



## Lesson 7: Natural Threats to Sea Turtles

Description: Students will learn about natural threats to sea turtles, including climate change and harmful algal blooms.

### Objectives:

By the conclusion of the activities, students will

- Be able to collect data on their local weather for a period of time (determined by the teacher).
- Learn to follow a protocol to ensure collection of uniform data by different team members.
- Be able to develop a graph that represents the data they collected.
- Be able to compare the data they collected on local weather with data published on weather.com for their zip code.
- Be able to describe why the data they collected might be different from published data.
- Be able to compare data they collected with trends published for the same time period and extending back 30 years.

### You will need:

- Copies of chapter 7, *Natural Threats to Sea Turtles*, for each student.
- Word wall words (pages 7-13 to 7-15)—printed, cut out and laminated (if desired)
- Instructions for daily weather observations.
- Daily data sheets (page 7-6). These may be maintained in a class notebook or on a clipboard. If this is done as a class activity one set of data can be used by the entire class.
- A thermometer.
- Pencils.
- Internet access for published data ([www.weather.com](http://www.weather.com)).
- Graph paper for data analysis.

### Standards:

Florida Sunshine State Standards-

*English Language Arts*

- **LAFS.5.RI.2.4** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

*Mathematics*

- **MAFS.5.OA.1.1** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

*Science*

- **SC.5.E.7.3** Recognize how air temperature, barometric pressure, humidity, wind speed and direction, and precipitation determine the weather in a particular place and time.
- **SC.5.E.7.4** Distinguish among the various forms of precipitation (rain, snow, sleet, and hail), making connections to the weather in a particular place and time.



## Common Core Standards-

ELA/Literacy

- **RI.5.4** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

Mathematics

- **OA.A.1** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

Vocabulary:

**Average:** A number that describes what is true most of the time. In math, the average is the result of adding together all the possible values and dividing by the number of values.

**Carbon Dioxide:** [CAR-bun die-OX-ide] A gas produced when plants and animals breathe. It is also made when people burn gasoline or coal.

**Climate:** The average weather in a place over many years.

**Greenhouse Effect:** The warming of Earth's surface and lower atmosphere caused by certain gases.

**Harmful Algal Bloom:** A bloom forms when tiny plants that live in water grow very, very quickly. If those plants can make toxins, they form a harmful algal bloom.

**Plankton:** Plants and animals that cannot swim against a current.

**Weather:** The state of the atmosphere at any given time. Weather includes temperature, rainfall, wind and more.

Procedure:

1. Add words for this lesson (pages 7-13 to 7-15) to your sea turtle word wall. Review these words with students (definitions are given in Vocabulary, above).
2. Have students read "Natural Threats to Sea Turtles" (Chapter 7 in *One in a Thousand: Those Amazing Sea Turtles*).

Activities:

Activity 1: **Weather and climate** (pages 7-3 to 7-11). The activity is divided into three parts. Teachers may choose to do all or part of this, depending on the time and resources (ie. Internet access) available.

Activity 2: **Ocean acidification** (page 7-12). A link is provided to a website that has an easy to follow activity in which students use common household products to create three solutions which will be acidic, neutral and basic respectively. The students will place chicken eggs in these solutions and observe changes in the eggshells over a period of 3-4 days.

**Activity 1a: Collection of daily weather data at your school**

- As a class, review procedure for collection of weather data. You may want to have the entire class work together to collect the information for the first 2-3 days. Emphasize the importance of collecting the data in the same manner, at the same time, and using the same equipment each day. Subsequently you may wish to have smaller teams of students work together to collect the daily observations.
- Instructions for collection of data should be provided to students conducting the observations each day. Posting a copy of the instructions in a prominent location in the classroom is also encouraged.
- Determine how long you wish to record the daily weather data. A minimum of one-week is recommended. Two weeks may be ideal so that some kind of change (ie. A rainy day) is observed.
- Develop a class “laboratory notebook” for the data sheets. This could be a three-ring notebook where sheets are added daily, or they could be maintained on a clip board.
- When analyzing data it may be easiest to project raw data that you have made into a table, or have the students create a table. It is also feasible for the instructor to create a table with the data on it, make copies, and hand these out to the students.
- Students should create a graph that has “date” on the x-axis and “temperature” on the y-axis.

**Activity 1b: Compare locally collected data with official weather data from weather.com**

- Each student should have a copy of the data summary sheet (page 7-6).
- Have students write down the daily temperature readings from the class “laboratory notebook”. Be sure to include the time of day the recording was done.
- Visit Weather.com ([www.weather.com](http://www.weather.com)) to find the official high and low temperatures recorded for the local zip code for the days the student’s made local observations.
- Provide this information to the students or have them go on-line to find it. They should record official high and low daily temperatures directly from the website.
- Students should calculate the official mean daily temperature from the data obtained from weather.com. (Averaging the high and low temperatures already recorded will yield the mean daily temperature).
- Using colored pencils (if available) students should add the official mean daily temperature to their graph that already shows the local temperature that they measured.



