



- You may want to display tips for drawing Color Codes to your students so their maps are successful: <http://ozo.bot/ColorCodeTips>
- You can display the slides in the attachments to introduce and help students complete the activity.

## Direct Instruction (Teacher Facing Instructions):

- 1 Ask students: "Can anyone tell me what a constellation is?"  
Explain: "A constellation is an imaginary shape or pattern a group of stars form. For thousands of years, people found patterns in the stars and used them to tell stories. Today, there are 88 constellations recognized by astronomers."
- 2 Introduce activity: "Today, we are going to choose a constellation to draw with markers, and program Evo to travel along the constellation."
- 3 Show students examples of well-known constellations to choose from. If time allows, students can research other constellations and choose one based on their research.

## Lesson Closure (Optional)

(None)

## Student Practice (Student Facing Instructions):

- 1 Choose a constellation to re-create with Ozobot.  
**Goals:** Students or groups will choose a constellation to re-create on paper.
- 2 Plan your drawing with pencil. Plot out:
  - The position of the stars of your constellation
  - The path for your Ozobot to travel the constellation
  - At least 3 Color Codes for along your constellation
  - Write the name of your constellation
  - Tip: If your constellation has parts that don't connect, you'll need to use a Line-End U-Turn Color Code to make sure it can complete your constellation**Goals:** Students will plan their constellation map.
- 3 Fill in your constellation map with markers. Use:
  - Small circles (the same width as your path lines) to show the stars in the constellation
  - Black marker to create a path for Ozobot to travel along the stars**Goals:** Plan constellation map and ensure all the components fit on the page.
- 4 Test your map and de-bug! Did Ozobot travel to all the stars? Did it read all your Color Codes? If not, correct your map using stickers.  
**Goals:** Ozobot should follow a black line and read at least three Color Codes.
- 5 Share with the class
  - What constellation did you choose?
  - Show your Ozobot traveling along your constellation.

# Supplements

## Additional Attachments

- [Constellation-Map-Solution-Sample.pdf](#)
- [Constellation-Map-Blank-For-Students.pdf](#)
- [color-codes-tips.pdf](#)
- [https://docs.google.com/presentation/d/1VT\\_ZqzKH8pwPRzRc9Snnn8XUIO8GrExaLx5grlojhs8/edit#slide=id.g83623e33c5\\_1\\_76](https://docs.google.com/presentation/d/1VT_ZqzKH8pwPRzRc9Snnn8XUIO8GrExaLx5grlojhs8/edit#slide=id.g83623e33c5_1_76)

