

Make a Card



1. Fold the card
in half

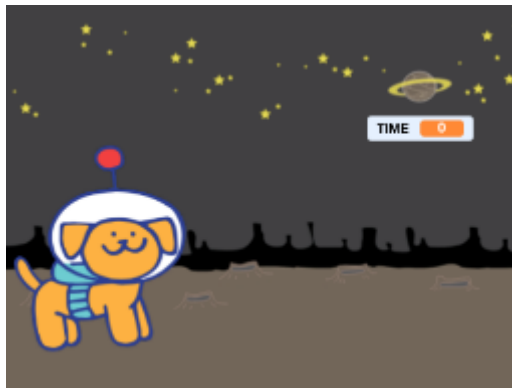
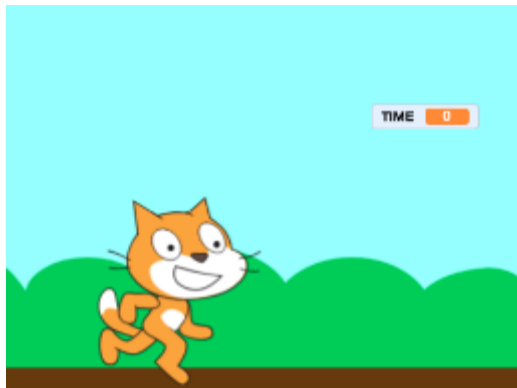


2. Glue the backs
together



3. Cut along the
dashed line

Stopwatch Cards



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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microbit.org/scratch



Make a Card



1. Fold the card in half



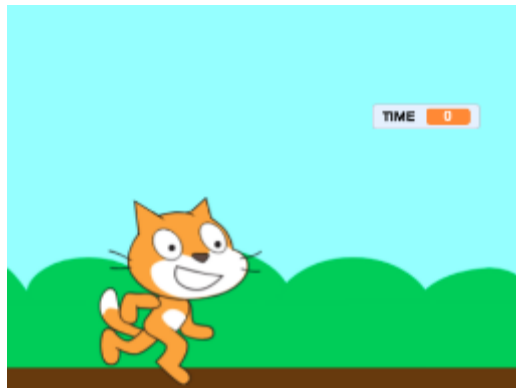
2. Glue the backs together



3. Cut along the dashed line

Create a Variable

Add a changeable value on the screen.



TIME

1

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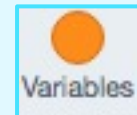
1

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Create a Variable

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GET READY



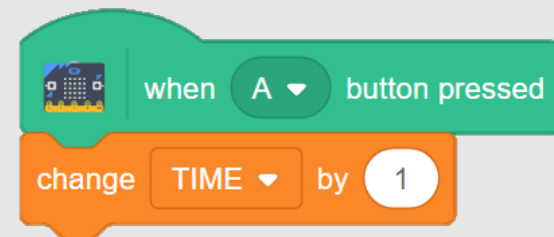
Choose in the Blocks Palette.

Make a Variable



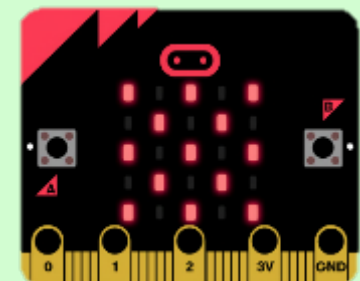
Add a checkmark to your variable to make it appear on the screen.

ADD THIS CODE



TRY IT

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



Make a Card



1. Fold the card in half



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Start the Clock

Add a loop to increase the time on the clock.

TIME

0

TIME

2

TIME

5

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2

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Start the Clock

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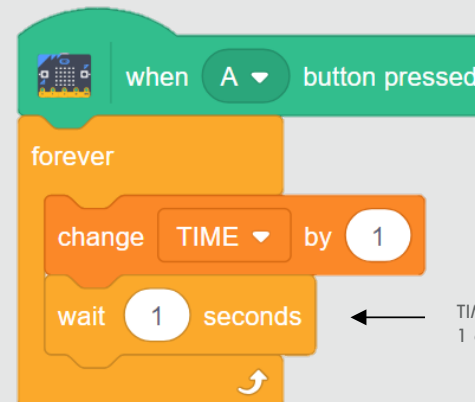
GET READY



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?



Make a Card



1. Fold the card in half



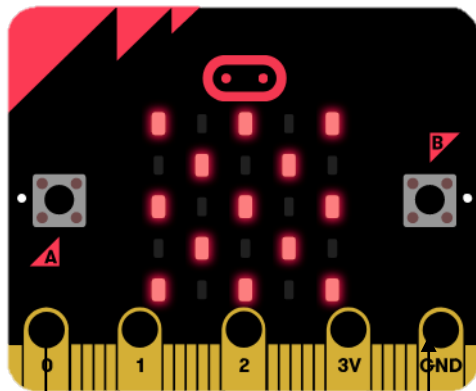
2. Glue the backs together



3. Cut along the dashed line

Stop and Reset

Control your stopwatch with the A and B buttons.



A

B

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3

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Stop and Reset

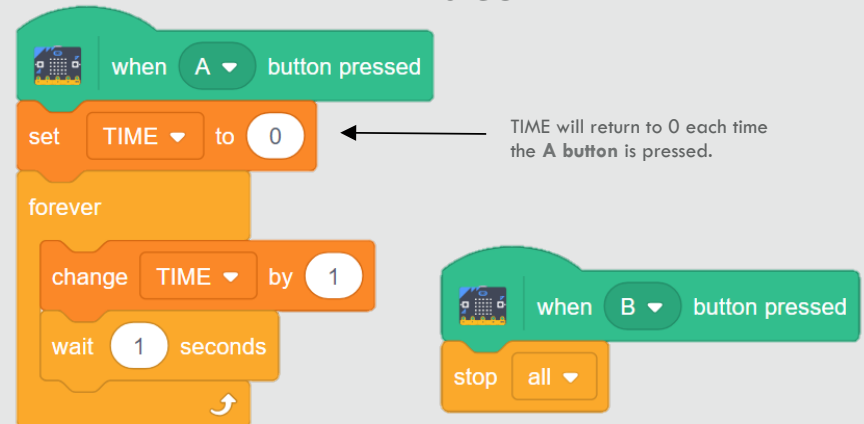
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GET READY



Add a RESET and a STOP code.

ADD THIS CODE



TRY IT

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



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



Make a Card



1. Fold the card
in half



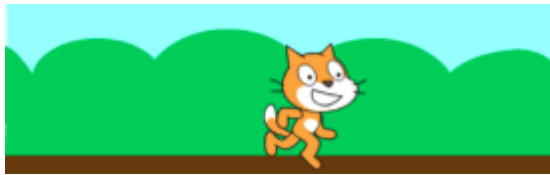
2. Glue the backs
together



3. Cut along the
dashed line

Get Moving

Make your sprite move as your
stopwatch advances!



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4

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Get Moving

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Choose a sprite.

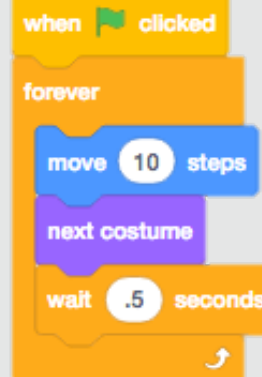
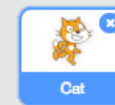
GET READY

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!

