BOLT Challenge Cards - EDUCATOR OVERVIEW

Challenge cards are an easy way to get started with BOLT in your classroom. Each challenge is a short introduction to programming BOLT on the Block Canvas, requiring about 15 minutes.

Challenge cards are divided into Beginner (Challenges 1-7) and Intermediate Levels (8-14).

Support for facilitating challenges including background information, solutions, and ideas for extra practice is available in the Teacher Support Doc:

sphero.cc/bolt-cc-support

If you've used the challenge cards, we'd love to hear from you. Please send us your feedback with this form

sphero.cc/bolt-cc-form

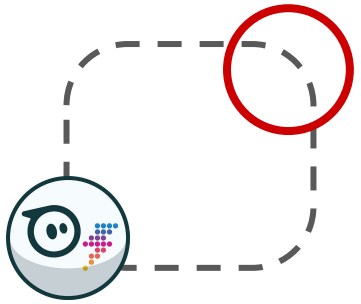
Challenge 1: A Square By Any Other Name

Program BOLT to make a square with sharp corners.

1 PROGRAM

2 PROBLEM SOLVE

1. Run the program and watch what happens. Does your square have rounded corners?



2. Modify the program to make the most accurate square you can. Hint: The **delay block**, found in **Controls**, might be useful.

3 PLAY

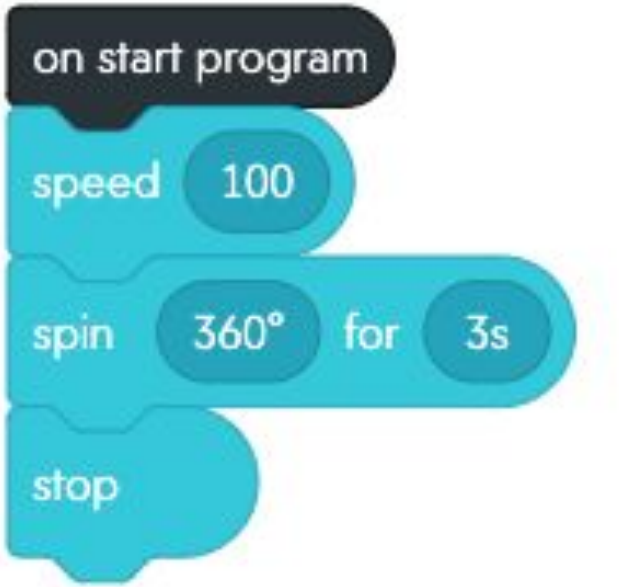
- How does increasing the **speed** impact the square?
- How does increasing the **duration** impact the square?
- How might you make two squares in a row? What happens to your accuracy?

BEGINNER

Challenge 2: Program a Circle

Learn how to make BOLT roll and spin at the same time.

1 PROGRAM



2 PROBLEM SOLVE

1. Run the program and watch what happens.
2. Modify the numbers in the blocks to make BOLT roll in a larger circle.

3 PLAY

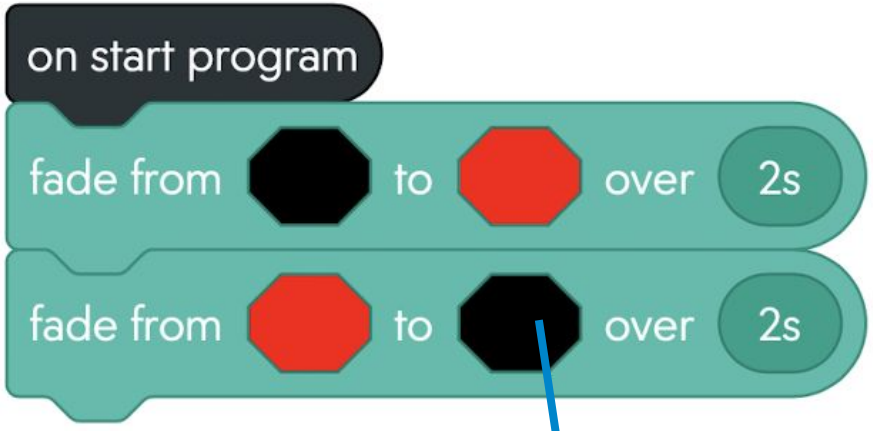
- How many ways can you find to program BOLT to make a larger circle?
- What happens if you remove the **stop block**?
- What can you change to make BOLT roll in a circle in the opposite direction?

