

Show Images

Textbook

Show Images



You can also create custom images on the micro:bit. If you look at the face of the micro:bit, you will see that the lights show up in a 5x5 grid. There are 5 lights across and 5 lights down. These lights are called [LED lights](#), so that's why the code has `leds`.

Now let's create a grid using Python code. First, use the following command:

```
1 basic.show_leds("""    """)
```

To create your grid, indent the next 5 lines inwards 1 tab space. Look at the example below as a reference of what this should look like. See how each new line is indented? This keeps your code clean and in a "grid" formation.

Now enter either periods or pound symbols `.` `#`

Each period means that the light will not turn on. Each pound symbol means the light will turn on.

```

1 basic.show_leds("""
2     . . . . .
3     . # . # .
4     . # . # .
5     . # . # .
6     . . . . .
7 """)

```

Copy

Try making your own images on the micro:bit!

Pause

A reminder that you can pause the image to make it show longer.

Add a pause block in your algorithm to tell the computer you want it to pause here for some amount of time.

```

1 basic.pause(2000)

```

Copy

The pause number is measured in milliseconds. This means that entering 2000 will pause for 2 seconds. 5000 will pause for 5 seconds.

Clear Screen

If you want to tell the micro:bit to not display anything, you can use the following code.

```

1 basic.clear_screen()

```

Copy

Adopted from microbit.org platform

Critical Thinking Questions

- Imagine you have a grid of tiny lights, like on a large stadium scoreboard. How could you use a pattern of "lights on" and "lights off" to create a simple image that communicates a message, even without words?
- If you wanted to make a series of images flash one after another to create a very simple animation, why would it be important to control how long each image stays on the screen, and what might happen if you didn't?
- Think about how old movies were made by showing many pictures very quickly. How is creating an image on a small light grid using dots and hashes, and then making it pause or disappear, similar to how digital displays on everyday devices show or change what you see?

Questions (10)

1. A student wants to create a simple smiley face with two eyes and a mouth. They start with this code but need to fill in the grid. Which pattern will make the best smiley face?

MULTIPLE CHOICE

```
basic.show_leds(""" ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? """)
```

Choose the correct answer:

- A. Eyes in row 2, mouth in row 4
- B. B) Eyes in row 5, mouth in row 3
- C. Eyes in row 3, mouth in row 2
- D. Eyes and mouth all in row 3

2. You want to make an animation where a dot moves across the top row from left to right. How many different custom images will you need to create?

MULTIPLE CHOICE

Choose the correct answer:

- A. 3 images
- B. 5 images
- C. 10 images
- D. 25 images

3. You want to create a program that shows a custom heart image for 3 seconds, then clears the screen. Which code structure works best?

MULTIPLE CHOICE

Choose the correct answer:

- A. `basic.show_leds(...)` `basic.clear_screen()` `basic.pause(3000)`
- B. `basic.show_leds(...)` `basic.pause(3000)` `basic.clear_screen()`
- C. `basic.pause(3000)` `basic.show_leds(...)` `basic.clear_screen()`
- D. `basic.clear_screen()` `basic.show_leds(...)` `basic.pause(3000)`

4. A student wants to make a blinking effect with their custom image. They create the image, then clear the screen, but the blinking happens too fast to see. What should they add?

MULTIPLE CHOICE

Choose the correct answer:

- A. More pound symbols in their image
- B. Pause commands after both the image and clear screen
- C. A longer clear_screen command
- D. More periods in their image

5. You are designing a custom arrow pointing right. Looking at the 5x5 grid, which row would be the best place to put the arrow's point?

MULTIPLE CHOICE

Choose the correct answer:

- A. Row 1 (top)
- B. Row 3 (middle)
- C. Row 5 (bottom)
- D. It does not matter which row

6. You want to create a simple animation of a ball bouncing up and down. Which approach would work best?

MULTIPLE CHOICE

Choose the correct answer:

- A. Create one image with the ball in different positions
- B. Create multiple images showing the ball at different heights, with pauses between each
- C. Use the clear_screen command repeatedly
- D. Make the ball bigger in each image

7. A student wants to make a custom image where only the four corner LEDs are lit up. How many pound symbols (#) should they use in their code?

MULTIPLE CHOICE

Choose the correct answer:

- A. 2 pound symbols
- B. 4 pound symbols
- C. 8 pound symbols
- D. 25 pound symbols

8. You are teaching a friend how to make custom images. They ask why they need to use both periods (.) and pound symbols (#). What is the best explanation?

