Activity 2.1

- Grade Level
  5-8

- Subject Areas
  Science, History, Social Studies, Mathematics

- Duration
  One to two 40-minute class sessions

- Setting
  Classroom

- Skills
  Graphing, interpreting, inferring, hypothesizing, demonstrating, explaining, correlating

- Vocabulary
  Natural resource, renewable resource, nonrenewable resource, fishery, schooner, dredge, tong, harvest, overfishing

- Correlation with Next Generation Science Standards
  5-ESS3-1, MS-LS2-1

  Correlation with NJ Core Curriculum Content Standards for Social Studies
  6.1.4.B.4-9,
  6.1.4.C.1,4, 5, 7-9, 14, 15,
  6.1.8.C.4.b-c

Materials:

- ☐ Student Worksheet-Activity 2.1

Too Many Bushels?

Charting the Course
Students will prepare a graph depicting oyster harvest data. They will interpret the graphs and hypothesize about events that might have affected oyster harvests.

Background
The oyster populations of the Delaware Bay represent an important **renewable natural resource.** Native-Americans living along the Delaware Bay Shore gathered oysters from inshore waters and used them as food. Later colonists used **skiffs, sloops,** and **schooners** to harvest oysters from deeper waters. Hand **tongs** and mechanical **dredges** were utilized to scrape the oysters from the bay bottom. During colonial times and through the 1800s oysters were a popular food. Harvest records indicate that in the late 1800s and early 1900s 1-2 million bushels of oysters were landed annually. Port Norris is recognized as the heart of the New Jersey oyster **fishery** and was one of the wealthiest cities in the State at the industry's prime. The expansion of the railroad and development of local canning plants resulted in an expansion of oyster commerce. In the 1930s and 1940s oyster abundance began to decline. The 1940s also saw a technological change as the sailing vessels that were traditionally used by the fishery were replaced by or transformed into motorized vessels. Oyster abundance continued to decline in the later part of the 20th century partly due to **overfishing** and partly due to changes in environmental conditions and the onset of two devastating oyster diseases, **MSX** and **Dermo**. Today oyster harvests are a fraction of what they once were. The oyster resource is carefully managed and efforts are underway to help preserve and restore Delaware Bay oyster populations.

Objectives / Students will be able to:
1. Recognize the oyster as a locally important natural resource.
2. Construct a graphical representation of oyster harvests.
3. Describe and interpret the graph.
4. Hypothesize cause and effect relating to changes in oyster harvests.

Procedure / Warm Up
Have a class discussion about natural resources. Have the students name some natural resources and identify those occurring within the region. Introduce the Delaware Bay oyster as a natural resource and have them define fishery. Discuss the importance of oysters to the Delaware Bay region and the long history of oystering in the Bay. Have students discuss what things might have impacted oyster production through the years.

The Activity

Present students with the data table of oyster harvests through time and graphingtemplate provided in student worksheet.

1. Have students create a bar graph showing oyster harvests through time. Review graphing techniques as needed. For this exercise the x-axis will be year and the y-axis will be the number of oysters harvested in bushels (there are approximately 300 oysters per bushel). Students should carefully label graph including units.
2. Have students interpret the graph. This may be done within student groups, with teacher led discussion, or through a writing exercise. Key discussion points or questions to be raised include:
3. Did oyster harvests remain constant through time?
4. If not, how did they change?
5. Was this change gradual or sudden?
6. When did the highest and lowest oyster harvests occur?
7. Have students speculate as to the cause of the changes (increases and decreases) in harvests that are indicated by their graphs.

Wrap Up / Student research teams should present their observations and speculations to class for comparisons and discussion. Discuss how the decline in the resource came about and how it may have been prevented.

Assessment / Students may be evaluated on oral presentations, and on their constructions of oyster harvest graph and oyster fishery history timeline.

