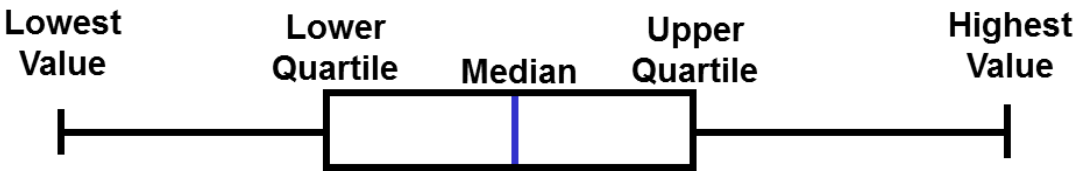
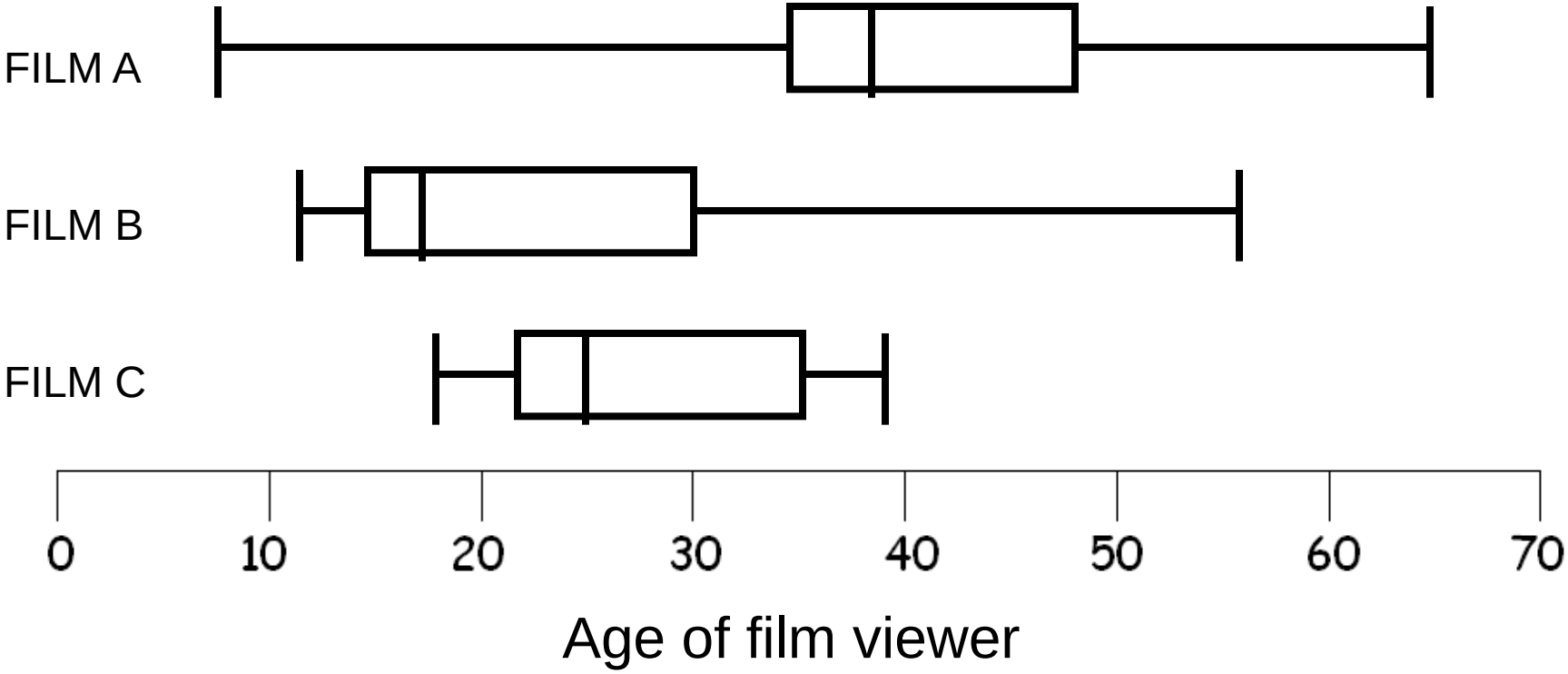
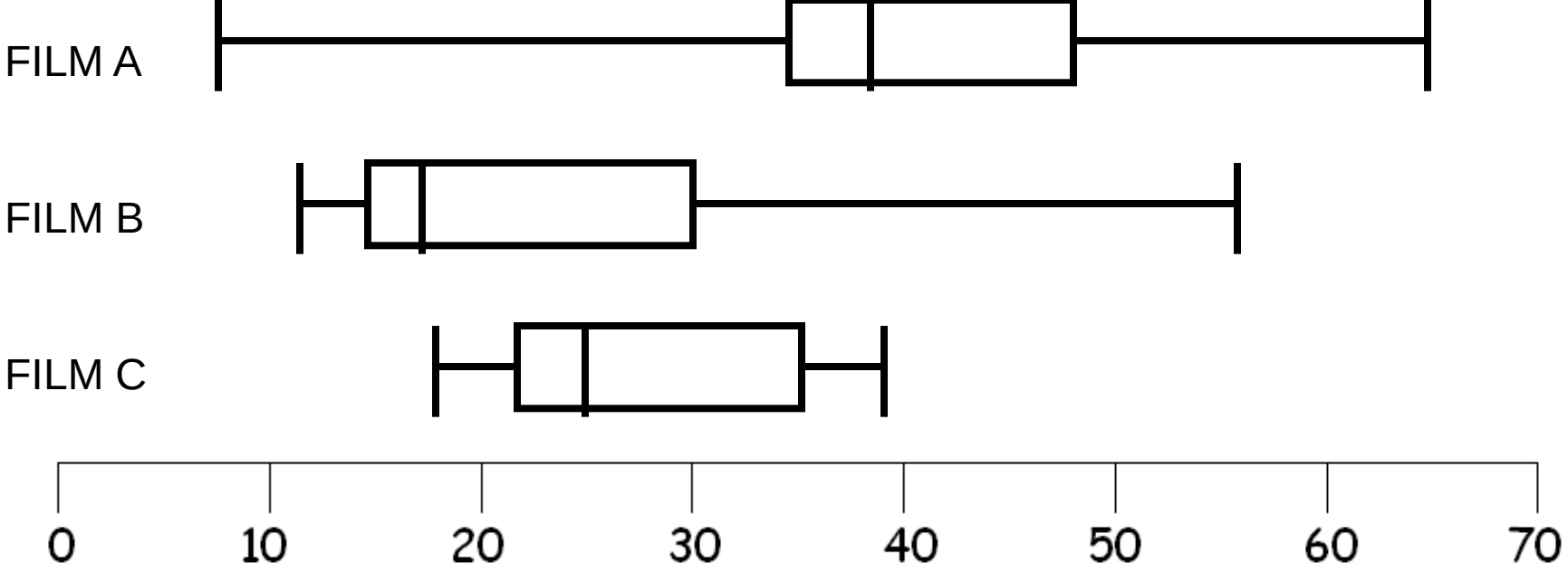

Lowest Value
Lower Quartile
Median
Upper Quartile
Highest Value



What can you tell about these films from this box plot?

Could you work out the genre of these films?

Compare the box plots and write down anything you notice



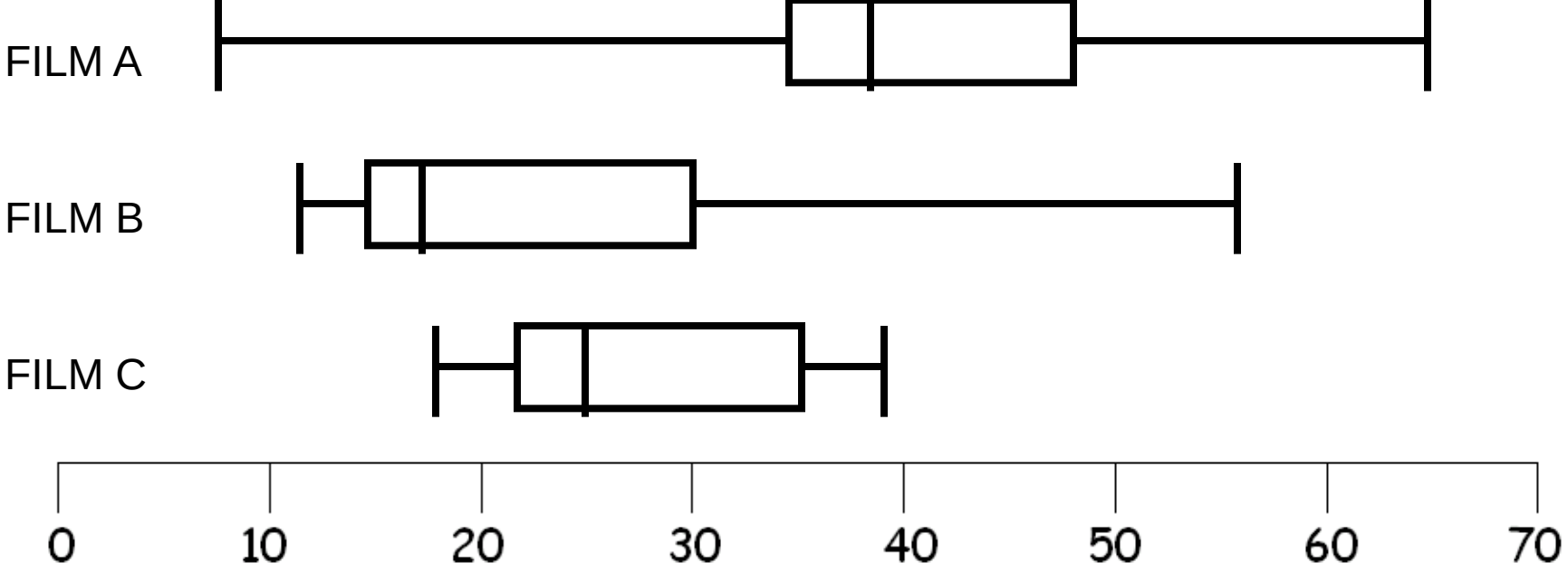
Which of the films do you think you would not be allowed to legally watch at the cinema?