BEGINNER

Challenge 3: Fade to Black

Learn how to fade the main LED to show your favorite color.

1 PROGRAM



Hint: Slide the brightness all the way to the left to choose black.

2 PROBLEM SOLVE

1. Run the program. What happens?
2. Modify the program so that BOLT shows your favorite color.

3 Play

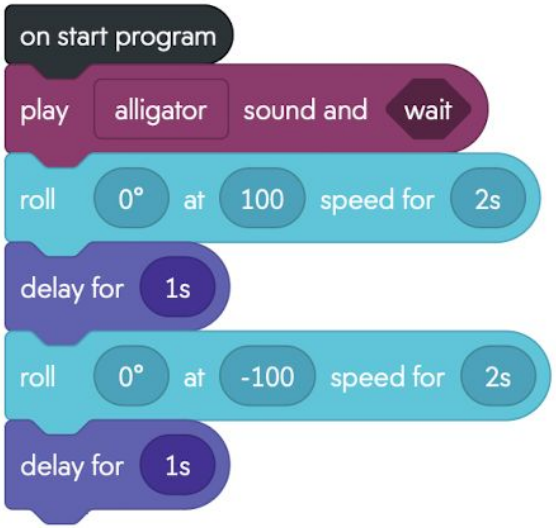
- How could you use **fade blocks** to show your three favorite colors?
- Set red to 255, blue to 255, and green to 0. Which color does that make?
- What happens if you drag random color from the operators category into the color input?

BEGINNER

Challenge 4: Sound Timing

Learn to control how BOLT plays sounds.

1 PROGRAM



Turn the volume up on your programming device so you can hear the sound.

2 PROBLEM SOLVE

1. Run the program and watch what happens.
2. Select **wait** in the sound block to toggle it to **continue**.

3. Run the program again. What's the difference?
4. Add more movement and lights blocks to fill the entire time it takes to play the sound!

3 PLAY

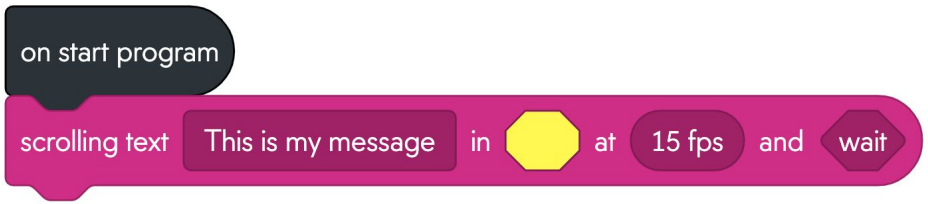
- What other sounds do you want to try?
- What happens if you try to play two sounds at the same time?

BEGINNER

Challenge 5: Message in a...BOLT(tle)

Make BOLT display your favorite food.

1 PROGRAM



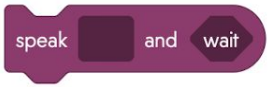
2 PROBLEM SOLVE

1. Run the program. What happens?
2. Change the message to your favorite or least favorite food.

3 PLAY

- What happens if you change the frames per second (fps)?
- What's the difference between these blocks?

- Can you use the **speak block** to say your favorite food while the text scrolls?



BEGINNER

Challenge 6: Matrix Pictures

Program your own picture with 

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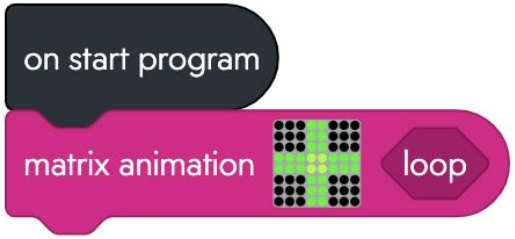
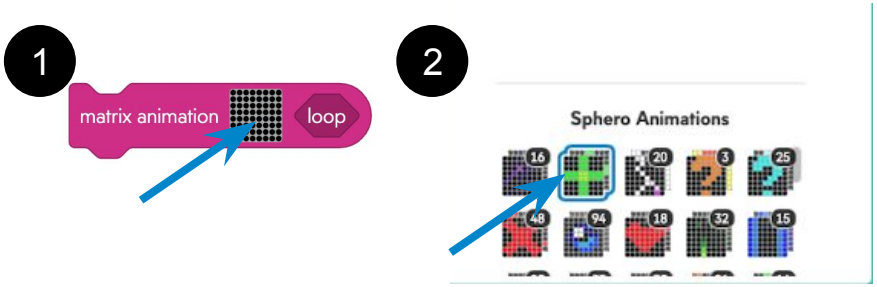
1 PROGRAM



Hint: Select the matrix, then select the green plus.



