

What happened next?

Activity sheet B – Hannah (simplified version)

Hannah works in an environmental health laboratory in California.

She must write a report about the mercury levels in fish living in the lakes and rivers of an old gold rush mining area of California.

Samples of fish from these lakes and rivers have been analysed by two specialist labs (lab H and lab G), using different methods. Hannah needs to check through all the results.

- 1 Hannah first looks at the results from each lab. The results are very close. This tells Hannah that the methods used by the two labs were repeatable.
true / false
- 2 Each lab was given a fish sample that contained no mercury. Both labs got a zero reading when they tested these samples. This means that these samples were contaminated.
true / false
- 3 Each lab was given some standard fish samples containing 4.64 mg kg^{-1} mercury to test.

At lab H, the average result for the standard samples was 4.59 mg kg^{-1} .

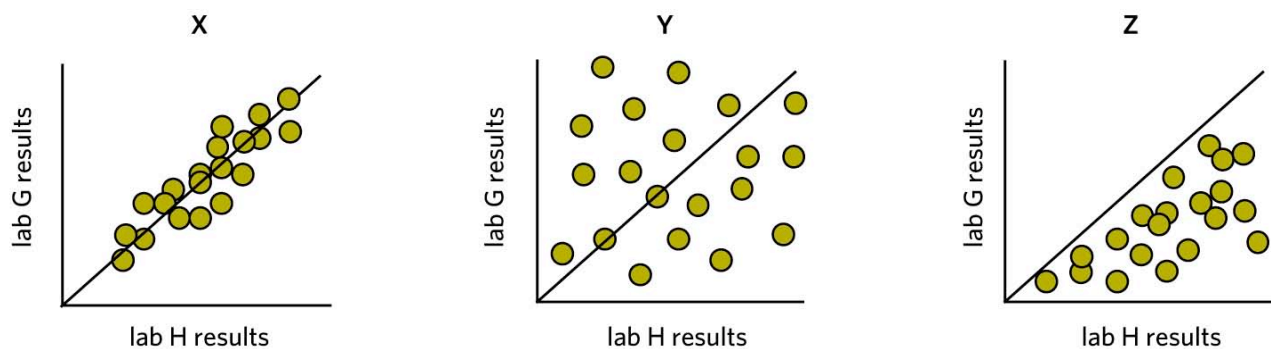
At lab G, the average result for the standard samples was 4.31 mg kg^{-1} .

From this, Hannah should expect all the results from lab H to be slightly **higher / lower** than the results from lab G.

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- 4 Hannah decides to compare all the results from the two labs by plotting them on a graph.

