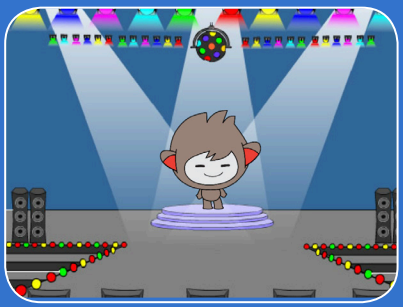
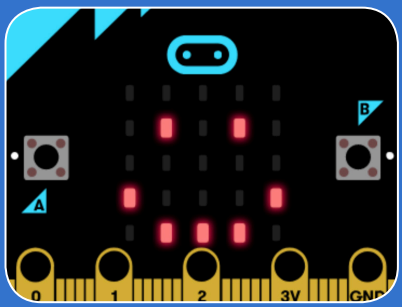
micro:bit Cards





Make projects that connect to the physical world with micro:bit!

micro:bit Cards

Try these cards in any order:

- **Cast a Spell**
- **Squeak**
- **Move Around**
- **Press a Button**
- **Jump**
- **Move Back and Forth**
- **Create an Emoji**

Cast a Spell

Make something happen when you move the micro:bit.

Cast a Spell

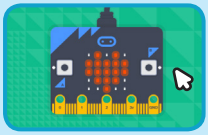
scratch.mit.edu/microbit

GET READY

Choose a backdrop.

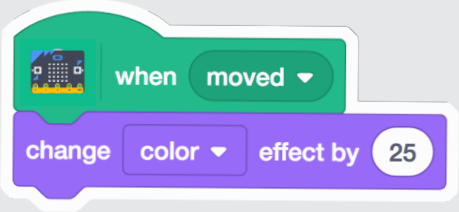
Choose a sprite.

Click the Extensions button.



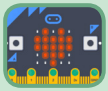
Then, click to add the micro:bit extension.

ADD THIS CODE



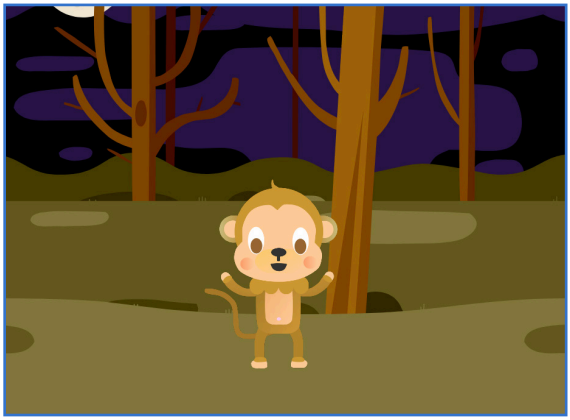
TRY IT

Move the micro:bit to start.



Squeak

Make a sound when you shake the micro:bit.



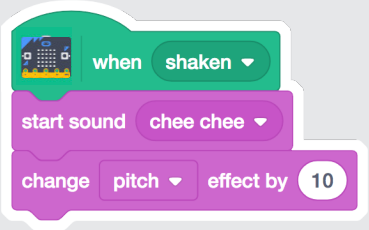
Squeak

scratch.mit.edu/microbit

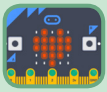
GET READY

Choose a sprite, like Monkey.

ADD THIS CODE



TRY IT



Shake the micro:bit to start.

Click the stop sign to reset the pitch.

TIP

You can click the **Sounds** tab to view your character's sounds.

Click this button to add a sound from the Sound library.

Move Around

Make a character glide around the screen.

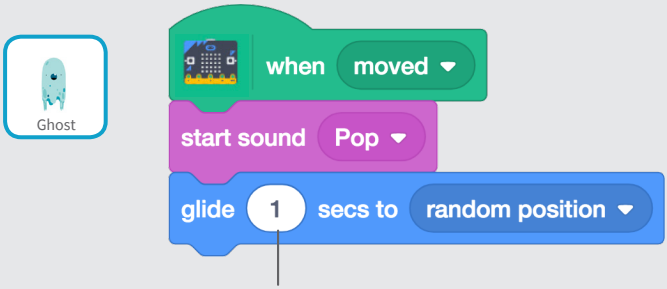
Move Around

scratch.mit.edu/microbit

GET READY

Choose a sprite, like Ghost.

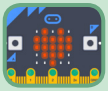
ADD THIS CODE



To move faster, type a smaller number, like 0.5

TRY IT

Move the micro:bit to start.



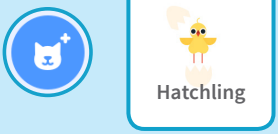
Press a Button

Make something happen when you press the micro:bit button.

Press a Button

scratch.mit.edu/microbit

GET READY



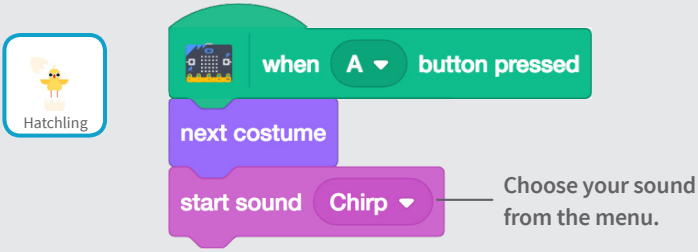
Choose a sprite with multiple costumes, like Hatchling.

Click the Sounds tab.

Choose a sound, like Chirp.

ADD THIS CODE

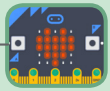
Click the Code tab.



Choose your sound from the menu.

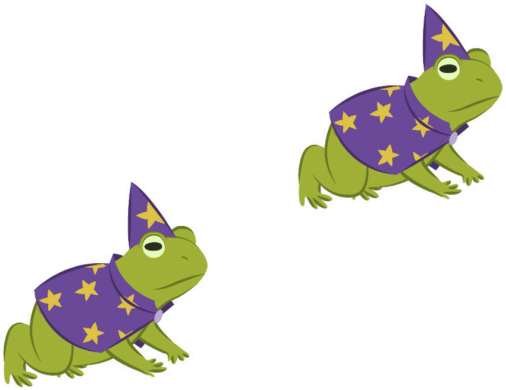
TRY IT

Press the **A** button on the micro:bit to start.



Jump

Have a character jump up and down.



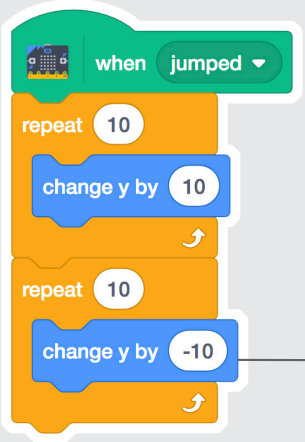
Jump

scratch.mit.edu/microbit

GET READY

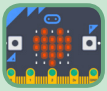
Choose a sprite, like Wizard-toad.

ADD THIS CODE



Type a minus sign to move down.

TRY IT



Jump with the micro:bit to start.

Move Back and Forth

Move a character from side to side when you tilt the micro:bit.

Move Back and Forth

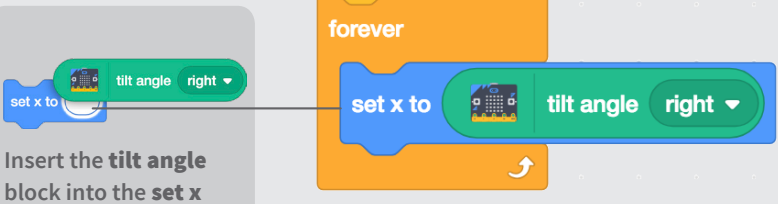
scratch.mit.edu/microbit

GET READY

Choose a backdrop, like Witch House

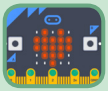
Choose a sprite, like Witch

ADD THIS CODE



Insert the **tilt angle** block into the **set x** block.

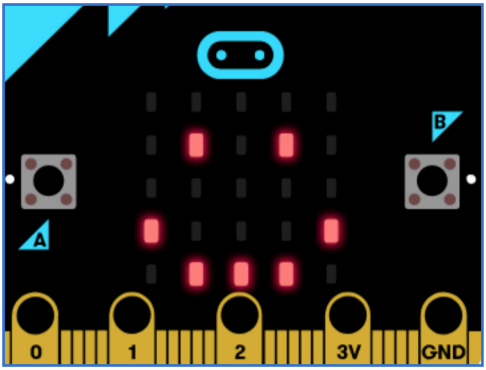
TRY IT

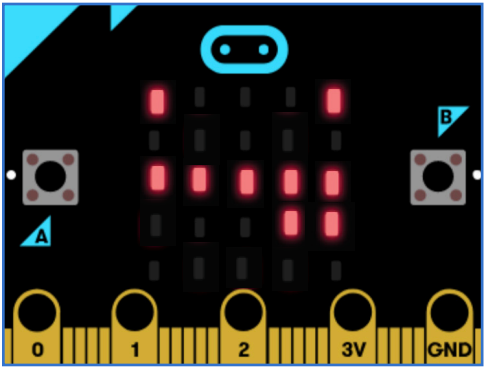


Tilt the micro:bit to move your character from side to side.

Create an Emoji

Make your own emoji on the micro:bit display.

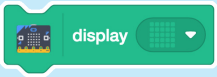




Create an Emoji

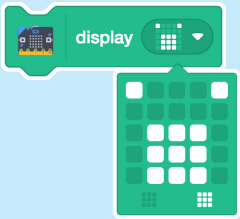
scratch.mit.edu/microbit

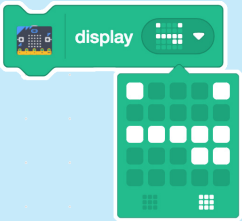
GET READY

Drag out a 

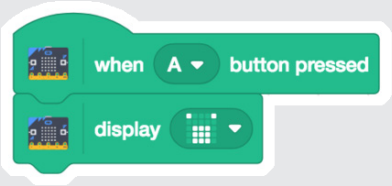
block and click on the grid.

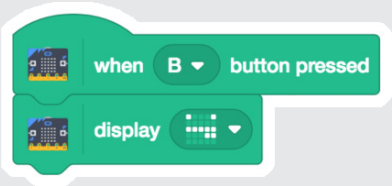
Click the individual squares to turn them on or off in your design.





ADD THIS CODE





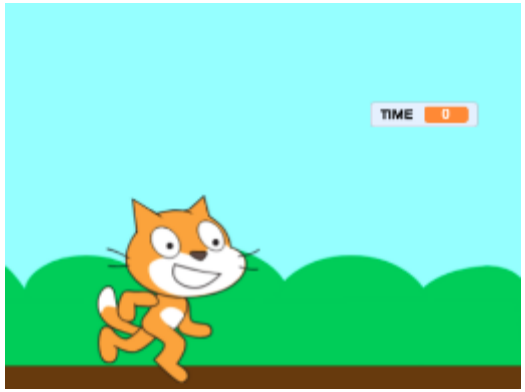
TRY IT

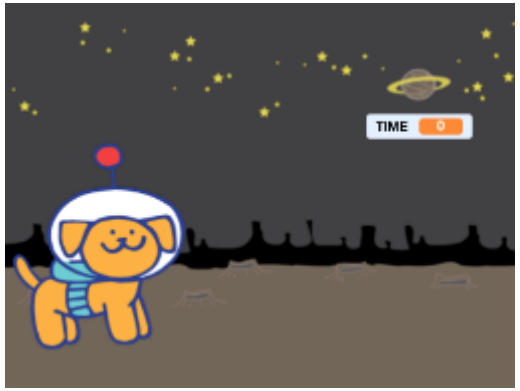
Press the A and B buttons to show your emojis on the micro:bit.

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Stopwatch Cards





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Stopwatch Cards

Use these cards in this order:

1. Create a Variable
2. Start the Clock
3. Stop and Reset
4. Get Moving
5. Time the Sprite
6. Background Effects

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Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

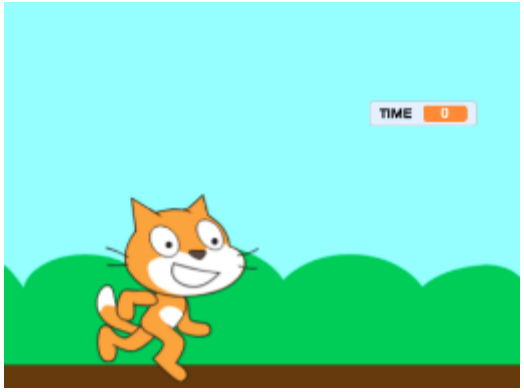
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Create a Variable

Add a changeable value on the screen.



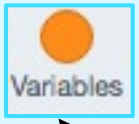
TIME 1

microbit.org/scratch 1 micro:bit

Create a Variable

microbit.org/scratch

GET READY

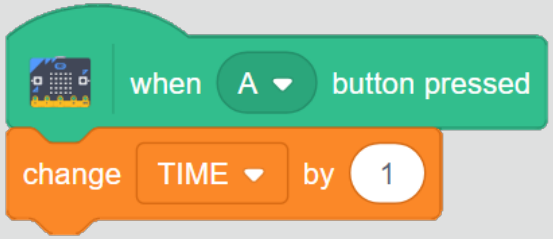


Make a Variable

Choose in the Blocks Palette.

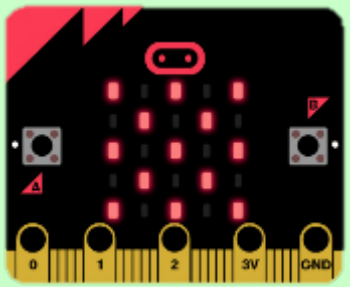
Add a checkmark to your variable to make it appear on the screen.

ADD THIS CODE



TRY IT

Click the **A button** to advance the number on the screen.



Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Start the Clock

Add a loop to increase the time on the clock.

TIME 0

TIME 2

TIME 5

microbit.org/scratch 2 micro:bit

Start the Clock

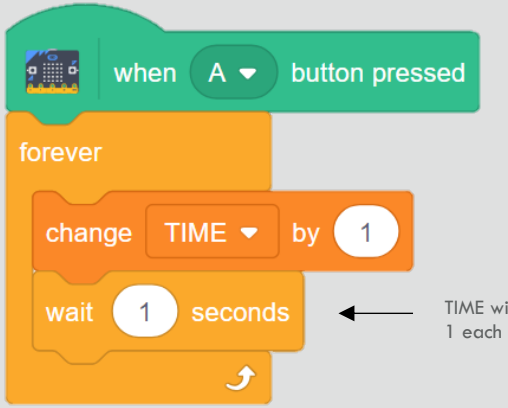
microbit.org/scratch

GET READY

A stopwatch should advance each second.

A forever loop will increase the time as long as the program is running.

ADD THIS CODE



TIME will increase by 1 each second.

TRY IT

Test your timer against a clock.

Does the time change each second?

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

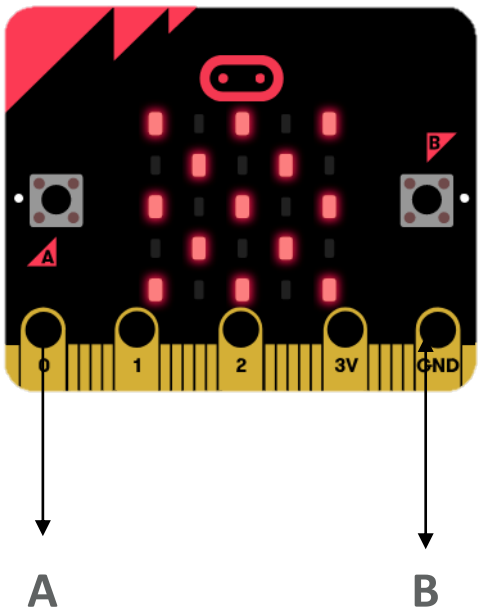
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Stop and Reset

Control your stopwatch with the A and B buttons.



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Stop and Reset

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GET READY

set TIME to 0

stop all

Add a RESET and a STOP code.

ADD THIS CODE

when A button pressed
set TIME to 0
forever
change TIME by 1
wait 1 seconds

TIME will return to 0 each time the **A button** is pressed.

when B button pressed
stop all

TRY IT

Click each button on the micro:bit and see how they affect the time displayed on screen.

set TIME to 60

CHALLENGE: Can you change your stopwatch into a countdown clock?

change TIME by -1

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

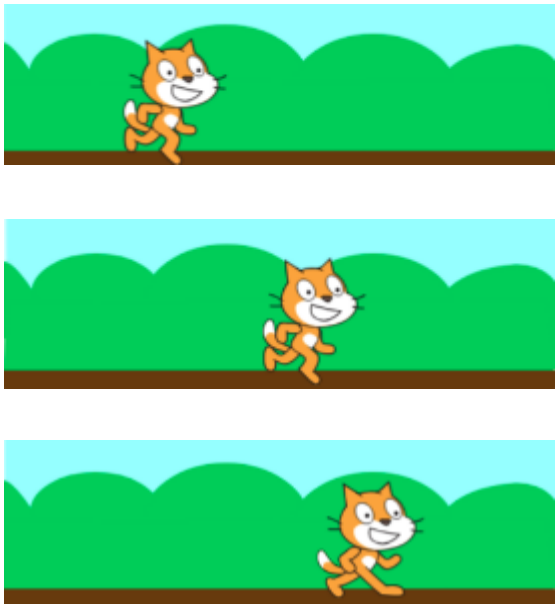
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Get Moving

Make your sprite move as your stopwatch advances!