## Academic Standards

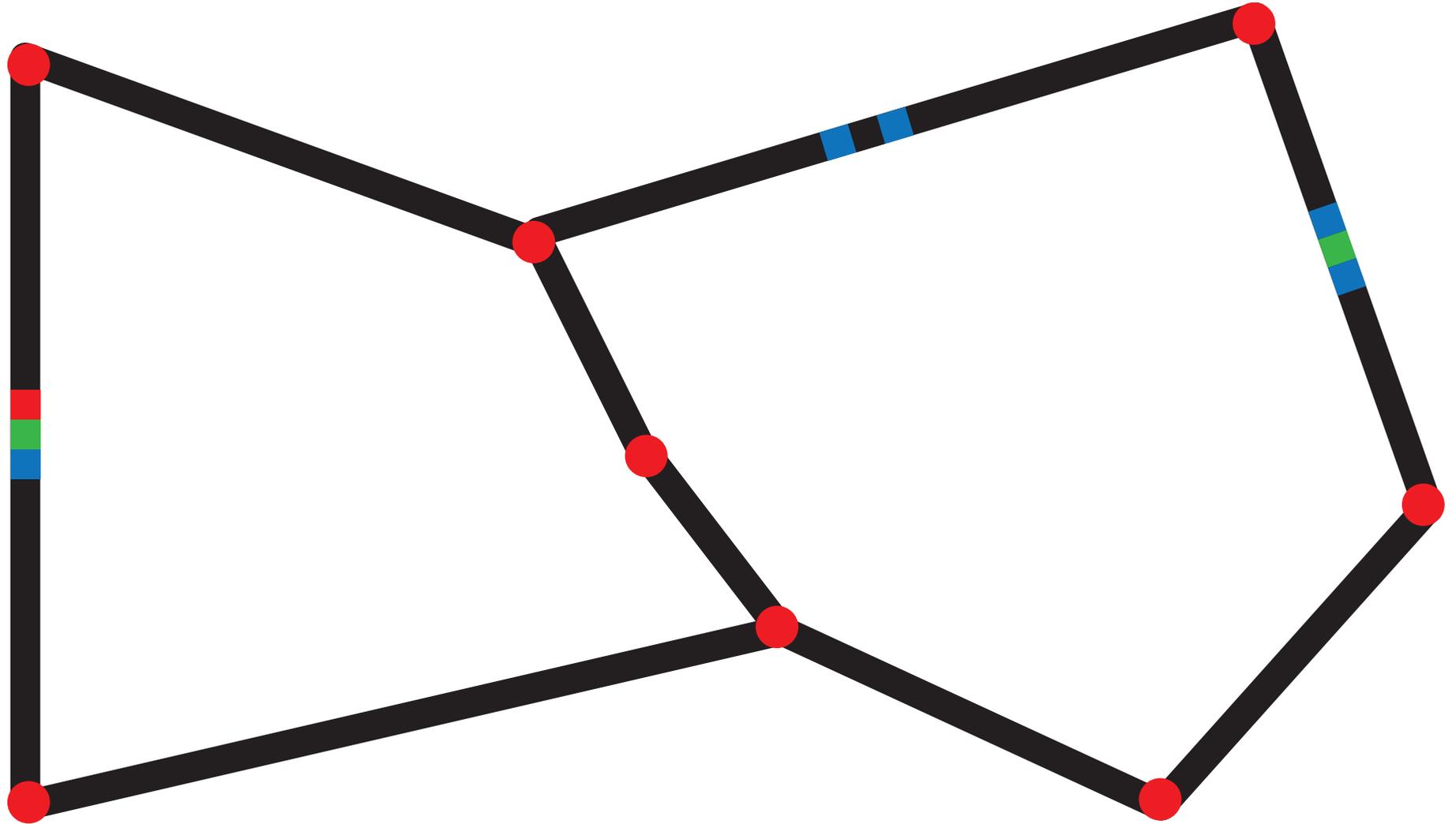
- CSTA.1A-AP-12
- ISTE.1.c
- ISTE.4.d

# Stargazing

Instructions: Draw a constellation for Evo to travel along.

## Orion

*Constellation Name*



# Stargazing

Instructions: Draw a constellation for Evo to travel along.

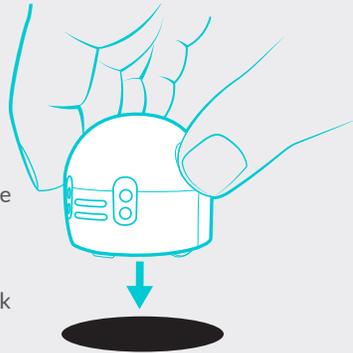


*Constellation Name*

# COLOR CODE TIPS

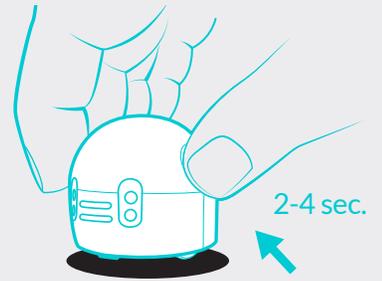
## PAPER CALIBRATION

**1** Make sure Ozobot is powered off, then place it in a black circle slightly bigger than Ozobot. If you are using markers, create this circle using a black marker.



**2**

Press & hold Ozobot's Power Button for 2-4 sec. until top light blinks white. Then, release Power Button.

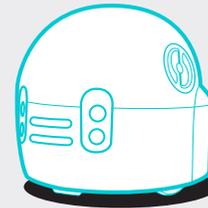


**3**



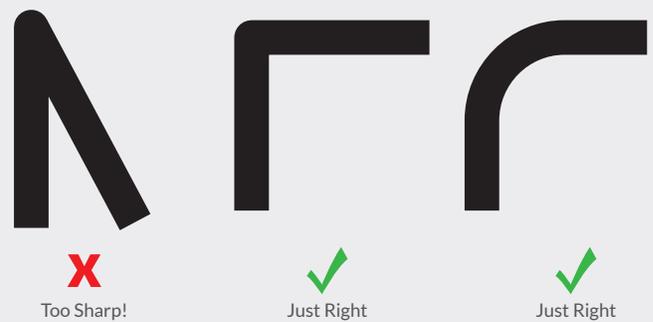
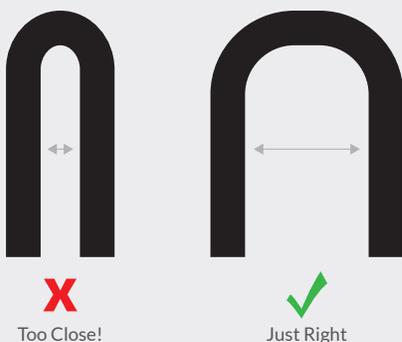
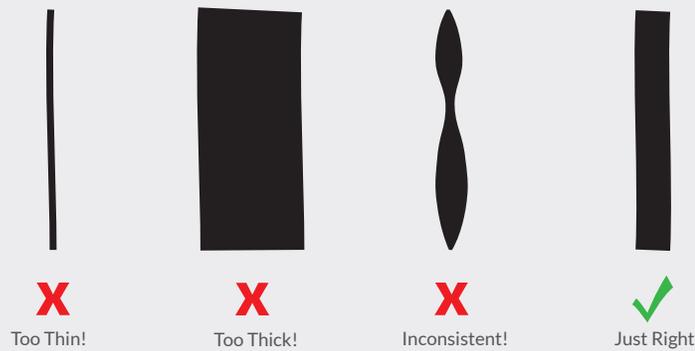
Ozobot blinks green when calibrated. If Ozobot blinks red, start over from step 1. Evo also spins during calibration.

