

SEINING THE RIVER WILD

LESSON OVERVIEW

OBJECTIVE

Students will learn how to count and use tally marks and bar graphs to display science information.

RECOMMENDED GRADE LEVELS

K-3

DURATION

15-20 minutes

MATERIALS

- Estuary fish images (provided)
- Post-it notes
- Tape
- Whiteboard
- Student worksheet (provided)

TOPIC BACKGROUND

The East River is an **estuary** that creates a very unique environment for a lot of different living organisms. **Community science** organizations, like Brooklyn Bridge Park Conservancy collect data to monitor changes in the number and type of animals living in the water.

There are over 100 species of fish in the East River. Additionally, there numerous **invertebrates**. Some examples of estuary invertebrates are crabs, snails, clams, mussels, shrimp, and barnacles.

Scientists often record data on a data

sheet. One method for quickly counting and recording amounts of certain objects is to use **tally marks**.

Scientists also graph their data. **Bar graphs** are used to compare amounts. **Line graphs** are used to observe changes over time. In this lesson, students will practice math and graphing using real life science scenarios.

GETTING READY

Activity 1:

1. Print out a copy of the fish images provided.
2. If desired, search the internet for additional estuary animal photos for other organisms students saw during their field trip.
3. Cut and tape images to a whiteboard.
4. Collect enough post-it notes to give 1 per student.

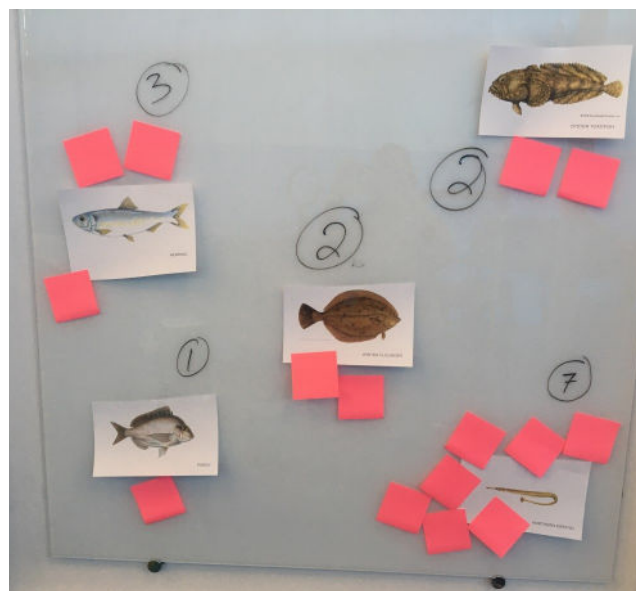
Activity 2:

1. Print a copy of the math worksheet for each student (Note: There is a counting page for younger students and a tally and charting page for older students)

