iRobot

Grades: 2nd, 3rd
Team Size: 1-2 competitors
Duration: 45 minutes (includes instruction time)
Supervisor: Dave Pawlowski, Advaidh Venkat, Yogesh Chavarkar

Summary Description

Participants will be tested on the following:
- Knowledge of basic computing and robot automation concepts including software.
- Understanding of how computers and robots solve problems.
- Ability to identify the correct color code sequence to have Ozobot complete an objective.

Concepts Covered

There are three sections on the test. The following describes each section.
1. **Computing and Robotic Basics (Section A):** This section tests basic knowledge of software programming languages, robotic sensors, parts and automation, etc.
2. **Path Algorithms (Section B):** This section tests the participant's understanding of how a task can be broken up into separate instructions understandable by a computer program and used to guide a robot to complete a defined objective.
3. **Practical Computing (Section C):** This section tests the participant's ability to identify the correct sequence of color codes to program the robot to complete an assigned objective. This will be accomplished using the color coded markers (or stickers).

Rules/Competition Format

Overall:

- Participants are not allowed to bring anything along with them, all materials needed for the event will be provided.
- Participants can only use the color coded markers and stickers provided to them during the competition.

Written Sections:

- Section A and part of Section B comprise a written examination.
- Each team will be provided with writing instruments and all necessary materials.

Practical Computing Section

- Section C is a practical computing challenge designed to be completed using the Ozobot. Each team will have access to exactly one Ozobot for this section.

Section B will contain hands-on activities in which each team will be asked to identify Ozobot parts on paper. A set of markers or color coded sticker sheets will be provided so the team can identify or mark necessary color code sequences for a given action.

For Section C, each team will be given an Ozobot along with a set of specific objectives for their robot to complete. WESO volunteers will evaluate the ability of the robot to meet the state objectives. The study guide will outline specific pacing guides and training material to create efficient color codes to trigger Ozobot actions.

Scoring

Total Score: 50 points
Breakdown:
- Section A (5 points)
  - Multiple-choice and matching questions
- Section B (25 points)
  - Hands-on activities.
    - Each activity will be scored based on the correctness of the solution and whether it addresses all parts of the question.
  - Identify various parts of the Ozobot and answer related questions
  - Use a set of markers (preferred) or color coded stickers to specify the correct color code sequence required for a given action. If a marker code is incorrect it can be overwritten using a blank sticker. Teams can use color coded stickers as the last option from a sealed pack, but using markers will be preferred and considered for accuracy and efficiency while breaking a tie.
- Section C (20 points)
  - Ozobot programming using color codes
    - (15 points) Correct color codes for Ozobot to complete objective successfully. Teams can use markers (preferred) or stickers with guidelines same as section B.
    - (5 points) Neatness and efficiency

Tie Break Criteria

First Tie Breaker: Use of markers over sticker codes and fastest completion of code sheets.

Second Tie Breaker: Neatness of code sheets with least overwrites and efficiency of the code.

Materials Distributed by WESO

The study guide will contain PDF documents provided by WESO on their website. The PDF's will have embedded links that provide videos and detailed lesson plans needed for the event.

Additional Materials useful for practices

Each school will be given one Ozobot that they have to share with all the participating grades.The Ozobot comes with a basic manual and markers for color coding. Sticker sheets with color codes will be provided. The participants should learn using marker color coding and sticker sheets both for programming the Ozobot. Additional sticker sheets can be bought from Amazon.

Materials to be brought to competition

None

? Event Questions

Event Coaches should submit any questions about the event to weso.events@gmail.com. Please enter the event title in the subject line. Answers will be posted on the WESO Blog. You can sign up to receive blog posts at https://wesoscience.org.

Additional Resources/References

- Ozobot Classroom (needs setting up a FREE educator account)
- Pacing Guide (has links to all lesson plans - follow 1 through 15 for this event)
- Get to know Evo (Link for this lesson is also available in the pacing guide)
- Introduction to Color Codes (Link for this lesson is also available in pacing guide)

Sign up for a FREE educator account on Ozobot.com to get access to the training materials recommended for the event. You will NOT be able to use the links in the PDF documents if you don't have an educator login.