A Film A

B Film B

C Film C

D Cannot tell



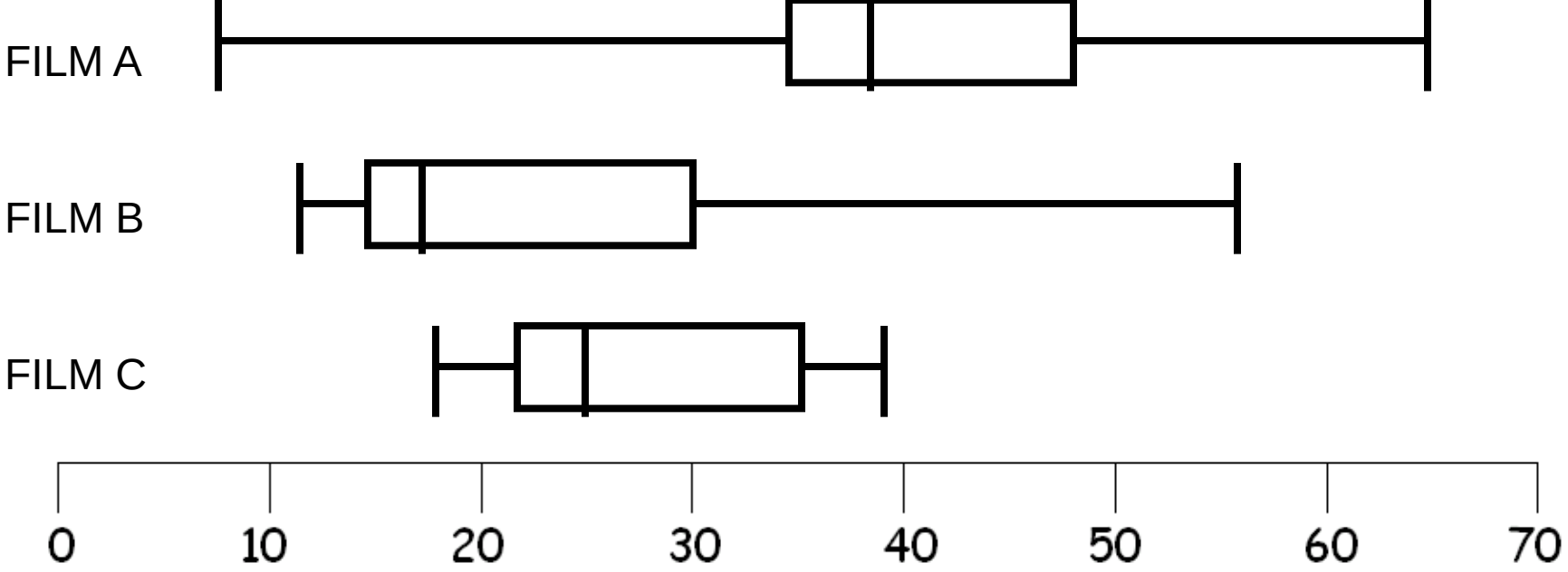
How can we tell that the film you would not be allowed to see is film C?

A The minimum value

B The lower quartile

C The upper quartile

D The maximum value



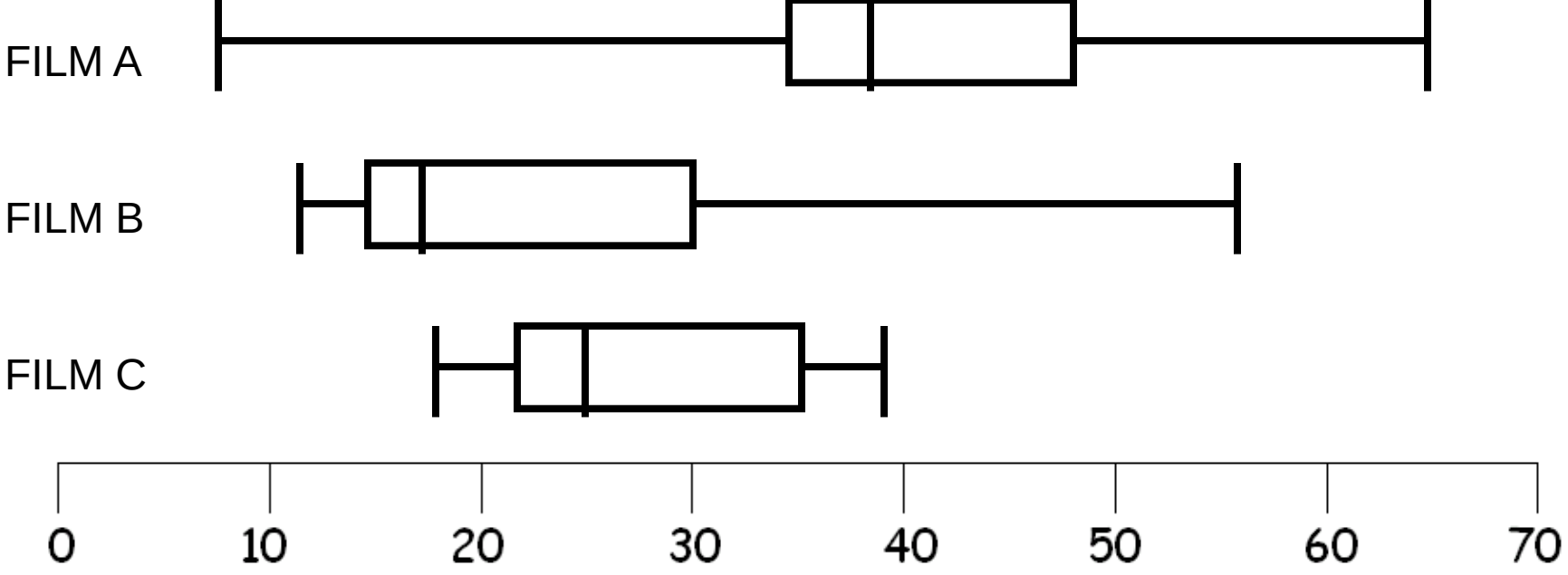
Which of the films do you think you would enjoy the most?

A Film A

B Film B

C Film C

D Cannot tell



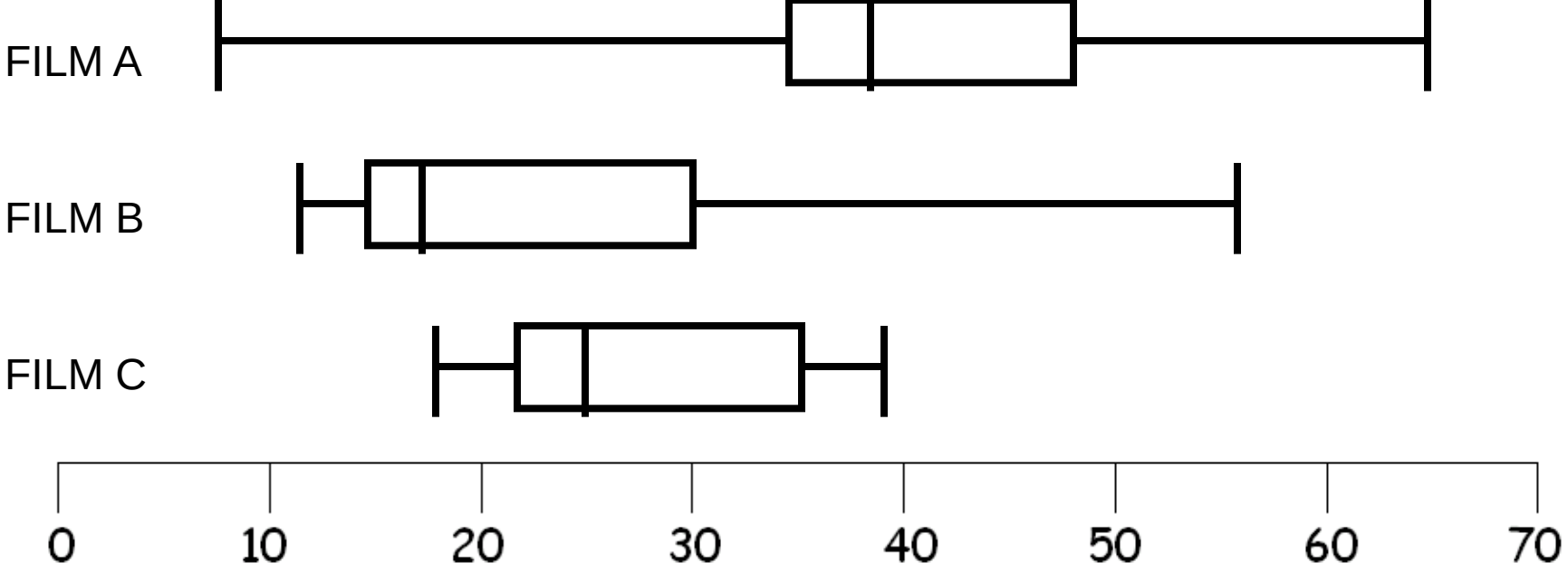
What percentage of film B's audience were between 15 and 30 (the box)?