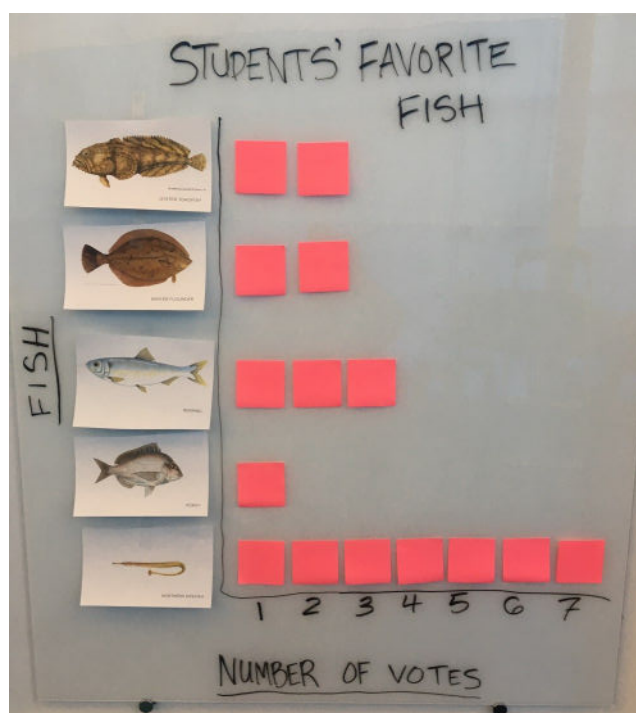
PROCEDURE

ACTIVITY 1: VOTING AND TALLYING

1. Begin by challenging students to think about the organisms they learned about during their trip. Can they remember the names of any the animals they saw? Hold up the estuary fish images (provided) one at a time, allowing students to guess the correct name.
(Only 8 common fish images are provided here, but you can also do a quick internet search for photos of other organisms seen during your class. E-mail the Conservancy if you'd like a reminder of all species caught!)
2. Hand each student a post-it note and tell them we are going to take a class vote on their favorite East River fish.
3. Tape the organism images to the board or wall (leaving adequate space between each image for post-it note votes).
4. Allow each student to cast their vote by sticking their post-it near the image representing their favorite.
5. Once everyone has voted, count the number of votes for each organism, by creating a tally table on the board.
Explain that scientists often use tally marks to quickly keep track of the number of organisms as they are found. When scientists have completed their research or study, they count the lines up for the final number.
******For younger students, simply count the post it notes out loud together and write the numbers on the board near each photo. Have your students practice writing the numbers with you on their own paper.**
6. Next, if old enough explain and show students that we can better interpret data by creating a chart. Relocate the post-its and images to create a bar graph. (See photo example) Use a whiteboard marker to add a scale and axis titles.
7. Explain to students that each post-it square counts as 1 unit, or in this case 1 vote. Continue to explain to students the different ways we can show data (pictograph, line graph, bar graph).



	TALLY
Oyster Toadfish	(3)
Flounder	(2)
Herring	(3)
Porgy	(1)
Pipefish	(7)



PROCEDURE CON'T

ACTIVITY 2: PRACTICE WORKSHEETS

1. Have students continue to practice counting or using tallies and bar graphs by completing one or more of the worksheets provided. We recommend the counting page for K-1st and tallies and bar graph for 2nd-3rd.
2. For similar math practice using real data, contact us at education@brooklynbridgepark.org for a copy of the seining data collected during your class.

RECOMMENDED VIDEO

Seining the River (How we will fish during your field trip!)

<https://www.youtube.com/watch?v=fhPM5CbL4z0>

RECOMMENDED BOOKS

- *Hooray for Fish* by Lucy Cousins
- *Fish Eyes: A Book You Can Count On* by Lois Ehlert
- *DK Eyewitness Books: Fish* by Steve Parker
- *What's It Like to Be a Fish?* by Wendy Pfeffer
- *About Fish: A Guide for Children* by Cathryn Sill and John Sill

RECOMMENDED WEBSITES

Clearwater's Key to Common Hudson River Fishes

<http://clearwater.org/fishkey>

NYS DEC Hudson River Estuary

<https://www.dec.ny.gov/lands/4923.html>

East River Crew Estuary Guide

<http://bit.ly/ERCGuide>

The River Project

<https://www.riverprojectnyc.org/>

TEACHER NOTES:

VOCABULARY

Bar graph: A graph that shows rectangles with lengths proportional to numbers as a visual way of comparing the numbers.

Biodiversity: The variety of life in a particular habitat or ecosystem.

Brackish: Slightly salty water; the mixture of river water and seawater in estuaries.

Camouflage: The use of any combination of materials, coloration, or illumination for concealment, either by making animals or objects hard to see or by disguising them as something else. Animals often camouflage to hide from predators or to sneak up on prey.

Ecosystem: a biological community of interacting organisms and their physical environment.

Estuary: A semi-enclosed body of water containing both fresh and salt water.

Habitat: The area or environment where an organism or ecological community normally lives or occurs.

Horizontal: Moving across or a left to right movement. Horizontal lines are parallel to the horizon.

Line graph: A graph in which line segments join points representing different values

Migrate: To move from one region or habitat to another. Animals migrate to find food or more livable conditions. Some animals migrate to breed.

Plot: To mark, note, or locate on a map or chart.

Population: A group of organisms of a species that live in the same place at a same time.

Tally: A method of keeping count where you draw one line (or tally) for each item you count.

Tidal Strait: A channel that connects two saltwater bodies. The East River is technically a tidal strait because it connects the New York Bay to the Long Island Sound.

Vertical: An up and down movement. Vertical lines are perpendicular to the horizon.