If on edge, bounce

set rotation style left-right

Make a Card



1. Fold the card in half



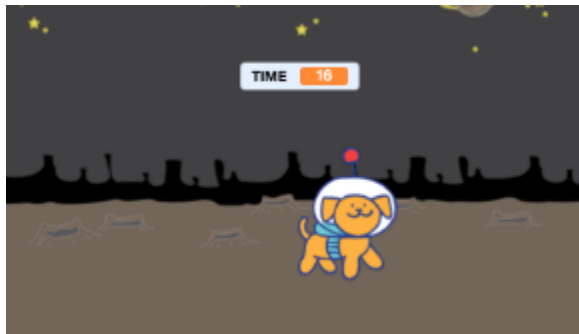
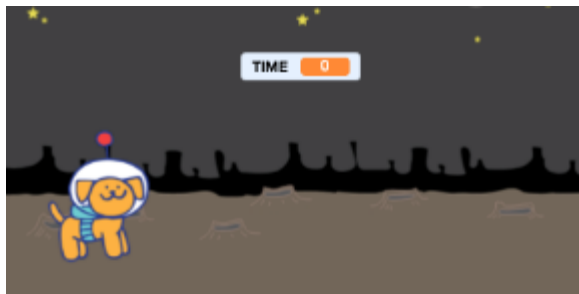
2. Glue the backs together



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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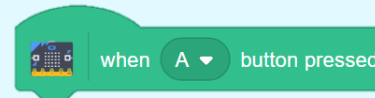
5

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Time the Sprite

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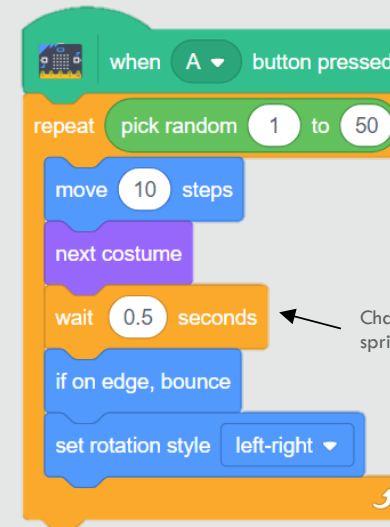
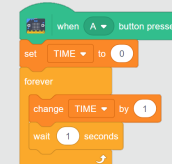
GET READY



Start your sprite with the A button.

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

ADD THIS CODE



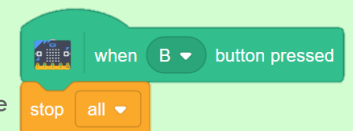
Let Scratch decide how long the code will run.

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.



Make a Card



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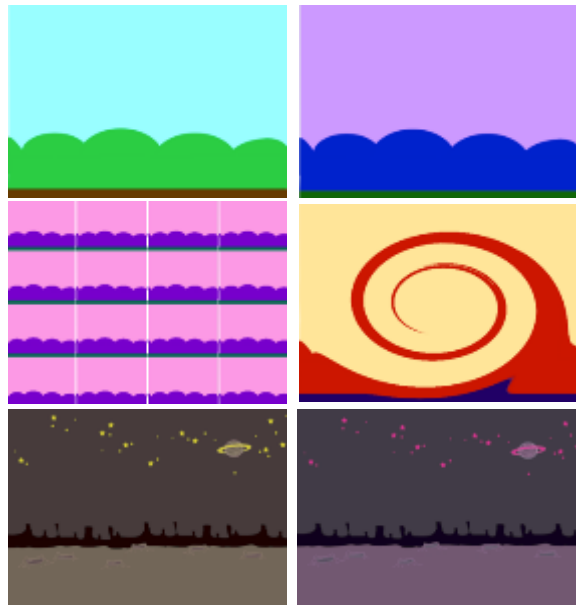
2. Glue the backs together



3. Cut along the dashed line

Background Effects

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



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6

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Background Effects

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GET READY

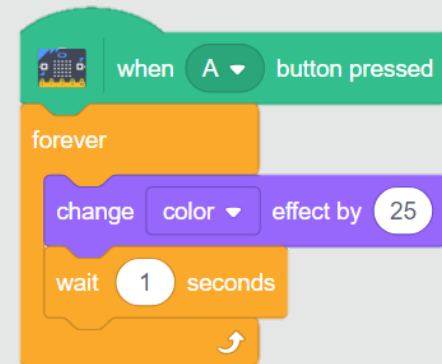
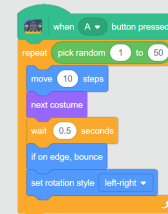
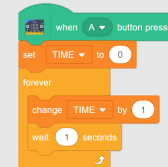


Choose a background.



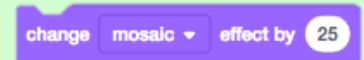
Click the Backdrops tab.

ADD THIS CODE



TRY IT

Experiment with other background effects.



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

clear graphic effects

Make a Card



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in half



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dashed line

Dance Cards



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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Make a Card



1. Fold the card in half



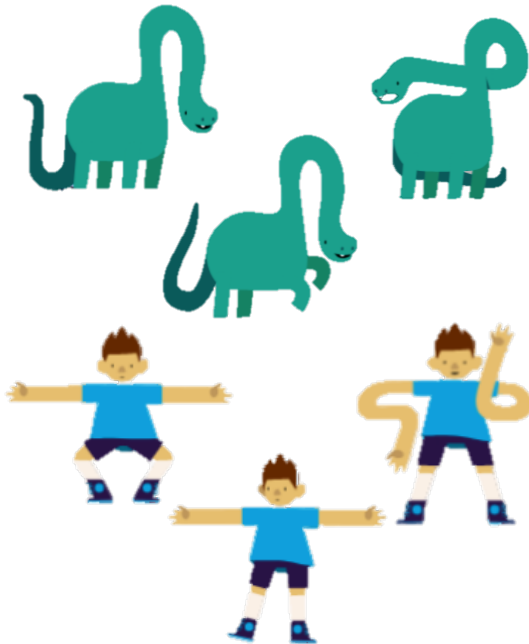
2. Glue the backs together



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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1

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Show Your Moves

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Choose a sprite.

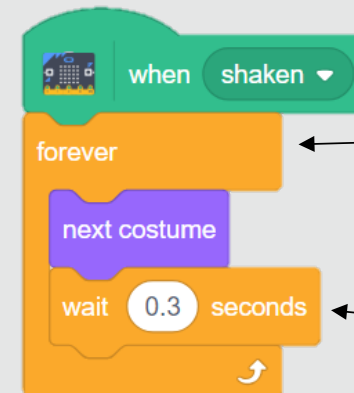
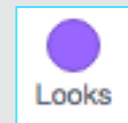
GET READY

Click the  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!

Make a Card



1. Fold the card in half



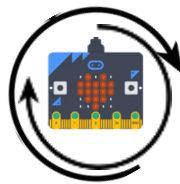
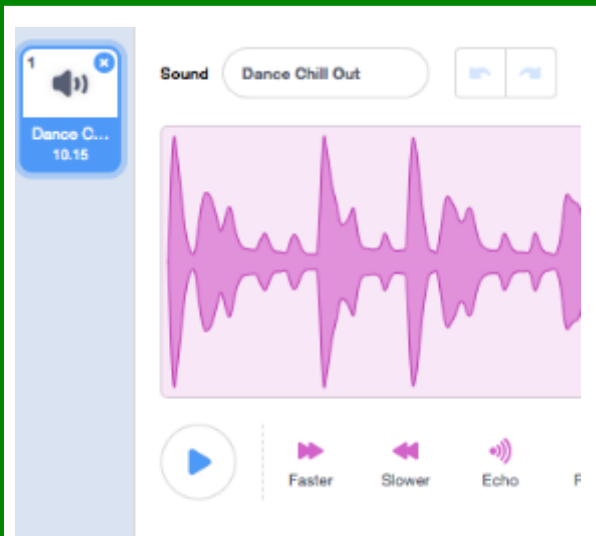
2. Glue the backs together



3. Cut along the dashed line

Add Music

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



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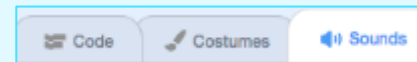
2

 micro:bit

Add Music

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GET READY

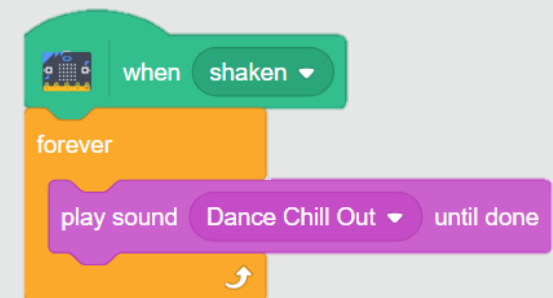
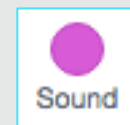


Click the Sounds tab.

