "My favorite food is ice cream"
- "I have 10 pennies and 4 quarters in my pocket."
- "24"

All of these are examples of strings. Strings can be one word or many words. Strings can also have numbers. This string block will put quotation marks around the information for you. All you need to do is add your words or numbers.



Giving Computers Instructions: Algorithms and Steps

When we tell a computer or a robot what to do, we have to be super clear! Computers don't guess; they follow instructions exactly. This is where algorithms and computational steps come in.

An algorithm is like a recipe or a set of step-by-step instructions to reach a goal. It's a plan that a computer (or even you!) can follow.

Expressing Solutions as Computational Steps:

When you solve a problem using a computer, you break it down into small, clear steps. We call these computational steps. Instead of trying to do everything at once, you solve it piece by piece.

Think about making your bed:

1. Pull the sheet up to the top.
2. Pull the blanket up over the sheet.

3. Place the pillows at the head of the bed.
4. Smooth out any wrinkles.

Each of those is a computational step! Computers need instructions just like that.

Creating Algorithms to Achieve a Goal

When you write code, you are actually creating an algorithm! You think about the goal you want to reach and then design a list of steps for the computer to follow to get there.

- **Goal:** Make the micro:bit say "Hello!"
- **Algorithm (the plan):**
 1. Start the program.
 2. Tell the micro:bit to show the words "Hello!"

When you create an algorithm, it's a good idea to:

- **Plan it out:** Think about all the steps needed.
- **Test it:** Does your plan actually work?
- **Make it better:** Can you find an easier or faster way to do it? (This is like comparing the "efficiency" of algorithms!)
- **Check your work:** Does the solution make sense? How do you know?

By breaking down problems into steps and creating algorithms, you can tell computers exactly what to do!

Code It! – Strings

Let's practice. If I want my robot to say "Hi!" I could

1. Drag the `on start` block into the code editor.
2. Drag the `string` block and connect it within the `on start` block.
3. Type `"Hi!"` in the string block.

This is telling the computer that when you press play to start the code, the robot will say "Hi!" Now you try!

Notice that when the string or picture does not fit on the 5x5 grid at once, it will scroll through the message.

Adopted from microbit.org platform

Critical Thinking Questions

1. Why do you think strings need to be enclosed in quotation marks when coding?
2. How might programmers use strings to create interactive experiences, such as in chatbots or video games?
3. What challenges do you think programmers face when developing software that supports multiple languages?

Questions (5)

1. Which of the following is a string in computer science?

MULTIPLE CHOICE

Choose the correct answer:

- A. $10 + 5$
- B. "10 + 5"
- C. 15
- D. 10.5

2. You want your micro:bit to say "Hello!". Which block should you use to add the message?

MULTIPLE CHOICE

Choose the correct answer:

- A. Math block
- B. Loop block
- C. String block
- D. Icon block

3. What happens when your string message is too long for the 5x5 LED grid?

MULTIPLE CHOICE

Choose the correct answer:

- A. The program crashes
- B. Only the first word is shown
- C. The message scrolls across the screen
- D. The message disappears

4. You want to make your robot say "Let's go!" when the program starts. What should you do?

MULTIPLE CHOICE

Choose the correct answer:

- A. Use a math block and type "Let's go!"
- B. Use a string block inside an "on button A pressed" block
- C. Use a string block inside an "on start" block
- D. Use a show icon block inside a loop

5. Why do programmers need to understand strings when working with different cultures and languages?

MULTIPLE CHOICE

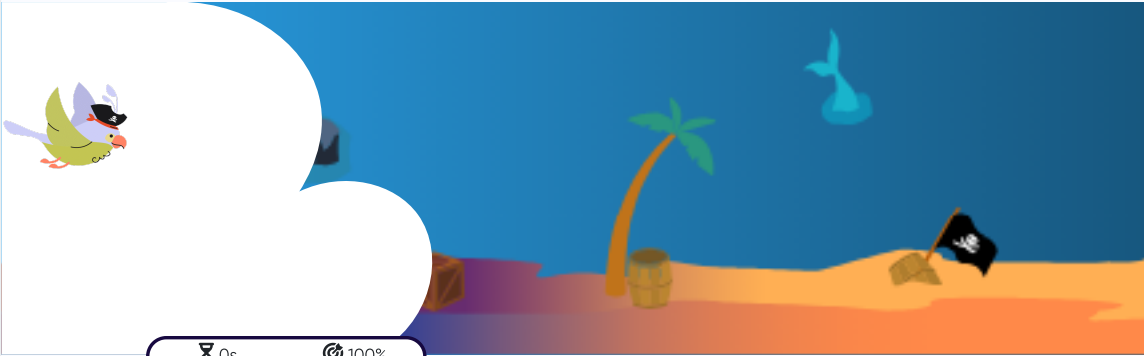
Choose the correct answer:

- A. So they can use math in other languages
- B. To avoid typing errors
- C. To display and store text properly in many formats
- D. To scroll longer messages faster

Games (2)

1. Strings Typing

Full Screen Audio Instructions Restart Pause



0s 100%

Computers use strings to

2. Strings Memory

Find the pairs of string examples.

Full Screen

Audio

Instructions

Answer Key

Pause

Flips: 0

1 "34"

3 "My favorite food is ice cream"

3 "I have 10 pennies and 4 darters in my pocket."

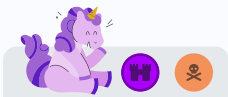
4 "Dg"

2 "34"

6 "My favorite food is ice cream"

7 "Dg"

8 "I have 10 pennies and 4 darters in my pocket."



Robotics Challenges (10)

1. Hello!

Challenge

Textbook

Hello!

Code the micro:bit to say "Hello!" using the **show string** block when you press play.

Requirements

Use a 'show string' block to say "Hello!"

Answer Key

Submit

Download

2. Be a Superhero

Challenge

Textbook

Be a Superhero

What's your superhero name? Think of a word to describe you, like amazing, silly, or strong! Then add the name of your first pet. Never had a pet? Use the name of a friend or family member's pet. For example, Brave Rocky or Crazy Fluffy!

Use a **string** block to spell your superhero name on the microbit.

Requirements

Spell your superhero name using a string block

Answer Key

Submit

Download

3. School Colors

Challenge

Textbook

School Colors

Imagine you get to open a school! What would your school colors be?

Use a separate string block to share each of your school's colors. You must have at least 2 colors.

Requirements

Share at least 2 school colors using show string blocks

Answer Key

Submit

Step 1

Begin with the **on start** block.

School Colors Step 1 of 4

1 Next

Toolbox

Search...

Basic

Input

Music

Led

Radio

Loops

Logic

Variables

Math

Extensions

Advanced

Download

4. Code Word

Challenge

Textbook

Code Word

Imagine you're sending a secret code word to a friend. Program the micro:bit to spell out this top secret word. Make sure it is school appropriate.

Requirements

Show a secret code word on the LED screen

Answer Key

Submit

Code Word

Begin with the **on start** block.

Code Word Step 1 of 4

1 Next

Toolbox

Search...

Basic

Input

Music

Led

Radio

Loops

Logic

Variables

Math

Extensions

Advanced

Download

5. Fly or Read Minds

Challenge

Textbook

Fly or Read Minds

Would you rather fly or read minds? Reveal your answer by using the `show string` block.

Requirements

Show your answer using a string block.

Answer Key

Submit

Step 1

Begin with the `on start` block.

Fly or Read Minds Step 1 of 2

1 Next

Download

Toolbox

Search...

Basic

Input

Music

Led

Radio

Loops

Logic

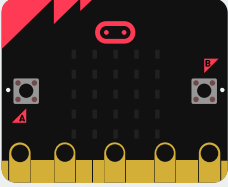
Variables

Math

Extensions

Advanced

forever



Download

6. Secret Hobby

Challenge

Textbook

Secret Hobby

Reveal 3 secret hobbies you have by spelling them out using `show string` blocks.

Requirements

Use string blocks to share 3 secret hobbies of yours

Answer Key

Submit

Step 1

Begin with the `on start` block.

Secret Hobby Step 1 of 2

1 Next

Download

Toolbox

Search...

