LESSON 1

ANATOMY OF AN ANCIENT FISH

Activity 2: Assessing Sturgeon Growth

Students use data to compare the relationships between sturgeon length, girth, and weight.

Activity Preparation

Pre-Reading

In "Saving Our Sturgeon," have students read Chapter 4: Sturgeon by the Numbers p. 38-44.

Prior Knowledge

Familiarity with concepts of ratio, and the graphical concepts of X-axis, Y-axis, clustering, outliers, linear association and/or nonlinear association.

Familiarity with the process of adding and dividing whole numbers to calculate a mean.

Key Vocabulary

Mean: a single value that summarizes or represents the general significance of a set of unequal values.

X-axis: the horizontal line on a graph.

Y-axis: the vertical line on a graph.

Girth: the distance around its body at its thickest point, typically measured at the midsection just in front of the dorsal fin.

Files Needed

- Calculating Mean Girth (handout and answer key)
- Calculating Mean Weight (handout and answer key)

Materials Needed

- Graphing supplies including Google Sheets or Microsoft Excel, graph paper, or whiteboard

Objectives

After participating in this activity, students can:

Calculate the mean girth and weight of a sturgeon of specified length using data derived from a provided data table.

Create line graphs that plot length vs. girth and length vs. weight of a sturgeon using multiple data points derived from interpretation of data and their prior mean calculations.

Describe patterns within their graphs such as clustering, outliers, linear association and/or nonlinear association.

Next Generation Science Standards

Assessed

MS-LS1-5

Wisconsin Academic Standards

Assessed

Math

M.6.NS.B.2, M.6.NS.C.6 c, M.7.RP.A.2a, M.8.EE.B.5., M.8.SP.A.1

Covered

Science

SCI.LS1.B.m, SCI.LS2.A.m

Great Lakes Literacy Principles

Principle 5

The Great Lakes support a broad diversity of life and ecosystems.

Activity Steps

Total estimated activity time – 90 minutes

1. If you have not already taught the concepts of ratio and the graphical concepts of clustering, outliers, linear association, and/or nonlinear association, be sure to do so. (Supporting materials not included within this lesson.)
2. Distribute one or both handouts on calculating mean girth and mean weight. Before students begin, review the examples given for each of the activities. Point out that a sturgeon of a particular length, for example 55 in. long, can have a girth that varies a great deal. In this case, a 55-in.-long sturgeon can have a girth between 18 in. and 30 in. and a corresponding weight between 30 lbs. and 69 lbs. Ask students what factors they imagine might contribute to these differences in girth and weight for sturgeon whose length is the same. [Answer: Environmental factors that promote or hinder growth.]
3. Have students practice their mathematical skills by calculating the mean girth and then mean weight of the five sturgeon on the handout. If you prefer, assign one group of students to calculate weight and one girth. Then have groups share and compare results.
4. Have students practice graphing skills by independently creating a graph that plots the length of the sturgeon in inches on the X-axis versus estimated weight in inches on the Y-axis.
5. Ask students if the ratio between length and weight of a sturgeon is a linear or nonlinear relationship and defend their response. Have students describe any clusters or outliers.

** To further explore lake sturgeon data, visit the Michigan Dept. of Natural Resources website: https://www.michigan.gov/dnr/-/media/Project/Websites/dnr/Documents/Fisheries/Research/StClair_weight_estimation.pdf