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micro:bit

Get Moving

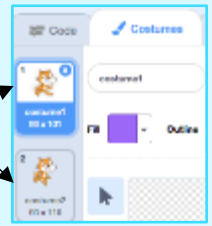
microbit.org/scratch

Choose a sprite.

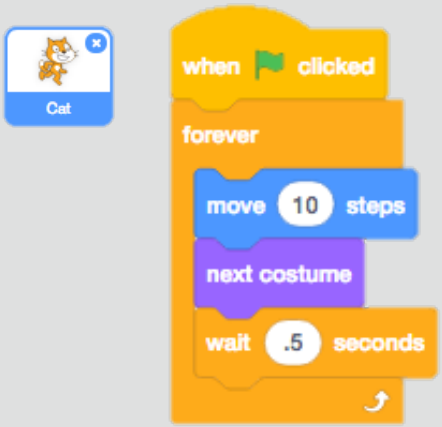
GET READY

Click the Costumes tab.

Make sure your sprite has more than one costume.



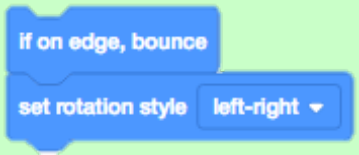
ADD THIS CODE



TRY IT

What happens when your sprite reaches the end of the screen?

Add these codes into the loop to fix the problem!



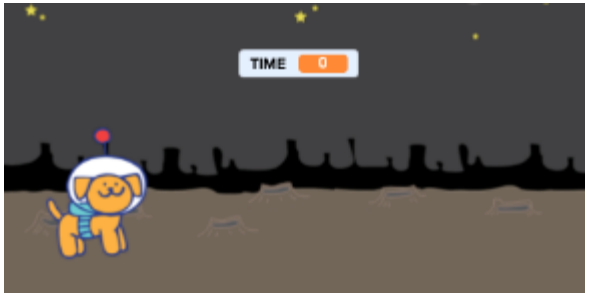
Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

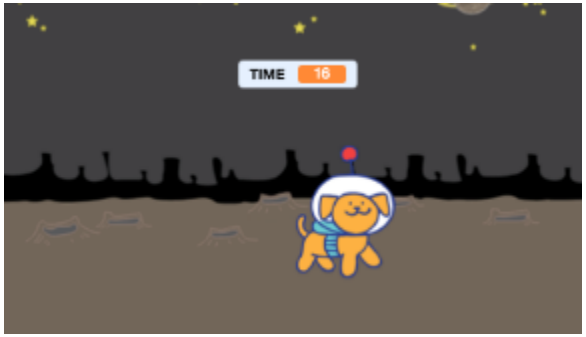
Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Time the Sprite

Let Scratch decide how many seconds your sprite will move. Use your stopwatch to figure it out.





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Time the Sprite

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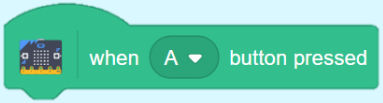
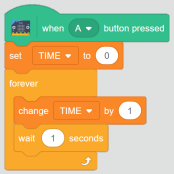
GET READY

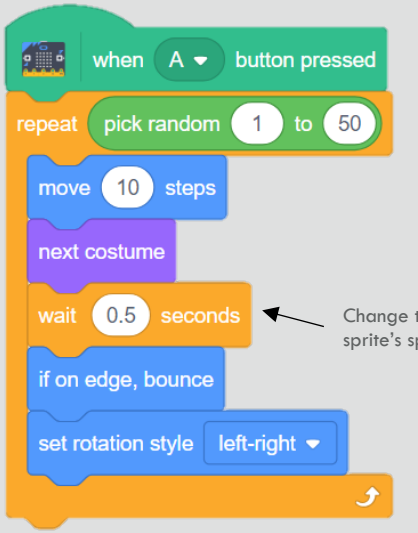


Start your sprite with the A button.

This will make the stopwatch and the sprite move at the same time.

ADD THIS CODE





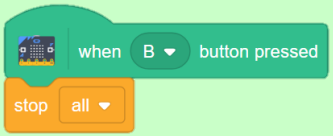
Let Scratch decide how long the code will run.

Change the number to affect the sprite's speed.

TRY IT

How long did the sprite move?

Freeze the clock by pushing the **B button** on the micro:bit when the sprite stops.



Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

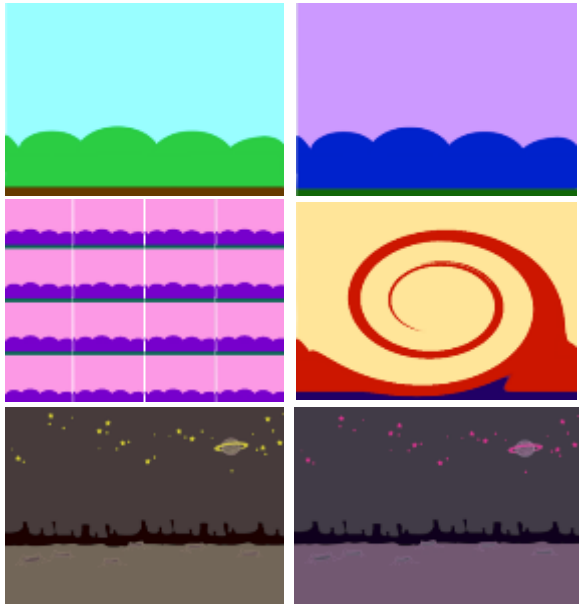
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Background Effects

Use graphic effects to alter your background as the program runs.



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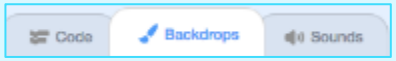
micro:bit

Background Effects

microbit.org/scratch

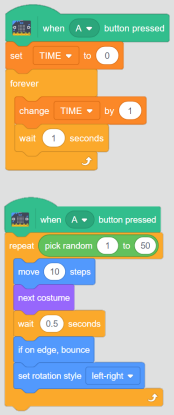
GET READY

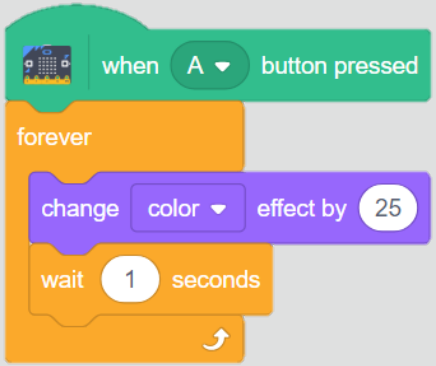
Choose a background.



Click the Backdrops tab.

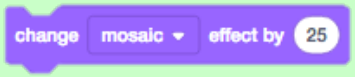
ADD THIS CODE



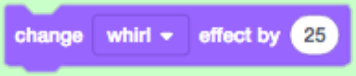


TRY IT

Experiment with other background effects.



CHALLENGE: Reset your graphic effect. Where should this block go in your code?

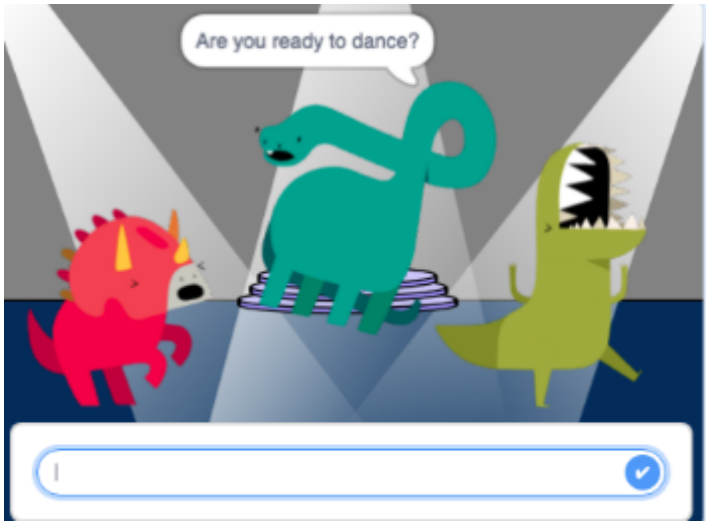


Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Dance Cards



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Dance Cards

Use these cards in this order:

1. Show Your Moves
2. Add Music
3. Spin
4. Change Colors
5. Copy & Paste: Add Friends
6. Ask and Answer

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Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

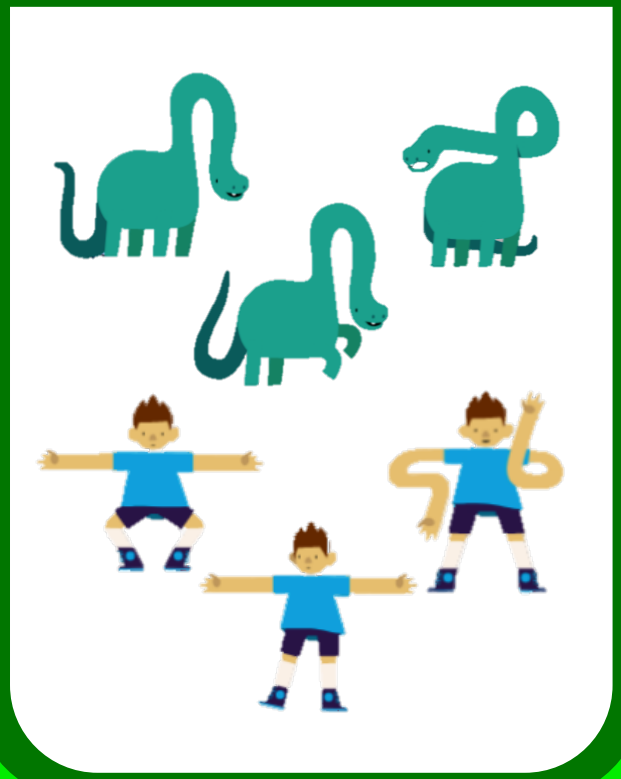
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Show Your Moves

Change costumes to make your sprite look like it is dancing around!



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Show Your Moves

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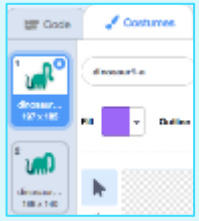
GET READY

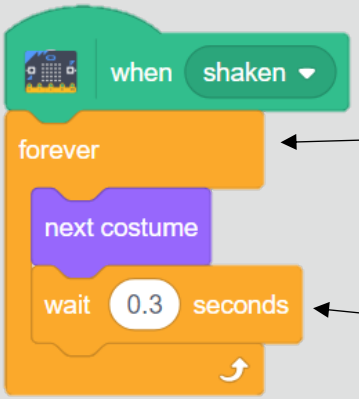
Choose a sprite.

Click the Costumes tab.

Make sure your sprite has more than one costume.



ADD THIS CODE



Make the costume change as long as the program runs.

Change the number to affect the sprite's speed.

TRY IT

Add a background.

Shake your micro:bit.

Make your sprite dance on the dance floor!

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

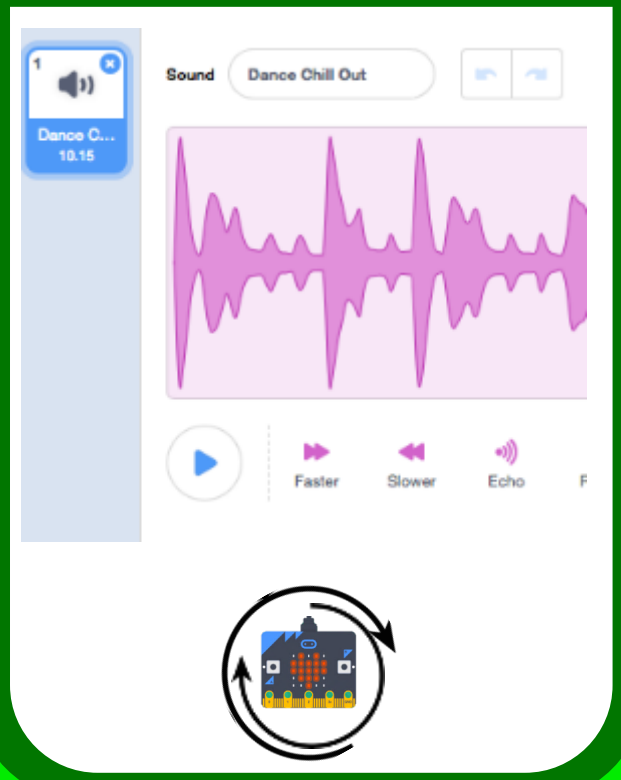
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Add Music

Make your character dance to a beat! Choose a soundtrack for the scene.



Add Music

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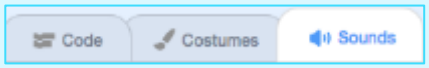
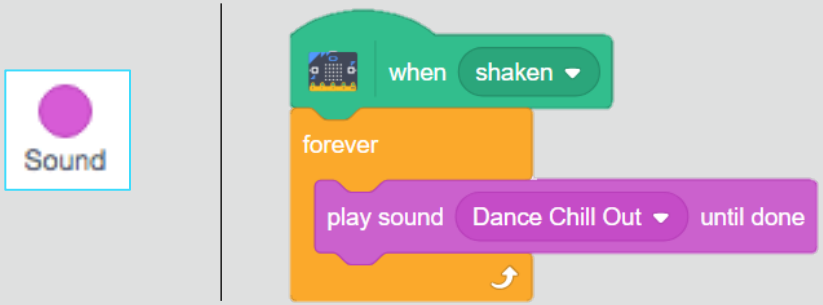
GET READY



Click the Sounds tab.

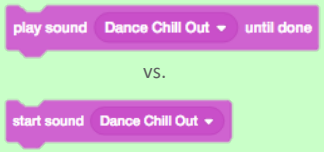
Choose a sound from the Library.

ADD THIS CODE

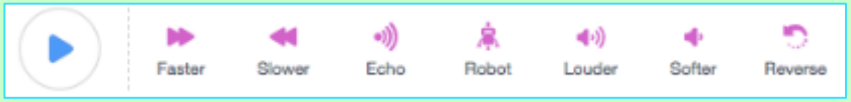


TRY IT

Make sure to choose **PLAY SOUND UNTIL DONE** so that the entire track plays before starting over.



Edit the track in the Sounds tab.



Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

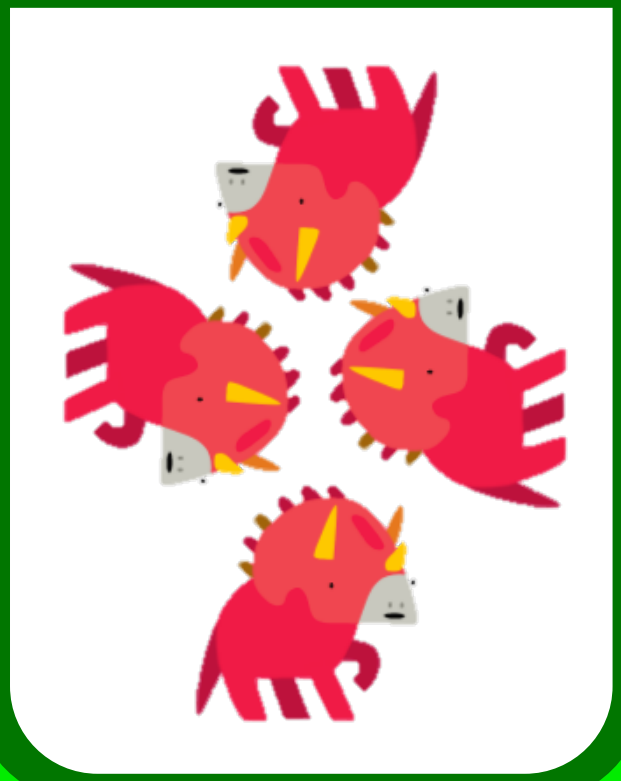
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Spin

Spin your sprites all around!



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micro:bit

Spin

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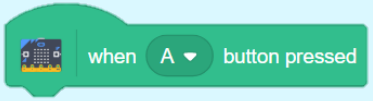
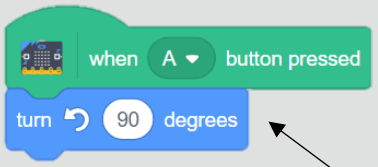
GET READY



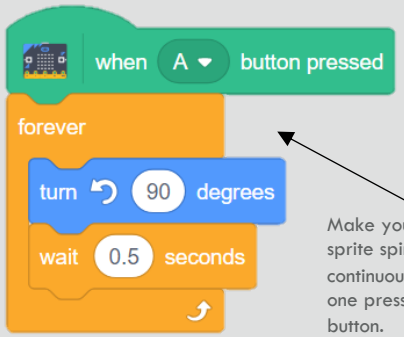
Start your sprite with the A button.