3
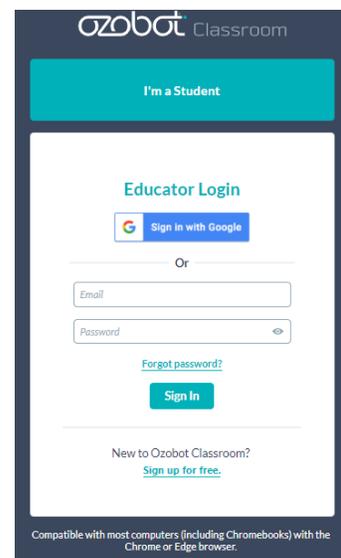
Sample Questions

Section A

1) Ozobot can be programmed using which the following ways:
   a) Speech instructions
   b) Light intensity
   c) Color codes
   d) None
2) What is a sensor?
   a) Song note at certain scale
   b) Device that responds to certain signals
   c) Light that flickers
   d) All of the above
3) Match the items in column A to their associated type in column B

Column A	Column B
Program	Algorithm
Logic	OzoBlockly
Proximity	Memory
Storage	Sensor

Section B

1) Evo has three types of sensors: Proximity, Line-Following, and Color. Can you find these on your bot? Label them on the provided Diagram Worksheet.
2) Can you find the LEDs (top and front) on your bot and on your Diagram Worksheet? Label the LEDs on your Diagram Worksheet.
3) Can you find the motherboard and the BLE antenna on the motherboard? Label the antenna on the Diagram Worksheet.
4) Can you find Evo's power button (on the left side) of your bot? Label it on your Diagram worksheet.
5) What color code would you use to make the robot turn right by 90 degrees while following a line?

Introduction to Ozobot

Name: _____

Date: _____

1

◎ | Get to Know Evo

Key Terms

- Bluetooth Antenna
- Color Sensor
- Line Following Sensors
- LED Light
- Proximity Sensors
- Power Button
- Speaker
- Charging Port
- Wheels/Motor

Front

Back

Top

Bottom

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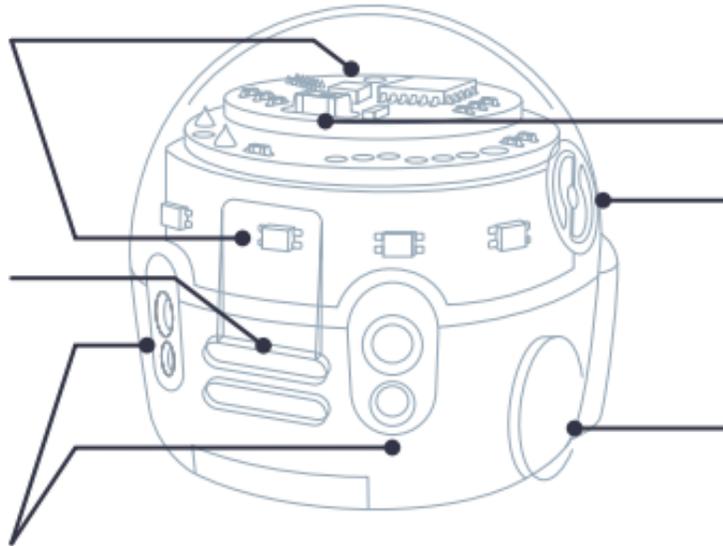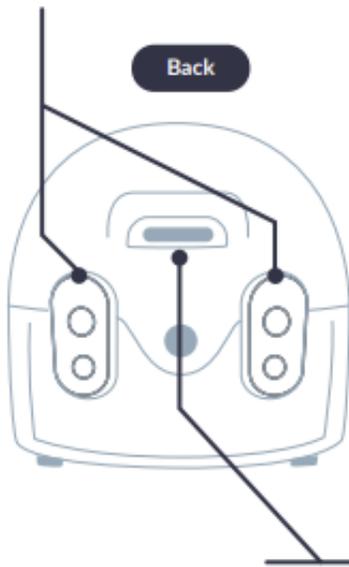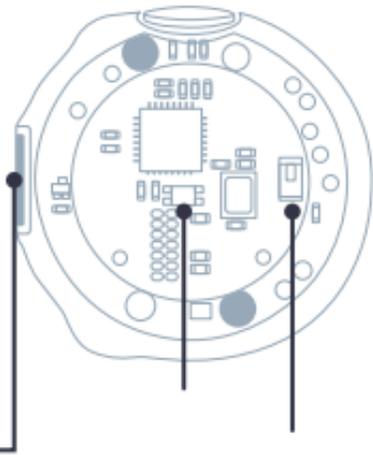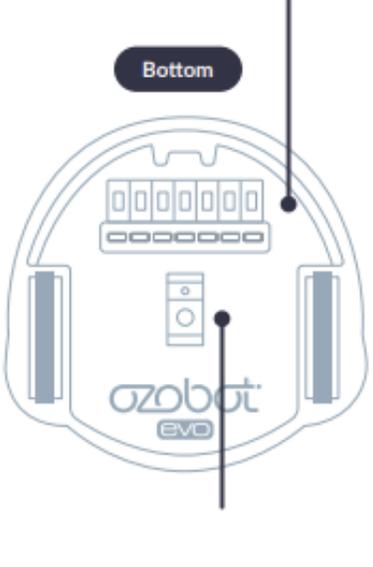
Use the sheet below to identify and mark the correct color code sequences on the color codes key. Then use your markers to fill in the correct colors on the sheet.

