



LESSON 3

SUMMER BAG: THE SHORT AND LONG OF IT

**HANDS - ON DISTANCE LEARNING
PROVIDED BY DOWNEAST INSTITUTE**

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THE SHORT AND LONG OF IT

(appropriate for all ages)



Background Info: The metric system has always been the system of measurement used by scientists, as well as most developed countries in our world. Actual use of the metric system is the best way for students to develop confidence in using it. This lesson also includes data collection, analysis, and graphing; all essential aspects of the scientific method.

Materials:

- ruler data
- graph paper
- pen or pencil
- table

Procedure:

1. Find a small plant (such as a dandelion) or part of a larger plant (such as a leaf) that has started to grow.
2. Measure the plant (or plant part) in millimeters. Remember that **millimeters are the tiniest marks** on your ruler (abbreviated as “mm”).
3. Record the **length** in the data table.
4. Beginning on the 2nd day, subtract the previous length from the newest length (newest length-previous length) to find out how much your plant or plant part has grown. Record the amount of **new growth** in the data table.
5. Repeat steps 2-4 every day for 2 weeks.
6. At the end of 2 weeks, look for any possible patterns in the data. (This is called analyzing the data.)
7. Graph your data, using one or both of the graphs provided.
8. If graphing **LENGTH**, label the y-axis (left side of the graph) by 1's (1, 2, 3, 4, 5, 6, and so on) or 2's (2, 4, 6, 8, 10, 12, and so on) or 5's (5, 10, 15, 20, 25, and so on); whichever best fits your data.
9. If graphing **NEW GROWTH**, label the y-axis (left side of the graph) by 1's (1, 2, 3, 4, 5, 6, and so on).

DEI Connection/Real Life Application:

DEI scientists and staff use small metric measurements of length and data recorded over time to determine average sizes and growth rates of bivalve larvae and juveniles grown in the hatchery, as well as bivalve juveniles grown in the field. DEI scientists often use graphs to assist in analysis of their experimental data, as well as to communicate information they have learned from their research.

Adaptations/Extensions/Helpful Hints:

- A blank data table and sample graphs are included on separate pages. If time permits, older students should be encouraged to create their own data tables and graphs.
- This lesson may be adapted for inside use (in the winter, for example) by using an inside plant or even a fingernail. Length of time between measurements may be adjusted to accommodate slower or faster growing specimens.
- Students may measure and record growth data for 2 different plants or plant parts and compare their growth rates or compare growth rates of the same plant species under different growing conditions, such as temperature, amount of light, or amount of water.
- If introducing students to millimeters, it may be helpful to have them measure the thickness of a dime, which is approximately 1 mm.
- This activity could also be used for measuring growth rates of juvenile clams or other species.

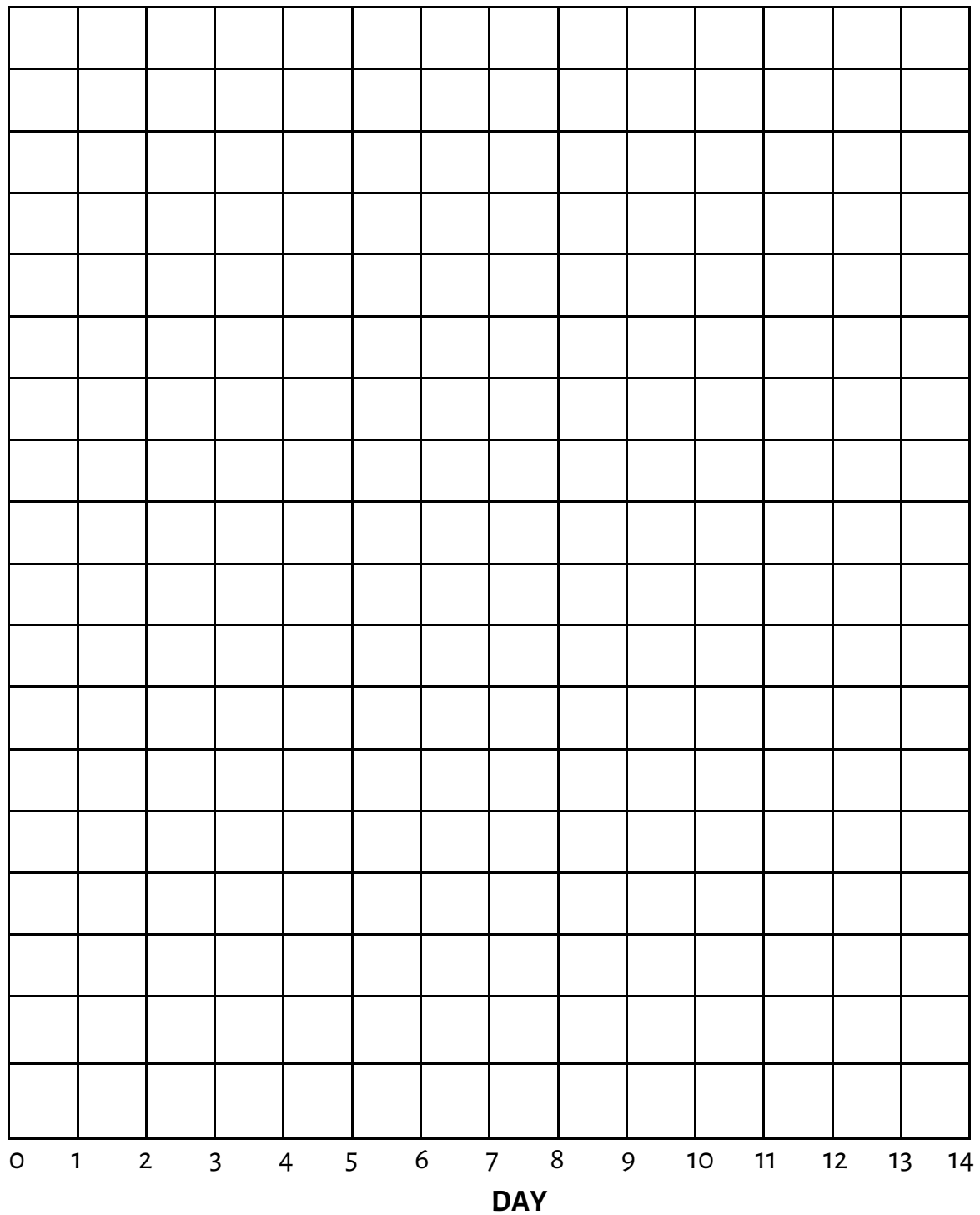
NEXT GENERATION SCIENCE STANDARDS (NGSS)**All Grades****Practices**

- 3. Planning and Carrying Out Investigations
- 4. Analyzing and Interpreting Data
- 8. Obtaining, Evaluating, and Communicating Information

DATA TABLE - The Short and Long of It

Day	Length (mm)	New Growth (mm)
1		Leave this data cell blank
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		

Graphing LENGTH (mm) - The Short and Long of It



A blank grid for plotting data over 14 days. The x-axis is labeled 'DAY' and ranges from 0 to 14. The y-axis is labeled 'COST' and ranges from 0 to 14. The grid consists of 15 columns and 15 rows.

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