**4**



Press the Power Button to turn Bit back on. Evo powers on automatically after calibrating.

## DRAWING LINES



# DRAWING COLOR CODES



**X**  
Codes on colored lines



**X**  
Different sizes



**X**  
White spaces



**X**  
Overlapping colors



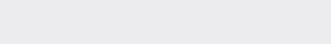
**X**  
Too dark



**X**  
Single color squares larger than 1/4"



**✓**  
Single color squares approx 1/4"



**✓**  
Codes on black lines

# MARKERS

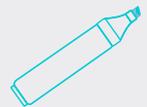
To draw any Color Code, you will need a combination of black, red, green and blue markers.



**X**  
Dry Erase



**X**  
Crayons



**✓**



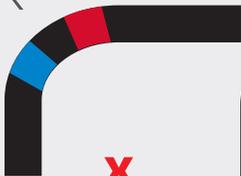
**X**  
Colored pencil



**X**  
Highlighter

**✓**  
Ozobot Markers  
Crayola Classic  
Crayola Pastels  
Sharpie Chisel Tips  
(use light green and light blue)

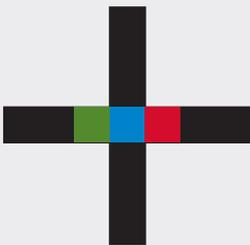
# COLOR CODE PLACEMENT



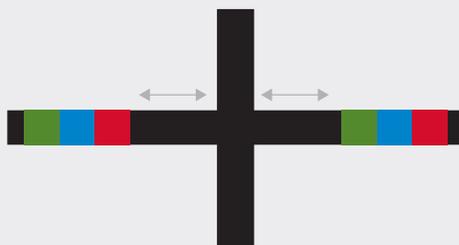
**X**  
Codes on corners



**✓**  
Keep codes on straight lines away from corners



**X**  
Too close to intersection



**✓**  
Place codes away from intersections



**X**  
Codes too close



**✓**  
Codes at least 1" apart



**✓**  
Two-color codes need to be at line end

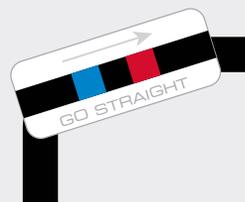


**✓**  
All other codes need black line before and after

# STICKERS



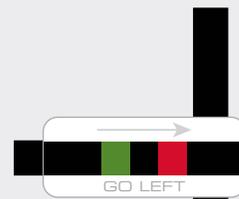
**X**  
Codes on colored lines



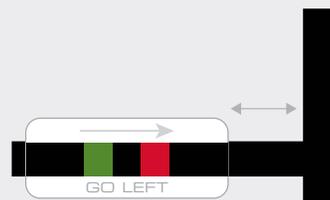
**X**  
Codes on corners



**X**  
Not lined up



**X**  
Too close



**✓**  
Align with straight, black lines  
At least 1-inch from corners, intersections, and other codes



# CALIBRATION DOT TEMPLATES

These calibration dots can be re-used for play on paper with Evo or Bit. **Cut along the dotted lines and fill circles in with black marker.**

Note: Do not laminate as your bot cannot properly calibrate on a laminated surface.

## CALIBRATION DOT

### How to Calibrate:

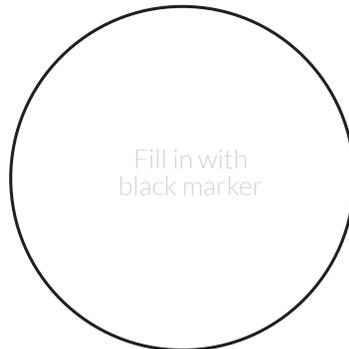
1. Make sure bot is powered off, then place it in the black circle.
2. Press & hold bot's Power Button for 2-4 sec. until top light blinks white. Then, release Power Button.
3. Your bot blinks green when calibrated. If bot blinks red, start over from step 1. Evo also spins during calibration.
4. Press the Power Button to turn Bit back on. Evo powers on automatically after calibrating.



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