STANDARDS

COMMON CORE ELA

- Reading Informational Text
- Speaking and Listening
- Literacy in Technical Subjects
- Literacy in Science
- Writing Standards

COMMON CORE MATH

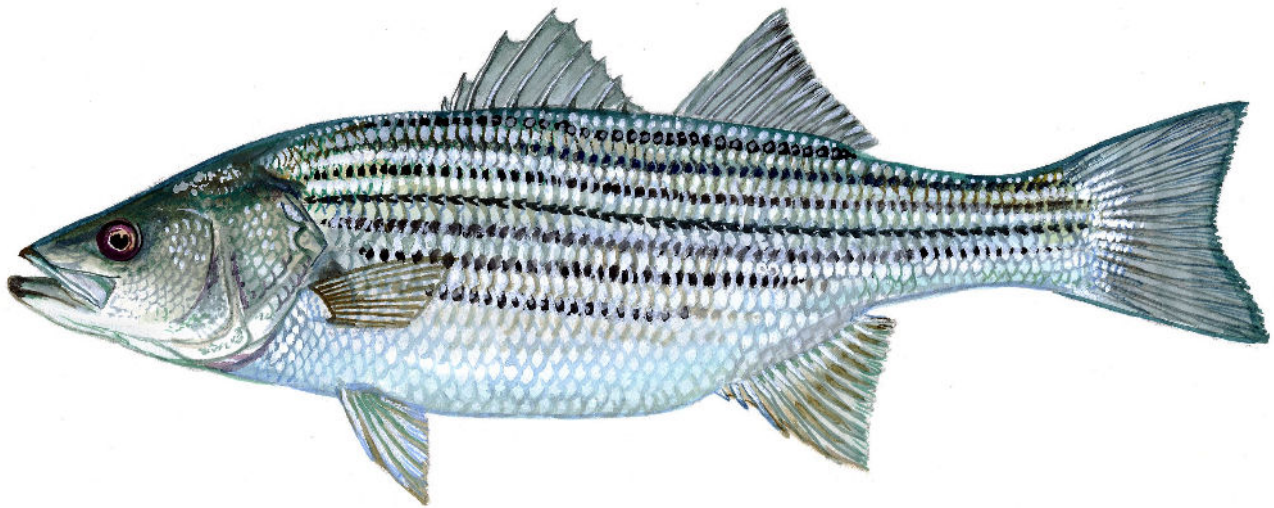
- Counting and Cardinality
- Measurement & Data

NYC K-8 SCIENCE & SOCIAL STUDIES SCOPE & SEQUENCE

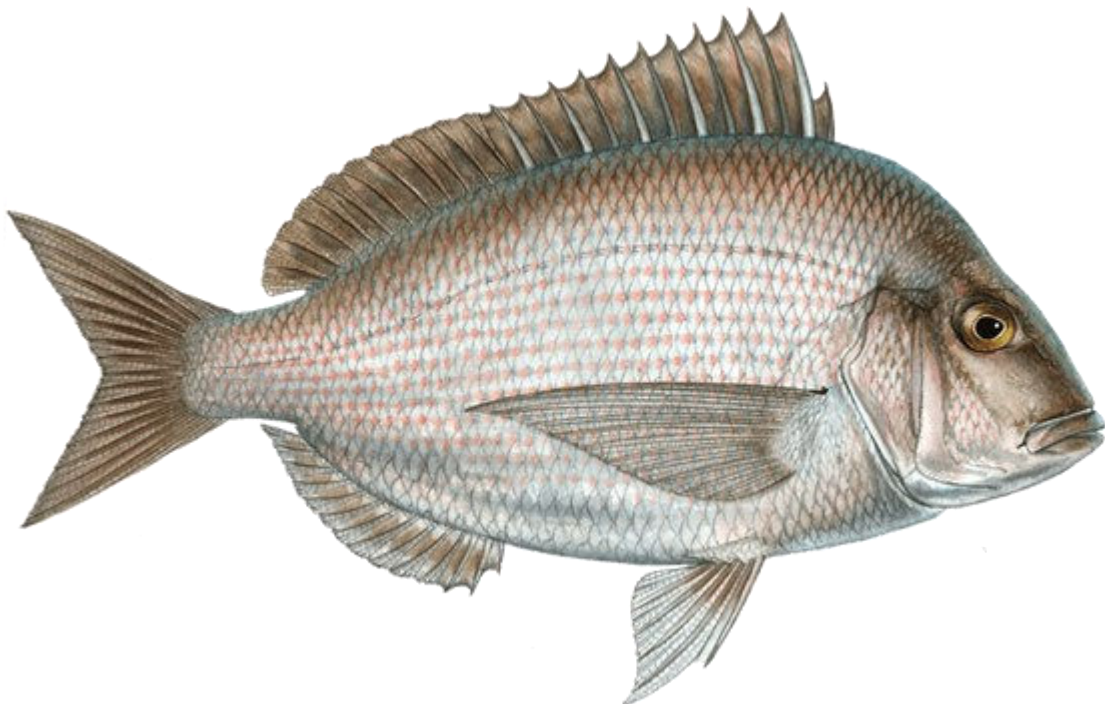
- Animals, Plants in their Environments
- Exploring Ecosystems
- Diversity of Life
- Interdependence
- Animal Diversity
- Plant and Animal Adaptations