Choose a sound from the Library.



ADD THIS CODE

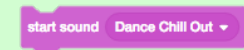


TRY IT

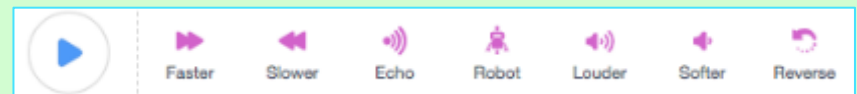
Make sure to choose **PLAY SOUND UNTIL DONE** so that the entire track plays before starting over.



vs.



Edit the track in the Sounds tab.



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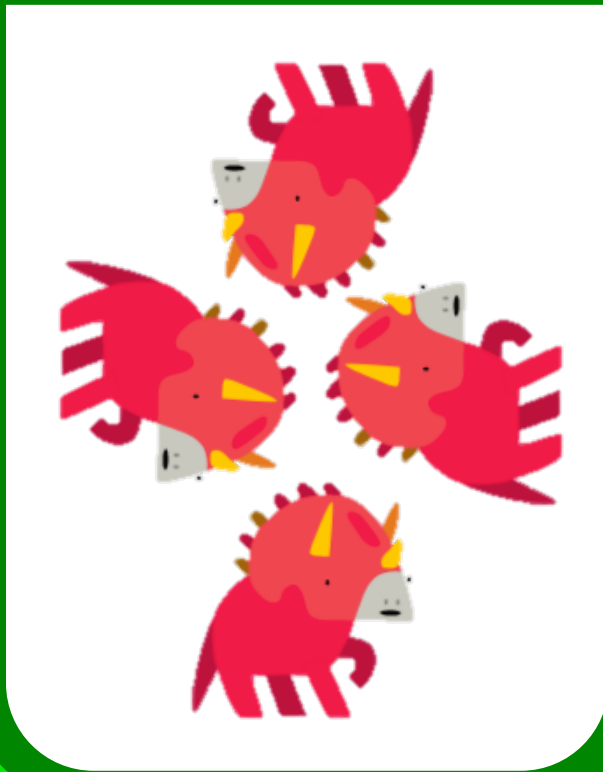
2. Glue the backs together



3. Cut along the dashed line

Spin

Spin your sprites all around!



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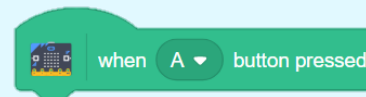
3

 micro:bit

Spin

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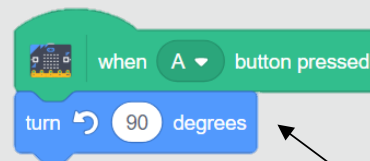
GET READY



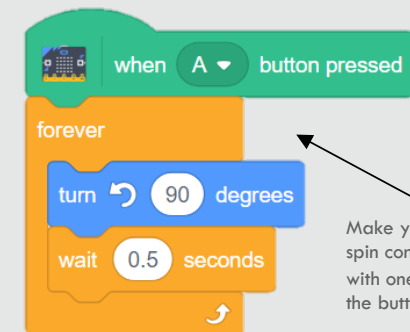
Start your sprite with the A button.

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.

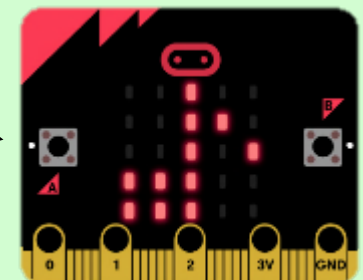


Make your sprite spin continuously with one press of the button.

TRY IT

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

TIP: Experiment with the degrees of rotation!



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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4

 micro:bit

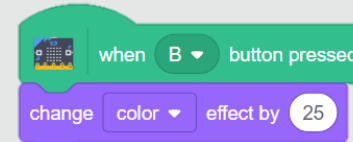
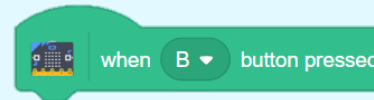
Change Colors

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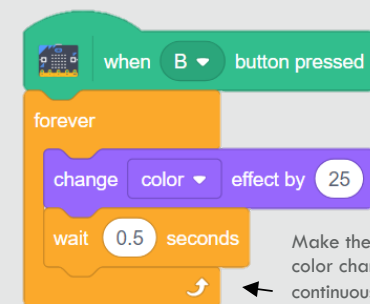
GET READY

Change your sprite's color with the B button.

Control when and how fast your sprite changes its appearance.

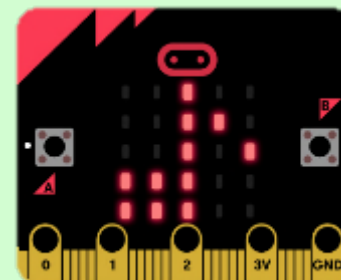


Make the sprite's color change once with each press of the button.



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?

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.



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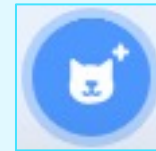
5

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Copy & Paste: Add Friends

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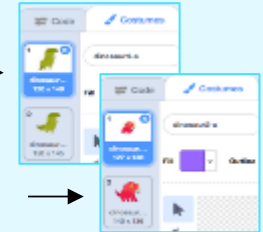
GET READY



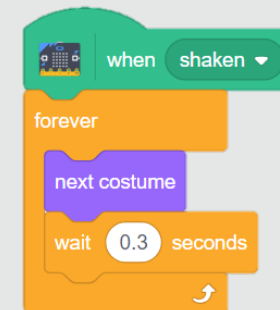
Add additional sprites.

Click the **Costumes** tab.

Make sure your sprites have more than one costume.



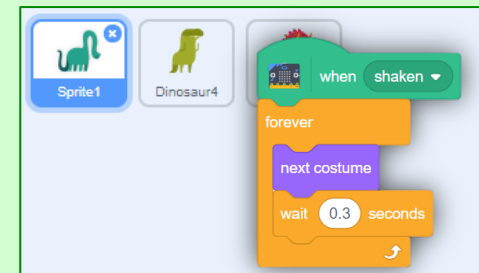
ADD THIS CODE



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.



Make a Card



1. Fold the card in half



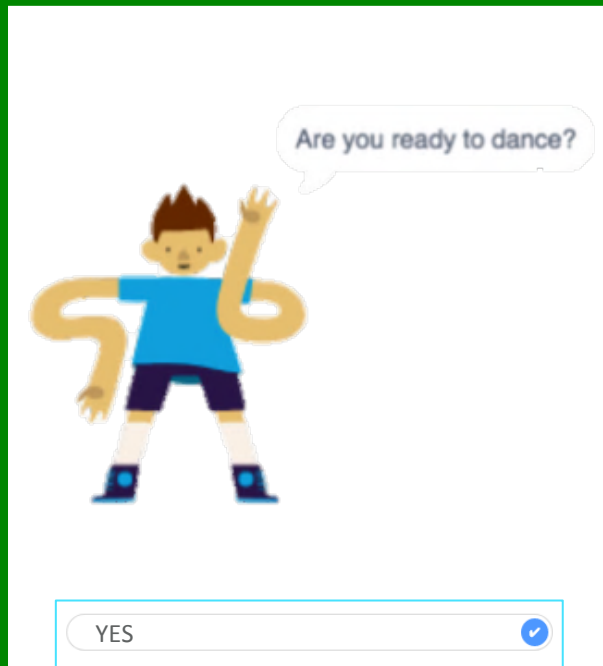
2. Glue the backs together



3. Cut along the dashed line

Ask and Answer

Interact with your micro:bit's display.