Control when and how fast your sprite spins in a circle.

ADD THIS CODE



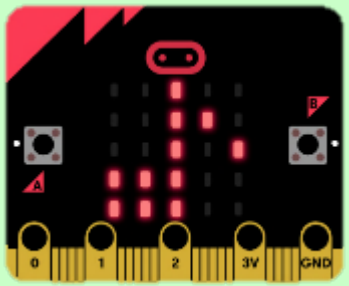
Make the sprite spin once with each press of the button.



Make your sprite spin continuously with one press of the button.

TRY IT

Click the **A button** to spin the sprite.



TIP: Experiment with the degrees of rotation!

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

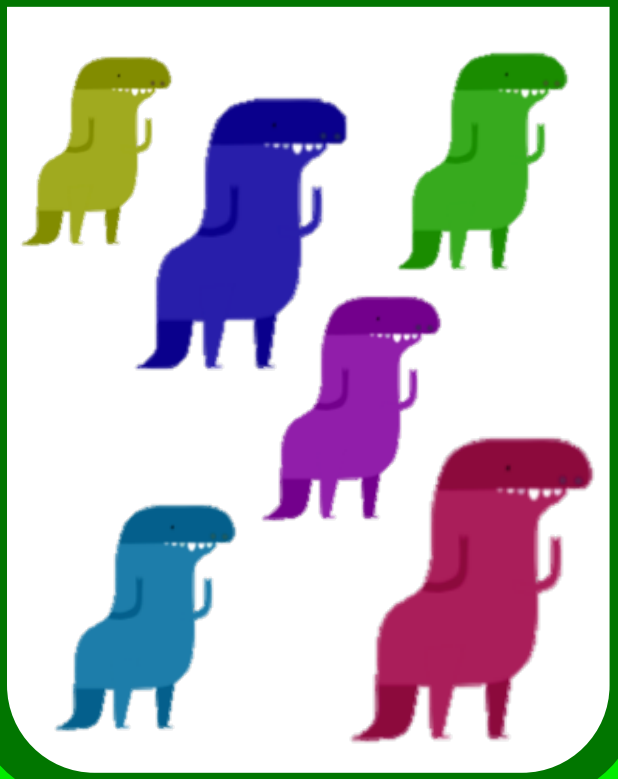
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Change Colors

Add image effects to change the way your sprite looks.



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Change Colors

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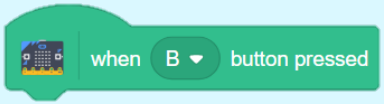
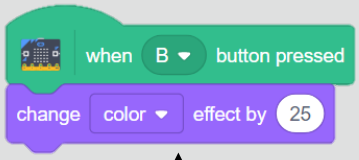
GET READY



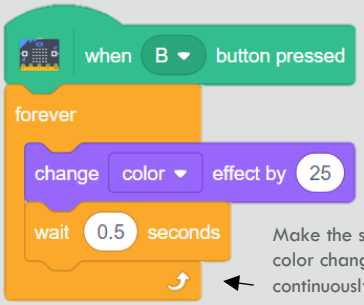
Change your sprite's color with the B button.

Control when and how fast your sprite changes its appearance.

ADD THIS CODE

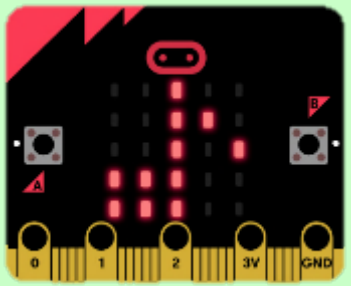


Make the sprite's color change once with each press of the button.



Make the sprite's color change continuously with one press of the button.

TRY IT



Click the **B button** to change the sprite's color.

CHALLENGE: What other effects can you use on your sprite?

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Copy & Paste: Add Friends

Duplicate code onto additional sprites.

Copy & Paste: Add Friends

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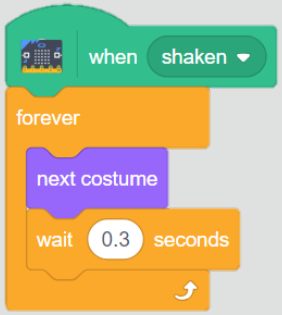
GET READY

Add additional sprites.

Click the Costumes tab.

Make sure your sprites have more than one costume.

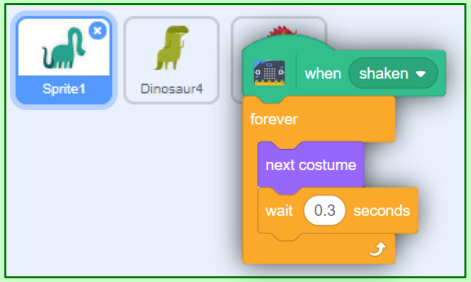
ADD THIS CODE



TRY IT

Drag and drop your code from the first sprite onto the additional characters.

Click each sprite to make sure that the code transferred.



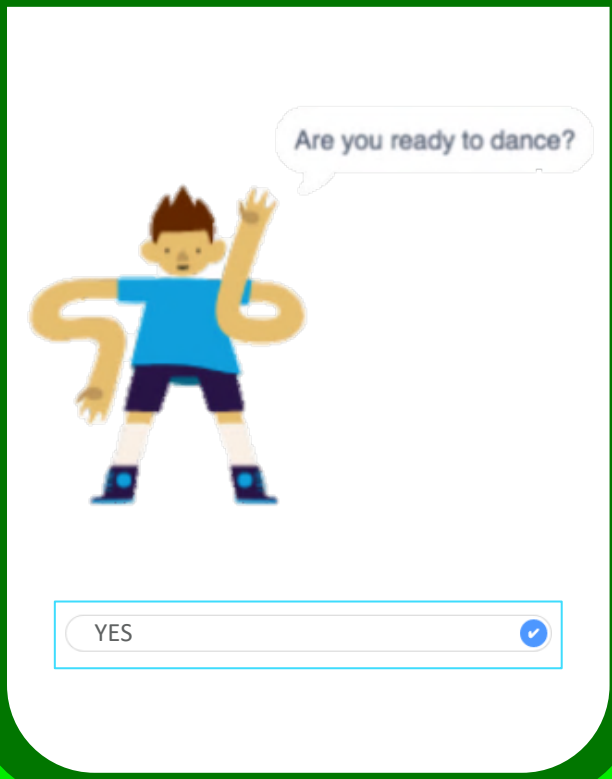
Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Ask and Answer

Interact with your micro:bit's display.



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Ask and Answer

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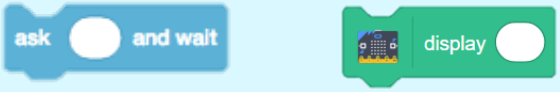
GET READY



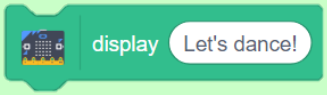
Use the Sensing blocks to interact with your micro:bit.

ADD THIS CODE

Start the program.

If you answer "yes," a message will be sent to the micro:bit. Otherwise, the program will ask the question again.

TRY IT



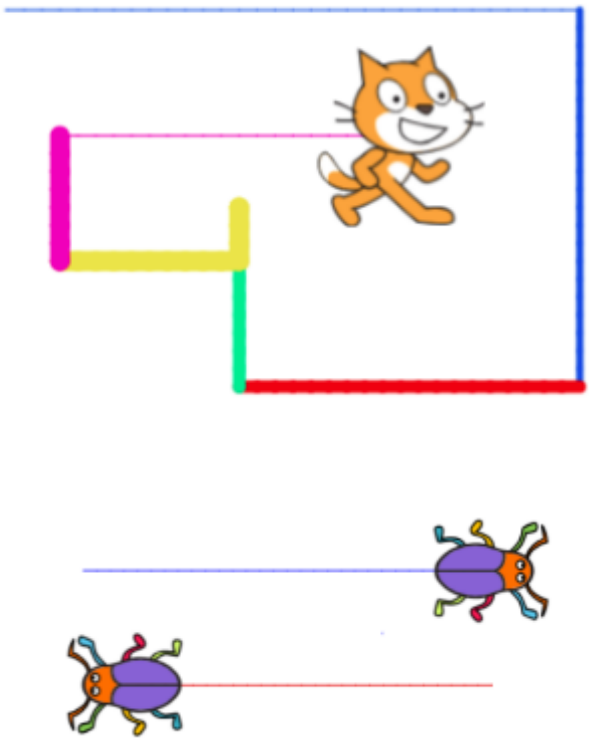
Run the program. Answer the question and check your micro:bit. Can you read the message?

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Pen Cards



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Pen Cards

Use these cards in this order:

1. **Back and Forth**
2. **Draw a Line**
3. **Special Effects**
4. **Random Drawing**
5. **Voting Machine**
6. **Stamp and Record**

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Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

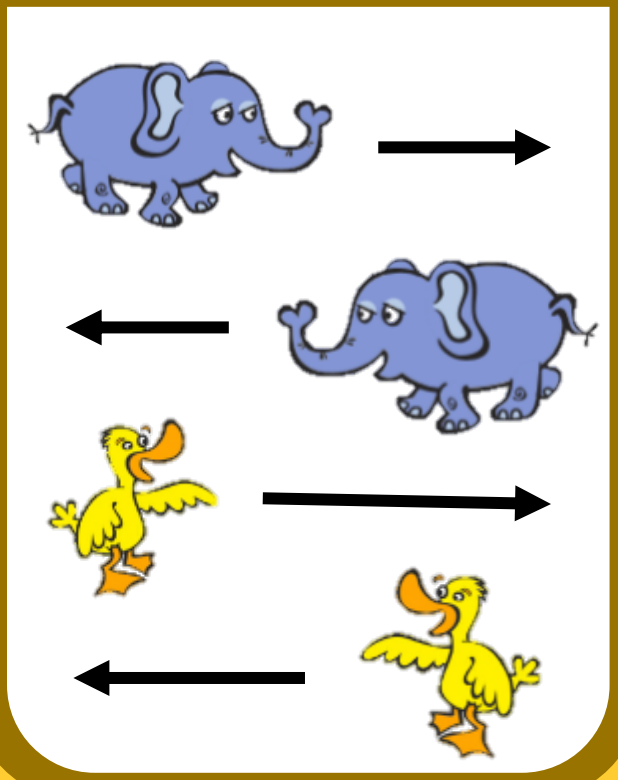
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Back and Forth

Use the A and B buttons to move your sprite.



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Back and Forth

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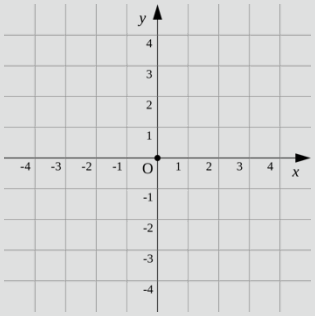
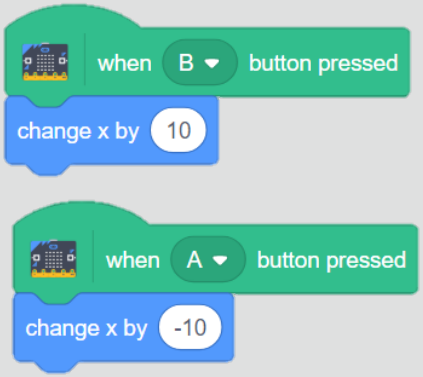
GET READY

Add a sprite and a background.

ADD THIS CODE

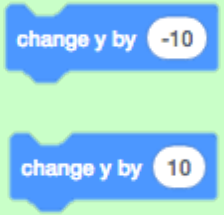




TRY IT

Press the A and B buttons to move your sprite.

CHALLENGE: Can you make your sprite move up and down instead of left and right?



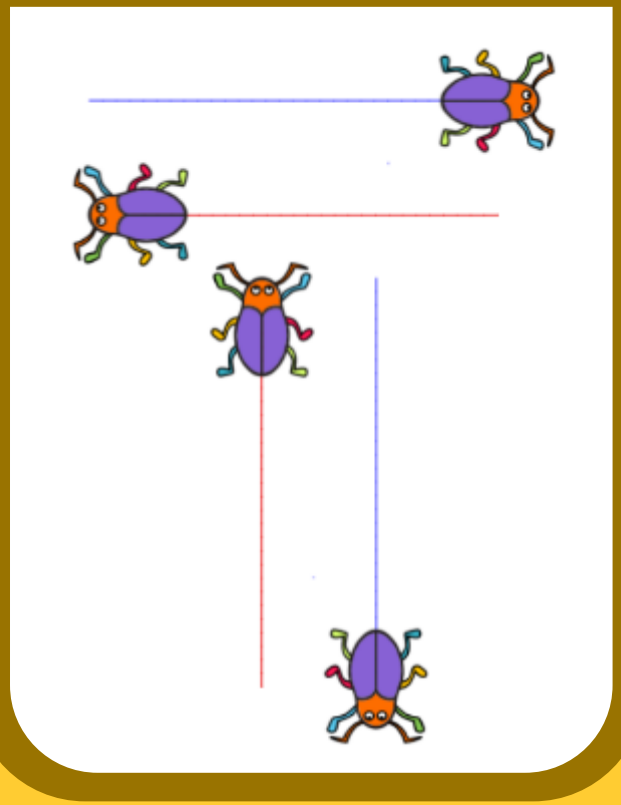
Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Draw a Line

Draw a line with your sprite as it moves.



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Draw a Line

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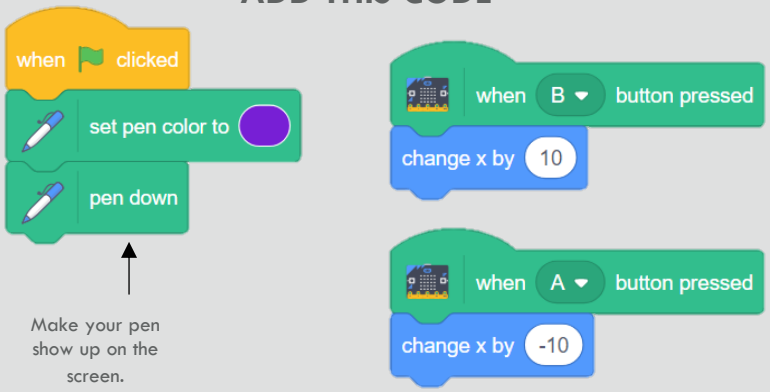
GET READY

Connect the Pen extension.

ADD THIS CODE

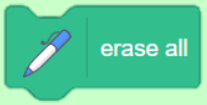


Make your pen show up on the screen.

TRY IT

Press the A and B buttons to move your sprite. Does it draw a line?

CHALLENGE: Can you add a RESET block to erase the line?



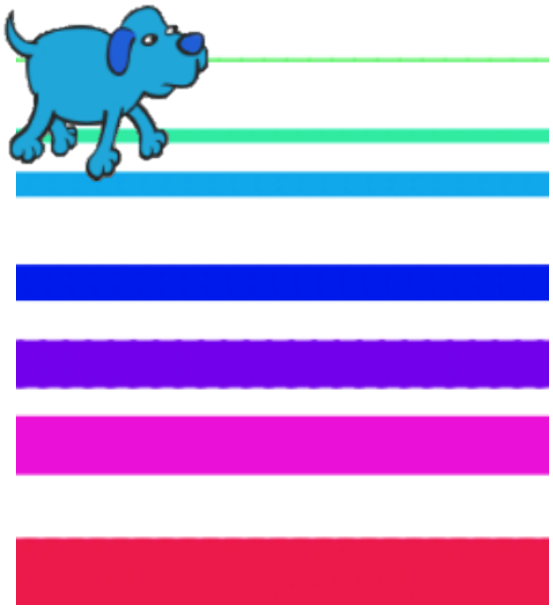
Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Special Effects

Change the color and size of your pen.



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Special Effects

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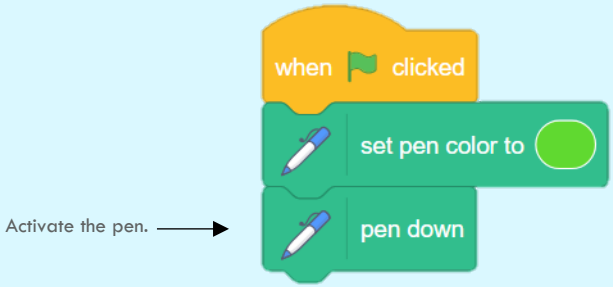
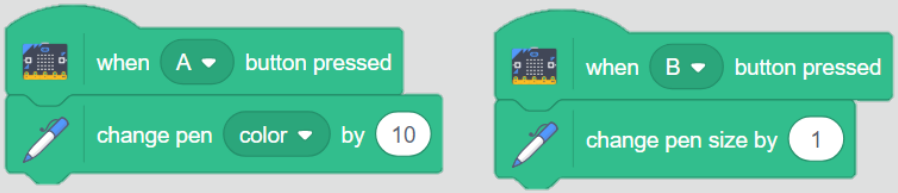
GET READY



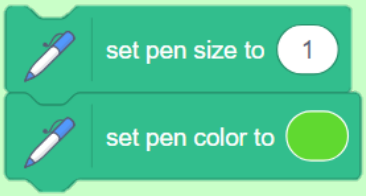
ADD THIS CODE



TRY IT

Press the A and B buttons to change the pen.

