

# The Waggle Dance

## Overview

If you've done "The Round Dance" lesson you will know all about communication between bees dancing. There are more dances the bees do, which mean different things. Have you heard of the waggle dance?

### CSTA Standards:

Standard Identifier	Standard Description
1A-AP-08	Model daily processes by creating and following algorithms (sets of step-by-step instructions) to complete tasks.
1A-AP-10	Develop programs with sequences and simple loops to express ideas or address a problem.
1A-AP-14	Debug (identify and fix) errors in an algorithm or program that includes sequences and simple loops.
1B-AP-08	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
1B-AP-10	Create programs that include sequences, events, loops, and conditionals.
1B-AP-15	Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.
2-AP-10	Use flowcharts and/or pseudocode to address complex problems as algorithms.
2-AP-12	Design and iteratively develop programs that combine control structures, including nested loops and compound conditionals.

2-DA-07	Represent data using multiple encoding schemes.
3A-DA-11	Create interactive data visualizations using software tools to help others better understand real-world phenomena.
3A-AP-16	Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.

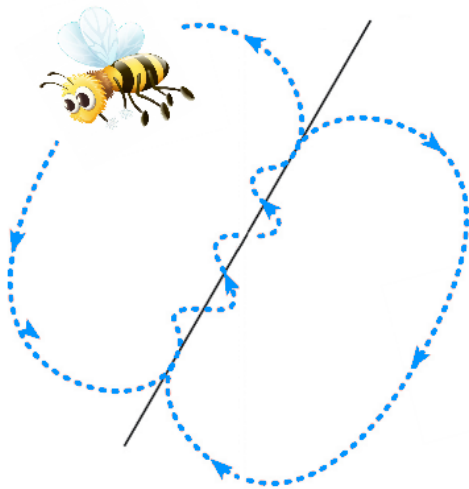
### What you will learn:

You will learn how to move the robot through a complicated path.

You will learn how bees communicate in real life, through their body.

## The Waggle Dance

Before we start this lesson, we need to know what the waggle dance actually looks like. Look at the image, and see the path the bee takes.



The waggle dance is performed when food is *further* than a hundred meters from the hive. The waggle dance looks like a figure 8 with a straight center section. The waggle dance means a lot more than you might expect.

When the food is in the direction of the sun, the bee will perform the wagtail portion of the dance while moving up the comb. The wagtail section of the dance is the center, where the bee wags its body back and forth. If the food is directly away from the sun, the waggle portion is performed while moving down the comb.

From this we can see that the bee basically wags in the direction of the food.

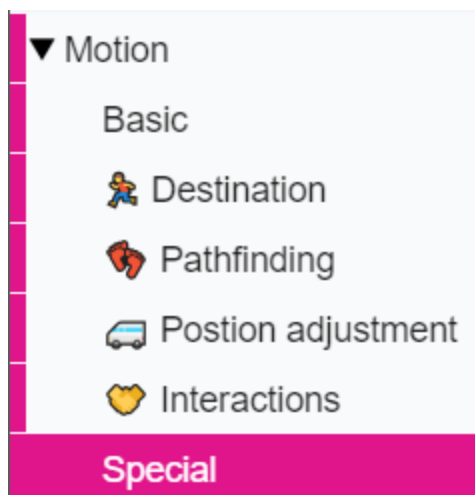
Before we can begin any problem, we must break it down into steps. How do you think we are going to move this robot to recreate the real life round dance? Maybe get a piece of paper, and draw how the *robot* could move.

We will have the code the robot to do two circles. Remember, the robot you are coding has limitations, it can be difficult to program complicated things like the waggle in the center. Lets replicate the waggle dance using the path below, two circles.



