



MAGELLAN'S JOURNEY

PREPARED FOR OZOBOT
BY LINDA MCCLURE

Essential Question

How can we use programming to understand history and geography?

Topics

World Geography: continents and oceans

Social Studies: Explorers

Computer Programming

Overview

As a class, students will program their Ozobot Bit to complete the journey of Ferdinand Magellan. After cutting out and assembling paper continents, students will use the OzoBlockly language to program an Ozobot Bit to navigate around the continents along the path Magellan took. Along the way students will label different parts of world geography.

Suggested prerequisites

Knowledge of how to program Ozobot Bit using OzoBlockly with blocks from the Movement category. To practice, please complete the ShapeTracer games on games.ozoblockly.com.

Grouping

Students can work in groups of two or three

Materials

- Ozobot Bit, one per group
- ozoblockly.com on a computer or tablet
- Background information on Magellan and the route he took:
 - Map: <http://www.enchantedlearning.com/explorers/printouts/m/magellan.shtml>

- Story: http://www.ducksters.com/biography/explorers/ferdinand_magellan.php
- Handout: copy of "Discussion Guide", one per group
- Handout: copy of all pages of "Cutouts of Continents", one per group
- One completed Continent Map for demonstration (see Preparation), or copy of "Continents Assembled" (one per group)
- Craft supplies:
 - Scissors
 - Construction paper or poster board
 - Glue sticks
 - Markers or crayons
 - Pencil

Age/Grade Level

Grade 3 and up

OzoBlockly programming topics

Movement, Logic

Differentiation for younger students: use Line Following to simplify the programming task. If you do, then practice the OzoTown games instead of the ShapeTracer games on games.ozoblockly.com

OzoBlockly mode

Use any mode. (If Line Following is used for younger students, choose mode 3 or higher.)

Duration

Approximately two class periods:

- Intro/Create a Map: 55 Minutes
- Program Ozobot Bit: 55 Minutes

Vocabulary

- *Ozobot Bit* - Little robot that can follow drawn lines and can be programmed using visual codes or through the OzoBlockly programming language
- *OzoBlockly* - A visual editor which allows to create programs by plugging blocks together. The blocks can be used to control Ozobot's behavior like movement, LED lights, etc.
- *Rotate Right or Left* - 90° turn

- *Rotate Slightly Right or Left* – Aprox. 45° turn
- *Steps* – a unit of movement forward or backward
- *Line Following* - Ozobot's capability of sensing and following lines on paper or tablets

Preparation

Ahead of time, teacher creates a sample of the continents cut out from the "Cutouts of Continents" and glued onto construction paper or poster board and labeled. Alternatively, give each group a copy of the handout "Continents Assembled."

ACTIVITY

1. Introduction

Divide the students into groups of three or four. Have the groups go to http://www.ducksters.com/biography/explorers/ferdinand_magellan.php and <http://www.enchantedlearning.com/explorers/printouts/m/magellan.shtml> (or provide printouts). As a group students read Magellan's story and discuss using the printout of the "Discussion Guide". Have selected students share items from the discussion guide with the whole class.

2. Guided Activity

Using the completed continent map or the printout of the "Continents Assembled" (see **Preparation** on previous page), teacher shows the class the route that Magellan took. Brainstorm as a class on a white board or document camera, the programming commands students might use. Depending on the level of the students, teacher may only want to demonstrate part of the map so that students can problem solve the remainder of the journey.

Optional: After brainstorming ideas, teacher can program a short example using OzoBlockly on a computer or tablet. Lay the map on a table and see if Ozobot Bit can travel the around the continents the way Magellan's ship traveled. Create adjustments to the code accordingly.

3. Independent Activity

1. In groups, have the students create a "Map of the World" for the Ozobot Bit to travel. Once created, the map can be used for other Explorer lessons. The map should be constructed as follows:
 - a. Have the students cut out the Continent shapes from the "Cutout of Continents" Worksheet. Looking at a map or website, have the students label the contents.
 - b. Students glue the continents onto a large piece of construction paper or poster board in the correct formation. Students can reference the map or

website for this step. Students can label other area of the map including oceans, countries or important landmarks.

2. Students use OzoBlockly on a computer or tablet to program the Ozobot Bit to travel Magellan's path around the continents. Use blocks from the Movement category to program the path.
 - c. *Note:* Program the Ozobot Bit without using line following but using blocks from the Movement category instead. This way, students must experiment with their programs to achieve the correct course.
 - d. Students may want to pencil in the path as a visual reference. Ozobot may not trace the path exactly, but the general movement should be achieved.
 - e. *Challenges:* provide tasks for the students to program into the journey to make it more individual and challenging. Tasks include having the Ozobot Bit spin or change colors near the locations Magellan stopped along the way.
 - f. After successfully programming the Ozobot Bit, have the groups compete against other groups. Can they tweak their code for a better outcome?

Accommodations

For younger students, the route can be drawn on the map with a black marker and the Ozobot Bit can follow the line using blocks from the Line Following category.

4. Extensions

- Create "costumes" for Ozobot Bit by decorating the blank DIY skins.
- Students can create a video of the journey with a voice over telling Magellan's story.
- Have the students choose a different explorer to study and create the route that explorer took.
- Students can create a presentation on Magellan or another explorer and how they programmed their Ozobot Bit.
- Students can create a timeline of explorers.

5. Share

We would love to see your students' creations! Please share your documents, photos and videos with us for a chance to win cool prizes and be featured on our website. Contact us at ozoedu@ozobot.com.

**Magellan's Journey
Discussion Guide**

Question	Your Answer	Discussion	Final Answer
<p>What were some of the biggest accomplishments from the Magellan Voyage?</p>			
<p>What were some of the biggest challenges from the Magellan Voyage?</p>			
<p>How did this voyage impact history?</p>			
<p>What are some of the programming challenges the Ozobot Bit journey may find?</p>			

Cutouts of Continents



Cutouts of Continents



Cutouts of Continents



Continents Assembled