1. Slow
2. Short Super Slow
3. Cruise
4. Turbo
5. Fast
6. Nitro Boost

⊙ | Introduction to Color Codes 02:
Speed

Name: _____   ①
Date: _____

• **Color Codes Key**

Short Super Slow
R G B

Slow
R BK R
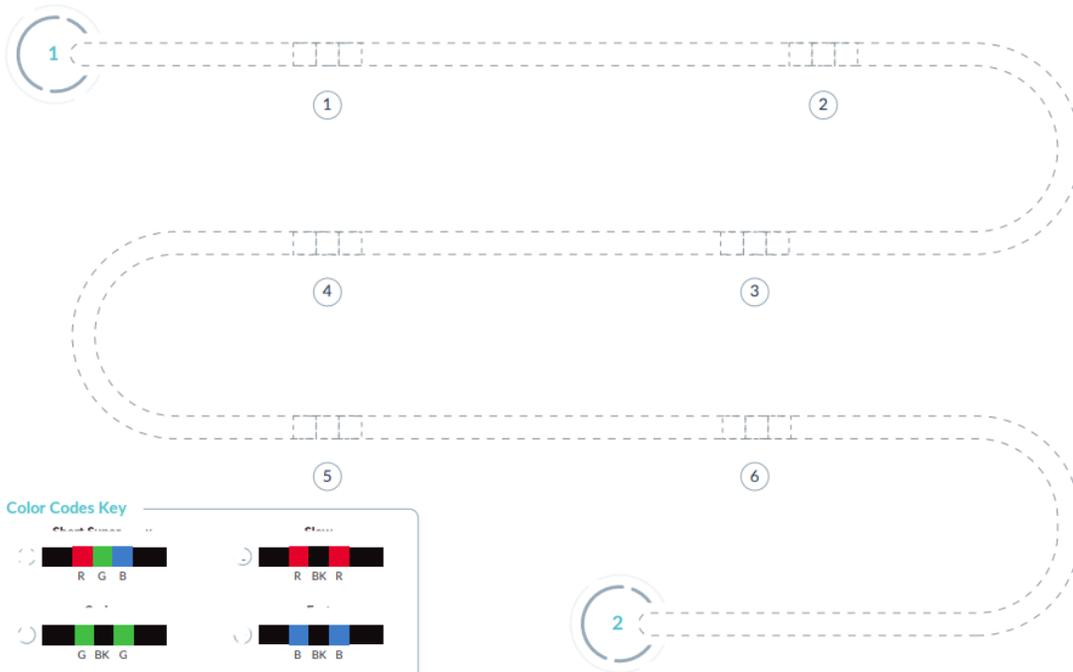
G BK G
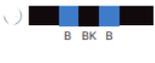
B BK B

Turbo
B G B

B G R

All Grades | Computer Science

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Section C

1) Using the color code to complete the objective defined for your Ozobot. Fill the map/path by using correct codes on the sheet provided. Once you have filled the color codes in, place the ozobot on the circles to test the operation. Change your code if necessary by using stickers. (Note: the key does not provide all the codes needed to complete the objective. You may have to remember some of the codes you may have used in the practice to perform some actions). Finally program the path so that your robot completes the provided objective and ends with the win/exit play again code.

Introduction to Color Codes 05:
Skills Check

Name: _____
Date: _____

Color Codes Key

G BK R

B R G

Win/Exit (Play Again)

G B

G R G R

B BK G R

Ozobot spins to chase the dog. (4)

Ozobot spins to swing the bat. (5)

Ozobot plays on the way to school. (6)

Grade K-2 | Computer Science

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