STEM Explorers

Fish Ecology Data and Graphing Worksheet

Introduction

Now that you are familiar with our fish ecology survey, it is time for you to take on the roll of a scientist at Hudson River Park by analyzing and graphing the fish ecology data that we collected. As you will see in our data below, HRPK scientists collect a lot of fish as they conduct this survey, and each fish collected has information associated with it: what species it was, when it was caught, how long the fish was, which trap it was collected in, etc.

This is a lot of information to communicate, and it can be hard to understand what is going on when looking at raw data. Scientists use sets of data like this to build **graphs** in order to effectively communicate their findings to other scientists and the public. For an introduction into graphing fish ecology data, please check out our Fish Ecology Graphing 101 lesson.

Today, we will be working with data from our 2019 Fish Ecology Survey.

Fish Ecology Data

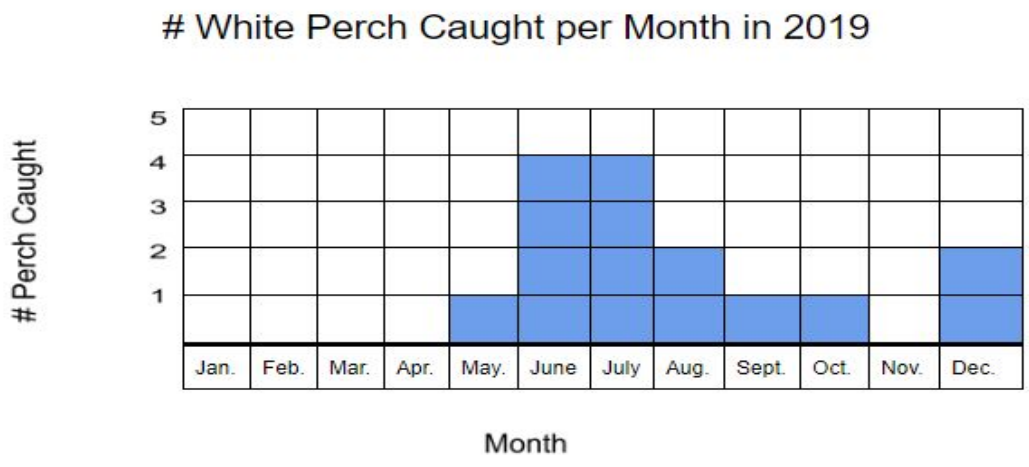
On the following page, you will find a segment of our 2019 Fish Ecology Survey data. This set of data is a summary of how many fish of each species were caught in each month of 2019. In 2019, 17 different species of fish were caught and recorded. This data set also includes a separate line for catch of blue crabs by month. Blue crabs are a commercially important species and the only species of invertebrates recorded as part of the fish ecology survey.

Activity Instructions:

Choose a fish species from the data table on the next page and produce a graph showing the number of fish caught each month.

Example:

		January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
White perch	*Morone americana*	0	0	0	0	1	4	4	2	1	1	0	2	15



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2019 Fish Ecology Data

		January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
American eel	*Anguilla rostrata*	0	0	0	0	0	0	2	0	0	1	0	0	3
Black sea bass	*Centropristis striatc*	0	0	0	0	0	2	1	6	12	20	9	0	50
Blackfish	*Tautoga onitis*	0	0	0	1	16	28	13	11	25	16	1	0	111
Butterfish	*Peprilus triacanthu.*	0	0	0	0	0	0	1	4	2	1	0	0	8
Feather blenny	*Hyposoblennius he.*	0	0	0	0	0	0	0	0	0	0	4	0	4
Lined seahorse	*Hippocampus erect*	0	0	0	1	2	0	4	1	0	0	0	0	8
Naked goby	*Gobiosoma bosc*	0	0	0	0	1	1	0	3	0	2	0	0	7
Northern pipefish	*Syngnathus fuscus*	0	0	0	0	0	0	1	2	1	0	0	0	4
Oyster Toadfish	*Opsanus tau*	0	0	0	0	11	19	25	82	73	20	3	0	233
Scup	*Stenotomus chryso*	0	0	0	0	0	0	0	0	0	1	0	0	1
Skilletfish	*Gobiesox strumosu*	0	0	0	0	5	1	0	2	4	1	0	0	13
Spotfin butterfly fis	*Chaetodon ocellatu.*	0	0	0	0	0	0	0	0	0	1	0	0	1
Spotted hake	*Urophycis regia*	0	0	0	0	0	0	0	0	0	0	2	0	2
Striped bass	*Morone saxatilis*	0	0	0	0	0	0	0	1	0	0	8	1	10
Tomcod	*Microgadus tomco.*	0	0	0	0	0	0	2	0	0	0	0	1	3
White perch	*Morone americana*	0	0	0	0	1	4	4	2	1	1	0	2	15
Winter flounder	*Pseudopleuronecte*	0	0	0	1	0	0	0	0	0	0	0	0	1
Total Fish		0	0	0	3	36	55	53	114	118	64	27	4	474
Blue crab	*Callinectes sapidus*	0	0	1	0	0	9	23	206	435	54	43	3	774
TOTAL		0	0	1	6	72	119	129	434	671	182	97	11	1248