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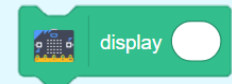
6

 micro:bit

Ask and Answer

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GET READY



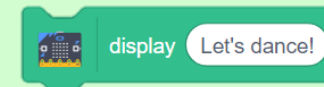
Use the Sensing blocks to interact with your micro:bit.

ADD THIS CODE



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?

Make a Card



1. Fold the card
in half

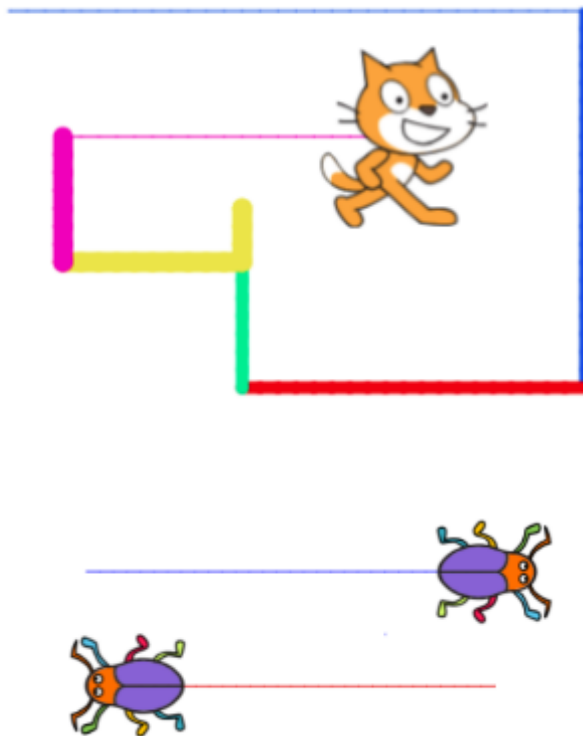


2. Glue the backs
together



3. Cut along the
dashed line

Pen Cards



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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Make a Card



1. Fold the card in half



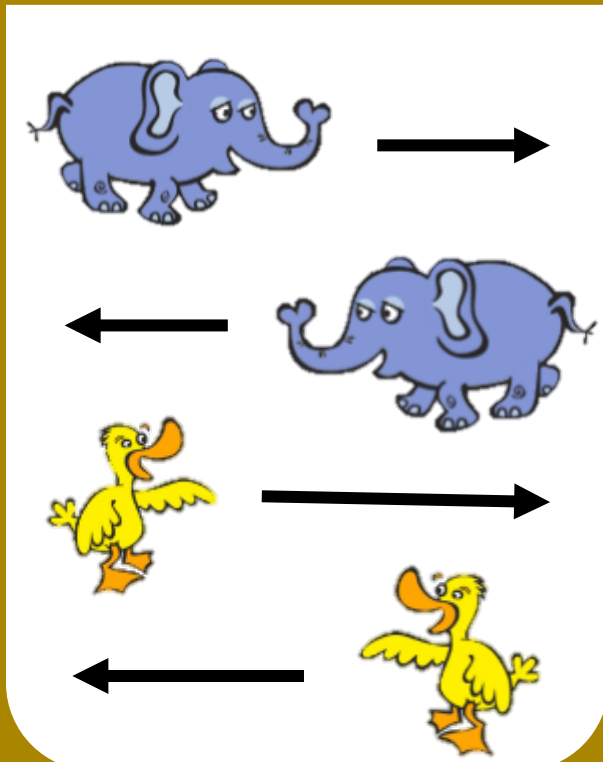
2. Glue the backs together



3. Cut along the dashed line

Back and Forth

Use the A and B buttons to move your sprite.



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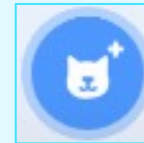
1

 micro:bit

Back and Forth

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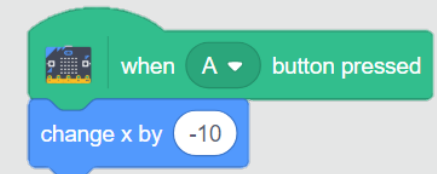
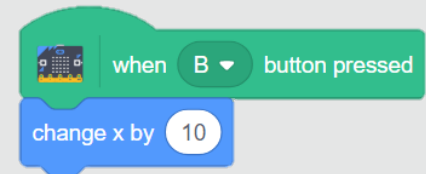
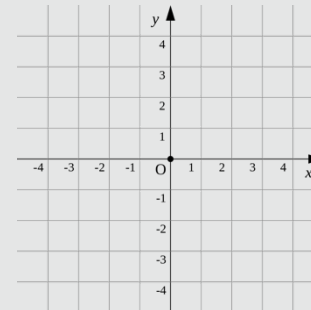
GET READY



Add a sprite and a background.



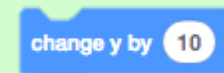
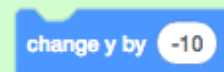
ADD THIS CODE



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?



Make a Card



1. Fold the card in half



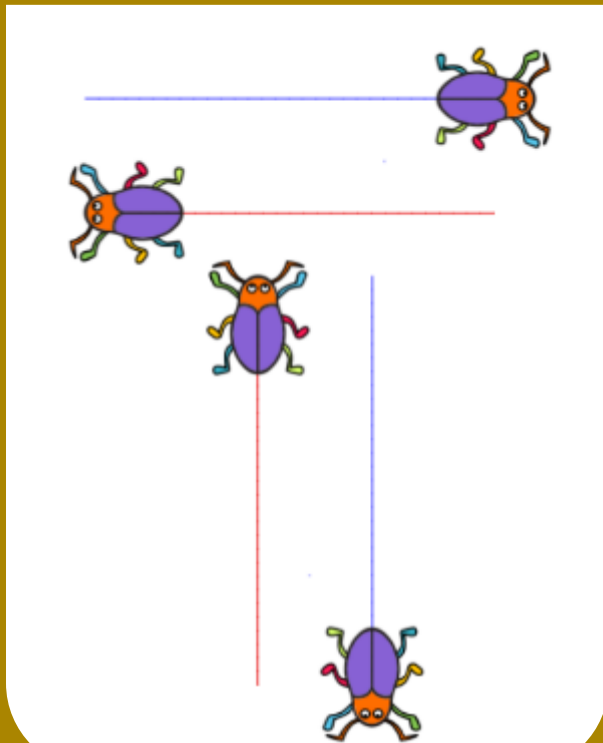
2. Glue the backs together



3. Cut along the dashed line

Draw a Line

Draw a line with your sprite as it moves.



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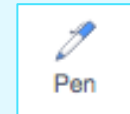
2

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Draw a Line

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GET READY



Connect the Pen extension.

ADD THIS CODE

when clicked



set pen color to



pen down

Make your pen show up on the screen.

when B button pressed

change x by 10

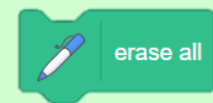
when A button pressed

change x by -10

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?



Make a Card



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3. Cut along the dashed line

Special Effects

Change the color and size of your pen.



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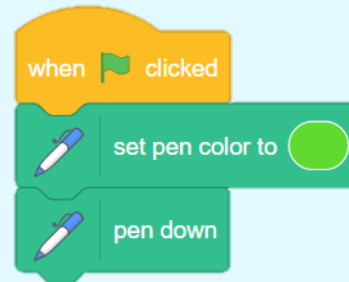
3

 micro:bit

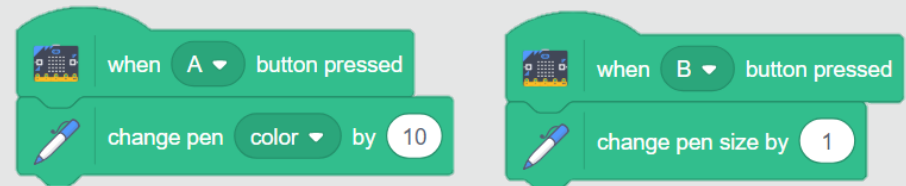
Special Effects

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GET READY



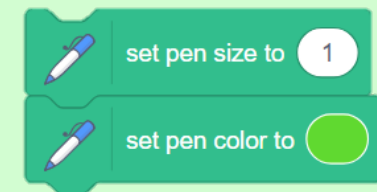
ADD THIS CODE



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?