2 PROBLEM SOLVE

1. Run the program. What happens?

2. Select the + in the matrix animation editor and draw a picture.
   - A face? 🙂
   - A pet? 🐐
   - Something else?

3 PLAY

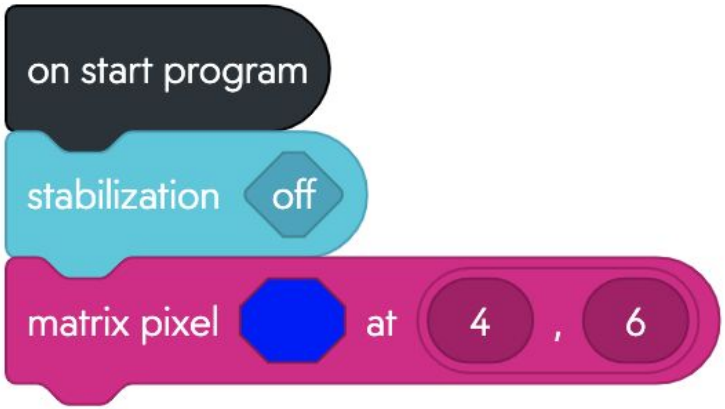
- How can you add frames to animate your picture?
- What do all of these buttons do in the editor?

BEGINNER

Challenge 7: Four Corners

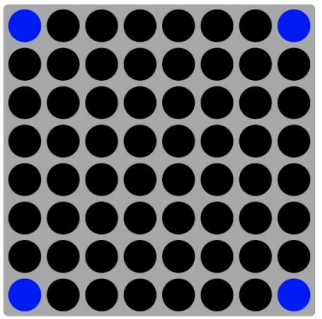
Learn how to program individual LEDs on the matrix.

1 PROGRAM



2 PROBLEM SOLVE

1. Run the program. What happens?
2. Modify your program so that there is a pixel highlighted in each of the four corners of BOLT's matrix.



3 PLAY

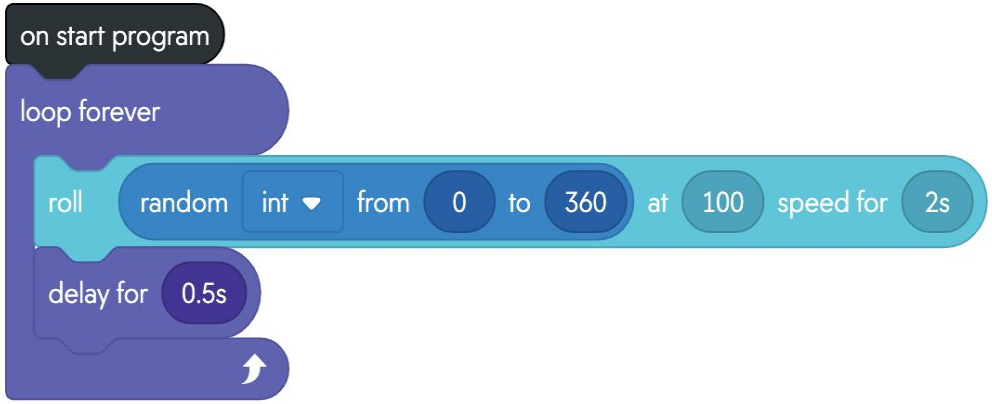
- How can you create your first initial on the matrix?
- What other block(s) might make it easier if you want BOLT to display this letter?
- What happens if you toggle stabilization on? 

BEGINNER

Challenge 8: Random Roller

Make BOLT roll in random directions forever.

1 PROGRAM



Hint: Drag the random int block into the first circle in the movement block.

2 PROBLEM SOLVE

1. Run the program and get ready to chase BOLT!
2. Add two more **random int blocks** to the speed and duration inputs to further randomize BOLT's movement.

3 PLAY

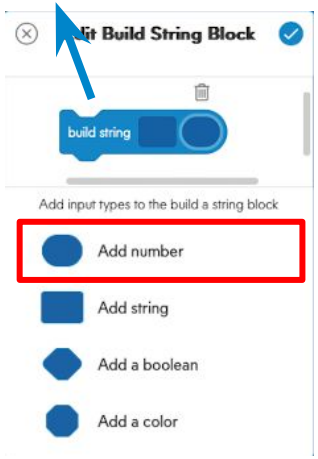
- What happens if you remove the **loop forever block**?
- How does changing the numbers in a **random int block** affect BOLT's movement?
- Which other blocks could you try a **random int block** in?