A 25%

B 50%

C 75%

D Cannot tell



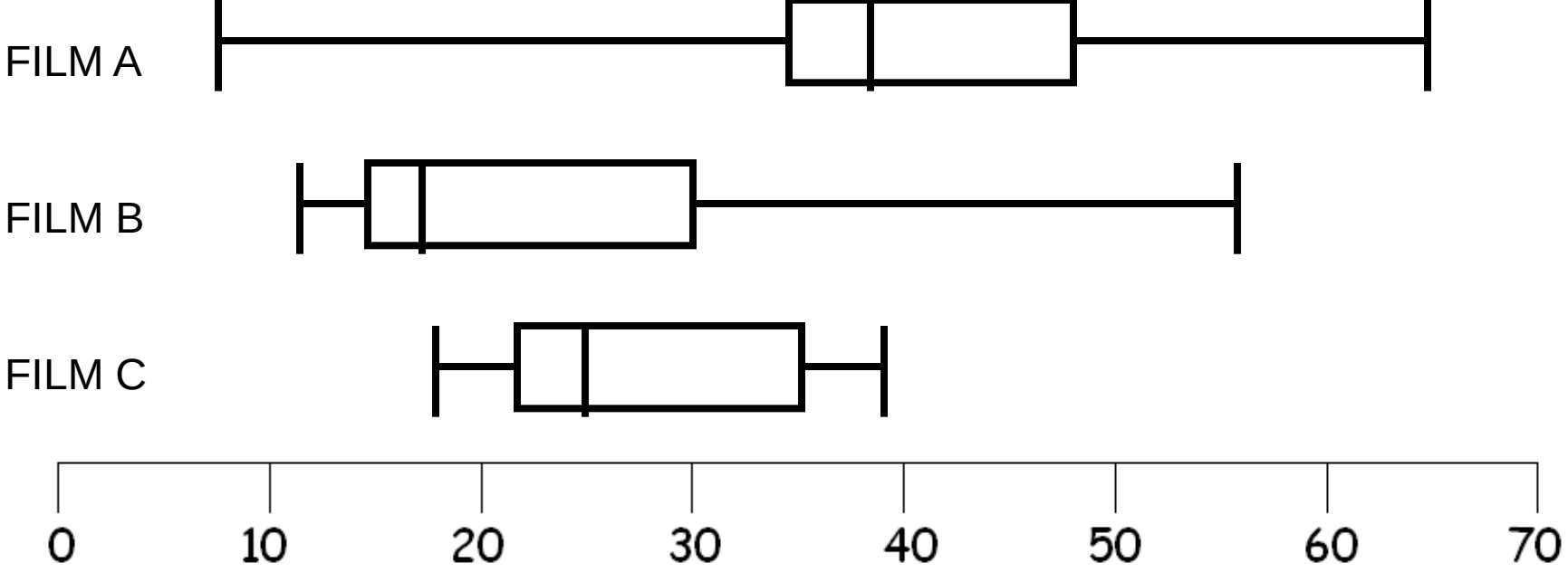
What film would your parents probably enjoy most?

A Film A

B Film B

C Film C

D Can't tell



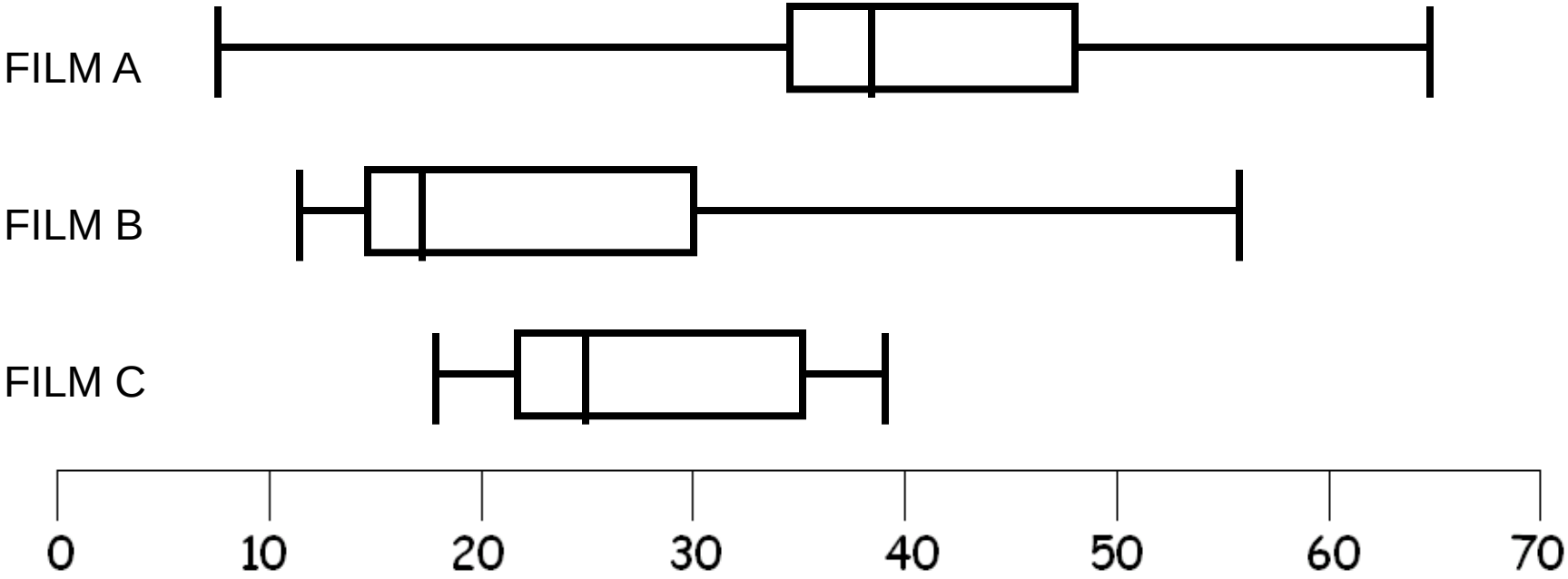
Which of the following are reasons for why your parents would probably prefer film A?

A Only 25% of the audience was less than 34

B The range is bigger

C It had the greatest maximum age

D The median is greater



Now we have analysed these box and whisker plots

Can you guess what genre of film each box plot might represent? Can you work out the target audience of each film?

Justify your decision using mathematical language

Film A

Genre - historical/political/crime
Target audience – 35 to 50 years old

Mathematical justification

- The most representative 50% of the audience were between approximately 35 and 50 years old.
- The lower quartile was approximately 35 years old.
- The upper quartile was approximately 50 years old.
- Only 25% of the audience were less than approximately 35 years old

Film B

Genre - comedy
Target audience – teenagers and people in their twenties

Mathematical justification

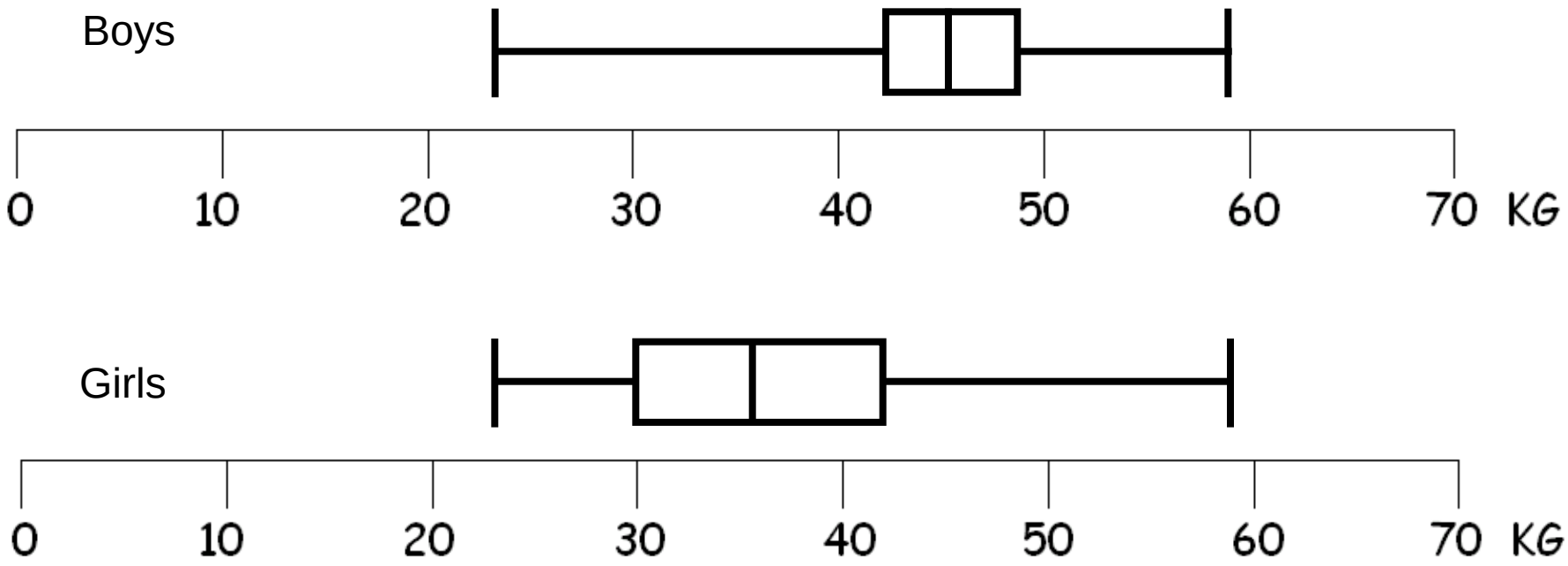
- 75% of the sample were less than 30 (upper quartile was 30)
- The lower quartile and median were very close together (25% of the sample were between approximately 15 and 17)
- 50% of the audience were between 15 and 30 (lower quartile = 15, upper quartile = 30)