Extensions / Take the class aboard the Bayshore Discovery Project's schooner the A.J. Meerwald for a first hand experience of sailing on the Delaware Bay.
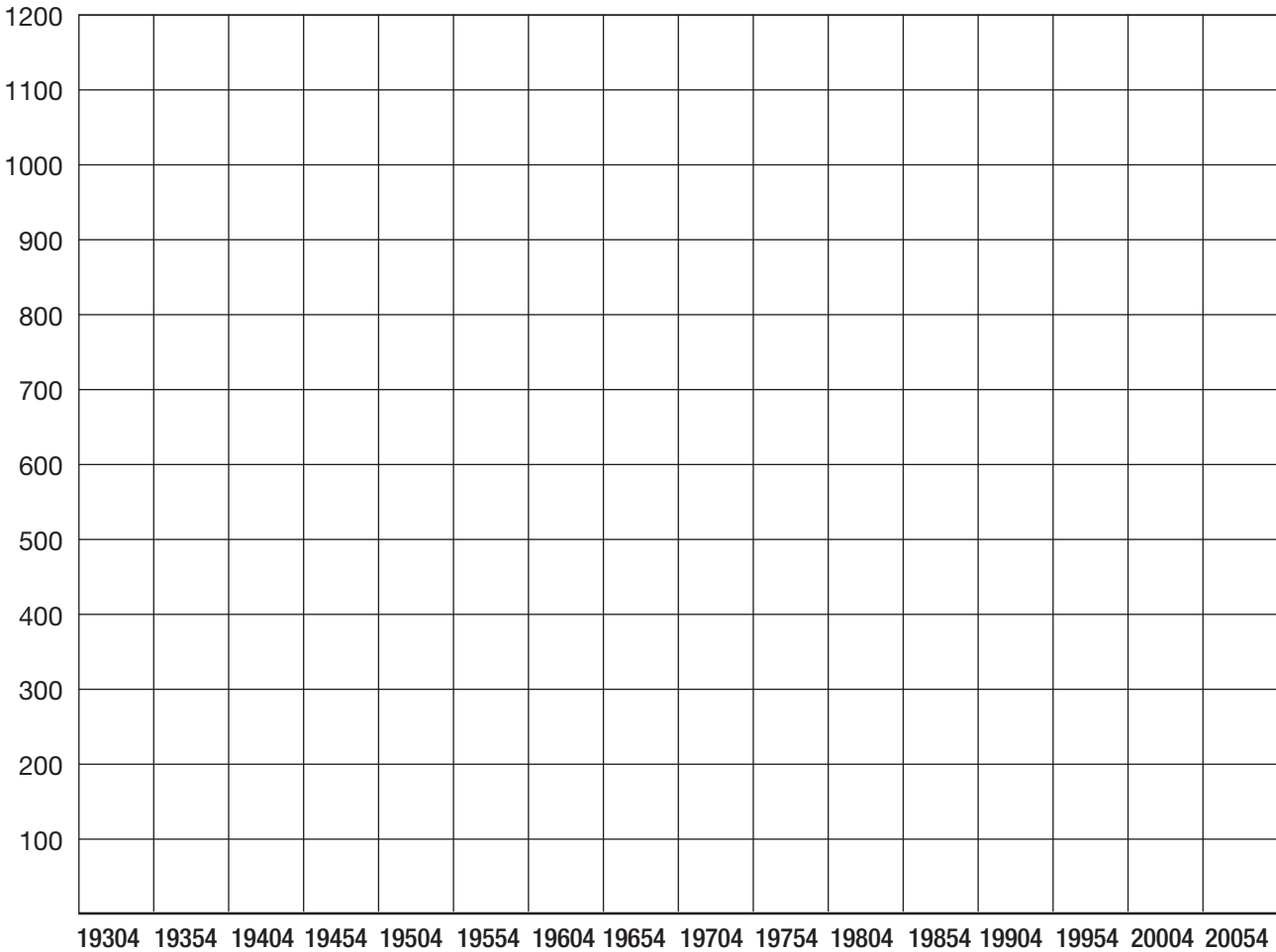
Student Worksheet   Activity 2.1 Too Many Bushels

Name_____**Date** _____

1. Plot oyster landing data with the y-axis representing thousands of bushels. Be sure to include axis labels on your graph.

2. Interpret your graph by answering the following questions.

     a. Did oyster harvests remain constant through time?

     b. If not, how did they change? Can you observe a trend in the data?

     c. Was this change gradual or sudden?

     d. When did the highest and lowest oyster harvests occur?

     e. What do you think oyster harvests changed through time?

Student Worksheet   Activity 2.1 Too Many Bushels

Name_____Date _____

Delaware Bay New Jersey Oyster Harvests

Year	Bushels (thousands)	Year	Bushels (thousands)
19304	11604	19704	1924
19354	6054	19754	1864
19404	6654	19804	934
19454	8354	19854	34
19504	6104	19904	304
19554	1754	19954	804
19604	854	20004	584
19654	1254	20054	

TABLE 1