

INTRO TO CARDINAL DIRECTIONS / INSTRUCTOR INFO

Summary

This lesson includes vocabulary, content, examples, and activities to help students learn cardinal directions. The goal of this lesson is for students to be able to describe the swimming patterns of sharks on the Global Shark Tracker™ by using the terms north, south, east, and west.

Part 1. Introduction

Part 2. Activity 1. Where are the sharks going?

Part 3. Activity 2. Directions and Maps

Part 4. Activity 3. Ocean Scenes

Part 5. Activity 4. Shark Tracking

Goals & Objectives

The students will:

- Be able to recite the four cardinal directions: north, south, east, and west;
- Use the terms north, south, east, and west to describe swimming patterns of the sharks on the Global Shark Tracker™ over a period of three days;
- Use a map of North America to plot three “ping points” that a pretend shark is going to make and describe the movements of that shark using cardinal directions.

// STANDARDS

This lesson aligns with the following TEKS:

Kindergarten: 4C

Grade 1: 4A, 5A, 5B

Grade 2: 5A, 5B, 6C

STEM

This lesson plan aims to assist teachers in implementing a STEM-based program into their classroom while inspiring the next generation of explorers, scientists, and stewards of the ocean. Based on real science and the Global Shark Tracker™, “Introduction to Cardinal Directions” is intended to promote environmental awareness and to prepare students for STEM careers.

Helpful Tips

1. The content in this lesson is based on the conservation work of OCEARCH™ and the Global Shark Tracker™. Spend a few minutes getting familiar with the website and the tracker if you have not done so already. The Global Shark Tracker™ is also available as an app for iPhone and android.
2. This lesson plan is designed to be adaptable to suit your specific needs. Use the entire lesson plan or just parts of it. This material can be expanded to be an entire unit or condensed for just one day in the classroom.
3. Vocabulary words will be underlined as they first appear in the lesson plan. A complete list of vocabulary words is included as well.
4. Answers to questions and prompts for discussions will appear in italics.
5. Optional activities and content (side notes) will appear in a box. Use these to enhance your lesson and adapt it to suit your needs!
6. Have questions for M/V OCEARCH Expedition Leader, Chris Fischer? Email info@OCEARCH.org to schedule a Skype session and let your students/child talk directly to Chris and the M/V OCEARCH crew!
7. Email all questions about this lesson to info@OCEARCH.org.

Vocabulary

Cardinal Directions: The four main compass points: north, south, east, and west. These are also known as cardinal points.

Compass Rose: A printed symbol used to find direction on a map.

Map: A drawing or a picture of selected features of an area.

INTRO TO CARDINAL DIRECTIONS / LESSON PLAN

PART 1. INTRODUCTION 10 - 15 mins

Ask students if they have ever used a map before. Discuss why people use maps, including specific jobs/professions. A map is a drawing or a picture of selected features of an area.

The OCEARCH crew uses many different maps every day to navigate the ocean, locate sharks to tag, and track the migrations of sharks they have already tagged (Figure 1). Without maps, OCEARCH would not be able to study great white sharks the way that they do!

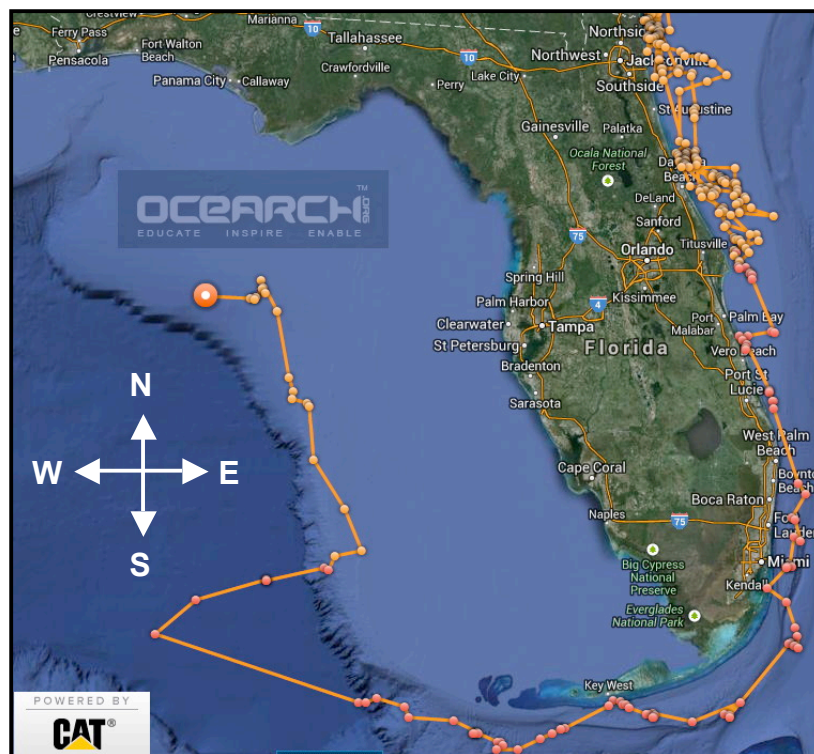


Figure 1. Map showing the migration pattern of Katharine, a female great white shark.