Film C

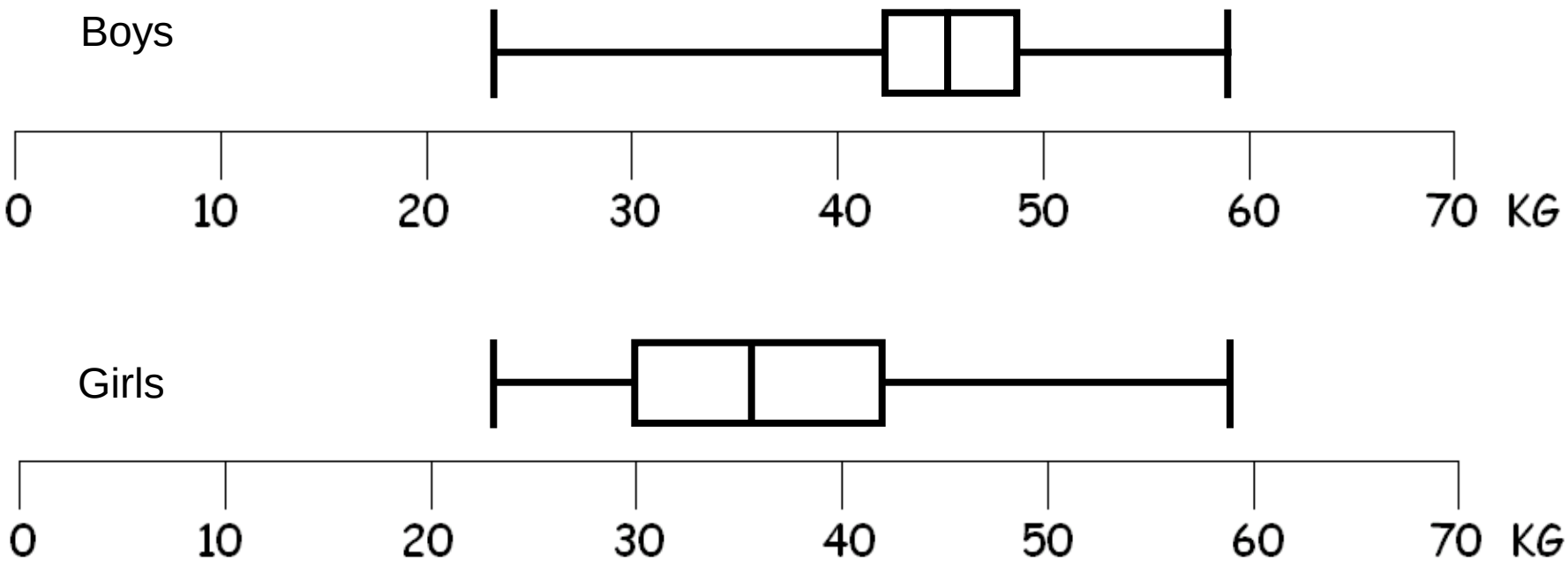
Genre - horror
Target audience – people between 18 and 35

Mathematical justification

- The minimum value was 18 (suggesting it had an 18 certificate)
- The maximum value was 40 (suggesting older people did not want to see this film)
- The range of this film was small
- 25% of the audience were between 22 and 25 (lower quartile = 22, median = 25)



Write down three comparisons between the weight of boys and girls that are shown in this box plot



Which of these comparisons are correct?

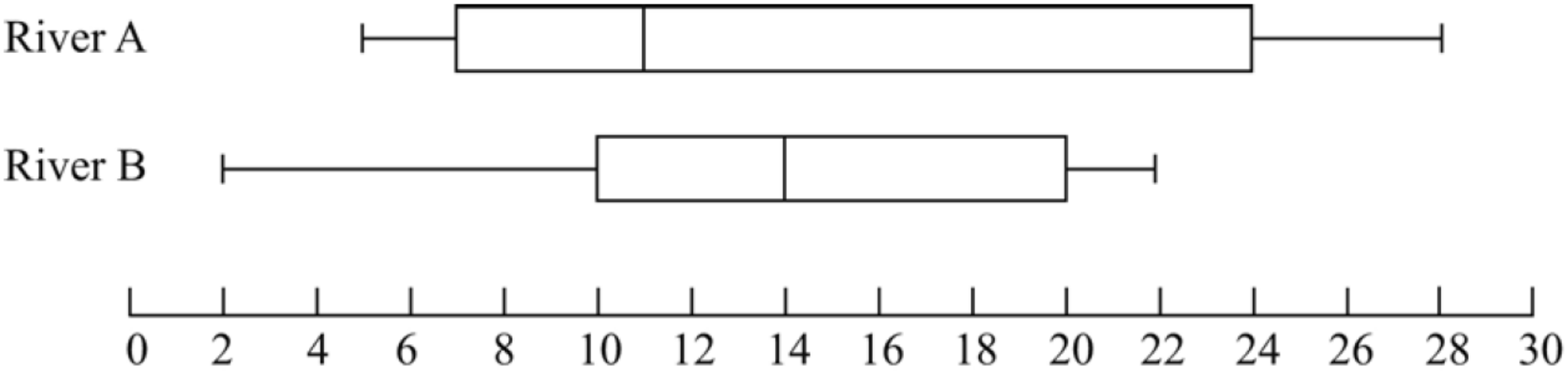
A Boys weigh more than girls on average

B The lightest girl is lighter than the lightest boy

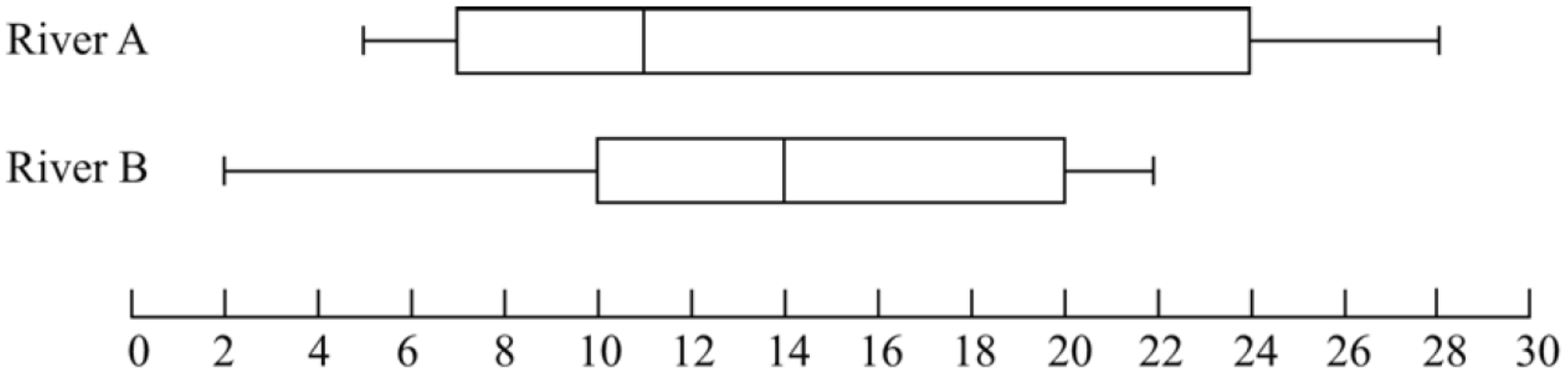
C The heaviest boy is the same weight as the heaviest girl

D Girls weight is less consistent than boys

The box and whisker diagrams below show the distributions of the lengths of fish found in two rivers in Co. Tyrone.



The box and whisker diagrams below show the distributions of the lengths of fish found in two rivers in Co. Tyrone.



In which river are the lengths of the fish on average longer?

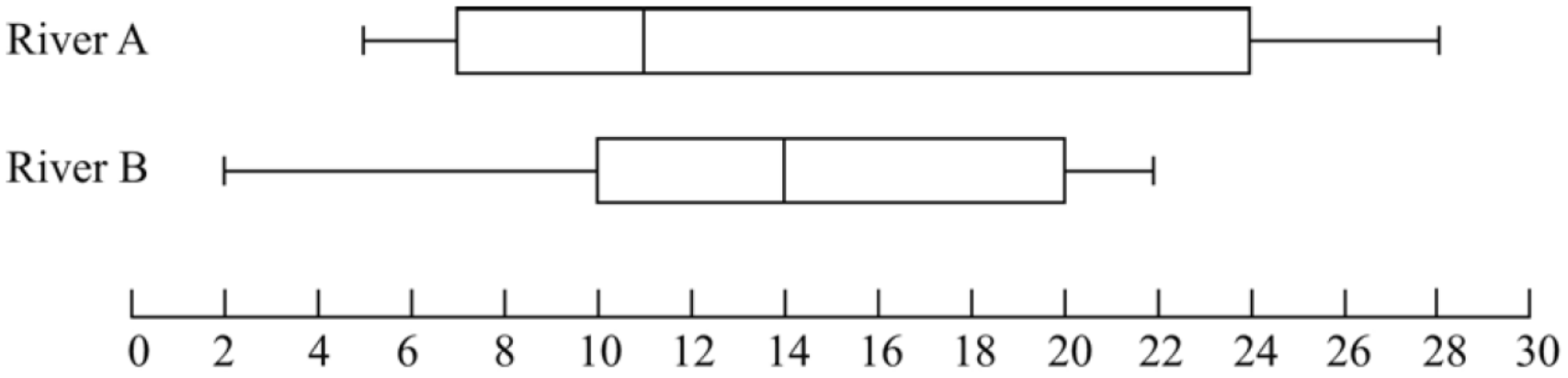
A River B as the median is bigger

B River B because the lower quartile is bigger

C River A because the upper quartile is bigger

D River A because the maximum value is bigger

The box and whisker diagrams below show the distributions of the lengths of fish found in two rivers in Co. Tyrone.