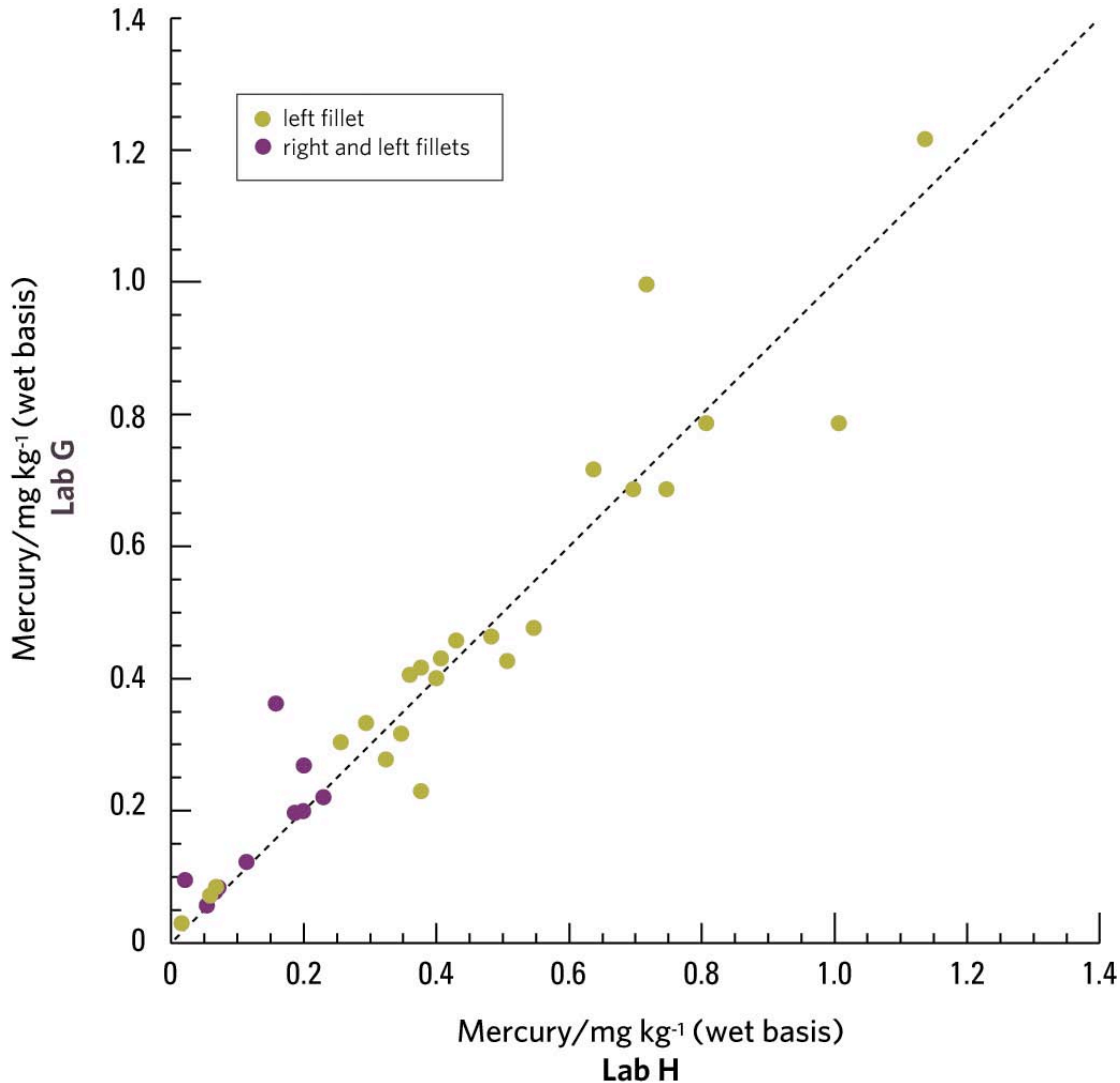
Look at the three graph shapes shown below.



Which graph shape (X, Y or Z) would Hannah see if

- lab G's results are always lower than those from lab H?
- the results from lab H are sometimes much bigger than lab G's results, and sometimes much smaller?
- lab H and lab G's results were similar most of the time?