INTERMEDIATE

Challenge 9: Data Ball

Learn how to make BOLT announce sensor values.

1 PROGRAM



Hint: Edit the build string block to add a number.

2 PROBLEM SOLVE

1. Run the program and listens to what BOLT says.
2. Move BOLT. When is the G force:
   - > 1
   - < 1
   - = 1?

3 Play

- Swap total accelerometer with pitch orientation. What data is BOLT reading now?
- Which other sensors fit in the build string block? Which ones don't?
- How can you add another string so the speak block reads a string after the sensor?

INTERMEDIATE

Challenge 10: A Polygon Algorithm

Modify an algorithm to program a different polygon.

1 PROGRAM

2 PROBLEM SOLVE

1. Run the program. Which shape does it make?
2. Modify the program to make BOLT roll in a hexagon.

3 PLAY

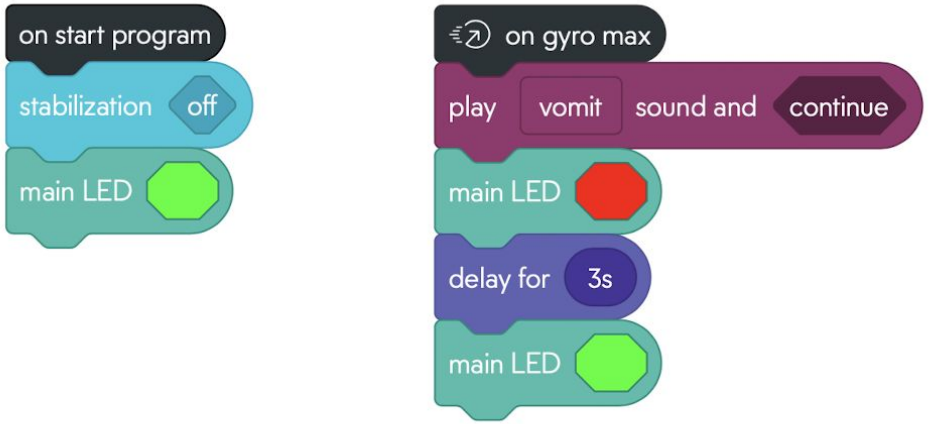
- Which other polygons can you make? Square? Octagon? Decagon?
- How can you modify the program to make polygons with longer sides?

INTERMEDIATE

Challenge 11: BOLT Feels Sick

Learn how to trigger blocks with an  ***event.***

1 PROGRAM



2 PROBLEM SOLVE

1. Run the program. Does you BOLT show green?
2. Move and manipulate BOLT to make the robot play the vomit sound and show red on the LED.

Hint: Long press or right click on the **on gyro max block** and select “block help” to learn more about how to trigger the event.

3 PLAY

- What happens to the program if **stabilization** is turned on?
- How do the other event blocks like    work?
- What does the sensor data tell you about when the event blocks are triggered?

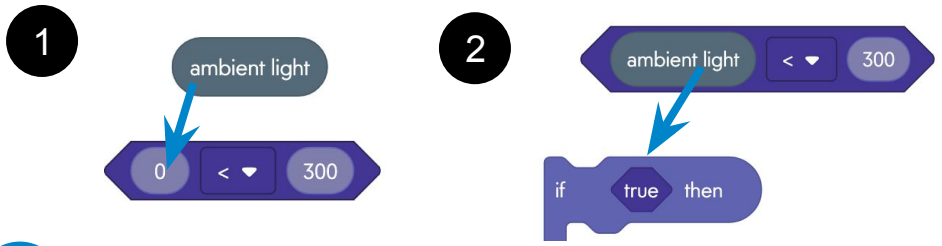
INTERMEDIATE

Challenge 12: Light at the End of the Tunnel

Program BOLT to say different things based on the light sensor value, ambient light.

1 PROGRAM

Hint: Here's the order to drag your bl[illegible]



2 PROBLEM SOLVE

1. Run the program. Which text does BOLT say??
2. Adjust the value in the comparator…

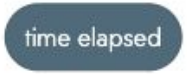
…so that BOLT thinks it's dark when you cover it up and light when it's…in the light.