Basic

Input

Music

Led

Radio

Loops

Logic

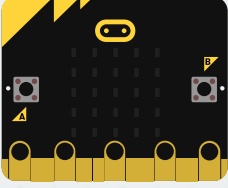
Variables

Math

Extensions

Advanced

forever



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7. Favorite Animals

Challenge

Textbook

Favorite Animals

Tell us your top 5 favorite animals by programming their names using **show string** blocks.

Requirements

Use string blocks to write your top 5 favorite animals

Answer Key

Submit

Step 1

Begin with the **on start** block.

Favorite Animals Step 1 of 2

1 Next

Toolbox

Search...

Basic

Input

Music

Led

Radio

Loops

Logic

Variables

Math

Extensions

Advanced

Download

8. How Are You Feeling?

Challenge

Textbook

How Are You Feeling?

Code the micro:bit to show how you are feeling today. Create your own face using a **show LEDs** block. Then, use the **show string** block to write the emotion you are feeling.

Requirements

Create a face that matches how you are feeling today

Use a string block and write the emotion you are feeling

Answer Key

Submit

Step 1

Begin with the **on start** block.

How Are You Feeling? Step 1 of 2

1 Next

Toolbox

Search...

Basic

Input

Music

Led

Radio

Loops

Logic

Variables

Math

Extensions

Advanced

Download

9. Spiders or Snakes

Challenge
Textbook

Spiders or Snakes

Do you like spiders or snakes more? Write which one you would choose and then create a picture of your choice with the **Show LEDs** block.

Requirements

- Use a string block to say which you prefer - spiders or snakes.

- Create your own icon of the one you picked.

[Answer Key](#)

Submit

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10. Talking Robot

Challenge

Textbook

Talking Robot

What if your robot could talk to you?
Program it to say 3 different things followed by pauses to act as if you were responding to it.

Requirements

Create 3 strings on the micro:bit

Add a pause after each string

Answer Key

Submit

Step 1

Begin with the **on start** block.

Talking Robot

Step 1 of 3

1

Next

Toolbox

Search...

Basic

Input

Music

Led

Radio

Loops

Logic

Variables

Math

Extensions

Advanced

on start

forever

Download

...

Answer Keys & Solutions

Questions

1. Which of the following is a string in computer science?

MULTIPLE CHOICE

Correct Answer:

- A. 10 + 5 ✗ Incorrect
- B. "10 + 5" ✓ Correct
- C. 15 ✗ Incorrect
- D. 10,5 ✗ Incorrect

Explanation:

Strings are text inside quotation marks—even if they look like numbers or math.

2. You want your micro:bit to say "Hello!". Which block should you use to add the message?

MULTIPLE CHOICE

Correct Answer:

- A. Math block ✗ Incorrect
- B. Loop block ✗ Incorrect
- C. String block ✓ Correct
- D. Icon block ✗ Incorrect

Explanation:

Use the string block to show words, letters, or symbols.

3. What happens when your string message is too long for the 5x5 LED grid?

MULTIPLE CHOICE

Correct Answer:

A. The program crashes

✗ Incorrect

B. Only the first word is shown

✗ Incorrect

C. The message scrolls across the screen

✓ Correct

D. The message disappears

✗ Incorrect

Explanation:

The micro:bit scrolls long strings so you can still read them.

4. You want to make your robot say "Let's go!" when the program starts. What should you do?

MULTIPLE CHOICE

Correct Answer:

A. Use a math block and type "Let's go!"

✗ Incorrect

B. Use a string block inside an "on button A pressed" block

✗ Incorrect

C. Use a string block inside an "on start" block

✓ Correct

D. Use a show icon block inside a loop

✗ Incorrect

Explanation:

"on start" begins the program, and the string tells it what to say.

5. Why do programmers need to understand strings when working with different cultures and languages?

MULTIPLE CHOICE

Correct Answer:

A. So they can use math in other languages

✗ Incorrect

B. To avoid typing errors

✗ Incorrect

C. To display and store text properly in many formats

✓ Correct

D. To scroll longer messages faster

✗ Incorrect

Explanation:

Strings need to support different symbols, directions, and characters worldwide.

Games

1. Strings Typing

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

2. Strings Memory

Memory Game Pairs:

1. ↔
2. ↔
3. ↔
4. ↔

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