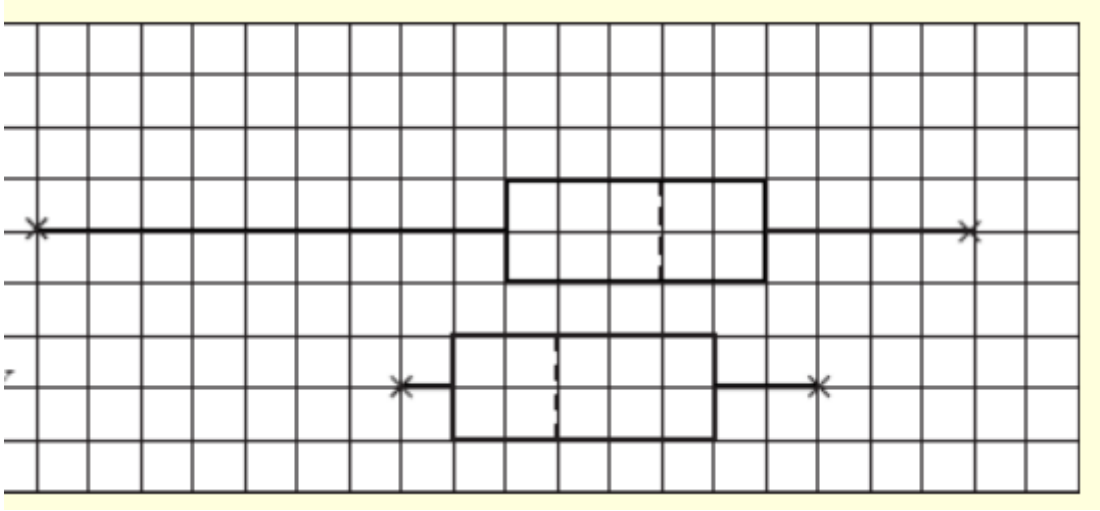
In which river are the lengths of the fish more variable?

A River B as the lower quartile is bigger

B River B because the lower quartile is bigger

C River A because the upper quartile is bigger

D River A because the IQR is bigger



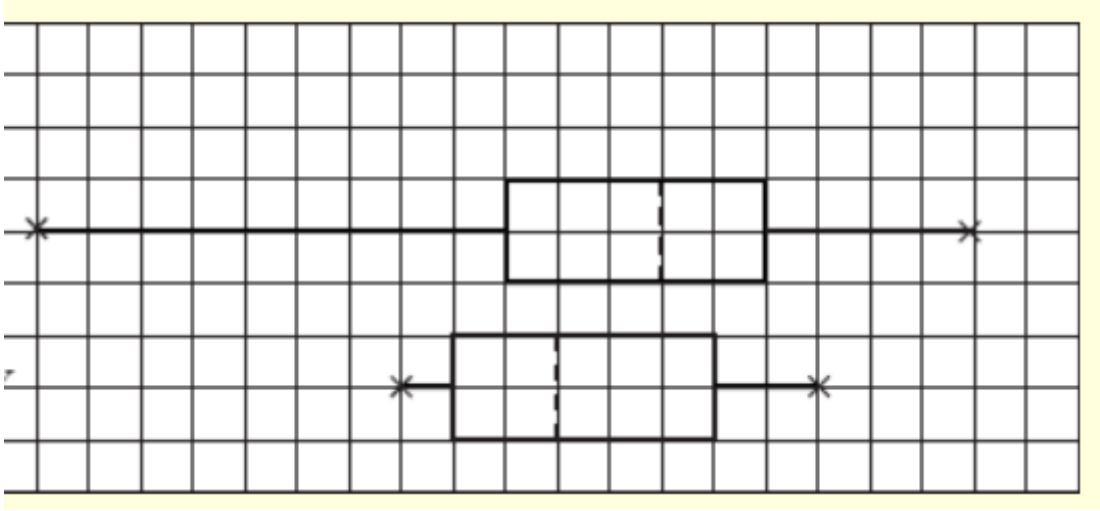
Box plot showing strength of bricks.
The builder might prefer to use red bricks because…

A The range is bigger for red bricks

B The median for red bricks is higher

C The minimum value is less for red bricks

D The IQR is less for red bricks



Box plot showing strength of bricks.
The builder might prefer to use yellow bricks because…

A The minimum value is smaller

B The median is smaller

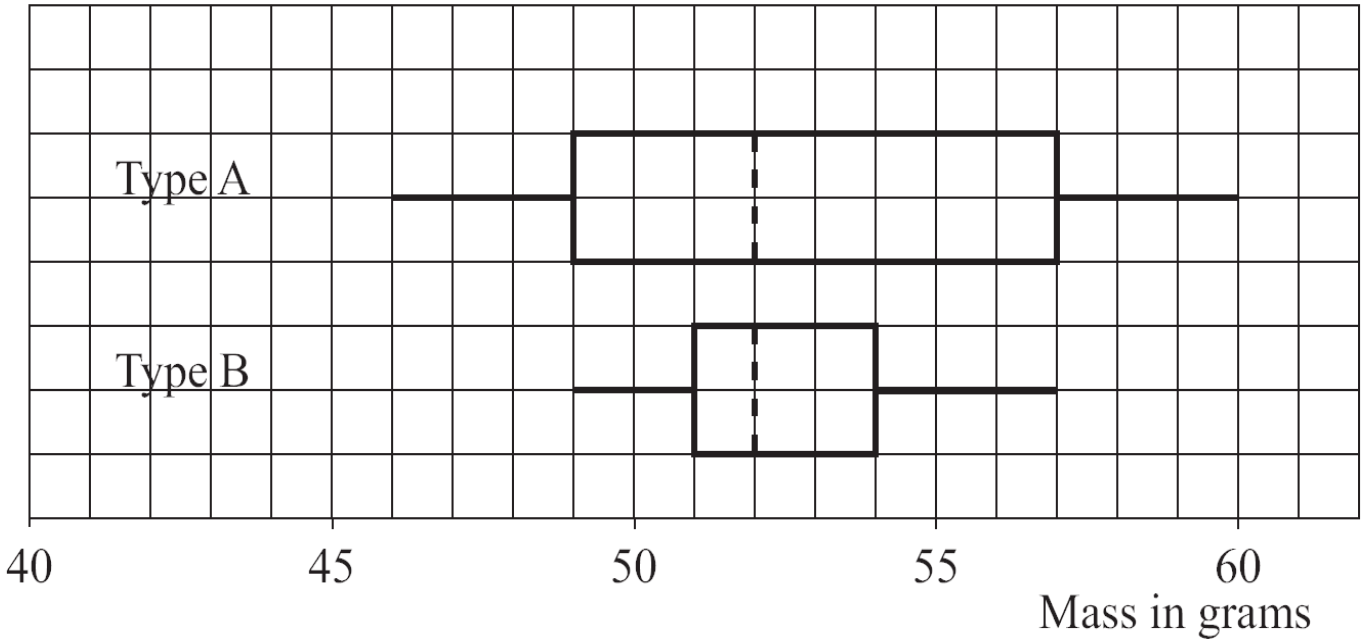
C The maximum value is smaller

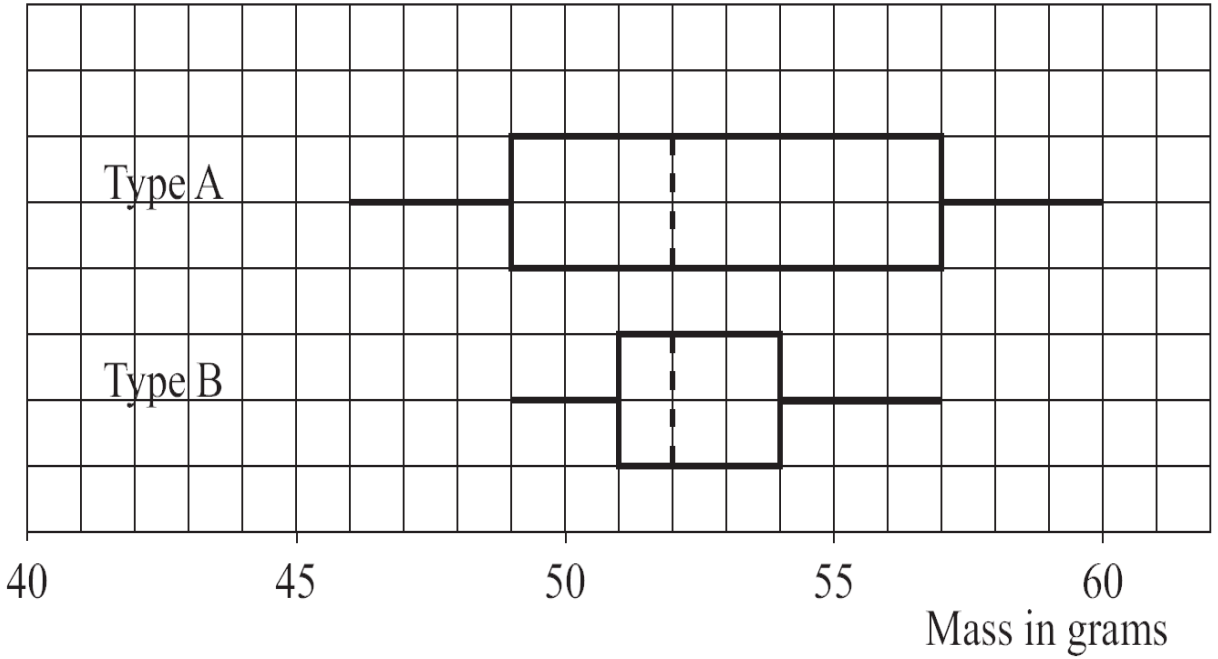
D The range is smaller (more consistent)

Box and whisker plots

A gardener collected data on two types of tomato. The box and whisker plot below shows data for the masses in grams of the tomatoes in the two samples.