Make a Card



1. Fold the card in half



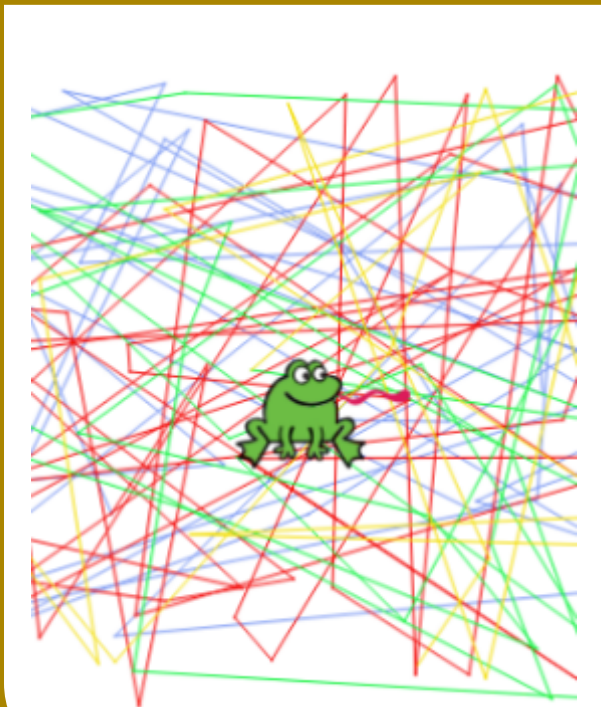
2. Glue the backs together



3. Cut along the dashed line

Random Drawing

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



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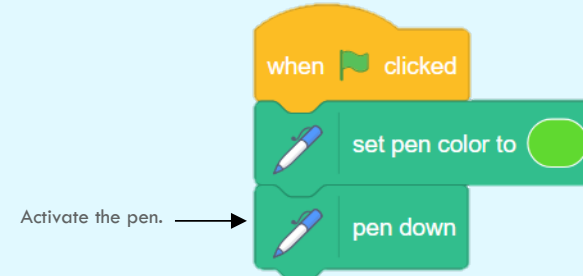
4

micro:bit

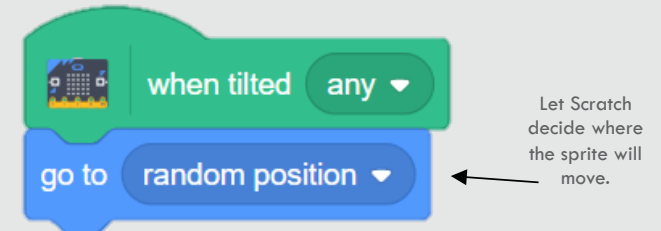
Random Drawing

microbit.org/scratch

GET READY



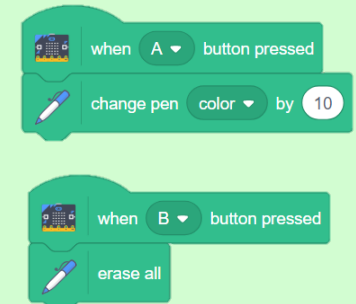
ADD THIS CODE



TRY IT

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

Can you make your sprite draw?



Make a Card



1. Fold the card in half



2. Glue the backs together



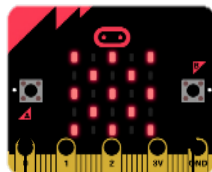
3. Cut along the dashed line

Voting Machine

Use your micro:bit to count responses.

CATS 0 DOGS 0

Cats or Dogs?



A

B

microbit.org/scratch

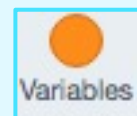
5

 micro:bit

Voting Machine

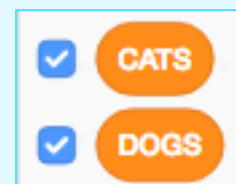
microbit.org/scratch

GET READY



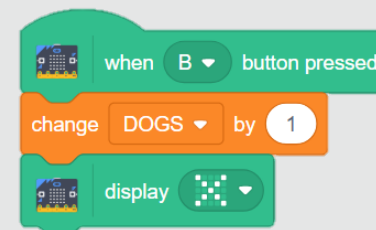
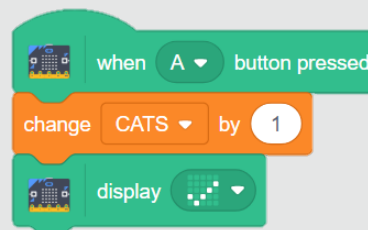
Choose in the Blocks Palette.

Make a Variable



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

ADD THIS CODE



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?



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.



microbit.org/scratch

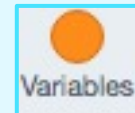
6

 micro:bit

Stamp and Record

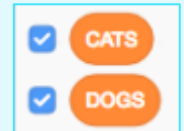
microbit.org/scratch

GET READY



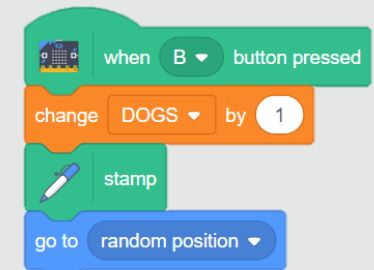
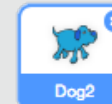
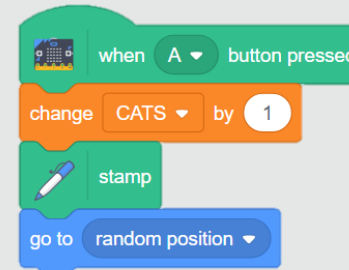
Choose in the Blocks Palette.

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?



Make a Card



1. Fold the card
in half

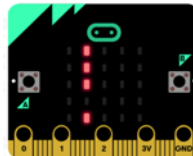
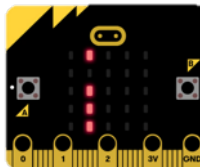
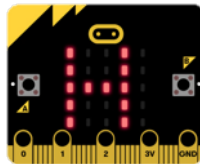
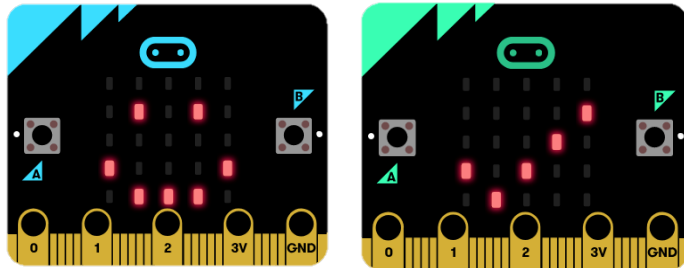


2. Glue the backs
together



3. Cut along the
dashed line

Display Cards



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

microbit.org/scratch



microbit.org/scratch



Make a Card



1. Fold the card in half



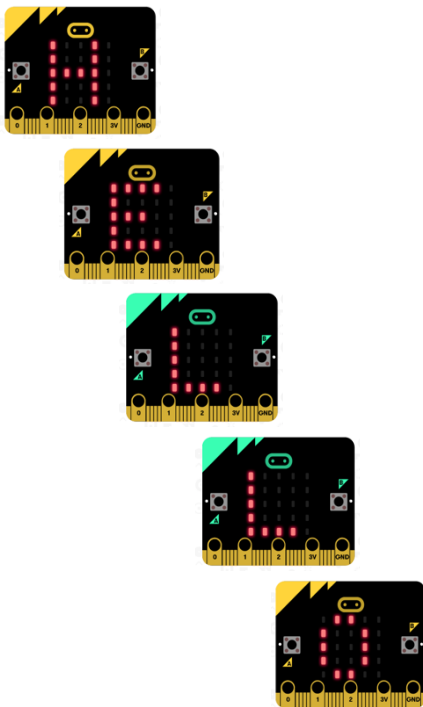
2. Glue the backs together



3. Cut along the dashed line

Say Hello

Make your micro:bit display a greeting.



microbit.org/scratch

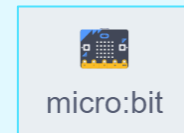
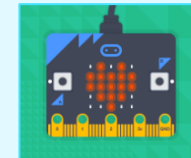
1

 micro:bit

Say Hello

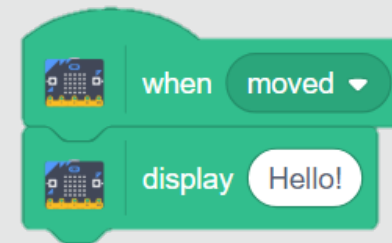
microbit.org/scratch

GET READY



Connect your micro:bit to Scratch.