CHALLENGE: Can you add code to make the pen go back to its original settings?



Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

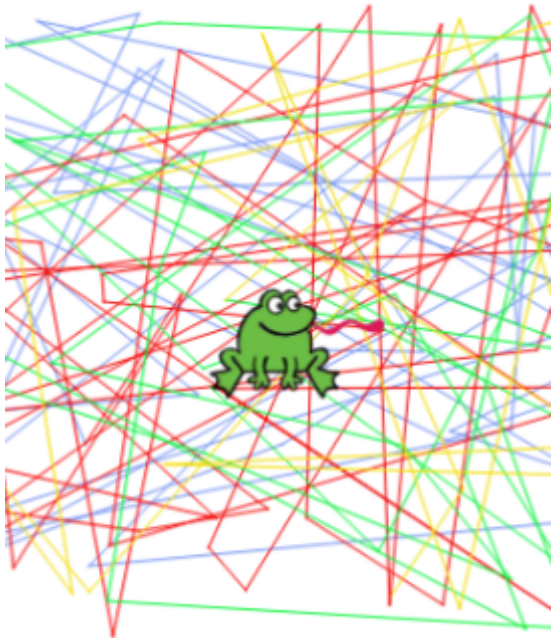
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Random Drawing

Make your sprite draw as it moves randomly around the stage.



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Random Drawing

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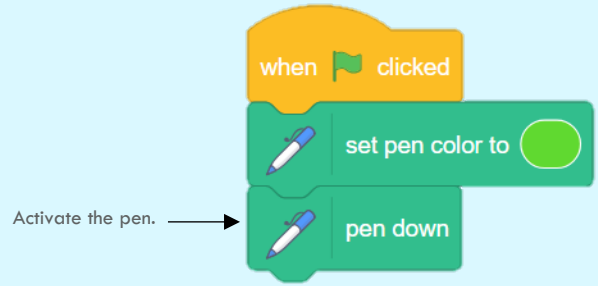
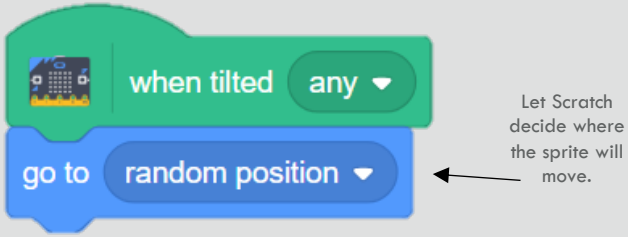
GET READY



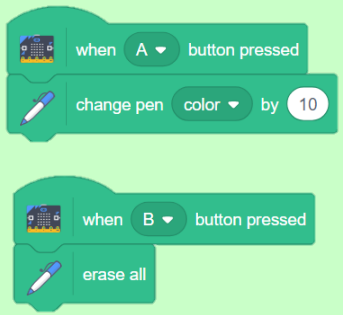
ADD THIS CODE



TRY IT

Put it all together. Add the **A and B buttons** to change the effects.

Can you make your sprite draw?



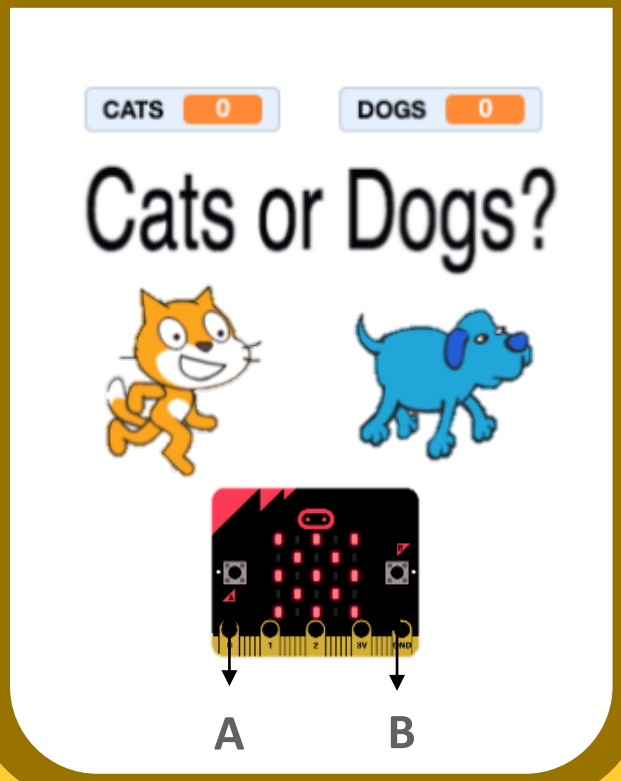
Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Voting Machine

Use your micro:bit to count responses.



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Voting Machine

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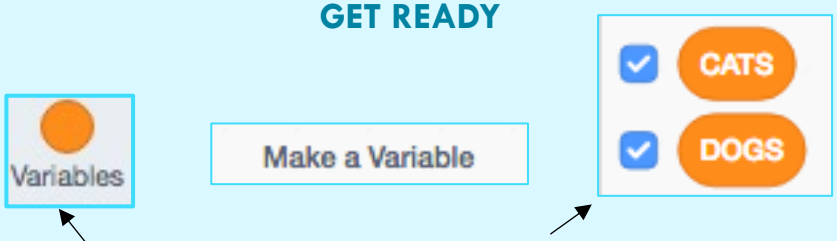
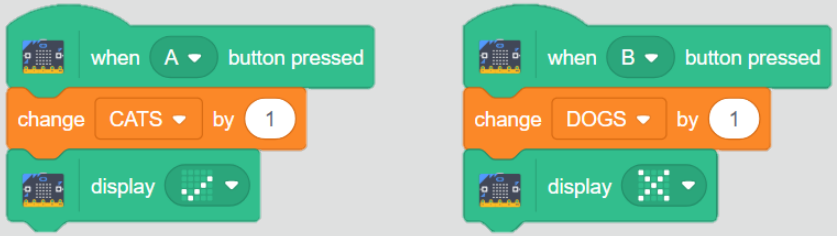
GET READY



Choose in the Blocks Palette.

Make 2 variables and check the boxes to make them appear on the screen.

ADD THIS CODE



Variables will increase with each button press.

TRY IT

Change the variables by clicking the **A button** or **B button**. What do you notice on your micro:bit?

CHALLENGE: Can you add a RESET script to change the numbers back to zero?

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Stamp and Record

Use the stamp function to add sprites as the voting machine advances.

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Stamp and Record

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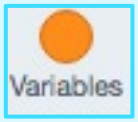
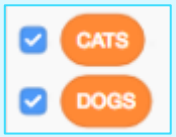
GET READY



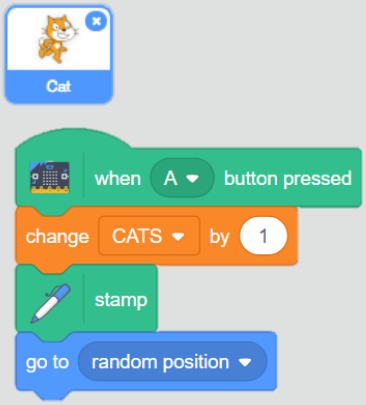
Choose in the Blocks Palette.

Make a Variable



Make 2 variables and check the boxes to make them appear on the screen.

ADD THIS CODE



TRY IT

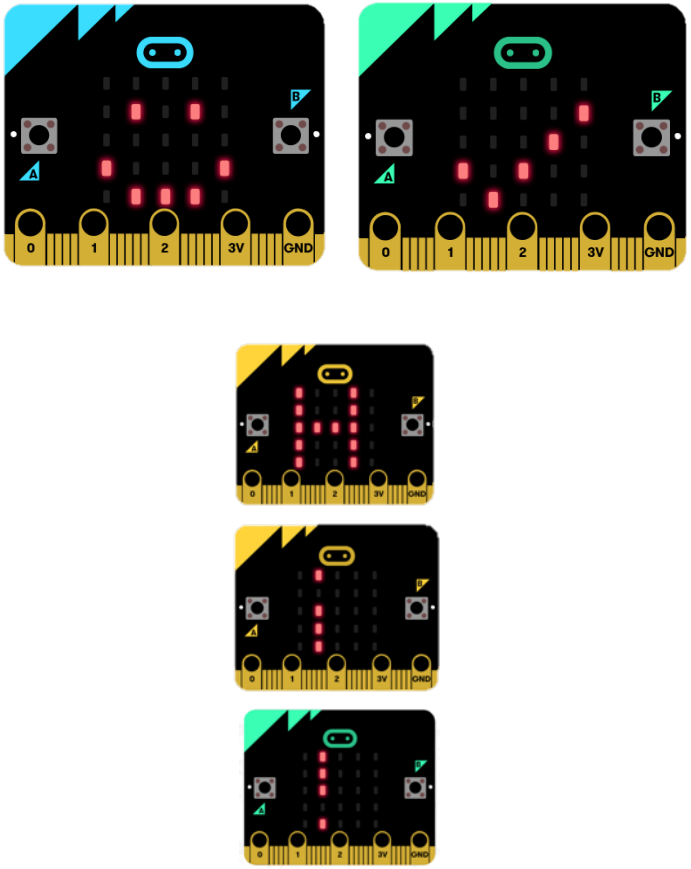
Add a RESET code and then try it out! Do stamped sprites appear?

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Display Cards



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Display Cards

Use these cards in this order:

1. Say Hello
2. Add Your Name
3. Display Image
4. Create an Emoji
5. Tell Time
6. Make a Wristband
7. Make a Badge

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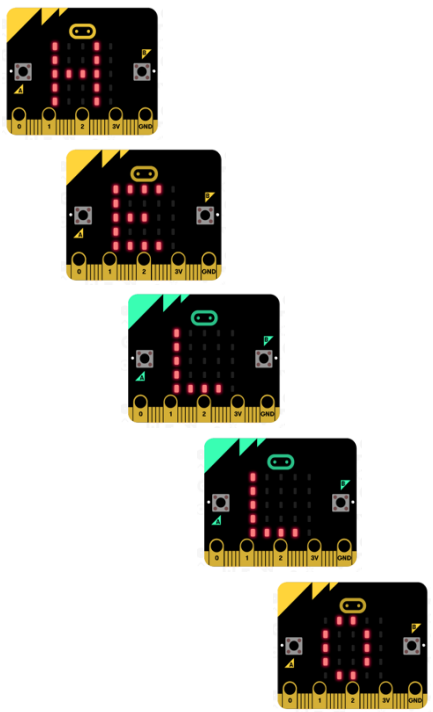
Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Say Hello

Make your micro:bit display a greeting.



microbit.org/scratch 1 micro:bit

Say Hello

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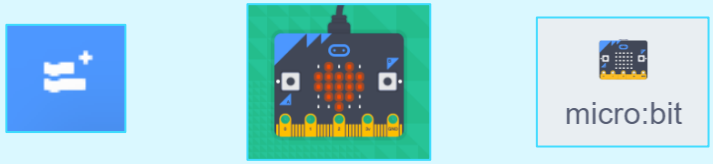
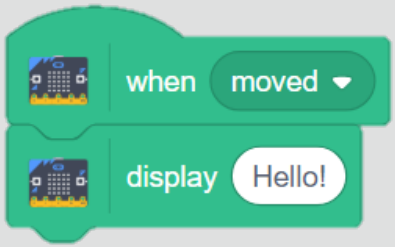
GET READY

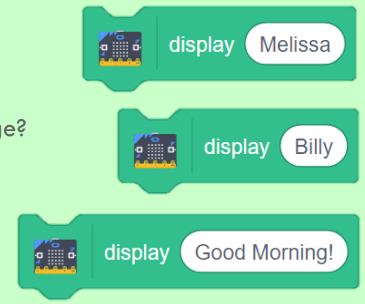


Connect your micro:bit to Scratch.

ADD THIS CODE



TRY IT



Move your micro:bit. Can you read the message?

CHALLENGE: What else can you make the display say?

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

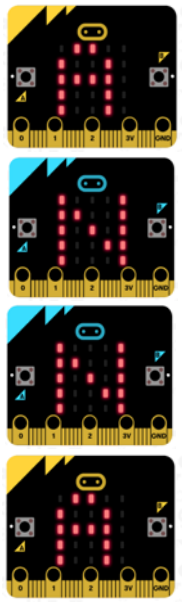
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Add Your Name

Program the micro:bit to display your name.



ANNA

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Add Your Name

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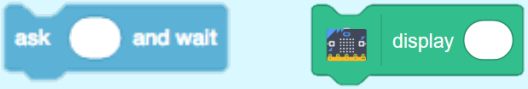
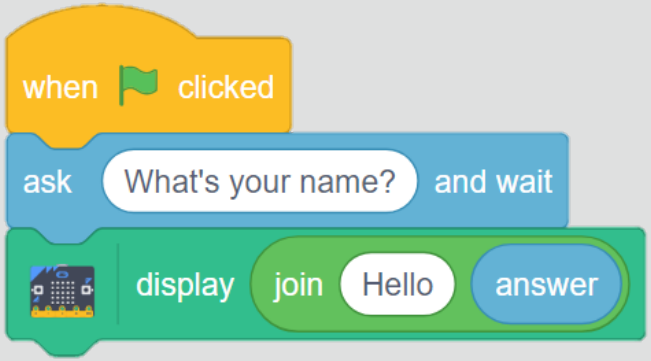
GET READY



Use the Sensing blocks to interact with your micro:bit.

ADD THIS CODE



Combine your answer into a phrase.

TRY IT

Start the program and type your name.
What happens on your micro:bit?

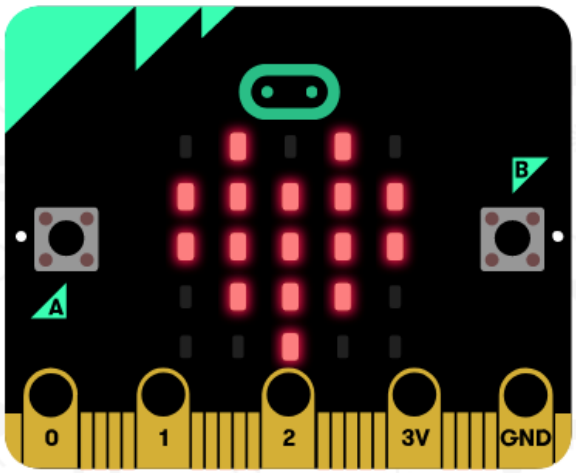
Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Display Image

Depict an image on your display.



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Display Image

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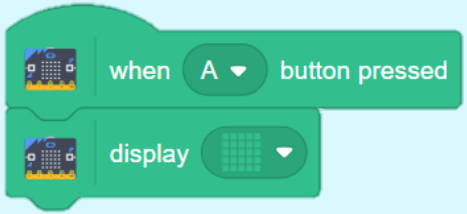
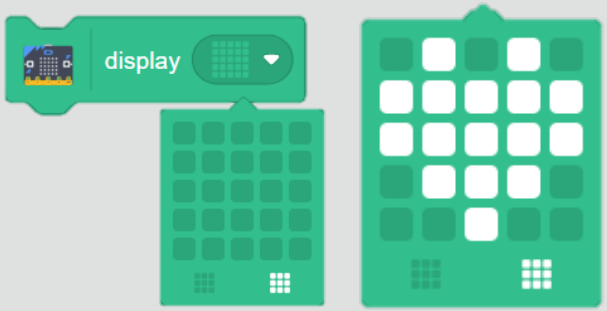
ADD THIS CODE



MAKE A DESIGN

Use the 5x5 grid to create your design.

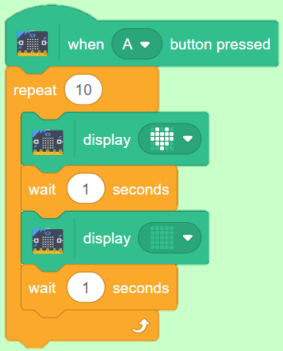
Turn on/off each light by clicking on the desired blocks.



TRY IT

Click the **A button** to display the image on your micro:bit.

CHALLENGE: Can you make the lights in your image blink on and off repeatedly?