Compare and contrast the two types and advise the gardener which type of tomato he should grow in future.

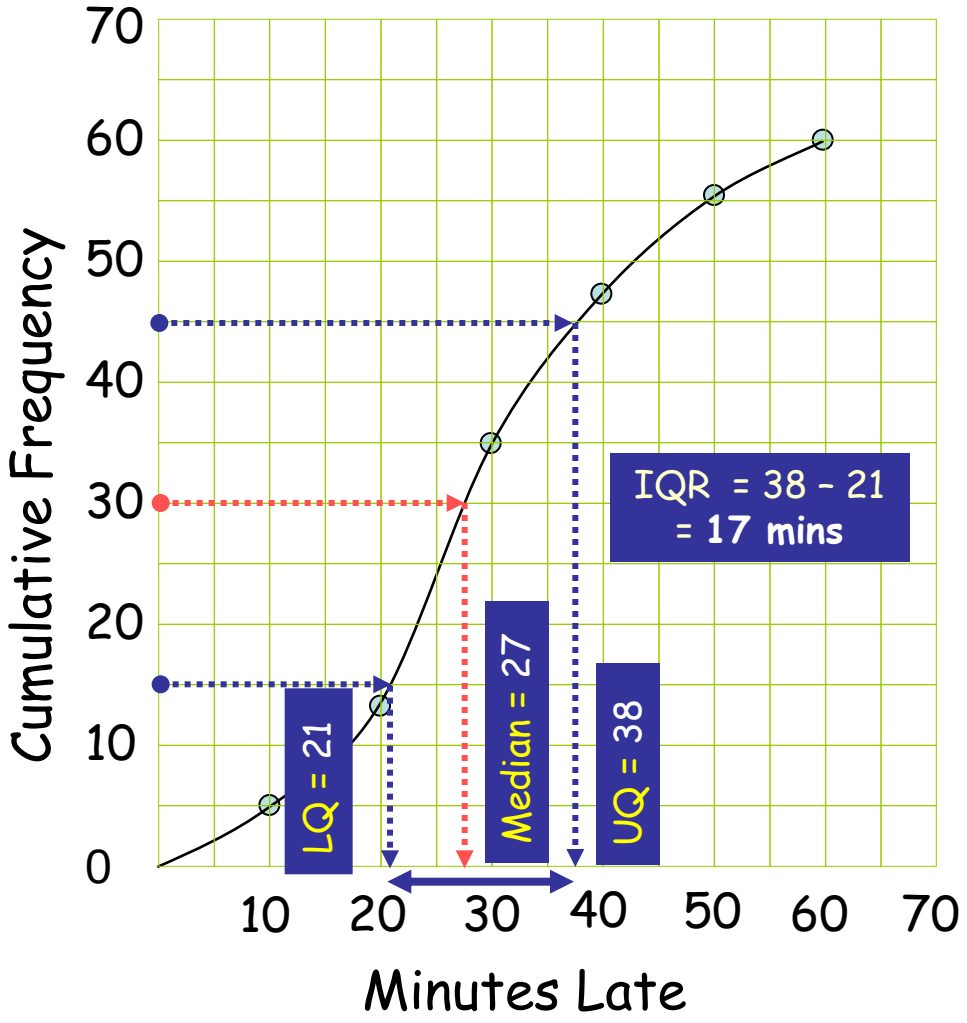


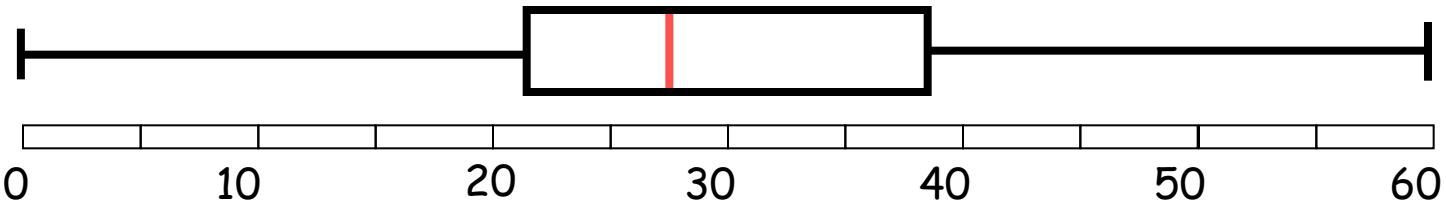


	Type A	*Type B*
Median		
Lower Quartile		
Upper Quartile		
Range		
Interquartile Range		

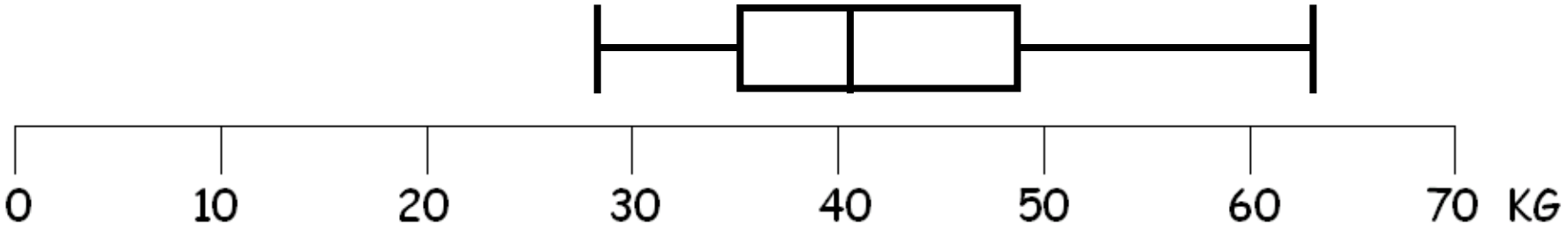
	Type A	*Type B*
Median	52 grams	52 grams
Lower Quartile	49 grams	51 grams
Upper Quartile	57 grams	54 grams
Range	14 grams	8 grams
Interquartile Range	8 grams	3 grams

Box Plot from Cumulative Frequency Curve



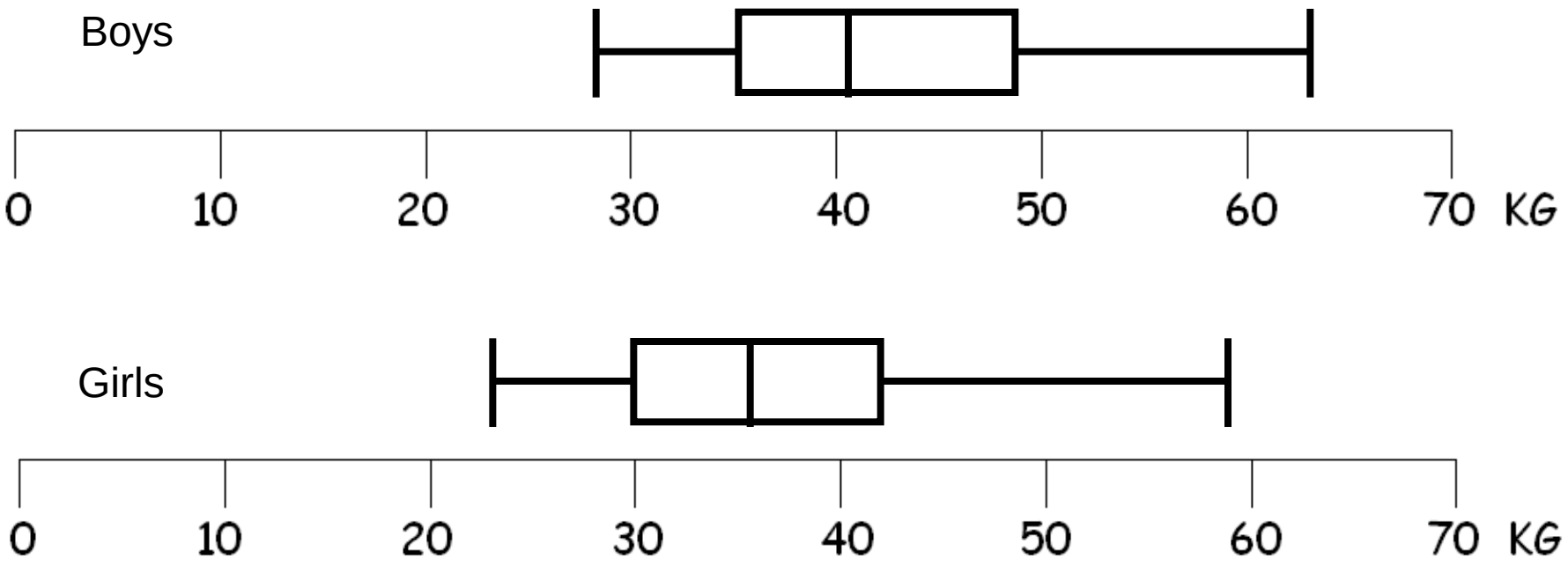


Interpreting the box plot



- Easily see lightest / heaviest and range
- The ‘box’ contains the middle 50% of people (the most ‘representative half’)
- The ‘whiskers’ show the lightest 25% and heaviest 25% of people (extremes)