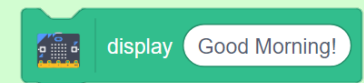
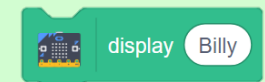
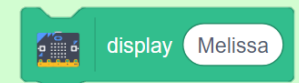
ADD THIS CODE



TRY IT

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

CHALLENGE: What else can you make the display say?



Make a Card



1. Fold the card in half



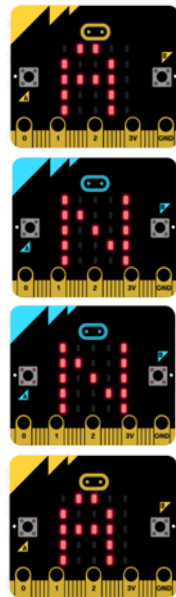
2. Glue the backs together



3. Cut along the dashed line

Add Your Name

Program the micro:bit to display your name.



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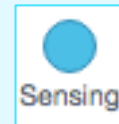
2

 micro:bit

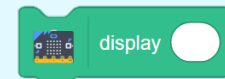
Add Your Name

microbit.org/scratch

GET READY

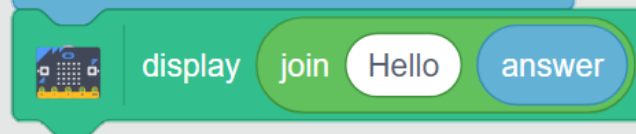
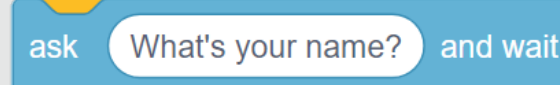
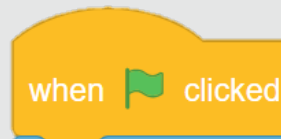


Sensing



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

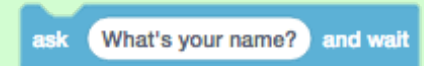
ADD THIS CODE



Combine your answer into a phrase.

TRY IT

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



Make a Card



1. Fold the card in half



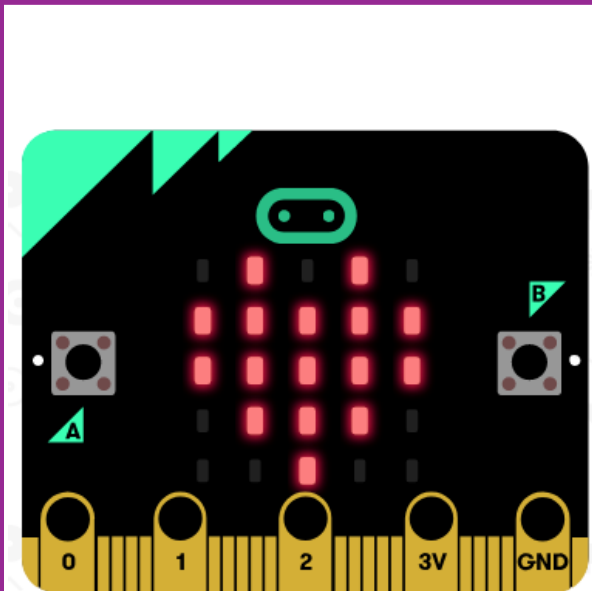
2. Glue the backs together



3. Cut along the dashed line

Display Image

Depict an image on your display.



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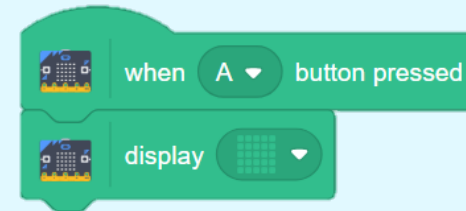
3

 micro:bit

Display Image

microbit.org/scratch

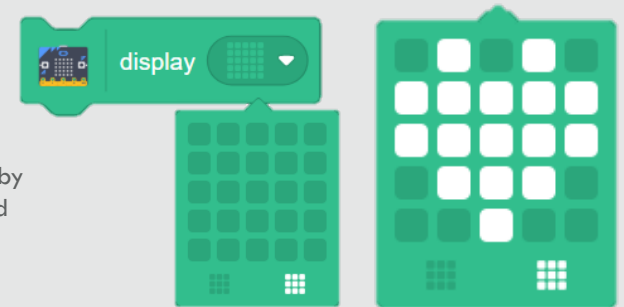
ADD THIS CODE



MAKE A DESIGN

Use the 5x5 grid to create your design.

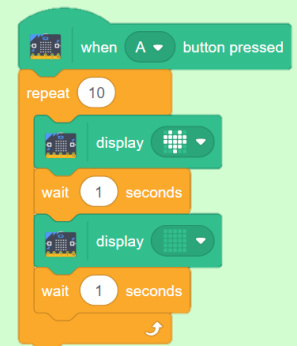
Turn on/off each light by clicking on the desired blocks.



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?



Make a Card



1. Fold the card in half



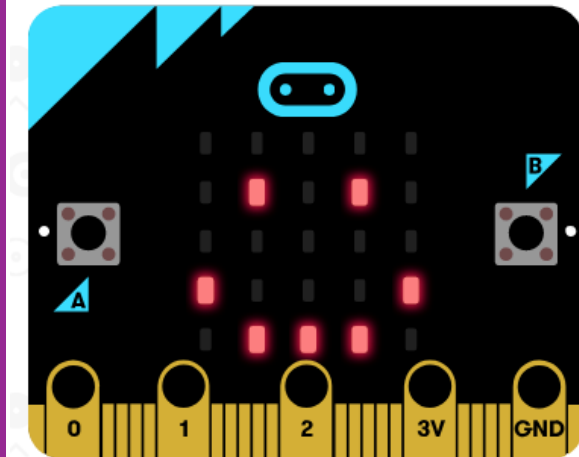
2. Glue the backs together



3. Cut along the dashed line

Create an Emoji

Create your own emoji for the display.



microbit.org/scratch

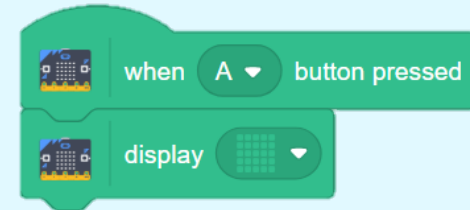
4

 micro:bit

Create an Emoji

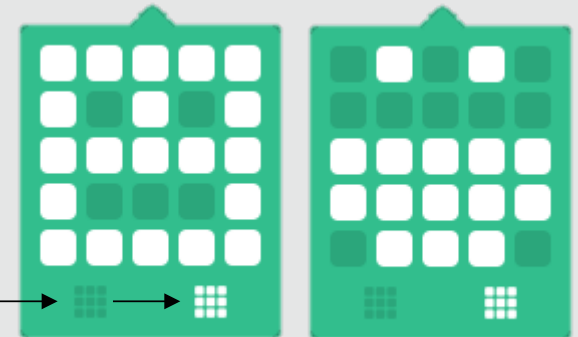
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ADD THIS CODE



MAKE A DESIGN

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

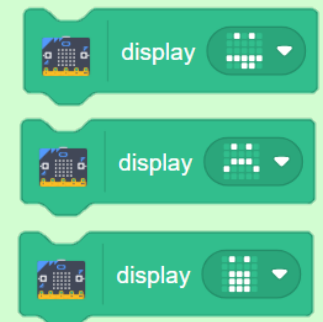


Click to turn all lights off/on.