5 This graph compares the mercury analysis results of lab H and lab G.

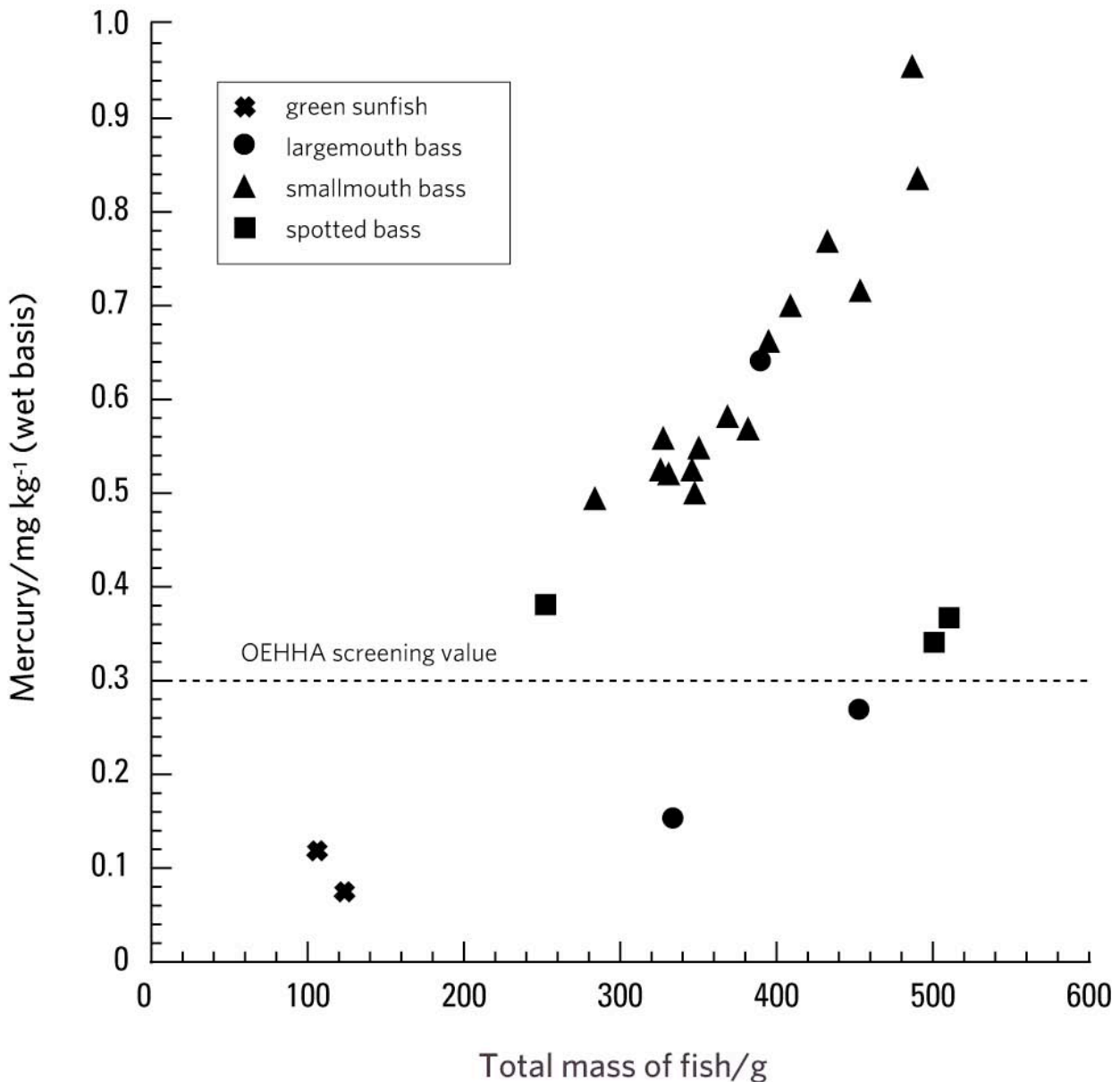


Which statement correctly describes what Hannah can find out from the graph?

- A Lab G's results are always much lower than those from lab H.
- B Lab H and lab G's results don't agree at all.
- C Sometimes the results from lab G are slightly bigger than the results from lab H and sometimes slightly smaller, but most of the time they are about the same.

