BLOCKS 2: IF/THEN/ELSE

OVERALL TIME *1- to 2-hour lesson*

GROUPS *Three to four kids*

PROGRAMMING LEVEL *Advanced Block: Functions, Variables, Complex Controls (If Then), and Comparators*

CONTENT THEME *Technology & Engineering*

OBJECTIVE

- **I can define and use conditionals, including if/then/else statements.**
- **I can create and execute a Blocks program.**

OVERVIEW

In this activity, you will learn your first conditional by building a fun animal sound game with your Sphero BOLT. This is a great follow-up activity to Blocks 1.

MATERIALS

- **Sphero BOLT**
- **Download and print Toss Game.pdf** *https://sphero-media-sphero-prod.s3.amazonaws.com/cwist/picturesteps/dd/06/Toss%20Game.pdf*

WARNING: If the Sphero BOLT is dropped from a distance of more than 36 inches (3 feet or .9 meters) above the ground, it may crack.

EXPLORATION: CONDITIONALS

Most software programs include conditionals. A conditional is an action that takes place when certain conditions are met. An example is an if/then/else statement.

EXPLORATION: TOSS GAME OVERVIEW

In this activity, you will design your own "Toss Game" to show your understanding of conditionals. Watch the video below for an overview.

▶ *https://youtu.be/GOUmz02io94*

Animal sounds?

Yup. Animal sounds.

Which animal sound is the most difficult for you to imitate?

SKILLS BUILDING: INITIAL LOGIC

In this video you will learn how to write the initial logic for the toss game.

▶ *https://youtu.be/hh2SMKLb1aM*

SKILLS BUILDING: IF/THEN/ELSE

Show your understanding of conditionals by using an if/then/else statement to develop the main structure of the game. Follow along with the video below.

▶ *https://youtu.be/kiIZqp5M1xw*

- *Why is it important to select TOTAL on the Accelerometer sensor?*
- *What does g measure?*
- *What do you think the g-force of an astronaut leaving the atmosphere is?*

SKILLS BUILDING: ANIMALS ROAR

Finally, add the logic for a random animal sound to play when the Sphero BOLT is tossed, and for the Sphero BOLT to stay quiet when it's not being tossed.

- *Why is it unnecessary to place an additional Accelerometer sensor measuring force under 3g under the ELSE condition?*

Watch the video below to see how you can make animals roar!

▶ *https://youtu.be/pQaHEobtfj0*

CHALLENGE: PLAY THE TOSS GAME

Now you get to play the game!

Did the game playout like it was meant to? If not, go back into your code and see what is causing the issue. This is called **debugging**. Replay the game after each change you make to the code.

Watch the video below to see how to play the game.

▶ *https://youtu.be/NZe3N3tOCtk*

CHALLENGE: RECORD THE GAME

When you have conquered your challenge, run your program and record your Sphero BOLT at the same time to share with your mentor.

Take a look below to see how to record your Sphero BOLT!

▶ *https://youtu.be/u7zvS2-Rvn0*

CHALLENGE: ADD A TIMER

Instead of having the toss game loop forever, add a custom timer that will end the game automatically after a set amount of time.

See how you can set a timer in this video.

▶ *https://youtu.be/dQGseEkLbmw*

REFLECTION

Write or reflect with a partner about what you learned in this activity:

- *What is a conditional?*
- *What was the conditional used in the toss game?*
  - Draw a diagram that shows the logic for this game.
- *What is an example of a conditional in your daily life?*
  - Write it as an if/then/else statement.