Comparing groups

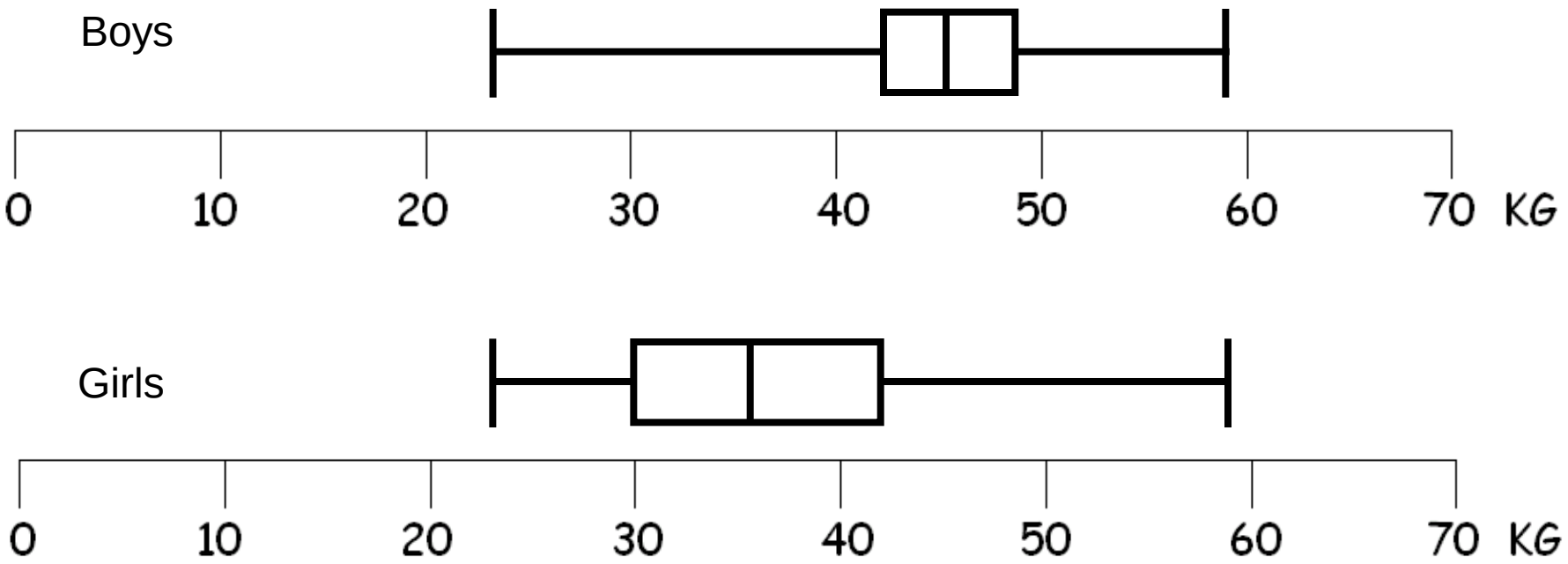


"Lightest girl lighter than lightest boy"

"Heaviest boy heavier than heaviest girl"

"Most representative half of girls generally lighter than most representative half of boys"

Comparing groups



"Lightest girl same as lightest boy"

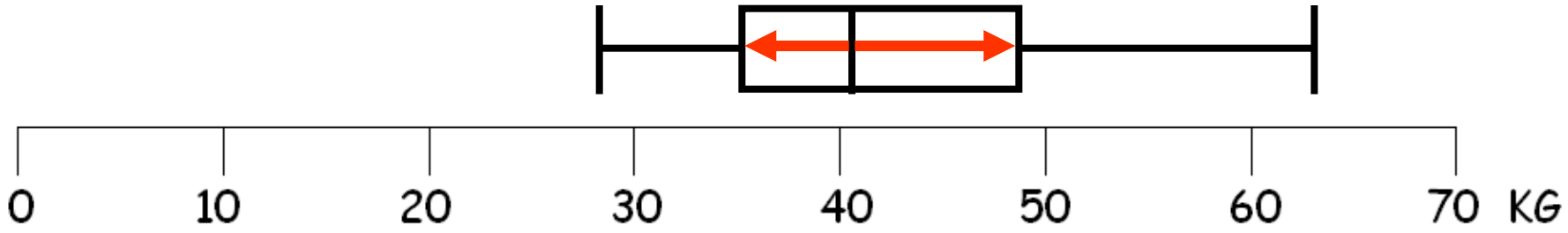
"Heaviest boy same as heaviest girl"

"All of the most representative half of girls lighter than most representative half of boys"

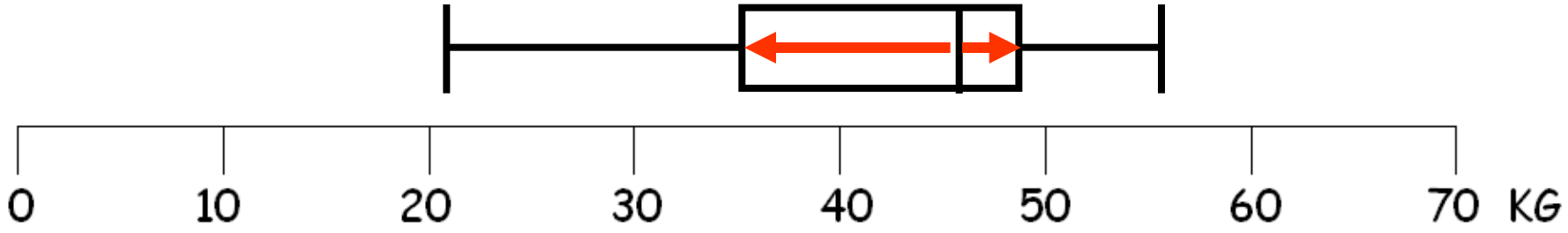
"Three quarters of girls lighter than three quarters of boys"