An important component on a map is the compass rose, which is a symbol on a map used to find direction. Direction is the line or course on which an object is moving or the way an object is pointing or facing. The four main directions, also known as cardinal directions, are north, south, east, and west.

After tagging a shark, OCEARCH researchers study the directions the sharks swim in order to learn migration patterns, eating grounds, and where mother sharks give birth. It is important for them to have this information so they are able to understand the habits of these animals and be able to protect them.

PART 2. ACTIVITY 1. WHERE ARE THE SHARKS GOING? 20 mins

In this activity, students will become familiar with the Global Shark Tracker™ and the four cardinal directions. Using directions, students will study the swimming patterns of sharks.

Materials

- Computer with internet access
- Pencil
- Colored pencils, crayons, or markers
- Worksheet (provided)

Instructions

Pre-select five individual sharks of any species, gender, and age. These five sharks will be used as examples in this activity, so write down their names. Try to select sharks whose migration patterns go in different directions so you have a variety. Alternatively, if you would rather it is random then do not pre-select sharks for the activity.

1. Open the Global Shark Tracker™ on the projector, computer, or ELMO machine for the students to see.
2. Spend a few minutes getting the students familiar with the tracker if you have not done so already.
3. Review the cardinal directions – north, south, east, and west. Be sure to use hand motions or a pointer to show the directions on the tracker as you describe them.
4. Call a student to the front of the class and if possible, ask him/her to point to North America. Now ask the student to find the Arctic. Which direction would a shark have to travel to go from North America to the Arctic? **Answer:** *North*
5. Call another student to the front of the class to point to Africa. Then ask the student to find Antarctica. Which direction would a shark have to travel to go from Africa to Antarctica? **Answer:** *South*
6. Now, while referring to your list of pre-selected sharks, click on each shark's profile. If you have not pre-selected sharks, choose sharks at random for the activity.
7. Begin with the first shark. Click "Where have I been?" to show the shark's swimming pattern, and its most recent ping.
8. Click on the shark profile on the shark tracker to show the students the species of shark and click on the "Where have I been?" button.

9. Discuss the directions this shark is swimming with the class. Is the shark traveling north, south, east, or west? Does the shark change directions? How often? Where is the shark currently located on the map in relation to your school?
10. Repeat this process for each of the sharks you have chosen.
11. Do the students notice any patterns? What was the most common direction for a shark to swim?

Have the students predict where the shark may ping in next and make note of the predictions. Check the tracker in a few days to see if the students were right!

PART 3. ACTIVITY 2. DIRECTIONS AND MAPS 30 mins

In this activity, students will use their listening skills and their new knowledge of cardinal directions to fill in a map of the United States of America!