MULTIPLE CHOICE

Choose the correct answer:

- A. Periods make the LEDs blink and pound symbols make them stay on
- B. Periods turn LEDs off and pound symbols turn LEDs on
- C. Periods are for numbers and pound symbols are for letters
- D. Periods and pound symbols both do the same thing

9. Debug the following code:

DEBUG CODE

Code to Debug:

```
1 basic.show_lights("""
2     . . . . .
3     . # . # .
4     . # . # .
5     . # . # .
6     . . . . .
7 """)
```

10. Debug the following code:

[DEBUG CODE](#)

Code to Debug:

```
1 basic.show_leds("""
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4     . # . # .
5     . # . # .
6     . . . . .
7 """)
8 basic.clearScreen()
```

Robotics Challenges (5)

1. Create Your Own Image

[Challenge](#)[Textbook](#)

Create Your Own Image

Create your own image to show on the micro:bit. Your image should have at least 15 lights on.

Requirements

- ☐ Create your own image
- ☐ Have at least 15 led lights on.

[Answer Key](#)[Submit](#)

Step 1

Display the image with at least 15 lights on

Create Your Own Image Step 1 of 1



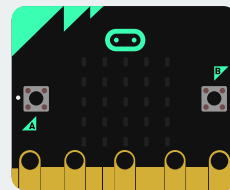
1

✓ Done

Toolbox

Search

```
1 def on_forever():
2     pass
3 basic.forever(on_forever)
4
```

[Download](#)

2. Create a Maze

Challenge

Textbook

Create a Maze

Create a maze with the lights on the micro:bit!

Requirements

- Create a maze on the micro:bit

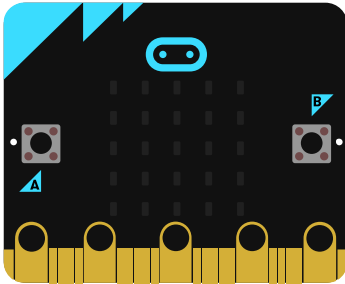
Answer Key

Submit

Basic

start

forever



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3. Alternating Chess Board

Challenge

Textbook

Alternating Chess Board

Create a chessboard that inverts! Start by displaying the **CHESSBOARD** icon. Then, add an image that is the opposite of the chessboard. The result: lights that were light will be dark, and lights that were dark will be light.

Switch back and forth so that you are showing both kinds of boards 3 times.

Requirements

- Display the CHESSBOARD icon 3 times.
- Display the reverse of the CHESSBOARD icon 3 times.

Answer Key

1

def on_forever():

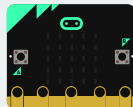
2

pass

3

basic.forever(on_forever)

4



Explorer

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4. Create Your Own Emoji

Challenge

Textbook

Create Your Own Emoji

Use the light display to create your own emoji!

1. Display the HAPPY icon
2. Add the code to display your own emoji
3. Pause for 2 seconds.
4. Display the name of your emoji.

Requirements

- Display the HAPPY icon
- Add the code to display your own emoji
- Pause for 2 seconds.
- Display the name of your emoji.

Answer Key

Submit

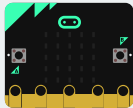
Step 1

Display 15 images.

Animate Images Step 1 of 1

1 Done

1 def on_forever():
2 pass
3 basic.forever(on_forever)
4



Explorer

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5. Animated Images

Challenge

Textbook

Animated Images

Program an animation on the micro:bit. Add at least 15 images that show one right after the other. The images should build on each other to look like an animation.

Requirements

- Add 15 images

Answer Key

Submit

Step 1

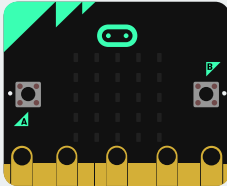
Display 15 images.

Animate Images Step 1 of 1

1 Done

Toolbox

1 def on_forever():
2 pass
3 basic.forever(on_forever)
4



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Answer Keys & Solutions

Questions

1. A student wants to create a simple smiley face with two eyes and a mouth. They start with this code but need to fill in the grid. Which pattern will make the best smiley face?

MULTIPLE CHOICE

Correct Answer:

- | | |
|-------------------------------------|-------------|
| A. Eyes in row 2, mouth in row 4 | ✓ Correct |
| B. B) Eyes in row 5, mouth in row 3 | ✗ Incorrect |
| C. Eyes in row 3, mouth in row 2 | ✗ Incorrect |
| D. Eyes and mouth all in row 3 | ✗ Incorrect |

Explanation:

Think about where eyes and mouth are positioned on a real face.

