

What should Jim Ford do?

Collecting data is a huge part of science. During the *LabVenture!* program students collect all kinds of data. They can access that data later on their *LabVenture!* webpage. The teacher who was the visit coordinator also has access to all the student pages associated with their accounts (If you have questions about how to access these pages please email us at labventure@gmri.org). Here is one idea on how to use some of the data collected during the fishing game.

Student Challenge:

Captain Jim Ford is looking for your help. He is about to head out on his next fishing trip with his standard 6" diamond mesh net. On this trip he would like to catch more flounder and less cod and is always looking to reduce his bycatch. Jim is wondering if he should invest in a new net. Should he buy a square mesh net, a 7" diamond net (bigger mesh), or stick with his standard 6" diamond mesh net? Your job is to come up with a recommendation for Jim. Don't forget to use evidence to support your answer.

**It is important to note that every class will have a different data set, and you may have to tweak the activity to fit your class' data. For example, it is possible that none of your students chose to buy the bigger mesh net, so you won't be able to compare the bigger mesh to the square mesh net, but you can still compare the bigger mesh net to the standard diamond mesh net. For that reason it may be helpful to take a look at your class' data before doing this activity with them, and figure out how to change the activity to best fit your class.*

Understanding the question and the data needed to answer it:

- 1) As a class, look at one team's data table and ask your students to explain what the table is showing them. Ask students, "What does this data tell us about this team's virtual fishing trip?"
 - a) From a student's research home page, click on the "Trawl to Table" station page and look at the table in the observation section.
- 2) Once they have a better understanding of the data and what it shows, have the students decide which categories of data (total catch, bycatch, cod, etc.) they need to look at in order to answer their question. Ask students to provide their reasoning about which categories of data are important to answering the question and which ones are not.
- 3) On the student's page, scroll down to the second data table in the investigation section, and look at different variables or gear modifications that students had to choose from on their virtual fishing trip (bigger mesh, square mesh, codend sensor, and fuel saving doors). Which of these variables/gear modifications do they need to consider to answer their question?
 - a) Discuss with students why it is important to include data where no gear modifications were made. For example how will you know that the square mesh net is catching more cod if you don't know what his standard net was catching.
- 4) Talk with students about why we only want to use data where one variable is changing at a time.

- a) You only want to use data from trips where either bigger mesh or square mesh is being used. Don't use any data that includes codend sensor, modified doors, or have both types of mesh in use.
- b) For this same reason you will only want to use data from one fishing location (Tantas Ledge, Jeffery's Ledge, or Platts Bank). Have your students choose which location to use or choose for them. (FYI Platts typically has the most data points).

Creating table and collecting needed data:

- 5) Create a new table with the relevant classroom data for the chosen fishing location for trips made **without fishing gear**. This table should reflect the class discussion from earlier.

Example Table:

Platts- 40 miles offshore No Gear Modifications (6" diamond mesh)

Team	Total Catch	Cod	Juvenile Cod	Flounder	Juvenile Flounder	Bycatch
Bluefin						
Diatom						
Dolphin						
Average						

- 6) Have students fill in their team's data so that you have all of the class data to work with (If one team went to that fishing ground multiple times then have them add all their data). For example, Bluefin could have 3 lines for the same fishing ground. Other groups may not have chosen to fish at the chosen location and therefore, won't have data to contribute.
- 7) Create the same table for bigger mesh for the chosen fishing ground. Students should contribute data where only bigger mesh (gear mod #3 on their website) was used. If another gear mod is chosen as well do not include that data. (Again some teams may have multiple lines of data and others might have none)

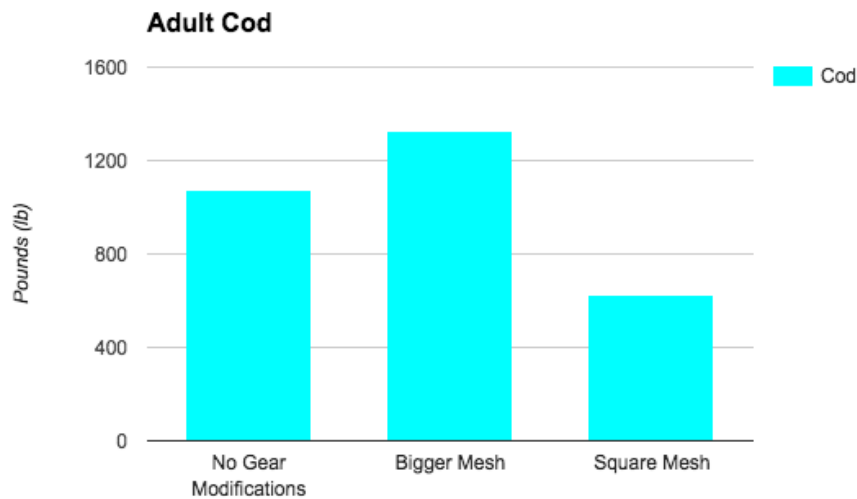
Platts- 40 miles offshore Bigger (7") Mesh Gear Mod

Team	Total Catch	Cod	Juvenile Cod	Flounder	Juvenile Flounder	Bycatch
Bluefin						
Diatom						
Dolphin						
Average						

- 8) Create the same table for square mesh for the chosen fishing ground. Students should contribute data where only square mesh (gear mod #2 on their website) was used. If another gear mod is chosen as well, do not include that data.
- 9) Once you have collected all of the data, find the average of each category (total catch, cod, juveniles, etc.) for each variable (bigger mesh, square mesh, no gear modifications) (round to the whole number).

Analyzing and Visualizing Data:

- 10) Break the class into 6 groups. Have each group create a bar graph comparing the three variables (no gear modifications, bigger mesh, and square mesh) for one of the catch categories (total catch, cod, juvenile cod, etc.) - see example graph below.



- 11) Have students display their graphs so that each of the 6 groups can look at all of the data visualizations.

Interpreting:

- 12) Ask each group to come up with a recommendation for Jim, including the evidence and reasoning for making that recommendation. (see worksheet below)
- 13) As a class, have each group share their recommendation, including supporting evidence. If there are different recommendations, discuss as a class and try to agree on one.

Possible Extension:

- 14) Compare this data set to a different fishing ground. Would you still make the same recommendations?

Conclusion

Using the knowledge you gained from this activity, write a recommendation for Jim Ford. Should Jim invest in a new net?

Claim

(Write a sentence stating why you think Jim Ford should get a new net or why he should stay with the net he has)

Evidence

(Provide accurate and reliable evidence to support your claim)

Reasoning

(Explain why your evidence supports your claim. Tell us why the net you chose will get Jim the type of catch he wants)