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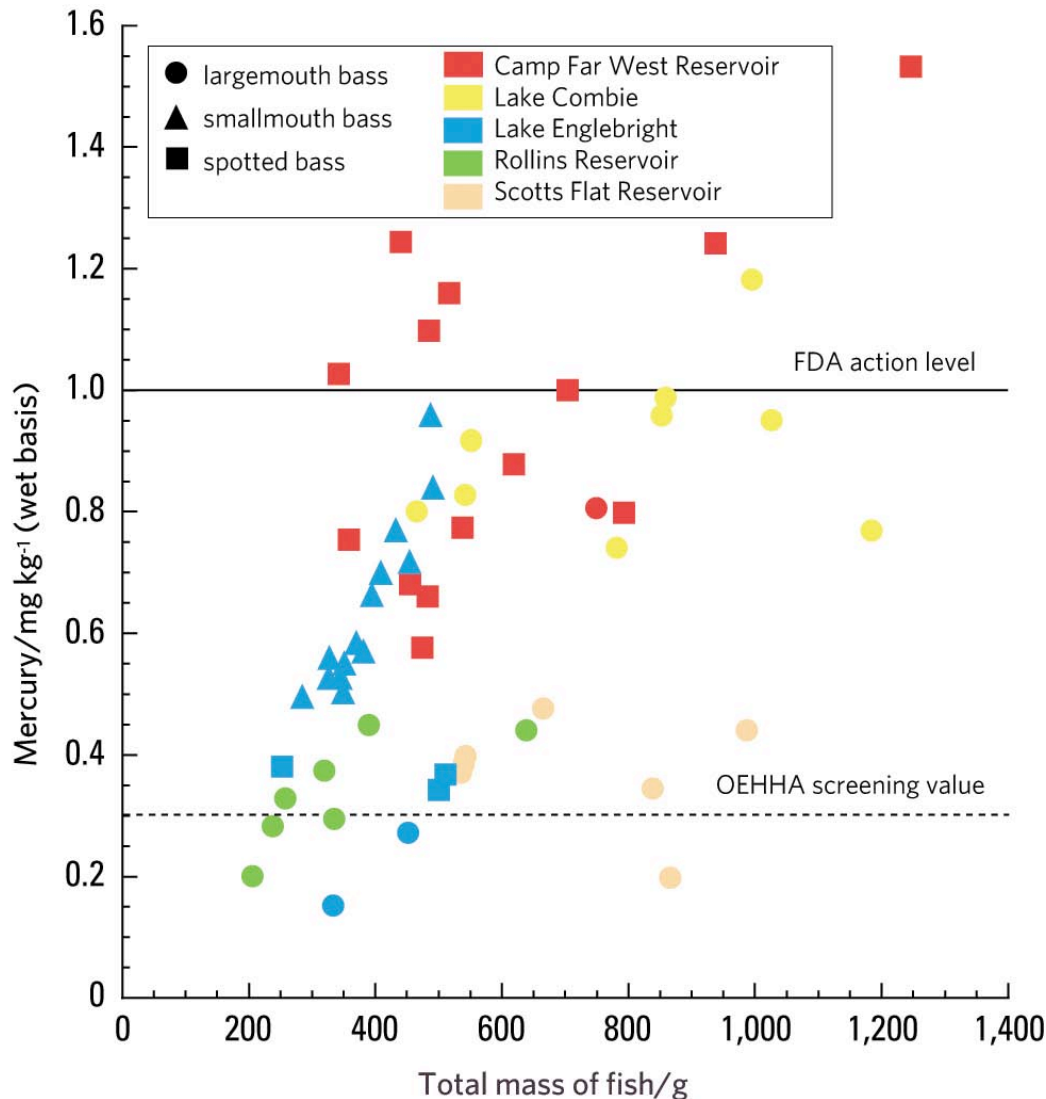
6 Now Hannah looks at this graph, showing the mercury analysis results for different species of fish caught in Lake Engelbright.



- Hannah concludes that the **smaller / larger** the mass of the fish, the **smaller / larger** the level of mercury present.
- Smallmouth bass / green sunfish** contain the highest levels of mercury.

Gold rush!

7 Hannah produces this graph to show the mercury analysis results for all the bass in the different lakes and reservoirs in the 'gold rush' mining area.



- Where were fish with the highest levels of mercury caught?
- Food cannot be sold if the mercury level is higher than the Food and Drug Administration's (FDA) action level. Below this level, fish is considered safe to eat. What is the FDA action level for mercury in fish?
- What advice should Hannah give to fishermen in the 'gold rush' area about which fish it is safe to eat if caught?