NEXT GENERATION SCIENCE STANDARDS

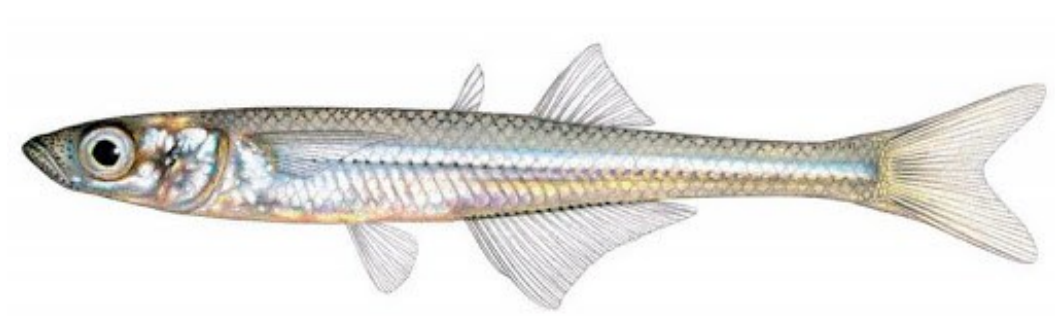
- K. Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment
1. Structure, Function, & Information Processing
 2. Interdependent Relationships in Ecosystems
 3. Interdependent Relationships in Ecosystems
 4. Structure, Function, & Information Processing