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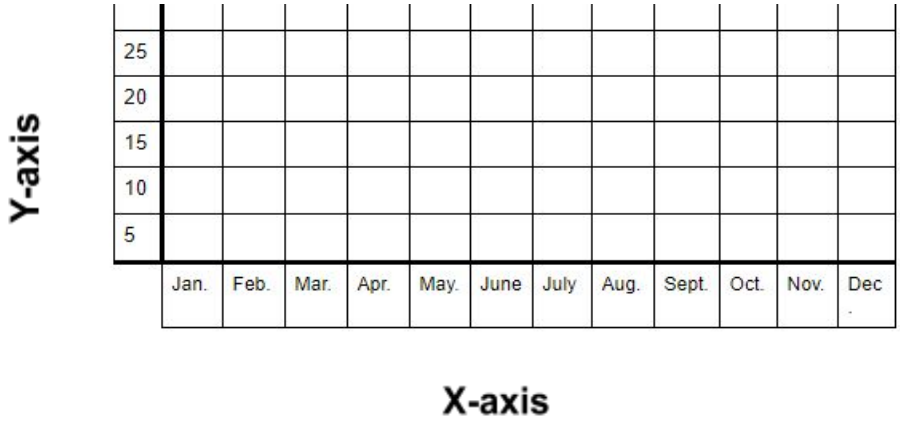
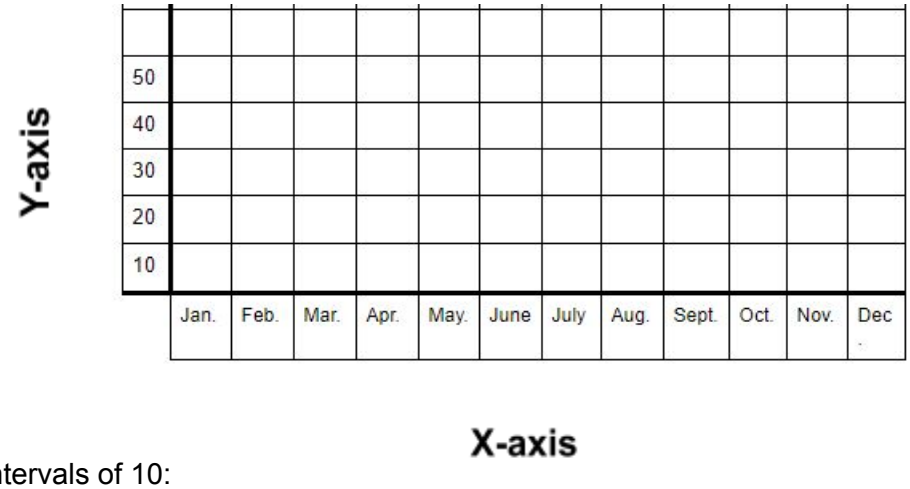
Graphing Tips**:**

1. Include a title so that people know what information this graph is displaying.
2. Label your X and Y axis to show what variables each axis represents. For example, in the X-axis (horizontal axis) was labeled 'Month', and the Y-axis (vertical axis) was labeled '# Perch Caught'.
3. Depending on the species that you choose to graph, you might be dealing with only a few fish caught, or you might be dealing with lots and lots of fish (like Oyster Toadfish, which we catch a lot of!) Adjust how many units each box in the graph represents on the Y-axis to make sure you can fit the entire catch into your graph. If the catch for your species was low, boxes can still represent one fish each, however if the catch is high you may want each box to represent 5, 10 or even more fish. See examples below.



Intervals of 5:



Intervals of 10:

4. Use pencils, pens, markers or whatever you have on hand to shade in your graph's boxes on this worksheet. If you have access to Microsoft Excel or Google Sheets on your computer, you can try to recreate graphs in these programs too!
5. Visit our Virtual Wetlab to learn more about the fish species represented in this data!
6. Check out our Fish Ecology Graphing 101 lesson (link on page 1) for more information on how to make a graph!
7. **Once your graph is complete, use it to answer the data analysis questions at the end of this packet!**

Graph Title

Y-axis Label

	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.

X-axis Label

5 - Post-Graphing Wrap Up and Questions

Use the graph you created to answer the following questions.

1. What month had the highest catch for your species? (if months are tied, list all months with highest catch)

2. During what season were the most of your species caught? (Spring, Summer, Fall, Winter)

3. Imagine that you caught 30 blackfish in 2017, 50 blackfish in 2018, and a total of 100 blackfish in 2019. You also know that the local park began restoring shoreline habitats in 2017. How has the restoration of shoreline habitats affected blackfish as a species?

Extension:

4. Imagine that you work on a river that has recently changed its fishing rules. The new rules allow fishermen to collect oyster toadfish. After a few years of these new rules, you notice that you are catching fewer toadfish, and lots more blue crabs in your research traps. Why do you think these changes happened?