- Using the observations from the data sheets (i.e. time of day, weather conditions such as wind, cloud cover or rain) they should be able to explain why the temperature they measured at the school differed (or was the same as) from the official mean temperature.

**Activity 1c: Interpret the class observations in the context of historical data**

- Internet access is required for this, or the teacher will have to get the data and provide it to the class.
- Use data from Weatherbase ([www.weatherbase.com](http://www.weatherbase.com)).
- Enter the local zip code in the top right hand corner search bar.
- The web site will provide information on local weather stations. Select the one closest to your location.
- The site will provide average monthly temperature data. Just above the right hand side of the table it will indicate how many years of data were available to arrive at the average number provided.
- Have students compare the average historical temperature for the month (s) they studied to the data they collected. This can be done by plotting the average temperature from the website onto their graph.
- Is the average temperature warmer or cooler than the temperatures they observed? Discuss why this might be.





# Weather and Climate

## Class Instructions for Collection of Daily Weather Data at Your School\*

(\* Modified from *Weather and Climate: What's the Difference*,

<https://www3.epa.gov/climatechange/kids/documents/weather-climate.pdf>)

1. Try to collect your data at the same time, and in the same location, every day.
2. Find a place outside for your weather station. Ideally it should be a shaded area that is away from the school building.
3. Before taking a temperature reading, wait several minutes for the thermometer to adjust to the outdoor temperature.
4. Hold the thermometer at eye level to take a reading. Be careful not to touch an area that will record temperature. Do not hold it in direct sunlight.
5. Record the air temperature on the data sheet provided.
6. Temperature readings should be recorded in degrees Fahrenheit (°F) and degrees Celsius (°C). If your measurement was recorded in degrees Fahrenheit (°F), please use the formula provided to also record the temperature in degrees Celsius (°C). If your thermometer gave you the reading in degrees Celsius (°C), please calculate the temperature in degrees Fahrenheit (°F) and also record that number.
7. Collect other data required on the data sheet and record the information. Be sure to include your name and the time of day.
8. Add the data sheet to the class "laboratory notebook".



Name: \_\_\_\_\_

### Daily Weather Data

Date: \_\_\_\_\_

Time: \_\_\_\_\_

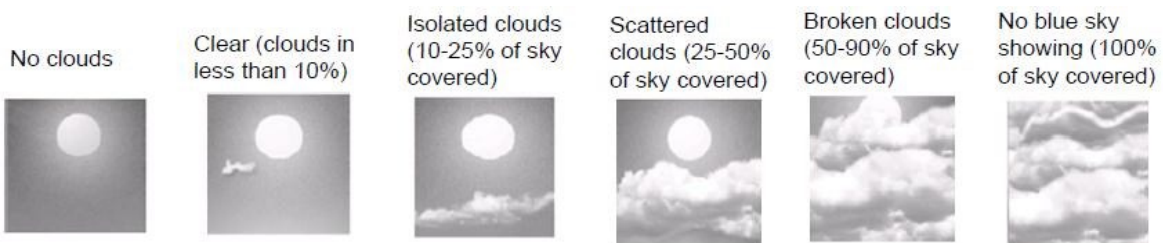
The temperature is:  °C  °F

*Unit conversion:*

$$^{\circ}\text{F} = (^{\circ}\text{C} \times 1.8) + 32$$

$$^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 1.8$$

Cloudiness (circle one):



Precipitation (check one):

- None
- Heavy rain
- Light rain
- Heavy snow
- Light snow
- Hail
- Other \_\_\_\_\_



Name: \_\_\_\_\_

### Comparing Your Data with Official Local Weather Data

Temperature unit (check one) \_\_\_\_\_ °F or \_\_\_\_\_ °C

Weather data (recorded by class)			Official data (daily averages from Weather.com)		
Date	Time	Temperature	Average high temperature	Average low temperature	Mean temperature