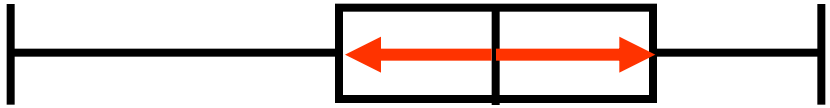
Some terminology

Positive skew: median closer to LQ than UQ

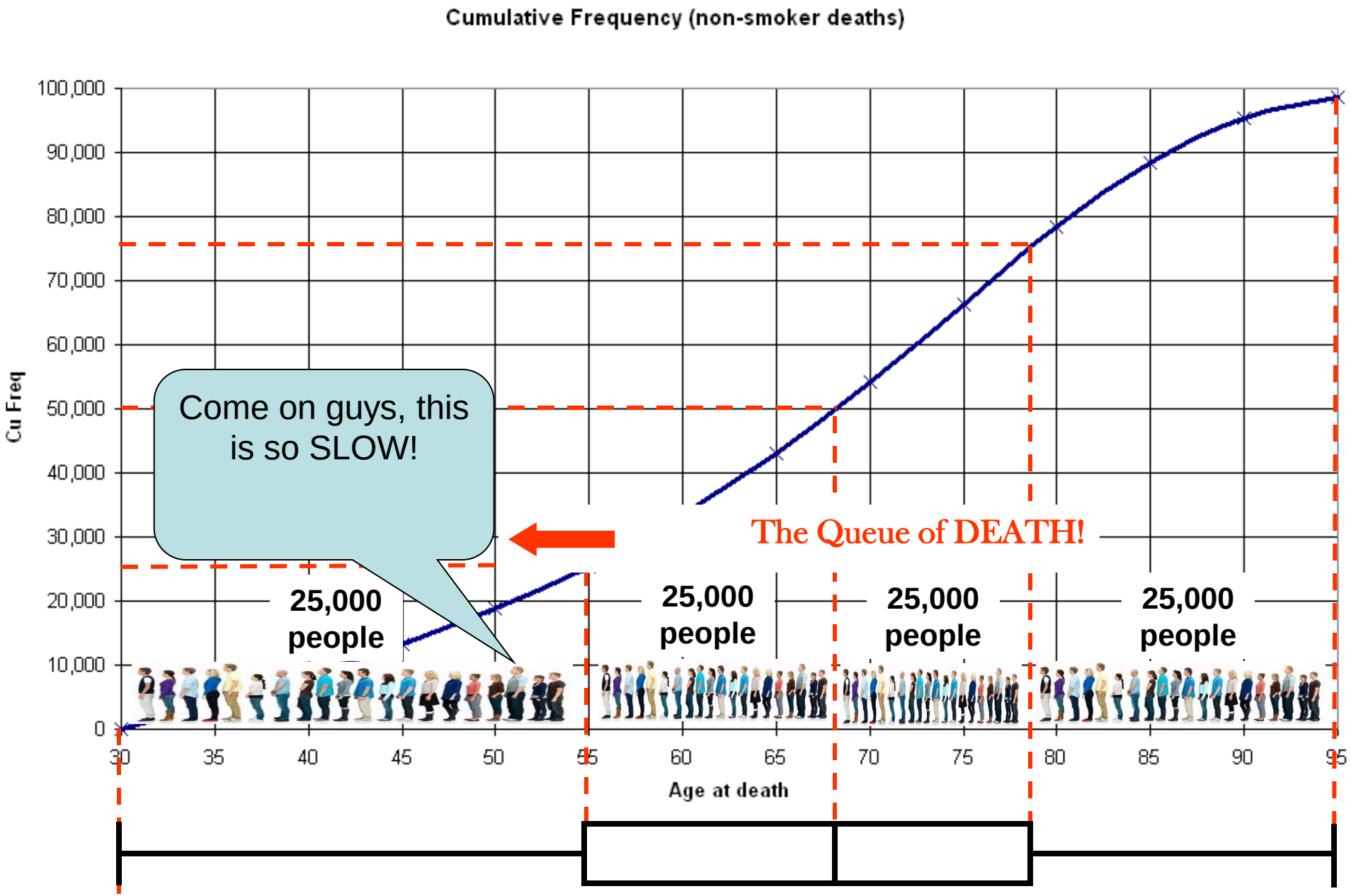


Negative skew: median closer to UQ than LQ

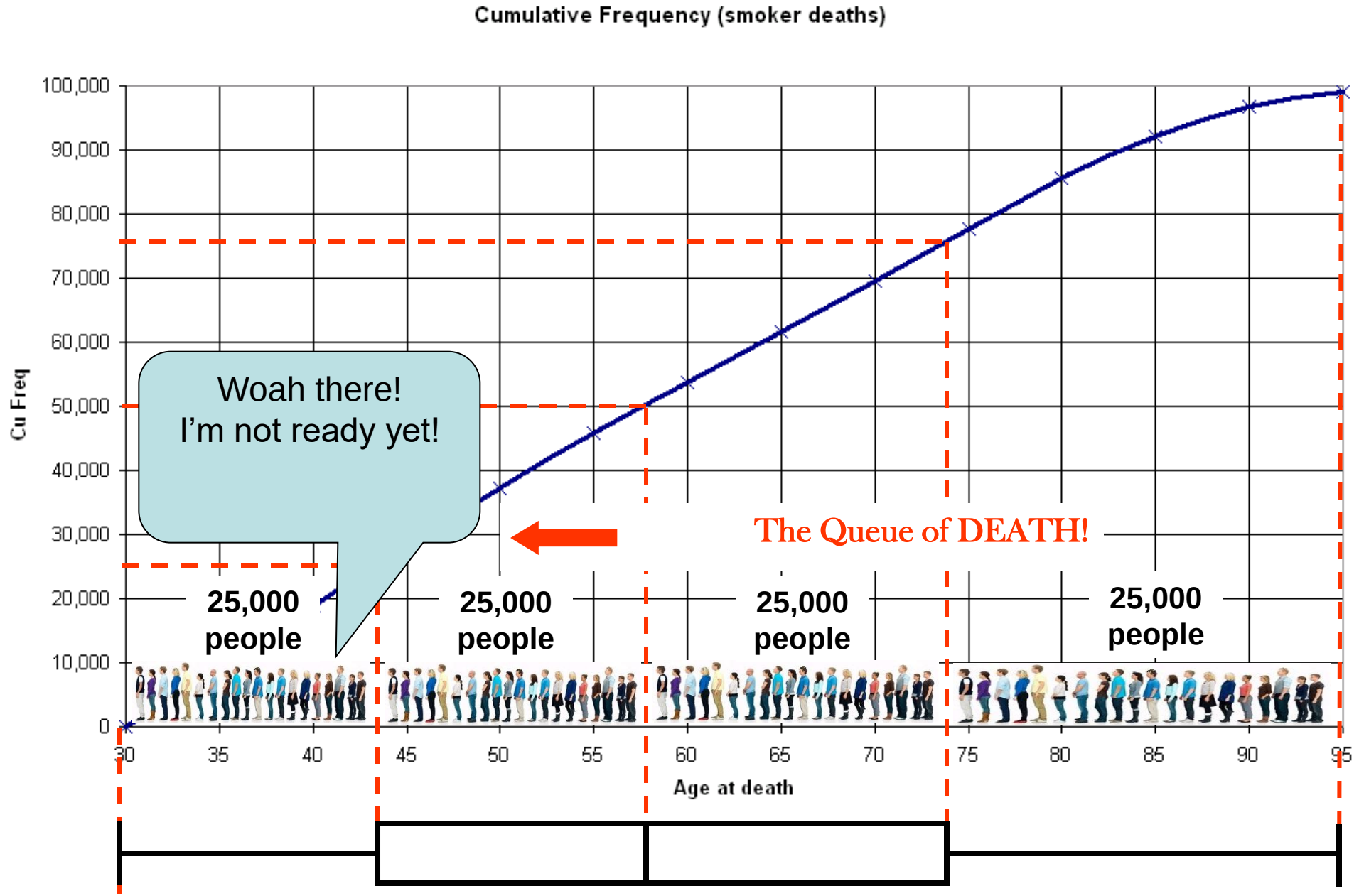




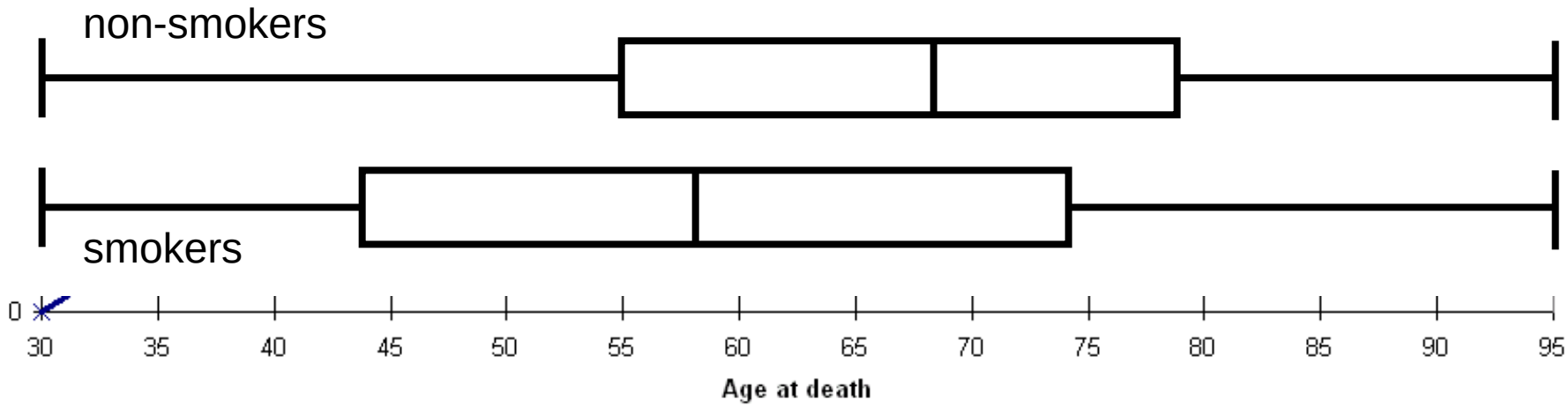
Symmetrical distribution



Source: Dr Pearl's 1938 study of 100,000 non smokers



Source: Dr Pearl's 1938 study of 100,000 smokers



Direct comparisons easy with box plots

PEER ASSESSMENT

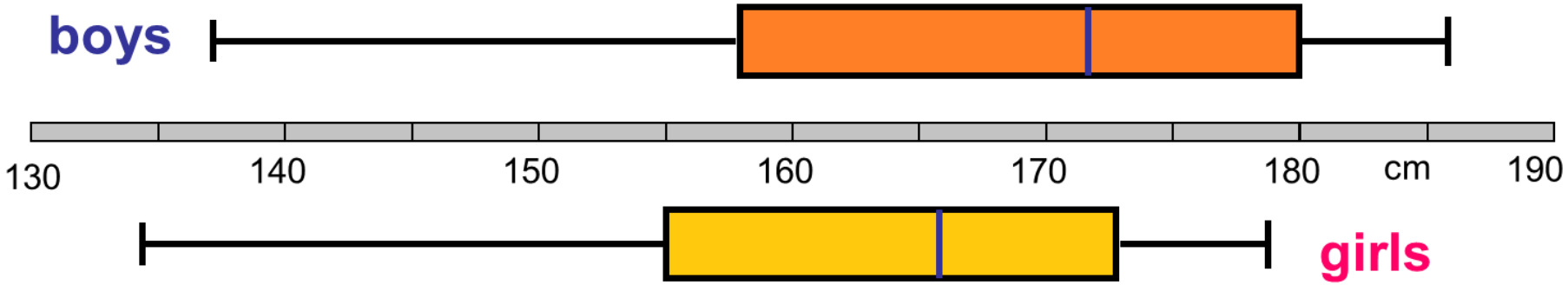
WWW (What Went Well)

EBI (Even Better If)

<u>Possible suggestions</u>

- EBI you used a ruler/improved presentation
- EBI you remembered to include the whiskers
- EBI you revised how to find the quartiles
- EBI you wrote in full sentences when writing an interpretation of the box plot
- EBI you showed your working

boxplot of student's heights:



which are true and why?

1. the girls are taller on average
2. the boys are taller on average
3. the girls show less spread in height
4. the boys show less spread in height
5. the shortest person is a girl
6. the tallest person is a boy
7. both data sets are skewed to the left
8. half the boys are over 172 cm tall
9. half the girls are under 165cm tall