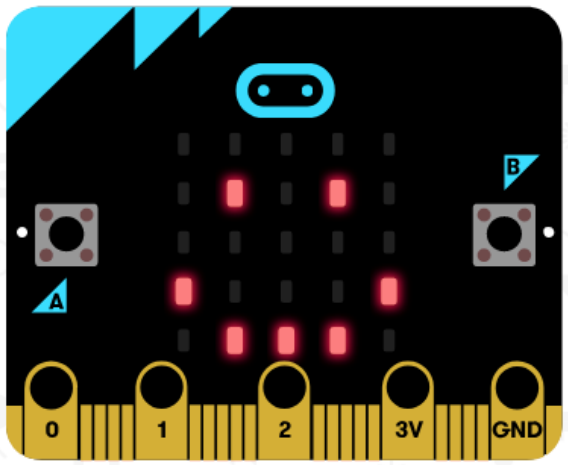
Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Create an Emoji

Create your own emoji for the display.



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Create an Emoji

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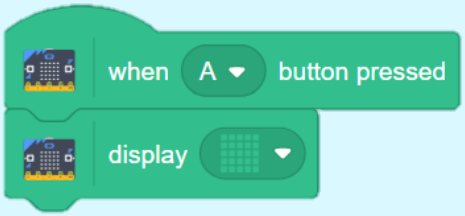
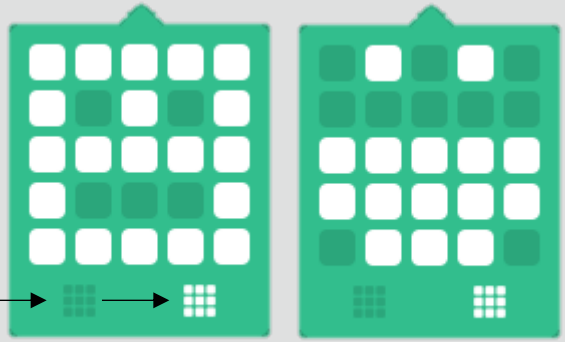
ADD THIS CODE



MAKE A DESIGN

Click the individual blocks to turn them on in your design.

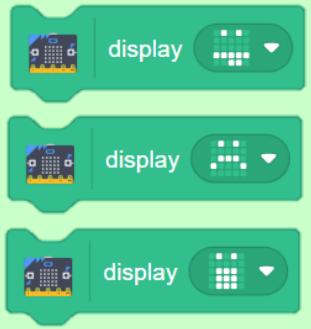
Click to turn all lights off/on.



TRY IT

Click the **A button** to display the image on your micro:bit.

CHALLENGE: What other emojis can you create?



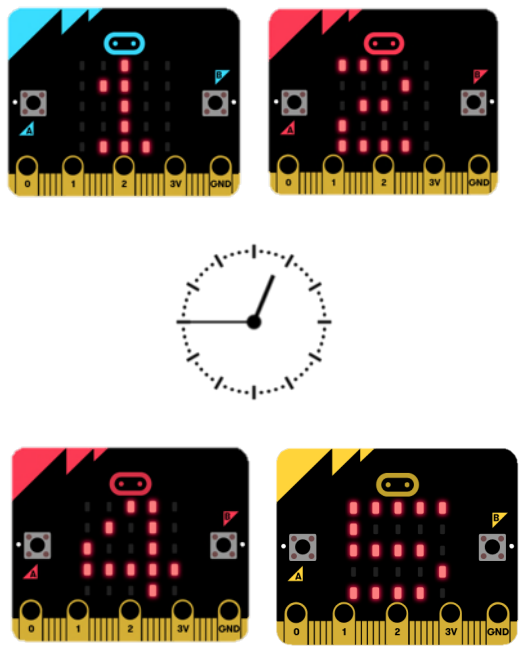
Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Tell Time

Display the correct time on your micro:bit.



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Tell Time

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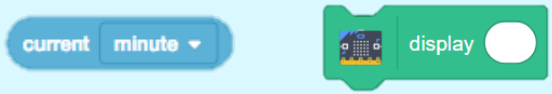
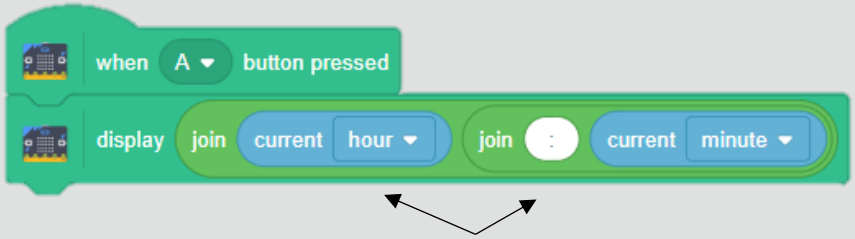
GET READY



Use the Sensing blocks to interact with your micro:bit.

ADD THIS CODE

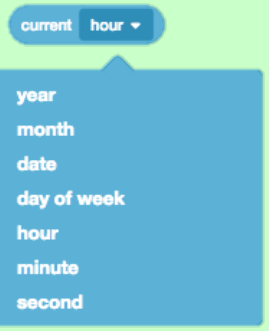


Join the current hour and minute together using these Operator blocks.

TRY IT

Click the **A button** to display the time on your micro:bit.

CHALLENGE: What other information can you make your micro:bit display?



Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Make a Wristband

Wear your micro:bit on your wrist!

Based on project from Microsoft workshop

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Make a Wristband

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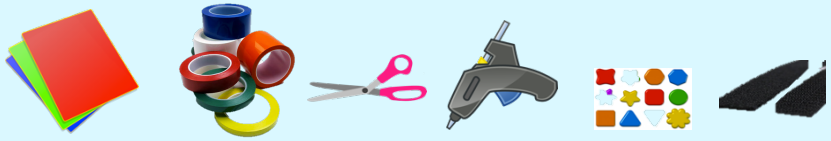
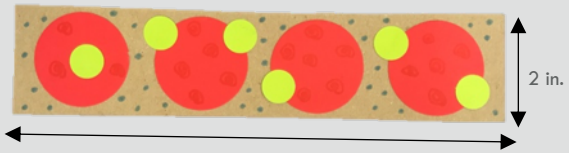
MATERIALS



Heavy paper or Duct tape (2in) | Scissors | Hot glue or Glue Dots | Craft materials | Velcro

PROCEDURE



Use heavy paper or folded Duct tape to create the wristband.

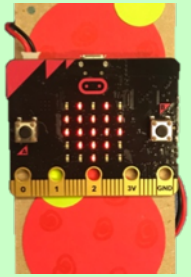
Decorate with craft materials.

Front

Back

Adhere Velcro fasteners.

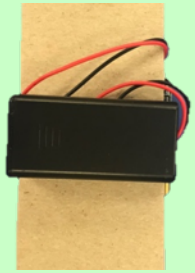
TRY IT



Use a small amount of hot glue or a Glue Dot to secure your micro:bit to the front of the wristband.

Attach the battery pack to the back.

***Hot glue placed on the back of the micro:bit (avoiding the pins) will not cause harm.



Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Make a Badge

Wear your micro:bit on your shirt!

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Make a Badge

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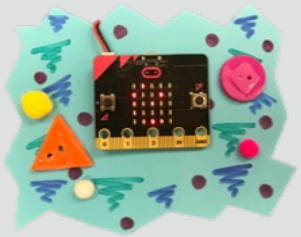
MATERIALS

Craft foam | Scissors | Hot glue or Glue Dots | Craft materials | String | Paper clip

PROCEDURE



BACK

Use foam to design the shape of your badge. Decorate with craft supplies.

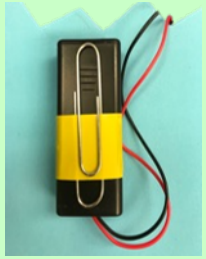
Attach your micro:bit with hot glue to the front of the badge. Connect the battery pack to the back.

TRY IT

Add a paperclip to the back of the battery pack to clip the badge onto your shirt!

To wear your badge as a necklace, poke a hole at each of the top corners and attach a string.

***Hot glue placed on the back of the micro:bit (avoiding the pins) will not cause harm.



Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Music Cards

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Music Cards

Use these cards in this order:

1. **Play a Note**
2. **Play a Chord**
3. **Sound Effects**
4. **Make an Instrument**
5. **Wire the Instrument**
6. **Program the Pins**
7. **Attach the micro:bit**
8. **Set the Stage**

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Make a Card

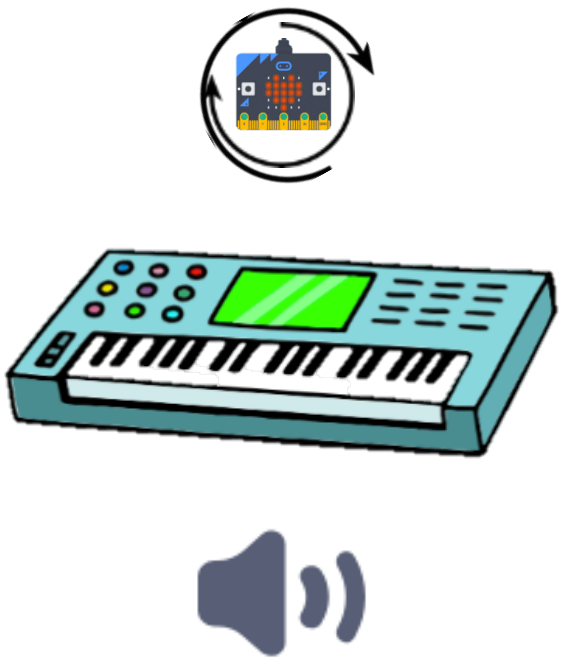
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Play a Note

Make your sprite play a sound.



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Play a Note

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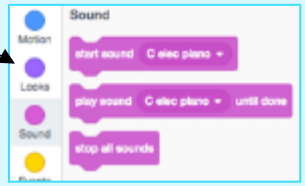
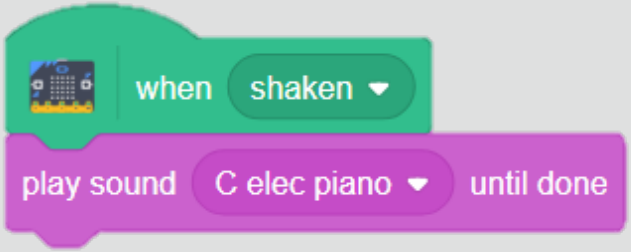
GET READY

Add a sprite.

Corresponding notes appear in the Sound blocks.



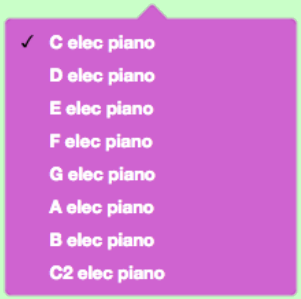
ADD THIS CODE



TRY IT

Shake your micro:bit. Does the note play?

CHALLENGE: What happens when you add multiple notes?



Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Play a Chord

Make your sprite play multiple notes at once.

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Play a Chord

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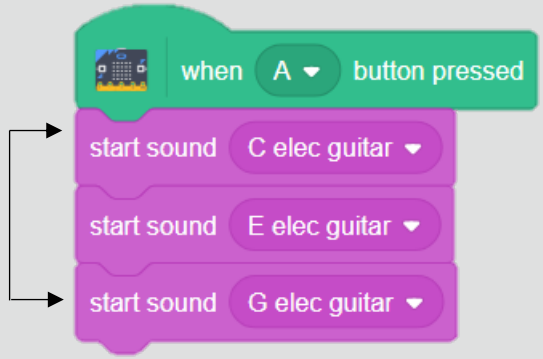
GET READY

Look closely at these two blocks. What is the difference between them?

ADD THIS CODE

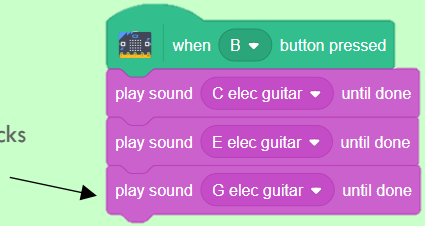


All three notes will play at the same time.

TRY IT

CHALLENGE: Can you make any other chords?

What happens when you use these blocks instead?



Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Sound Effects

Change the pitch and volume of your notes.

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Sound Effects

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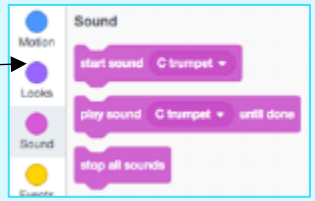
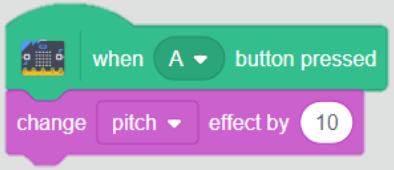
GET READY

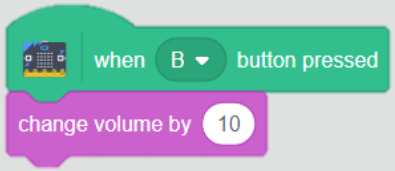
Add a sprite.

Corresponding notes appear in the Sound blocks.



ADD THIS CODE



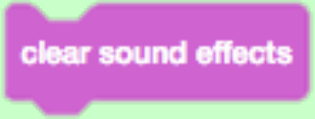


TRY IT

Press the A and B buttons to change the sound.

What other sound effects can you add?

CHALLENGE: Can you add a RESET block to make your sounds go back to their original notes?



Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

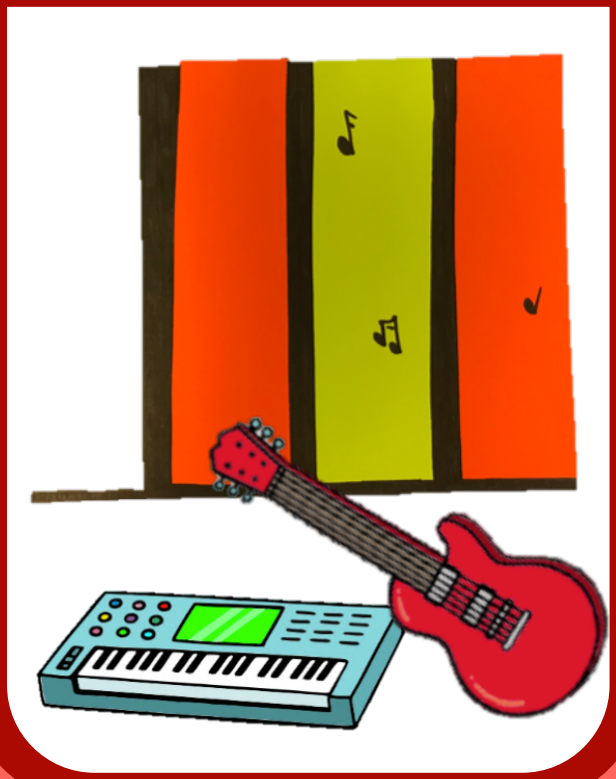
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Make an Instrument

Create your own instrument using cardboard and craft materials and play music via your micro:bit.



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Make an Instrument

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MATERIALS

Cardboard or heavy paper.

Scissors

Markers or crayons

Glue stick

Craft materials

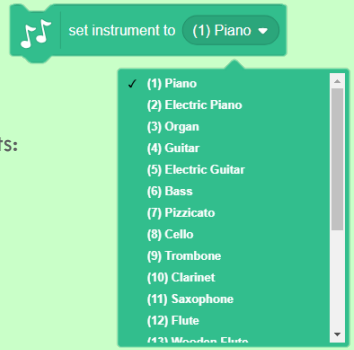
PROCEDURE

Using cardboard or heavy paper, draw your favorite instrument.

Decorate with craft supplies.

Leave room to add conductive materials. *The micro:bit will work by creating circuits that close and open as you touch the keys on your instrument!*

TRY IT



What instruments can you make?

Scratch offers sounds for the following instruments:

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Wire the Instrument

Use your instrument to create a circuit using conductive materials.

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Wire the Instrument

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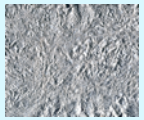
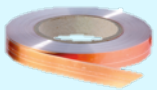
MATERIALS



Tinfoil

or



Copper Tape

Scissors

Glue stick

Craft materials

PROCEDURE

Cut strips of tinfoil, or add copper tape to each key or string.

Make sure the metal touches an edge on your instrument so that it can be connected to the micro:bit.

TRY IT

Decorate. Make sure to leave your metal areas open!

Tinfoil and copper tape are both metal, which means they will conduct electricity. When your micro:bit is attached and you touch a conductive area, the computer will play the note!