STRIPED BASS



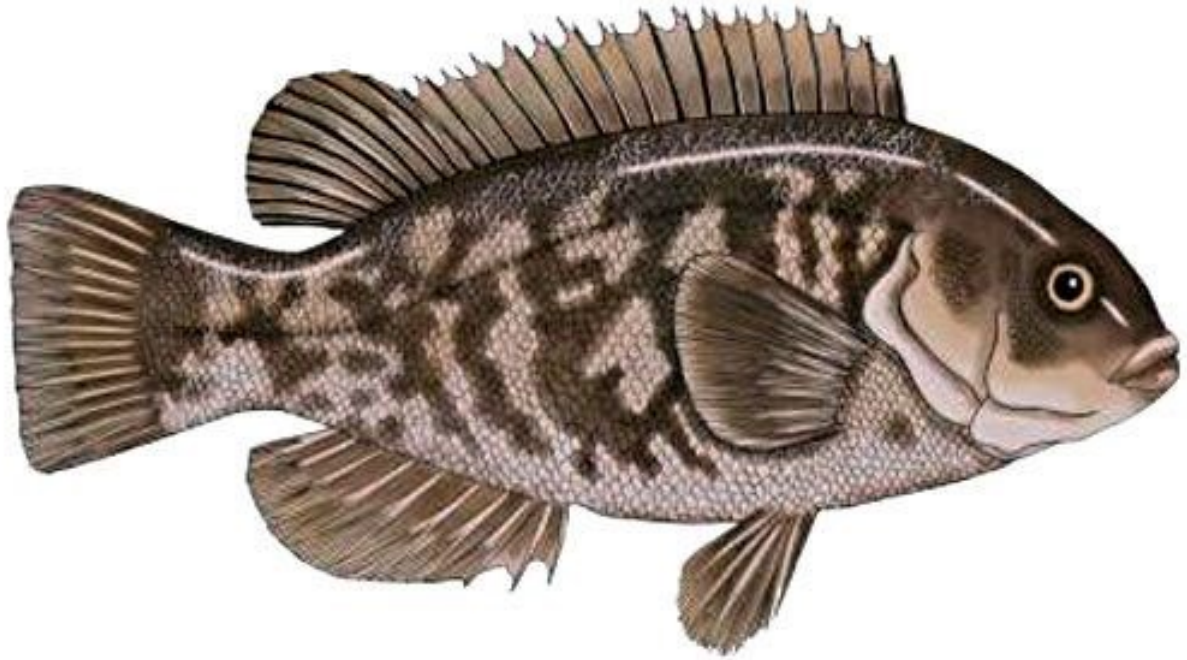
PORGY



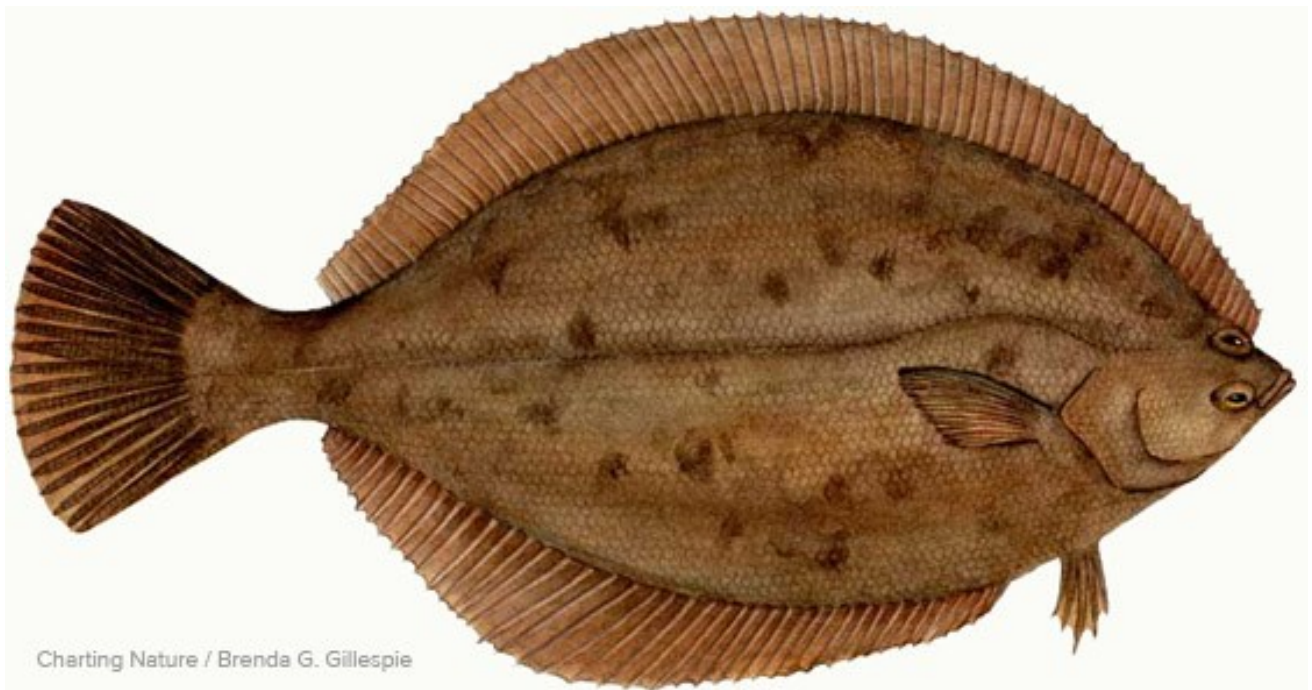
ATLANTIC SILVERSIDE



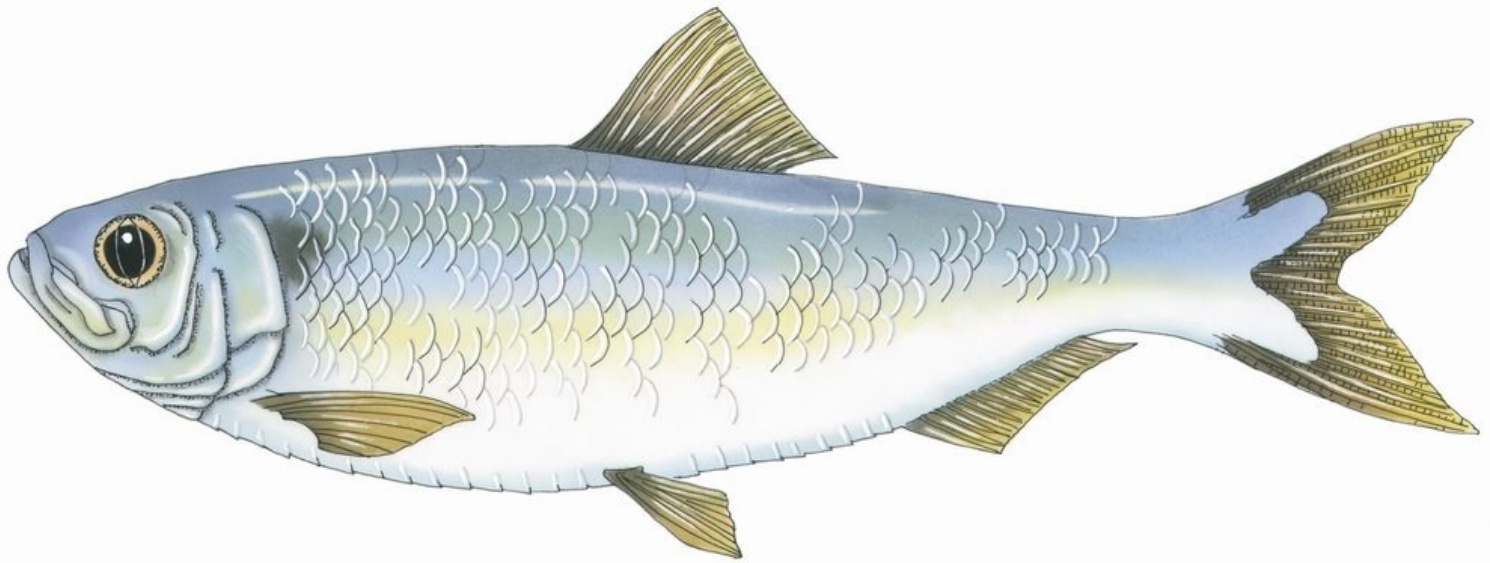
NORTHERN PIPEFISH



TAUTOG



WINTER FLOUNDER



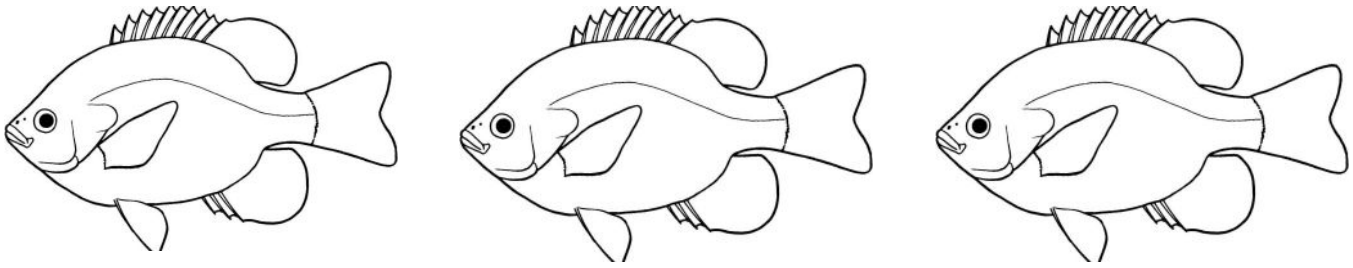
HERRING



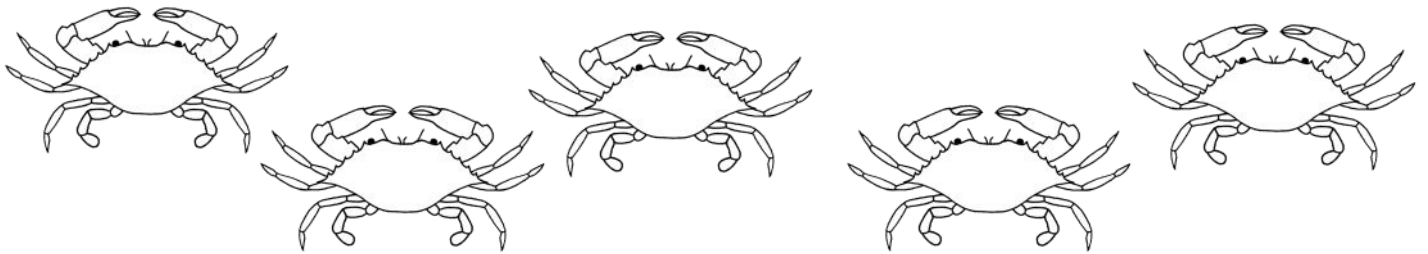
© 2009 Encyclopædia Britannica, Inc.

OYSTER TOADFISH

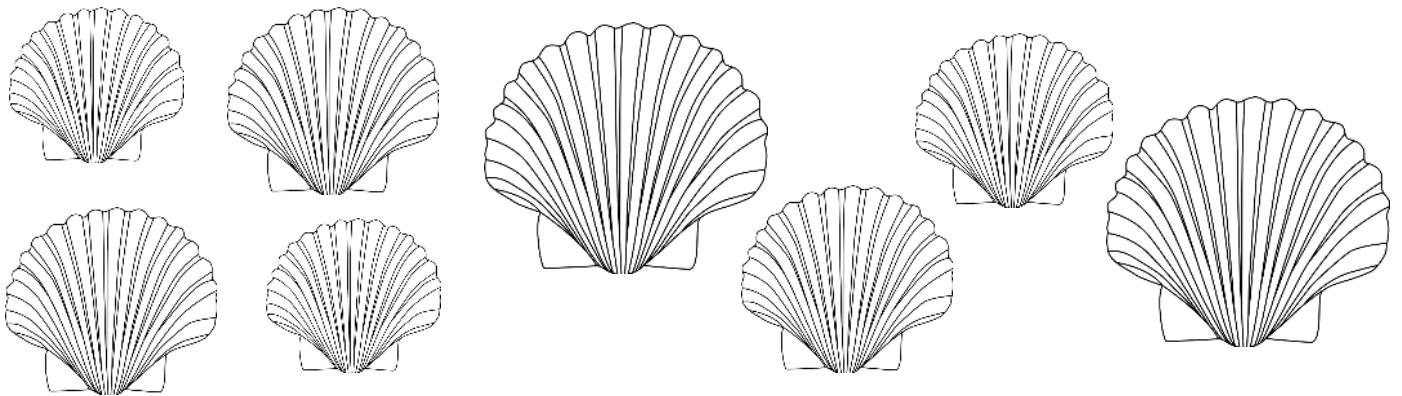
NAME: _____



COUNT THE FISH _____



COUNT THE CRABS _____



COUNT THE SHELLS _____

Name: _____

EAST RIVER SEINING DATA AT BROOKLYN BRIDGE PARK

When the Brooklyn Bridge Park Conservancy educators went fishing with a seine net, they kept track of how many animals were caught by drawing a tally mark (a line) for each organism they found.

If you see 4 lines (tallies),  that means 4 organisms were found.

Tallies are often kept in groups of 5, with the fifth line in the group drawn diagonal: 

Count the number of tallies in each row and record the number in the last column.

ORGANISM	TALLY	NUMBER
STRIPED BASS		
WINTER FLOUNDER		
ATLANTIC SILVERSIDE		
BLUE CRAB		
COMB JELLY		
HERMIT CRAB		
OYSTER DRILL SNAIL		

Name: _____

A group of scientists went seining at Brooklyn Bridge Park. They tallied the number of living things they caught in their net.

ANIMAL	TALLY	NUMBER
SILVERSIDE		
CRAB		
SHRIMP		
FLOUNDER		
STRIPED BASS		

1. Count the number of tallies in each row and record the number in the last column.

2. Which animal was found the most?

3. Which animal was found the least?

4. Using the data above, create a bar graph. Color enough boxes in each animal's row to equal the number tallied above. For example, 7 silverside fish were caught so 7 boxes in the silverside row have been shaded.