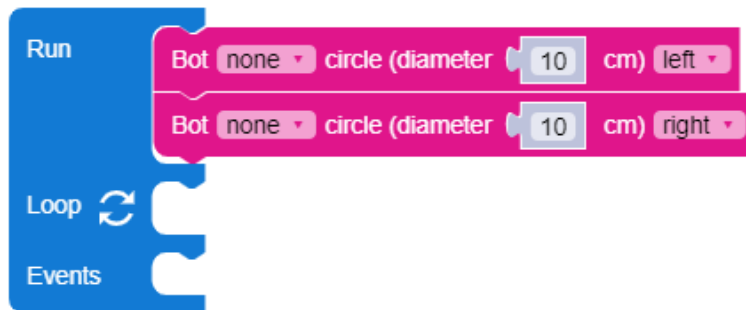
The first step in controlling your bee for the waggle dance, is moving in a circle. Let's start by coding the beginning of the round dance through our code blocks.

We will need to look inside the *Special* section in the *Motion* tab. This is what the Motion tab looks like:



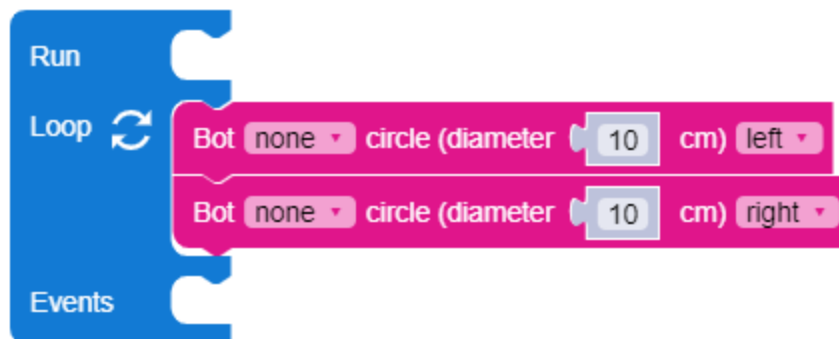
Grab the circle code block, and place it in the *Run* section of the code. You can change the diameter of the circle to whatever you'd like. Put the direction of the bee's circle left. Add

another with the same radius, but as right. Make sure the robot you are using is selected in the code block.



Tap on run and watch your bee move in two circles. Awesome, we've completed the dance!

The bee will do the dance every time you click run, but if you want it to do the dance constantly put the code in the loop section. Now the robot will keep doing the dance until you stop the code.

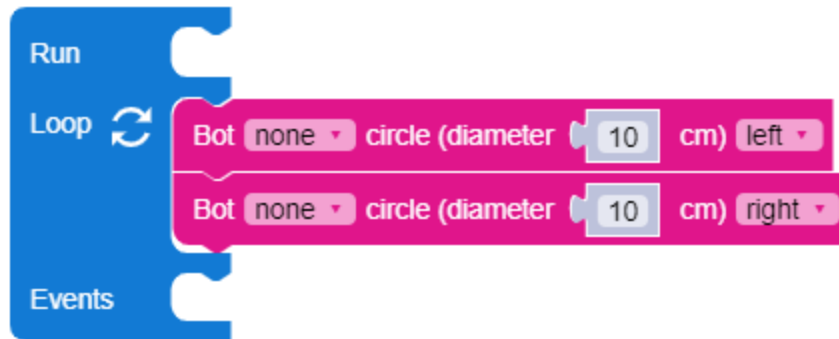


Great work! You have successfully made the bee do the waggles dance, this is essential for communication.

**Tips:**

Make sure you select your robot in the dropdown menu.

End Result:



The end result should look like the code above, and the robot should be able to do the dance.

You should have learnt how bees will use their bodies to communicate to other bees, and how the round dance tells other bees if food is within a hundred meters. How this form of communication is essential for survival.

## Want to Learn More?

If you are more interested in how the bees dance to communicate, check out the video below. This is what a real-life bee doing the waggle dance looks like!

<https://www.youtube.com/watch?v=-7ijl-g4jHg>

Recap:

**What didn't I complete? (If you did everything, you can skip this question!)**

**What was easy?**

**What was hard?**

**What did I enjoy?**