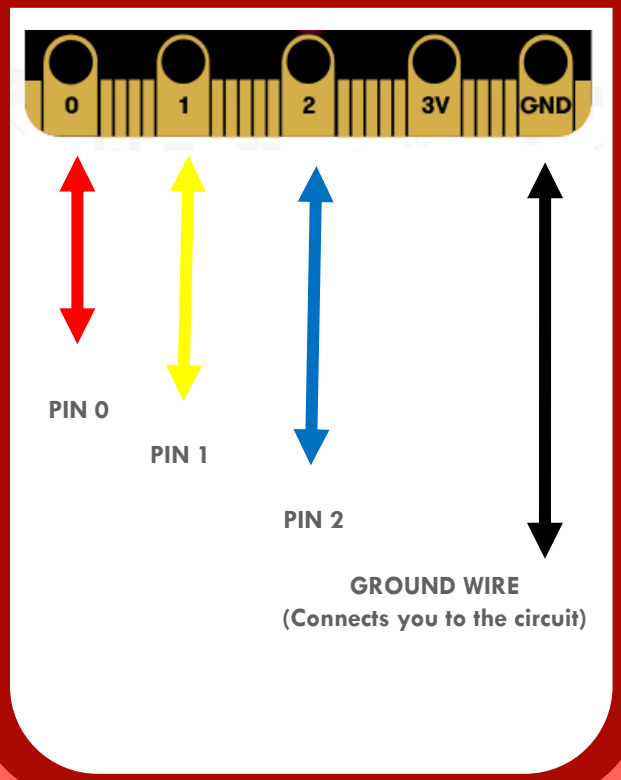
Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half
2. Glue the backs together
3. Cut along the dashed line

Program the Pins

Create codes that will correspond to the keys or strings on your instrument.



microbit.org/scratch

micro:bit

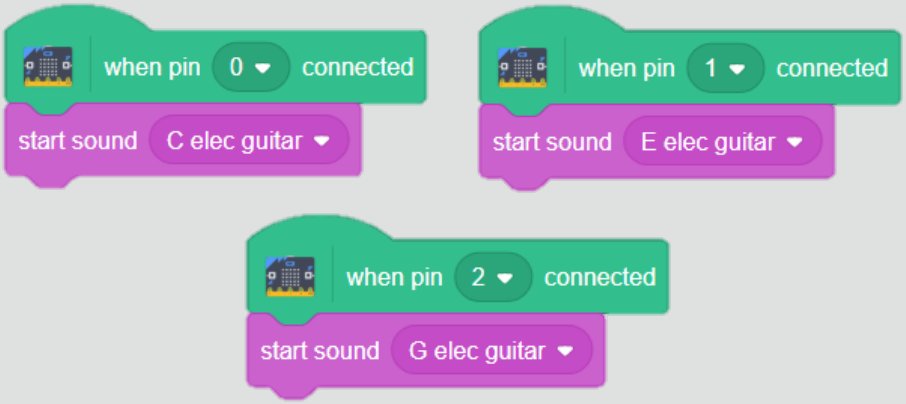
Program the Pins

microbit.org/scratch

MATERIALS

Alligator Clips

ADD THIS CODE



TRY IT

Clip your wires onto the pins as shown. Hold the ground wire in one hand and touch the metal end of one of the other wires. Does a note play?

CHALLENGE: Can you play multiple notes at once?

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

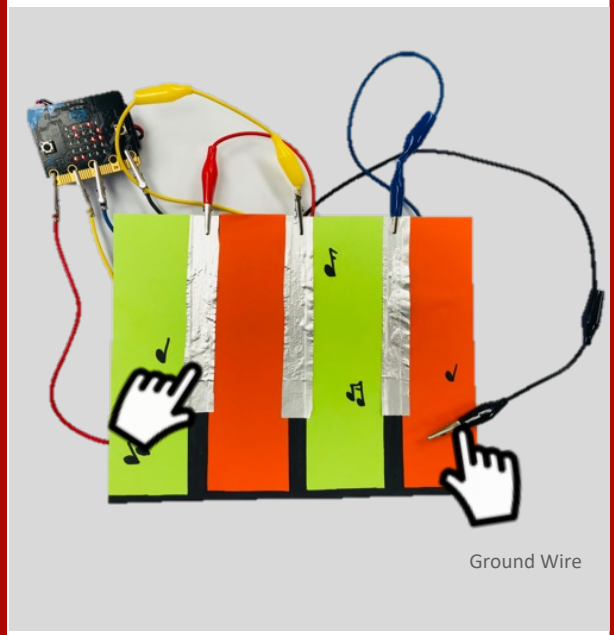
1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Attach the micro:bit

Use wires to connect the micro:bit to your instrument.



microbit.org/scratch

7

micro:bit

Attach the micro:bit

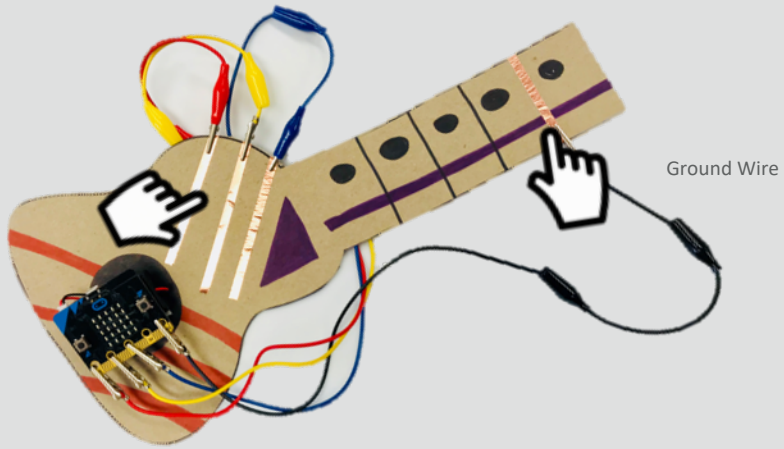
microbit.org/scratch

GET READY

Attach the end of each alligator clip to the conductive areas of your instrument.

PROCEDURE

Either hold the ground wire in your hand, or attach it to a conductive spot on the instrument that you know you will touch.



TRY IT

Rock on! Practice playing music on your instrument!

When you hold the ground wire and touch a key, you create a completed circuit between you and your computer, causing Scratch to play,

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Make a Card

1. Fold the card in half

2. Glue the backs together

3. Cut along the dashed line

Set the Stage

Make the sprites move on the screen as you play your instrument.

Set the Stage

microbit.org/scratch

GET READY

Add sprites and a background.

ADD THIS CODE

TRY IT

Put it all together!

Can you play your instrument while the animation plays on the screen?

Inspired by Scratch Cards created by Natalie Rusk scratch.mit.edu/cards

Scratch Jumping Cat

Step 1: Make it

What is it?

Get started with Scratch and micro:bit: make Scratch cat jump when you throw your own soft toy in the air.

How it works

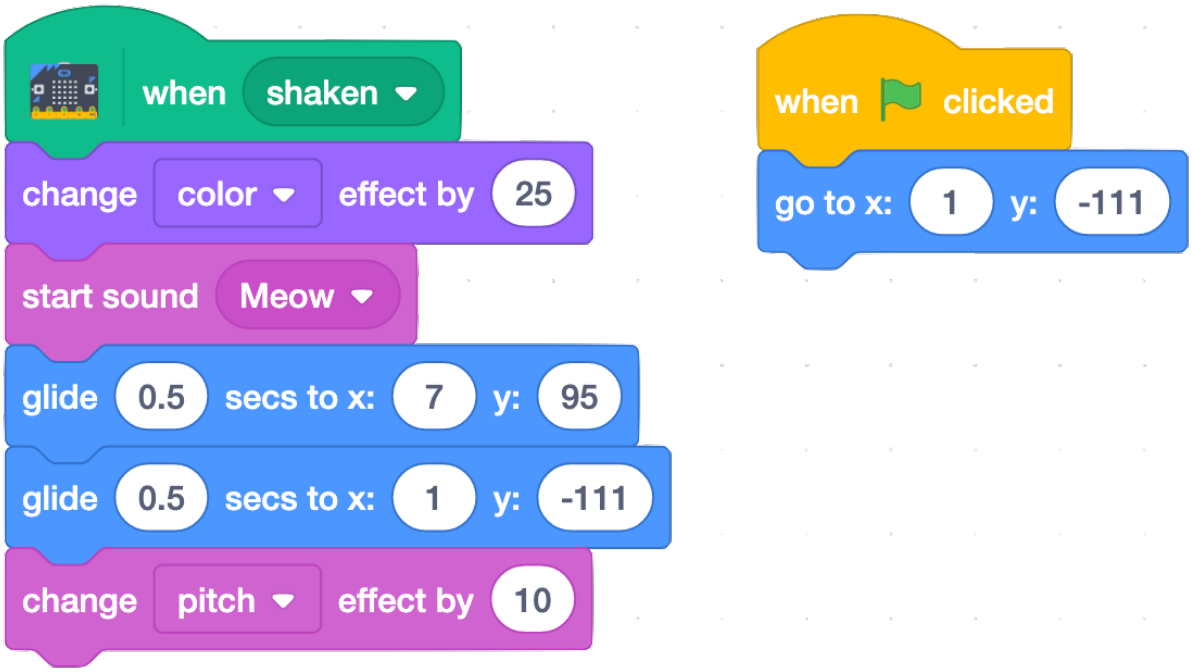
- Attach a battery pack to your micro:bit and connect it to Scratch, then attach it to a soft toy. Protect the micro:bit so that it doesn't get damaged if you drop it!
- Inspired by an awesome demo given by Kreg of the Scratch team, this program uses the micro:bit's accelerometer to sense when it's been thrown up in the air and makes the Scratch cat sprite jump at the same time.
- At the same time the sprite also changes colour, makes a meow sound and changes makes the pitch of the sound higher each time you throw it.
- It uses the glide block to make Scratch jump to the part of the screen each time, and then go back down again in a **sequence**.

What you need

- micro:bit and battery pack
- a suitable computer with Scratch link installed.
  See https://scratch.mit.edu/microbit for details on how to get Scratch working with micro:bit.
- soft toy or something soft and protective to put your micro:bit in

Step 2: Code it

Scratch



Scratch blocks for cat sprite

Download project

Step 3: Improve it

- Record your own sounds to replace the ‘meow’.
- Make something appear on the micro:bit’s display when you throw it up in the air.
- Change the sprite’s costume when you press a button on the micro:bit.
- Make Scratch cat jump higher each time you throw your micro:bit in the air.

Scratch Theremin

Step 1: Make it

What is it?

Make a spooky musical instrument you control by waving your hand.

How it works

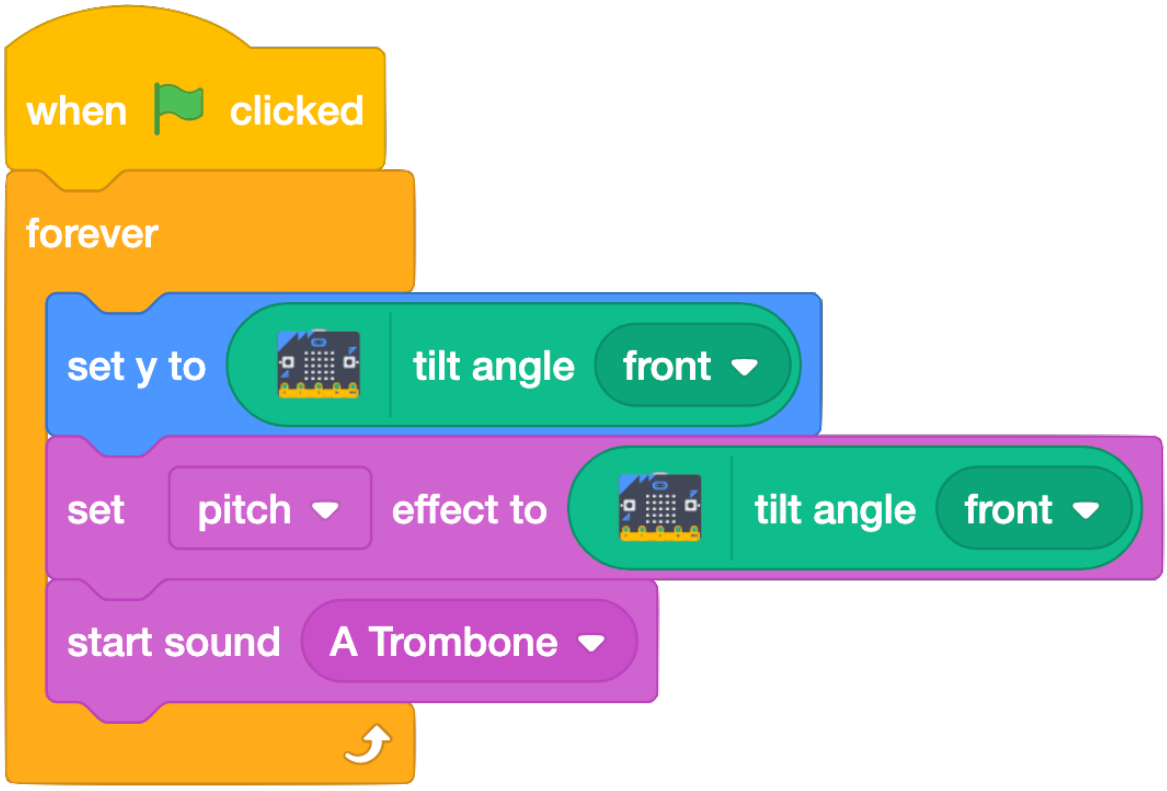
- A theremin is a musical instrument that makes spooky noises when you move your hands near it.
- The program runs in an infinite (forever) **loop** to constantly take readings from the micro:bit's accelerometer.
- It measures the angle at which you tilt it forwards and backwards: the greater the angle of tilt, the higher pitched the sound will be.
- Find out more about theremins here: https://en.wikipedia.org/wiki/Theremin

What you need

- micro:bit and optional battery pack
- a suitable computer with Scratch link installed.
  See https://scratch.mit.edu/microbit for details on how to get Scratch working with micro:bit

Step 2: Code it

Scratch



Download project

Step 3: Improve it

- Experiment with different instrument sounds.
- Record your own sounds and use them instead.
- Use the angle of tilt left and right to control the volume, like in a real theremin.

Scratch Boom-Box

Step 1: Make it

What is it?

Make your own sound machine using the micro:bit's buttons and accelerometer.

How it works

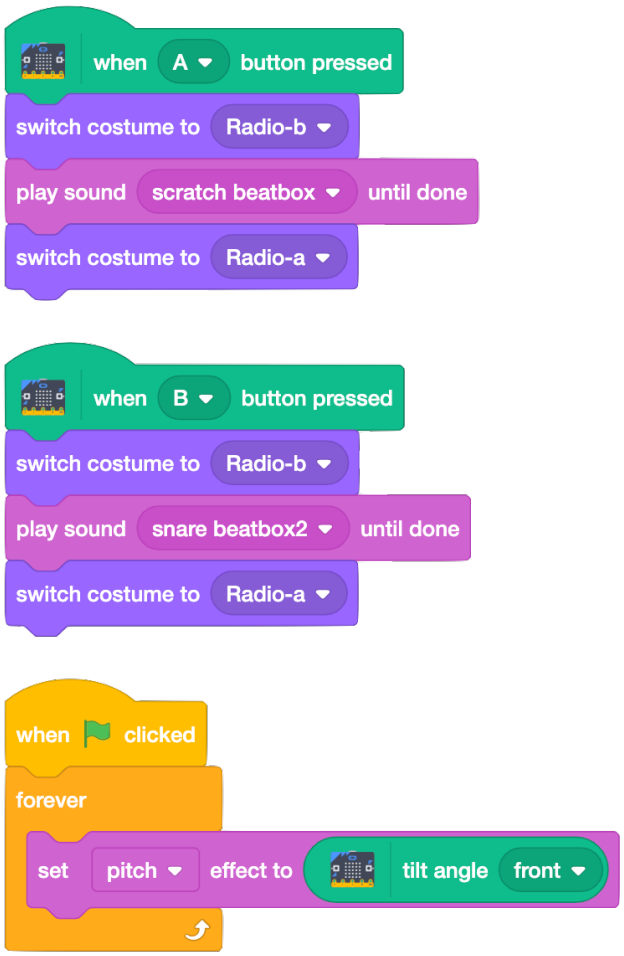
- Like the Scratch theremin project this uses the accelerometer to measure the angle of tilt to make sounds lower and higher in pitch.
- Instead of using a 'forever' loop to play a constant sound, this project plays two different beatbox sounds on your computer's audio **output** when you press micro:bit input button A or button B.