TRY IT

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

CHALLENGE: What other emojis can you create?



Make a Card



1. Fold the card in half



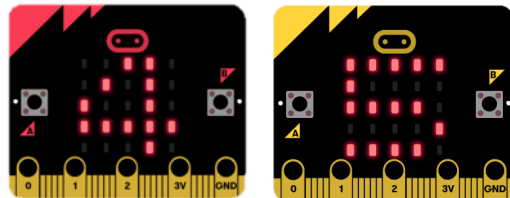
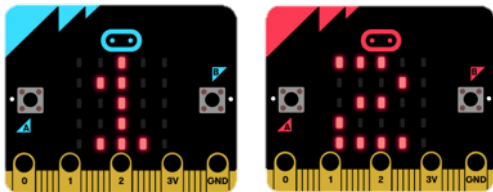
2. Glue the backs together



3. Cut along the dashed line

Tell Time

Display the correct time on your micro:bit.



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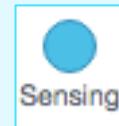
5

 micro:bit

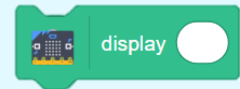
Tell Time

microbit.org/scratch

GET READY

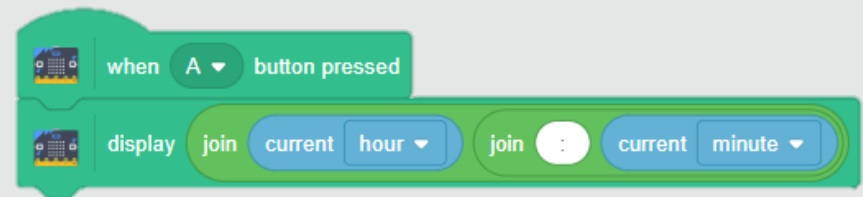


current minute ▾



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?

current hour ▾

year
month
date
day of week
✓ hour
minute
second

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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 micro:bit

Make a Wristband

microbit.org/scratch

MATERIALS



Heavy
paper

or



Duct tape
(2in)



Scissors



Hot glue or
Glue Dots

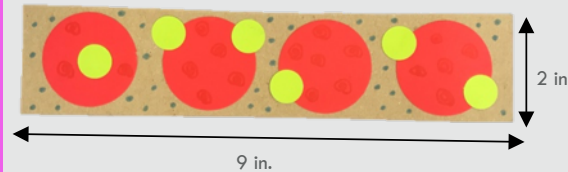


Craft
materials



Velcro

PROCEDURE



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

Decorate with craft materials.



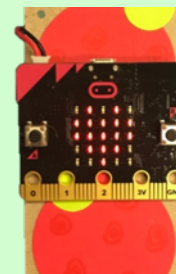
Front



Back

Adhere Velcro fasteners.

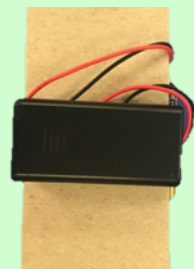
TRY IT



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.



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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 micro:bit

Make a Badge

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MATERIALS



Craft foam



Scissors



Hot glue or
Glue Dots



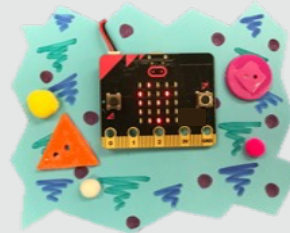
Craft
materials



String



Paper clip



PROCEDURE



BACK

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

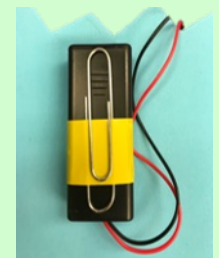
Attach your micro:bit with hot glue to the front of the badge. Connect the battery pack to the back.

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.



Make a Card



1. Fold the card in half



2. Glue the backs together



3. Cut along the dashed line

Music Cards



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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 micro:bit

microbit.org/scratch

 micro:bit

Make a Card



1. Fold the card in half



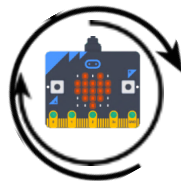
2. Glue the backs together



3. Cut along the dashed line

Play a Note

Make your sprite play a sound.



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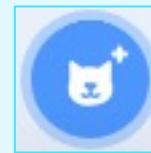
1

 micro:bit

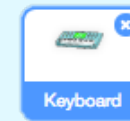
Play a Note

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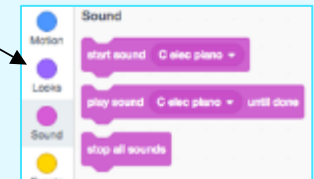
GET READY



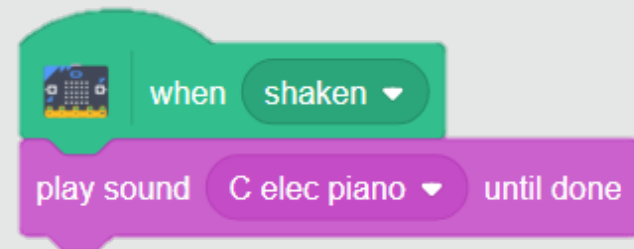
Add a sprite.



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?

- ✓ C elec piano
- D elec piano
- E elec piano
- F elec piano
- G elec piano
- A elec piano
- B elec piano
- C2 elec piano

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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2

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Play a Chord

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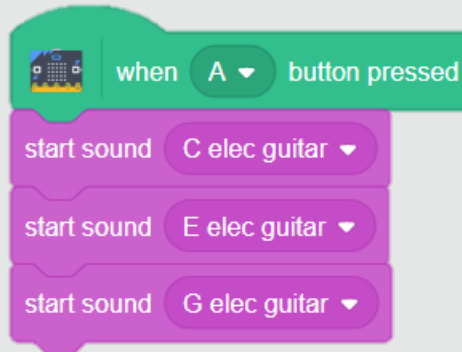
GET READY

start sound C elec guitar ▼

play sound C elec guitar ▼ until done

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

ADD THIS CODE

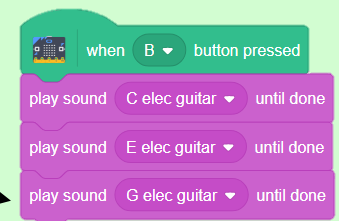


All three notes will play at the same time.

TRY IT

CHALLENGE: Can you make any other chords?

What happens when you use these blocks instead?



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.



microbit.org/scratch

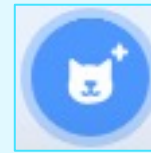
3

micro:bit

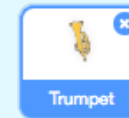
Sound Effects

microbit.org/scratch

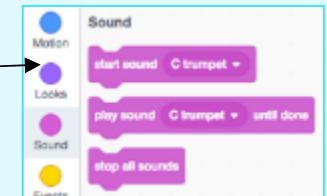
GET READY



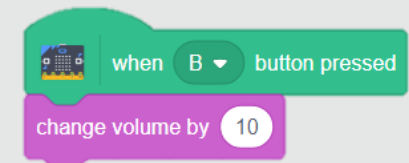
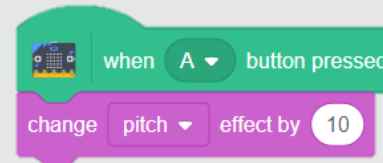
Add a sprite.