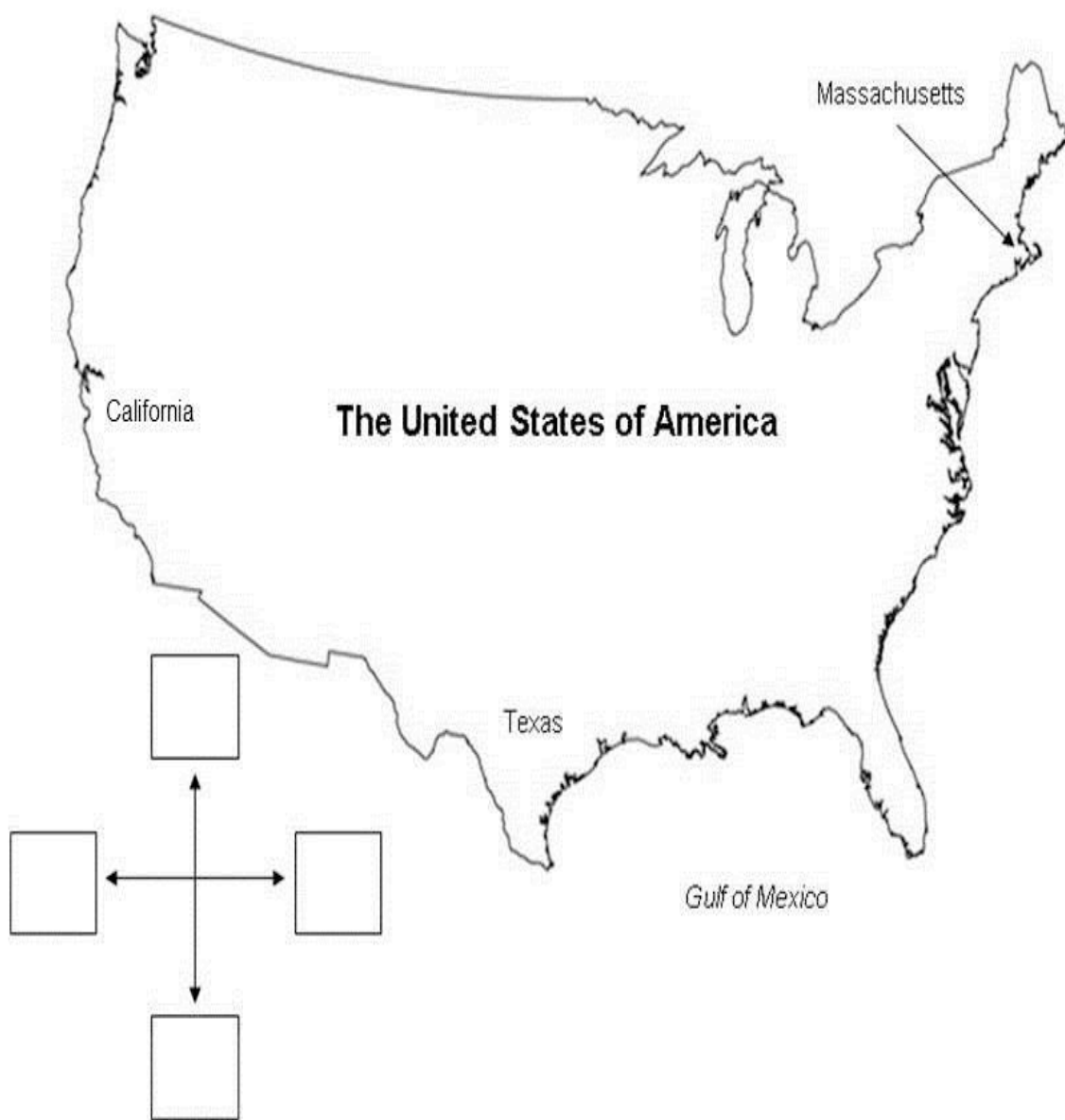
Materials

- Pencil
- Colored pencils, crayons, or markers
- Blank map of the United States of America (provided)

Instructions

1. Pass out a blank map of the United States of America to each student.
2. After writing their name on the map, students should fill in the four cardinal directions on the blank compass with just the first letter of the word (N for north).
3. Explain to the students that they will need to listen carefully in order to know where to draw the rest of symbols on their map.
 - a) Students will draw simple figures on the map by listening to the directions, "Draw a _____ to the (north south, east, or west) of _____."
4. Ask students to draw a blue shark fin (or a triangle) to the east of Massachusetts.
5. Draw a green ping (or a circle) to the south of the blue shark fin (triangle).
6. Draw a blue ping (or a circle) to the south of Texas.
7. Draw a yellow shark fin (or a triangle) to the north of the green ping (circle).
8. Draw a red ping (or a circle) to the west of California.
9. Draw a green shark fin (or a triangle) to the west of the red ping (circle).

10. Draw a red shark fin (or a triangle) to the east of the blue ping (circle).
11. Draw a yellow ping (or a circle) to the north of the green shark fin (triangle).
12. Once complete, have students trade their map with another student to check each other's work. Not everyone's map will look the same! Some students will draw their symbols further apart than others. But if completed correctly:
 - a) The blue triangle is east of Massachusetts.
 - b) The green circle is south of the blue triangle.
 - c) The blue circle is south of Texas.
 - d) The yellow triangle is north of the green circle.
 - e) The red circle is west of California.
 - f) The green triangle is west of the red circle.
 - g) The red triangle is east of the blue circle.
 - h) The yellow circle is north of the green triangle



PART 4. ACTIVITY 3. OCEAN SCENES 20 mins

In this activity, students will use cardinal directions to create their own ocean scene!

Materials

- Pencil
- Colored pencils, crayons, or markers
- Blank art paper, construction paper, or printer paper

Instructions

1. Ask the students to lay their blank sheet of paper on their desk horizontally. (Demonstrate which way you would like their paper to look on their desk.)
2. Ask the students draw yellow or brown sand at the bottom of the page.
3. Ask the students to draw blue waves at the top of the page.
4. Ask the students to draw a shark in the middle of the page.
5. Next, draw a fish to the west of the shark.
6. Draw a jellyfish to the east of the shark.
7. Draw a boat to the north of the shark.
8. Draw a sea star to the south of the shark.

If time allows, let the students fill in the rest of their picture with whatever they'd like. Display the drawings in the classroom!

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