What you need

- micro:bit and optional battery pack
- a suitable computer with Scratch link installed.
  See https://scratch.mit.edu/microbit for details on how to get Scratch working with micro:bit

Step 2: Code it

Scratch



Download project

Step 3: Improve it

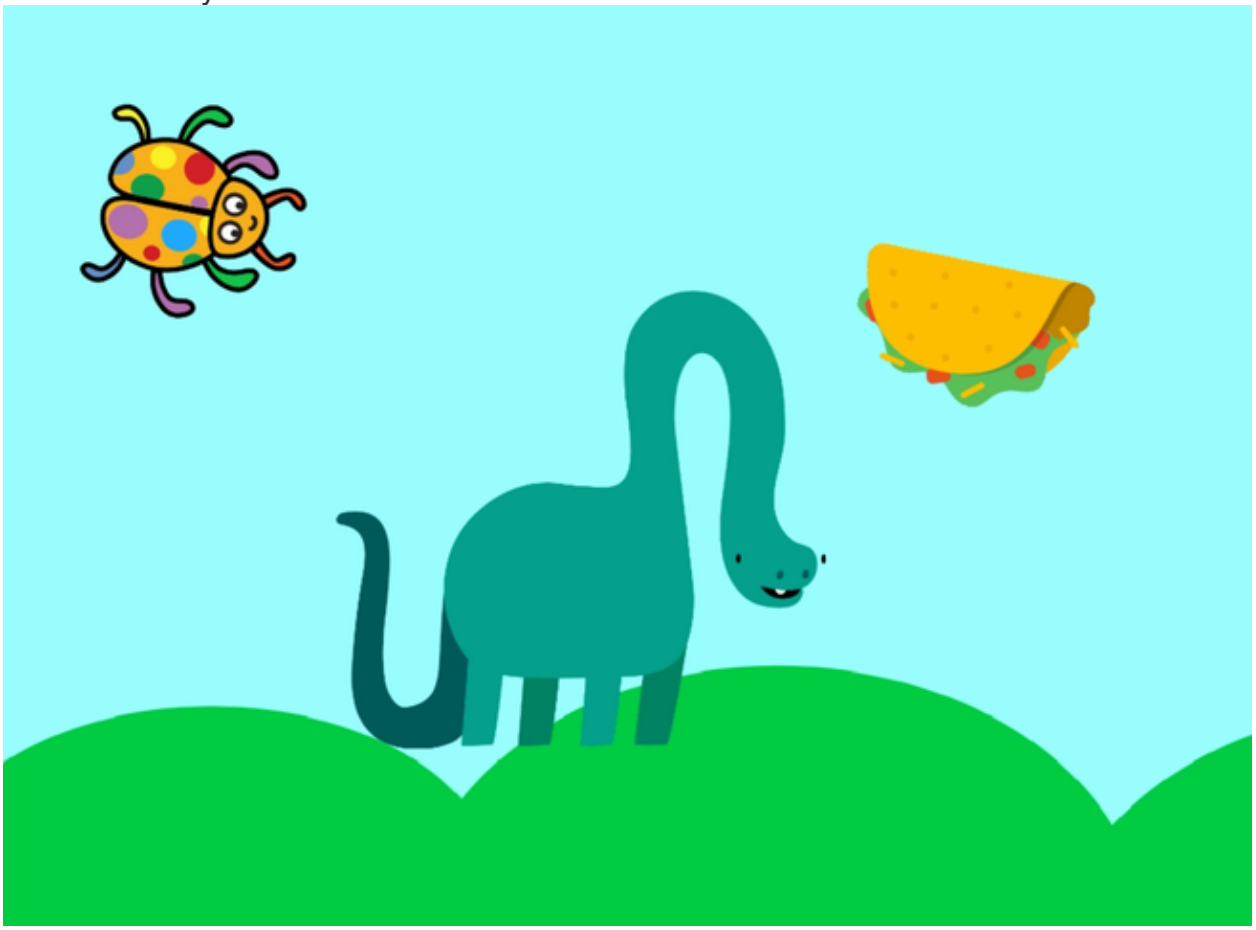
- Change the boom-box sounds or add others from Scratch's sound library.
- Record your own sounds, trigger them with button presses and change their pitch by tilting.
- Use sequences of notes to play different tunes when you press different buttons.

Scratch Hungry Dino

Step 1: Make it

What is it?

Learn how to make a wireless game controller with your micro:bit and Scratch - and help feed tacos to your dinosaur!



How it works

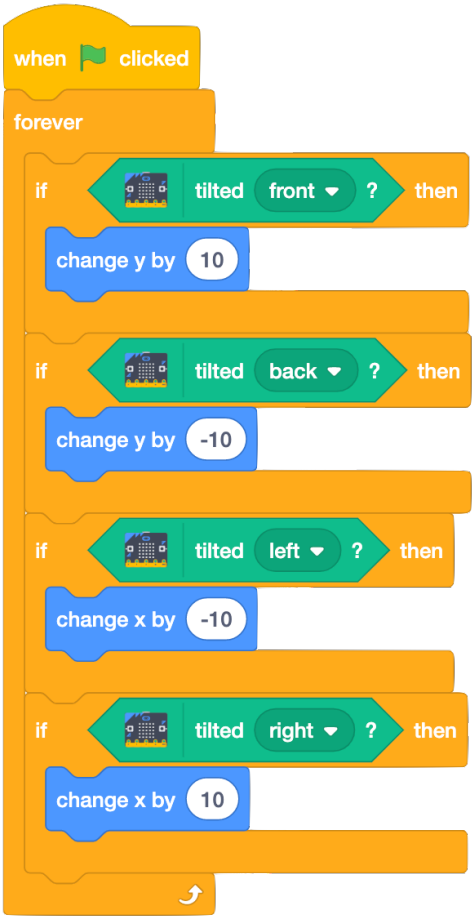
- To play the game, connect your micro:bit to Scratch, then tilt it to move the dinosaur to catch and eat tacos.
- Every time the dinosaur touches a taco the points **variable** increases by 1.
- Avoid the bugs – touch them and the points variable is reduced by 1.
- The program uses the micro:bit's accelerometer input readings to sense which way you tilt it.
- It then uses **selection** to decide what happens next: if you tilt it to the front or back it moves the dinosaur sprite up and down (in the Y-axis).

- If you tilt it left and right it moves the dinosaur across the screen in the X-axis.
- The program also sends your score to the micro:bit so it appears on its LED display output.

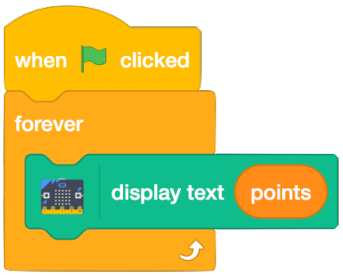
What you need

- micro:bit and optional battery pack
- suitable computer with Scratch link installed. See https://scratch.mit.edu/microbit for details on how to get Scratch working with micro:bit

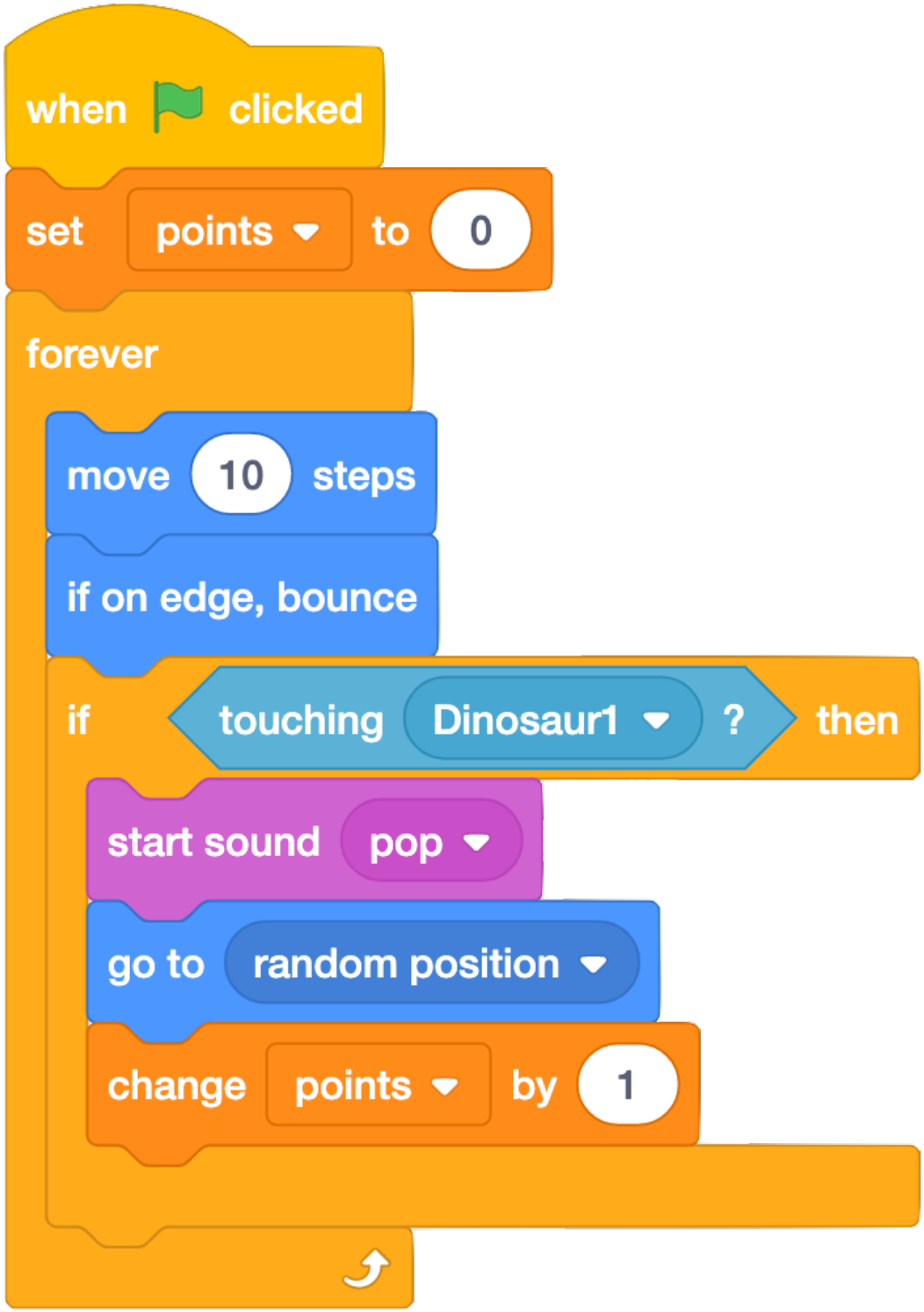
Step 2: Code it



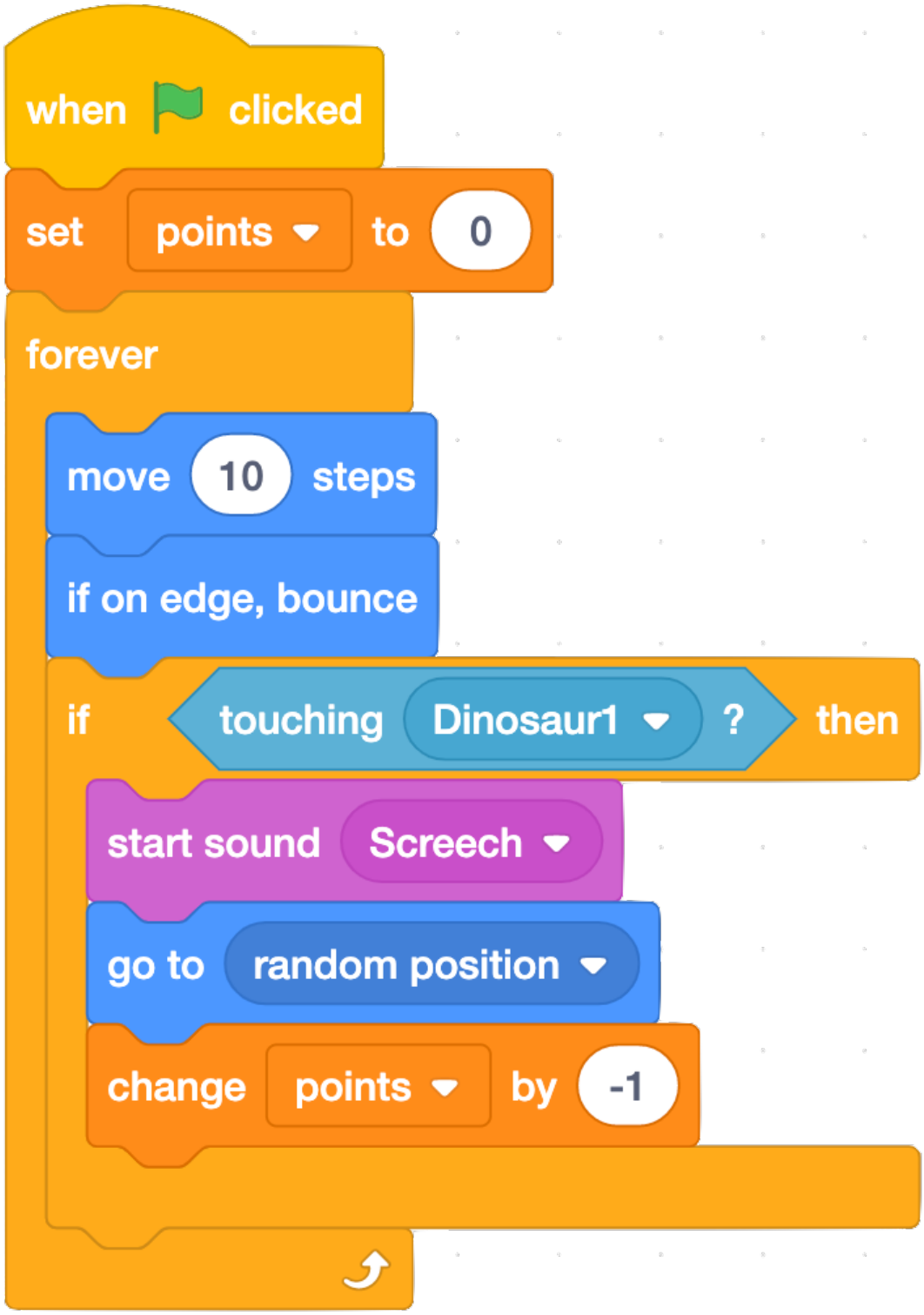
Scratch



Blocks for the dinosaur sprite



Code blocks for the taco sprite



Code blocks for the ladybug (ladybird) sprite

Download project

Step 3: Improve it

- Add a winning or losing score to end the game.
- Add more bugs or tacos or other goodies and baddies.
- Add levels to the game to make it harder as you progress.

Scratch Paint

Step 1: Make it

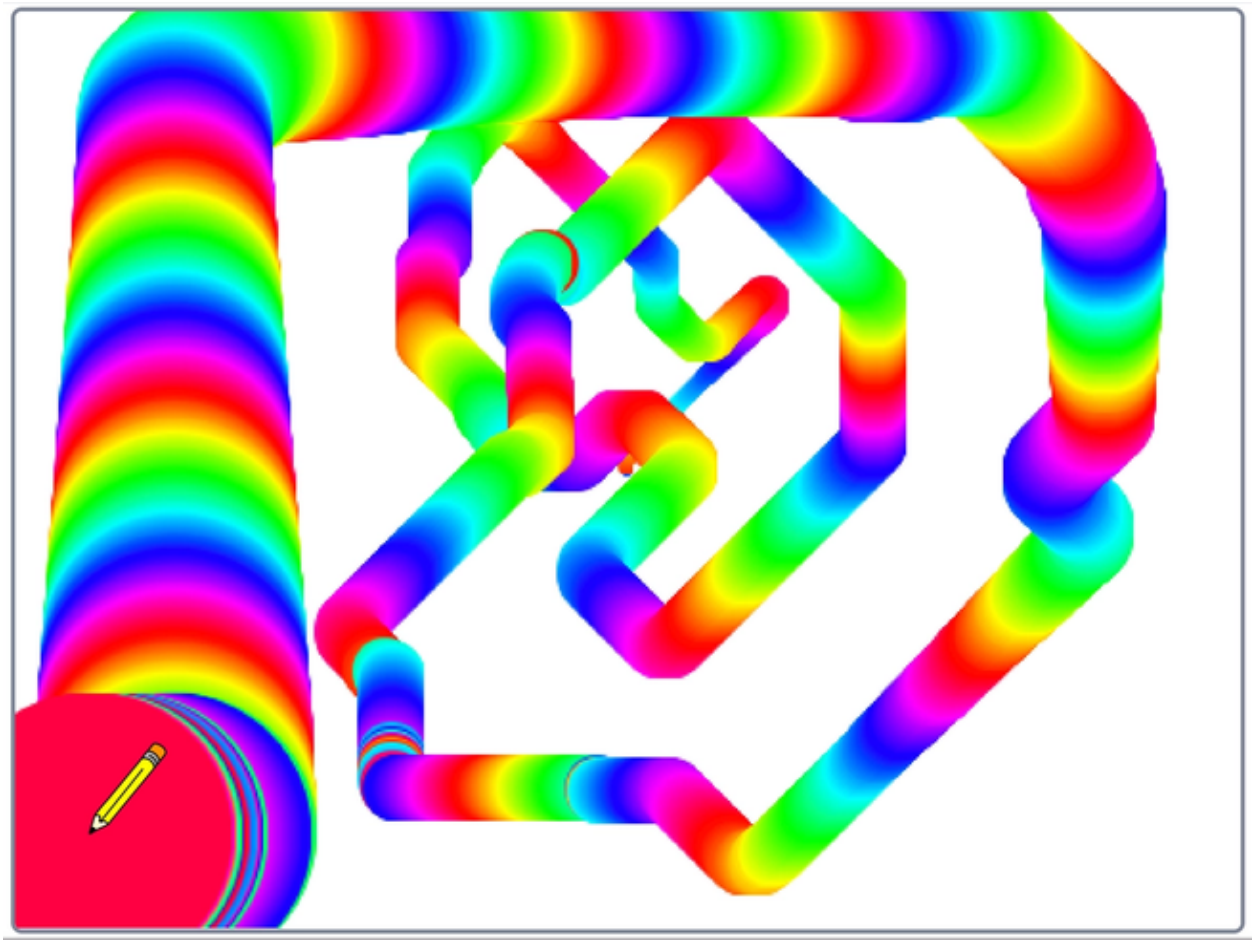
What is it?

