



Grow Baby Grow!

Created by the NC Aquarium at Fort Fisher Education Section

Essential Question:

How fast do sea turtle hatchlings grow?

Lesson Overview:

Students will learn about sea turtle growth by measuring pictures of hatchlings from the Aquarium and graphing the change over time.

Learning Objectives:

Students will be able to:

- Learn how scientists measure sea turtle hatchlings.
- Use a ruler to measure pictures of hatchlings.
- Graph data using a line graph.

North Carolina Standards:

Second Grade:

Math - Measurement & Data

- **2.MD.9** Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

Third Grade:

Math - Measurement & Data

- **3.MD.4** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units - whole numbers, halves, or quarters.

Fourth Grade:

Math - Measurement & Data

- **4.MD.1** Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. [Extension option 2]



Fifth Grade:

Math - Measurement & Data

- **5.MD.1** Convert among different-sized standard measurement units within a given measurement system, and use these conversions in solving multi-step, real world problems. [Extension option 2]
- **5.MD.2** Make a line plot to display a data set of measurements in fractions of a unit. Use operations on fractions for this grade to solve problems involving information presented in line plots.

Math- Geometry

- **5.G.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond
- **5.G.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Time Frame:

Preparation: 5 minutes

Activity: 30 minutes (to several weeks if you are following the blog)

Materials:

- Copies of sea turtle hatchling pictures for students to measure
- Data Sheet
- Rulers (adaptation for young students - rulers only showing 1 inch or ½ inch increments)
- Graph paper
- Pencil

Supplemental Background Information for Teachers:

Sea Turtle hatchlings, like other baby animals, grow a lot when they are young. Every year, the North Carolina Aquarium at Fort Fisher exhibits rescued sea turtle hatchlings. In order for the aquarium to keep these hatchlings, a federal permit must be obtained. In order to make sure that the turtles get the best care, they are closely monitored. Each week the turtles are weighed and measured to determine how much they are growing. The staff uses the weight of the turtles to determine how much the turtles should be fed. Each turtle is fed a percentage its body weight. The smaller the turtle, the larger the percentage they are fed. You can see the ratios here:



Turtle weight	Feed %
0-100g	15%
100-200g	7%
200-500g	4%
500g+	3%

The turtles are closely monitored each week to make sure they are growing at a healthy rate. If the turtles are fed too much, their bones will grow too quickly. This could potentially weaken the turtle's skeleton. If they are fed too little, the turtles will not grow to be strong and healthy. At the North Carolina Aquarium at Fort Fisher, our turtles are fed half of their food in the morning before they go on exhibit, and the other half at the end of the day. In the morning, the turtles typically receive a gel food, made from unflavored gelatin, vegetables, fish, and calcium powder. The gel food ensures that the hatchlings are receiving all the necessary nutrients. In the afternoon, the turtles are fed meat, which typically consists of fish or squid. On occasion they are also treated to jellyfish, one of their favorite foods.

Preparation:

Make copies of the hatchling pictures for students to measure, as well as copies of the data sheet and graph paper. Gather rulers and pencils.

Procedure:

1. Introduce students to the idea that these hatchling sea turtles are growing and we need to figure out how fast! A lot of things depend on knowing the size of the turtle. Scientists can track to make sure it is growing at a healthy rate. They also need to know how big the turtles are (including weight) in order to know how much food to provide (this concept is covered in the lesson "[Build Your Own Hatchling](http://seaturtleexploration.com/wp-content/uploads/2014/08/Build-your-own-hatchling-final1.pdf)" (<http://seaturtleexploration.com/wp-content/uploads/2014/08/Build-your-own-hatchling-final1.pdf>)).
2. Show students how to measure the sea turtle shells in the pictures from the front to the back of the shell and from side to side.
3. Give the sea turtle pictures and rulers to the students and have them measure all of the shells and record the data on their data sheets.
4. Have students set up their first graph, with time on the x-axis (horizontal) and shell length (front to back) on the y-axis (vertical).
5. Set up your second graph with time on the x-axis and shell width (side to side) on the y-axis. Make sure they put labels on their graphs.
6. Plot both sets of data on the graph. Ask students discussion questions about their graphs, such as: Is the sea turtle growing? Has it always grown at the same speed or did it have a growth spurt?



North Carolina Aquariums Education Section

7. 5th grade- You can have students draw a straight line connecting as many of the points as possible. Have them create a hypothesis for how big the turtle will be during weeks 5 or 6.

Extensions:

1. Now that your students understand the basics of measuring a sea turtle and graphing the data, you can follow along with the aquarium each week! Use the lesson “[Hatchling to Yearling](http://seaturtleexploration.com/wp-content/uploads/2014/08/Hatchling-to-yearling-final1.pdf)” (<http://seaturtleexploration.com/wp-content/uploads/2014/08/Hatchling-to-yearling-final1.pdf>) to learn more about this activity. We will be sending out data that our scientists collect about one of our sea turtles. You and your students can graph this data each week as an extended project.
2. After measuring and graphing the turtle’s length and width, have your students convert these measurements from inches to centimeters or centimeters to inches.