**Week 1**


**Week 2**

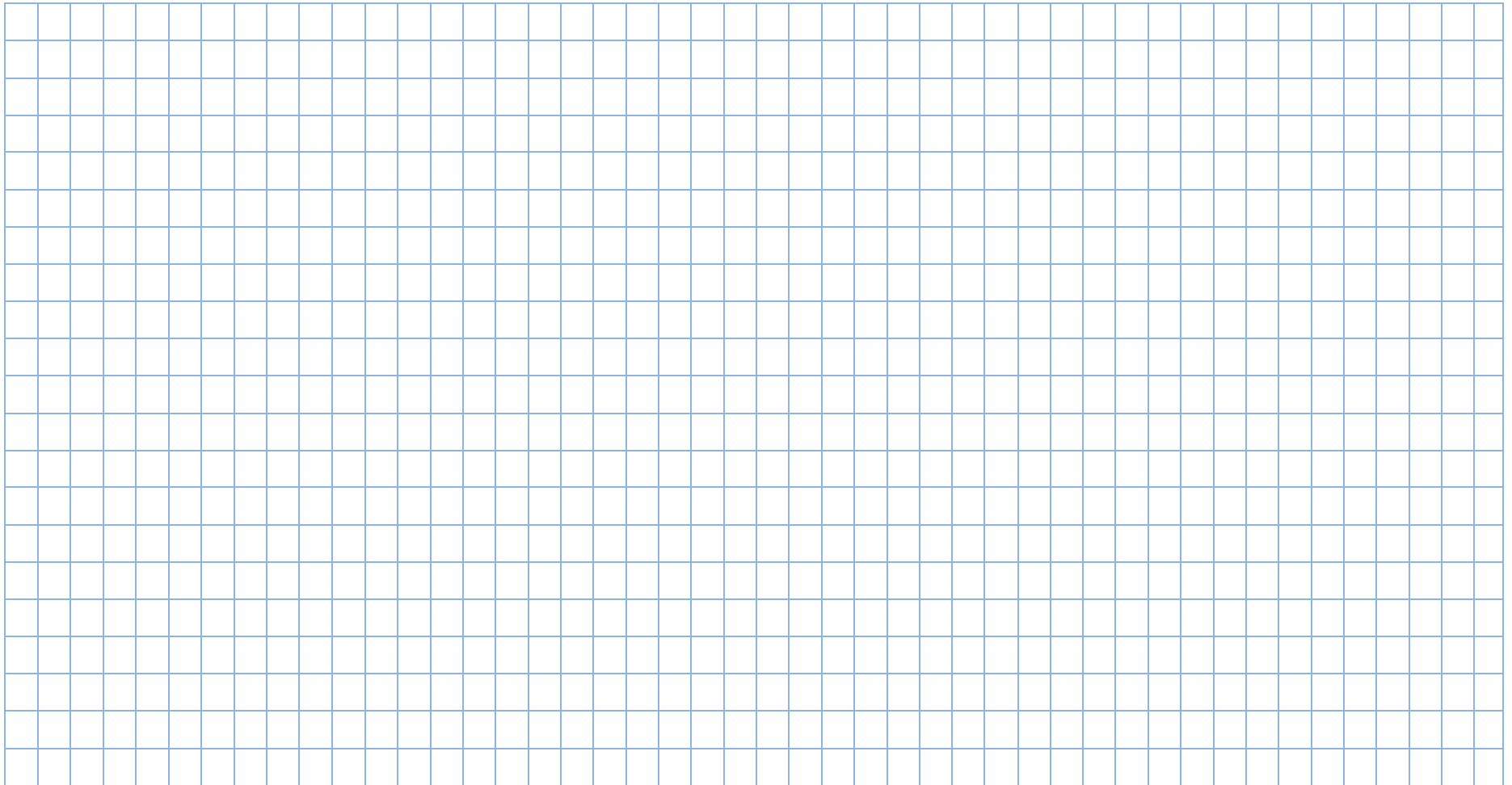

**Week 3**




Name: \_\_\_\_\_

### Graph Your Data and the Mean Official Temperature You Calculated

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_







1. Record date on the x-axis
2. Record temperature (include °F or °C) on the y-axis
3. Label your data and the official mean data (use different colors if you can)
4. Add a single red dot that is the historical mean temperature for this month for your area (use weatherbase.com) as instructed.



Name: \_\_\_\_\_

**Compare your current temperature data with historical data:**

- Go to [www.weatherbase.com](http://www.weatherbase.com)
- Type the school’s zip code into the upper right hand corner.
- Select a weather station close to your school.
- Average weather data will present with temperature information on the top of the page.
- The number of years the data was collected from will be listed in small blue print above and to the right of the table.

Please answer the following questions:

1. In what month did you collect weather data at your school? \_\_\_\_\_
2. For how many weeks did you collect weather data at your school? \_\_\_\_\_
3. What was the average temperature (from your data) during this time? \_\_\_\_\_
4. What was the official average temperature during this time? \_\_\_\_\_
5. What is the historical average temperature during the month you studied? \_\_\_\_\_
6. How many years of data were used to develop the historical average? \_\_\_\_\_
7. Was the average temperature you observed higher or lower, or the same, as the official average temperature? \_\_\_\_\_
8. Why do you think this happened?

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9. Was the average temperature you observed higher or lower, or the same, as the historical average temperature for your area? \_\_\_\_\_

10. Why do you think this happened?

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# Ocean Acidification and Egg Shells

- The lesson can be downloaded as a pdf from the website listed below:

<http://sciencelearn.org.nz/Contexts/Life-in-the-Sea/Teaching-and-Learning-Approaches/Ocean-acidification-and-eggshells>

**Average**

**Carbon dioxide**

**Climate**

**Greenhouse**

**effect**

**Plankton**

**Harmful algal**

**bloom**

**Weather**