Use your micro:bit to control a Scratch drawing program.

How it works

- This program uses the micro:bit's accelerometer to guide the pencil sprite around the screen, drawing a line as it moves.
- Tilting the micro:bit left or right makes the pen to move left or right in the X-axis, across the screen.
- Tilting the micro:bit forwards and backwards makes the pen move up and down, in the Y-axis.
- If you tilt it diagonally you get diagonal lines.
- You can control the thickness of the pen lines with micro:bit's A and B input buttons.
- Shake it to use the micro:bit's accelerometer input to raise and lower the pen, so you can move around without making a mark.

- The program keeps track the pen's status (whether it's up or down) using a variable called **penUp**. It shows different icons on the micro:bit's output display so you know if the pen is up or down.

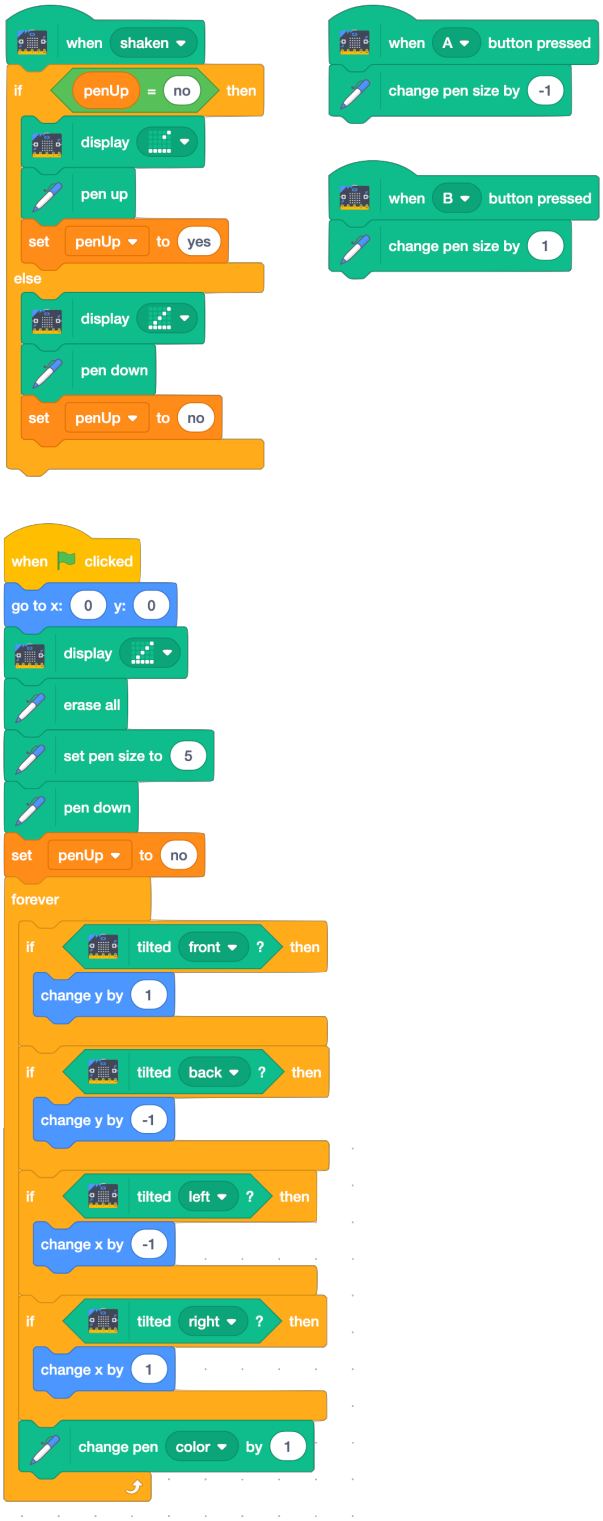


What you need

- micro:bit
- suitable computer with Scratch link installed. See https://scratch.mit.edu/microbit for details on how to get Scratch working with micro:bit.
- optional battery pack

Step 2: Code it

Scratch



Code blocks for pencil sprite

Download project

Step 3: Improve it

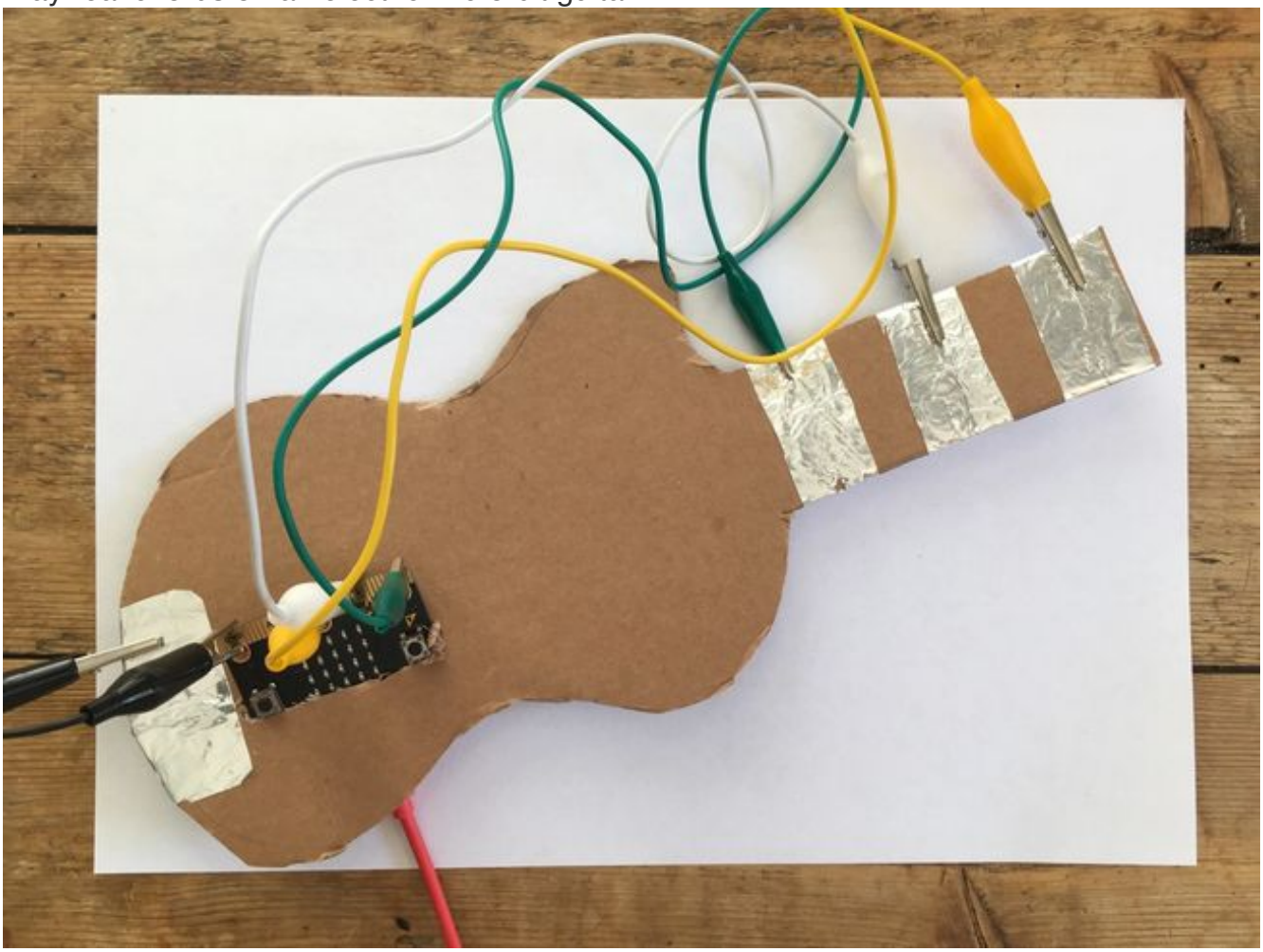
- Add a way of controlling when the colour changes.
- Modify the program so shaking or ‘jumping’ the micro:bit clears the screen.
- Show the pen thickness on the micro:bit’s display.

Scratch Guitar

Step 1: Make it

What is it?

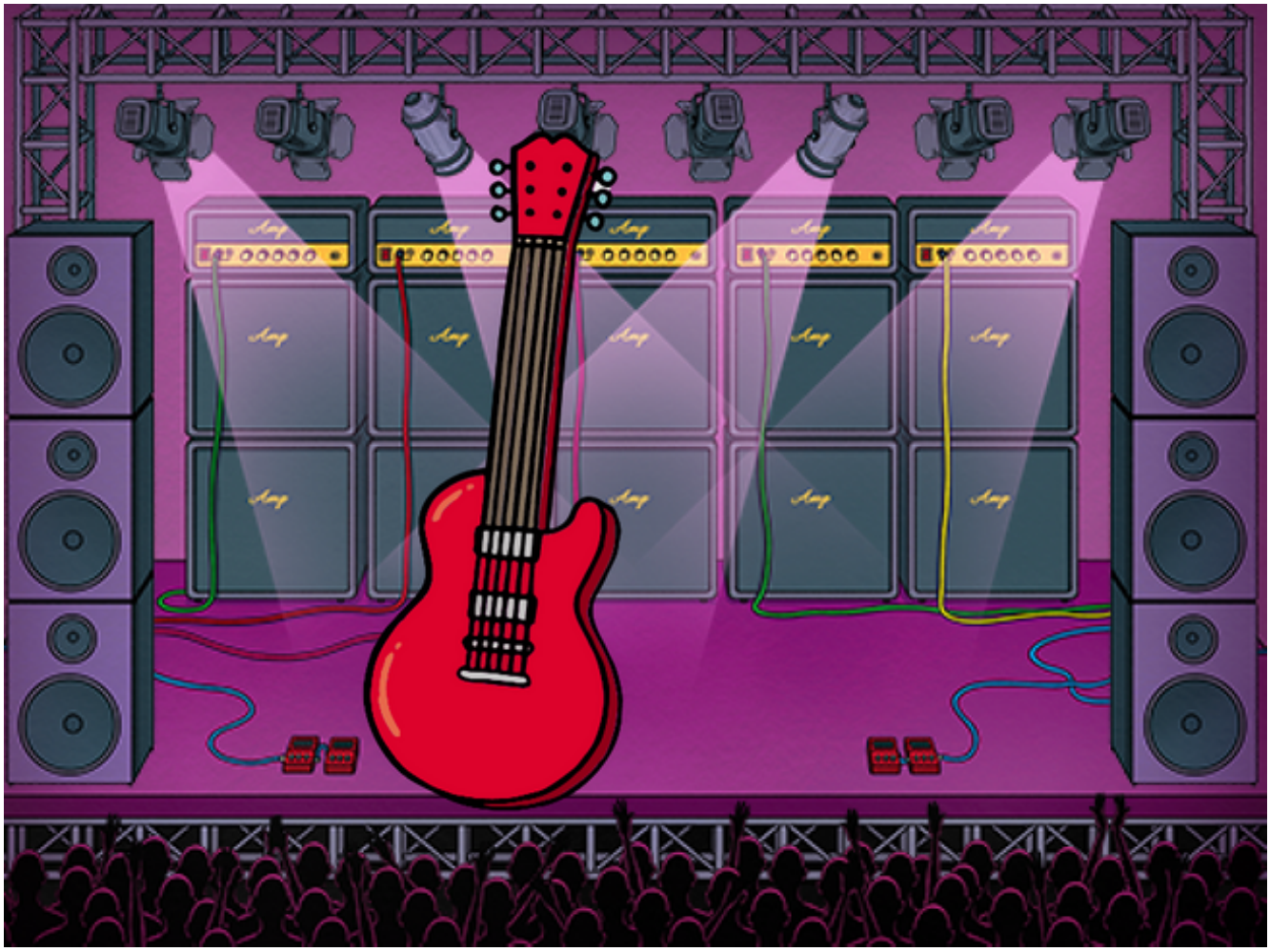
Play real chords on an electric micro:bit guitar.



How it works

- Make a guitar or keyboard from cardboard and foil like the one in the picture.
- Connect tin foil pads to the 0, 1, 2 and GND input pins on the micro:bit.
- When you touch the GND pin and one of the other pins, the program plays the note F, A or C in a guitar sound on your computer's audio output.
- If you press them all together it plays the 3 notes at the same time. This is an F major chord.

- Pressing button A or B on the micro:bit causes the program to shift the pitch up or down an octave (a pitch shift of +120 or -120 is up or down one whole octave – 8 notes).

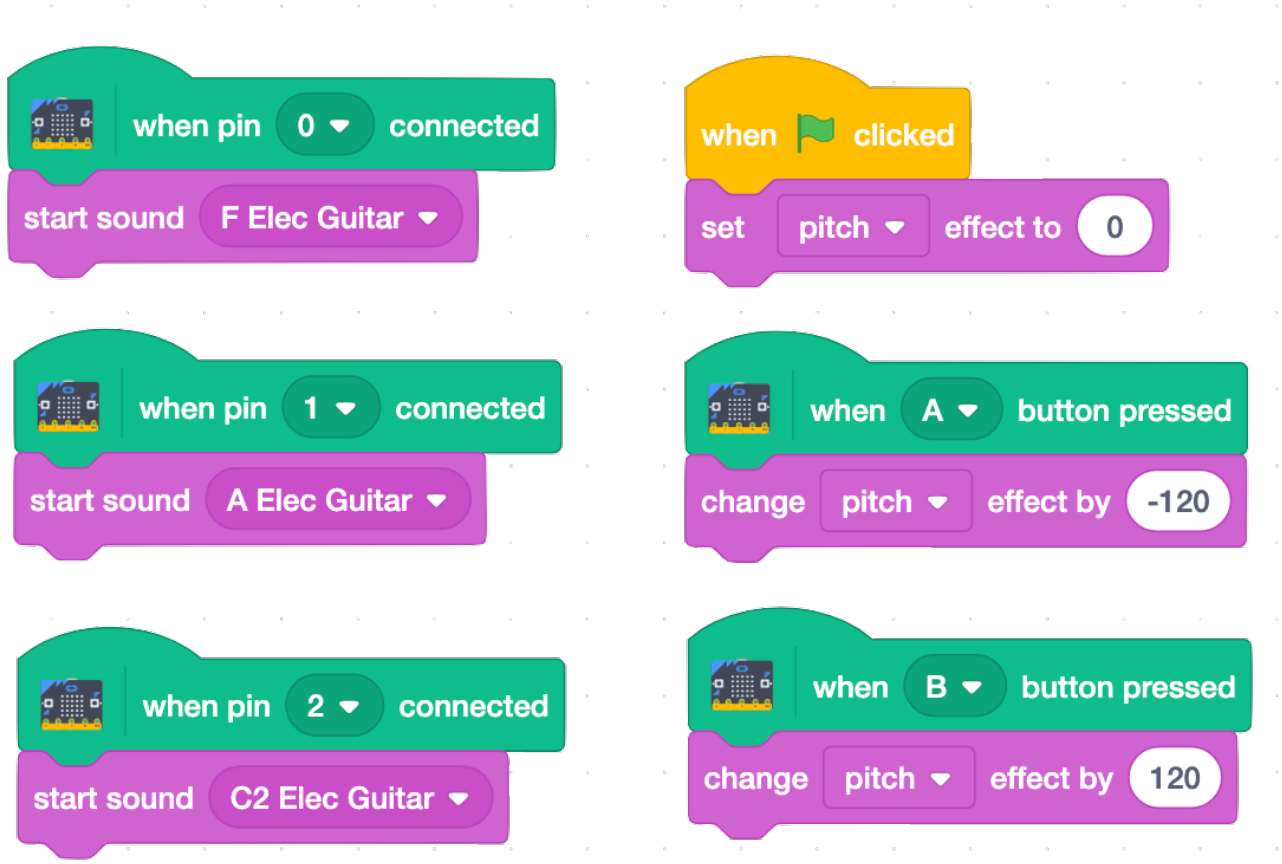


What you need

- micro:bit and optional battery pack
- suitable computer with Scratch link installed. See https://scratch.mit.edu/microbit for details on how to get Scratch working with micro:bit
- 4 crocodile clip leads
- cardboard, scissors, glue, tin foil

Step 2: Code it

Scratch



Code blocks for the guitar sprite

Download project

Step 3: Improve it

- Make the pitch change more subtle with smaller numbers: try 12 instead of 120.
- Add a volume control by measuring the angle of tilt of your micro:bit guitar.
- Add more chords or change the instrument sound in Scratch.