3 PLAY

- How can you change the **loop forever block** to something that won't go on for…forever?
- How do you change what BOLT says?
- Which sounds would go well with the **speak blocks** in this program?

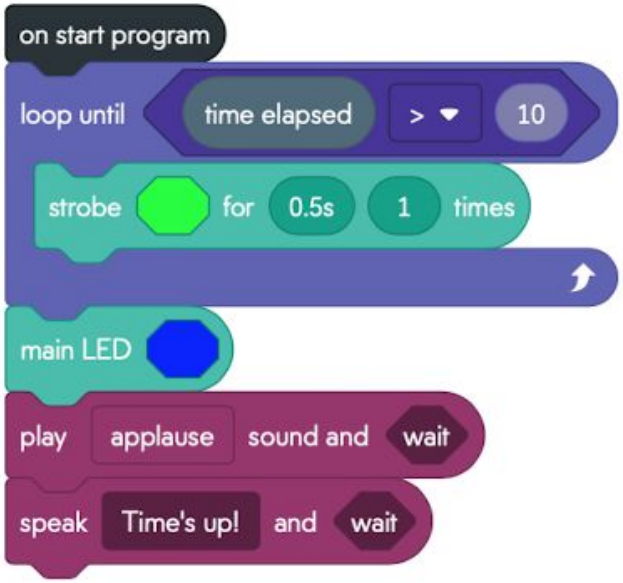
INTERMEDIATE

Challenge 13: A BOLT Timer

Use the 

sensor to control when BOLT exits a loop.

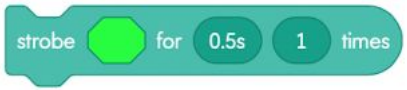
1 PROGRAM



2 PROBLEM SOLVE

1. Execute the program. *How long does it take for BOLT to show the blue light?*
2. Modify the program to change BOLT into a 20 second timer.

3 PLAY

- How can you make BOLT play a different sounds or say a different message?
- What do the inputs on 

do? Experiment to find out.
- What game could you invent with this program and 

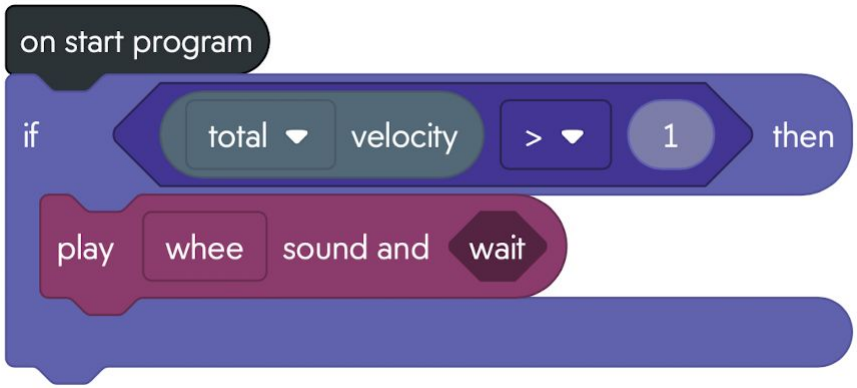
?

INTERMEDIATE

Challenge 14: Flying BOLT

Figure out how to make BOLT play a sound like it is flying!

1 PROGRAM

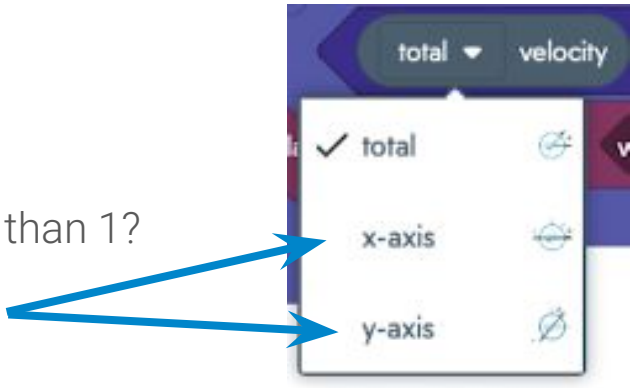


2 PROBLEM SOLVE

1. Run the program. Right now, your BOLT only says Whee! once at the beginning of your program if BOLT is moving (and won't say anything if BOLT is very still).
2. Modify your program so that BOLT says 'Whee!' anytime it is moved around.

3 PLAY

- What happens if you adjust the **velocity value** to something other than 1?
- What happens if you adjust the **total velocity** to **x-axis** or **y-axis**?



INTERMEDIATE