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?

clear sound effects

Make a Card



1. Fold the card in half



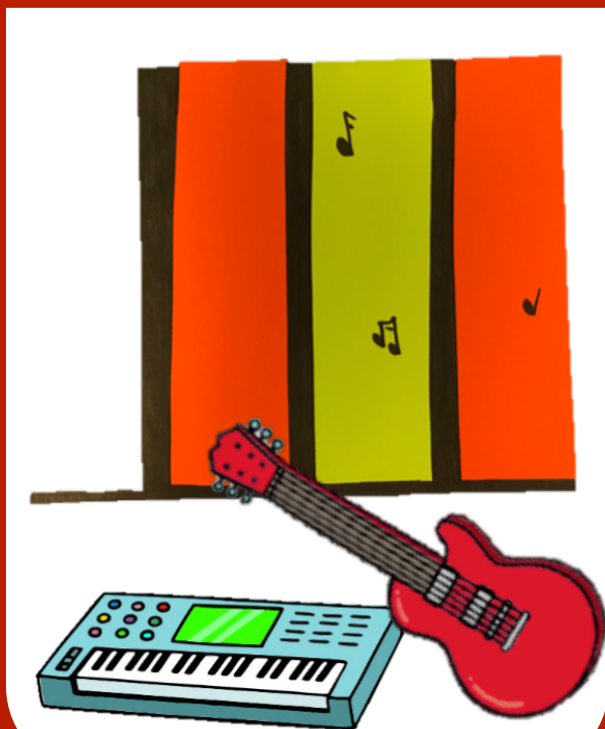
2. Glue the backs together



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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4

 micro:bit

Make an Instrument

microbit.org/scratch

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:



set instrument to (1) Piano

- (1) Piano
- (2) Electric Piano
- (3) Organ
- (4) Guitar
- (5) Electric Guitar
- (6) Bass
- (7) Pizzicato
- (8) Cello
- (9) Trombone
- (10) Clarinet
- (11) Saxophone
- (12) Flute
- (13) Microtonal Clavi

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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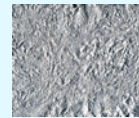
5

 micro:bit

Wire the Instrument

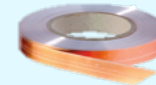
microbit.org/scratch

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!*

Make a Card



1. Fold the card
in half



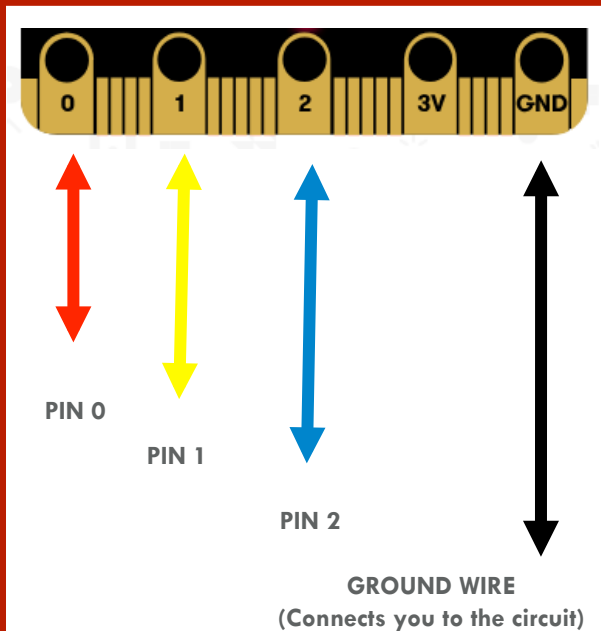
2. Glue the backs
together



3. Cut along the
dashed line

Program the Pins

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



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Program the Pins

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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?

Make a Card



1. Fold the card
in half



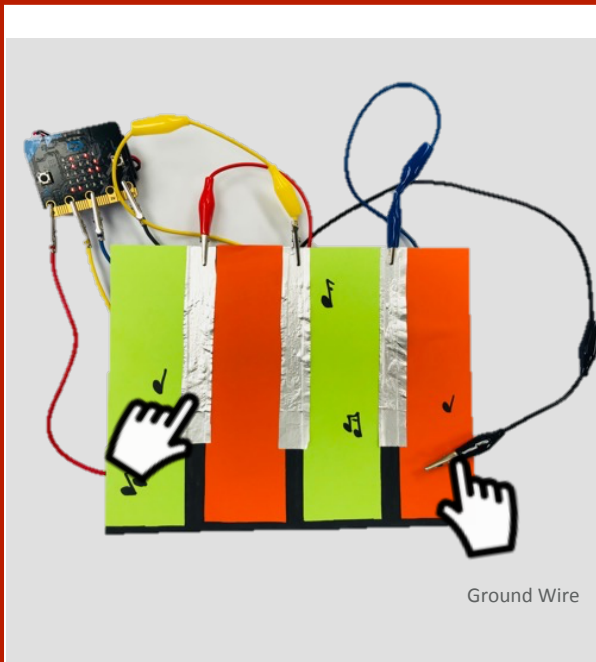
2. Glue the backs
together



3. Cut along the
dashed line

Attach the micro:bit

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



Ground Wire

Attach the micro:bit

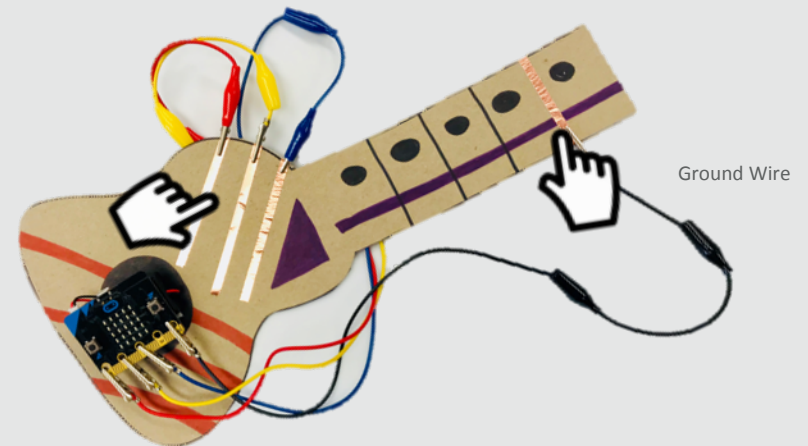
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GET READY

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.



Ground Wire

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,

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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.



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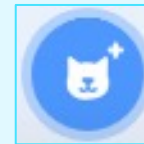
8

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Set the Stage

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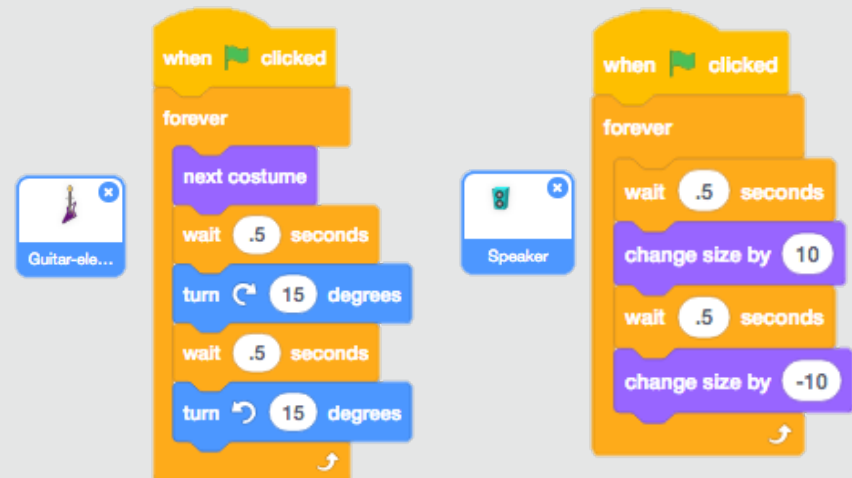
GET READY



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?