2. You want to make an animation where a dot moves across the top row from left to right. How many different custom images will you need to create?

MULTIPLE CHOICE

Correct Answer:

- | | |
|--------------|-------------|
| A. 3 images | ✗ Incorrect |
| B. 5 images | ✓ Correct |
| C. 10 images | ✗ Incorrect |
| D. 25 images | ✗ Incorrect |

Explanation:

Count how many positions exist across one row of the LED grid.

3. You want to create a program that shows a custom heart image for 3 seconds, then clears the screen. Which code structure works best?

MULTIPLE CHOICE

Correct Answer:

- A. `basic.show_leds(...)` `basic.clear_screen()` `basic.pause(3000)` ✗ Incorrect
- B. `basic.show_leds(...)` `basic.pause(3000)` `basic.clear_screen()` ✓ Correct
- C. `basic.pause(3000)` `basic.show_leds(...)` `basic.clear_screen()` ✗ Incorrect
- D. `basic.clear_screen()` `basic.show_leds(...)` `basic.pause(3000)` ✗ Incorrect

Explanation:

Think about the order: show the image, wait, then clear.

4. A student wants to make a blinking effect with their custom image. They create the image, then clear the screen, but the blinking happens too fast to see. What should they add?

MULTIPLE CHOICE

Correct Answer:

- A. More pound symbols in their image ✗ Incorrect
- B. Pause commands after both the image and clear screen ✓ Correct
- C. A longer `clear_screen` command ✗ Incorrect
- D. More periods in their image ✗ Incorrect

Explanation:

Human eyes need time to see changes between on and off states.

5. You are designing a custom arrow pointing right. Looking at the 5x5 grid, which row would be the best place to put the arrow's point?

MULTIPLE CHOICE

Correct Answer:

- A. Row 1 (top) ✗ Incorrect
- B. Row 3 (middle) ✓ Correct

C. Row 5 (bottom)

✗ Incorrect

D. It does not matter which row

✗ Incorrect

Explanation:

Think about where an arrow's point should be positioned for the best visual balance.

6. You want to create a simple animation of a ball bouncing up and down. Which approach would work best?

MULTIPLE CHOICE

Correct Answer:

A. Create one image with the ball in different positions

✗ Incorrect

B. Create multiple images showing the ball at different heights, with pauses between each

✓ Correct

C. Use the `clear_screen` command repeatedly

✗ Incorrect

D. Make the ball bigger in each image

✗ Incorrect

Explanation:

Animation requires showing different images in sequence with timing.

7. A student wants to make a custom image where only the four corner LEDs are lit up. How many pound symbols (#) should they use in their code?

MULTIPLE CHOICE

Correct Answer:

A. 2 pound symbols

✗ Incorrect

B. 4 pound symbols

✓ Correct

C. 8 pound symbols

✗ Incorrect

D. 25 pound symbols

✗ Incorrect

Explanation:

Count the corner positions on a square grid.

8. You are teaching a friend how to make custom images. They ask why they need to use both periods (.) and pound symbols (#). What is the best explanation?

MULTIPLE CHOICE

Correct Answer:

- A. Periods make the LEDs blink and pound symbols make them stay on ✗ Incorrect
- B. Periods turn LEDs off and pound symbols turn LEDs on ✓ Correct
- C. Periods are for numbers and pound symbols are for letters ✗ Incorrect
- D. Periods and pound symbols both do the same thing ✗ Incorrect

Explanation:

Think about what each symbol represents in terms of LED states.

9. Debug the following code:

DEBUG CODE

Incorrect Code:

```
1 basic.show_lights("""
2     . . . . .
3     . # . # .
4     . # . # .
5     . # . # .
6     . . . . .
7 """)
```

Correct Solution:

```
1 basic.show_leds("""
2     . . . . .
3     . # . # .
4     . # . # .
5     . # . # .
6     . . . . .
7 """)
```

10. Debug the following code:

DEBUG CODE

Incorrect Code:

```
1 basic.show_leds("""
2     . . . . .
3     . # . # .
4     . # . # .
5     . # . # .
```

```
6         . . . . .
7     """)
8 basic.clearScreen()
```

Correct Solution:

```
1 basic.show_leds("""
2     . . . . .
3     . # . # .
4     . # . # .
5     . # . # .
6     . . . . .
7 """)
8 basic.clear_screen()
```

Explanation:

This code needs an underscore.