



My foot length: Answers

<http://topdrawer.aamt.edu.au/Statistics/Misunderstandings/Misunderstandings-of-averages/Mean-median-and-mode>

1. What would you estimate the typical foot length of a year 5 student to be in centimetres?
2. In the table below are the foot lengths of 16 Australian year 5 students chosen at random from the CensusAtSchool website.

22 cm	22 cm
23 cm	28 cm
27 cm	23 cm
20 cm	24 cm
21 cm	22 cm
30 cm	23 cm
19 cm	32 cm
22 cm	26 cm

- (a) Which length occurs most often in the table? *22 cm*
- (b) This length is called the **mode**. Do you think the mode is a good estimate of the foot length of these students? Why or why not?

Answers will vary.

3. Another possibility for the typical value is the middle value when the foot lengths are placed in order from the smallest and largest.

- (a) Rewrite the **ordered** values.

19, 20, 21, 22, 22, 22, 22, 23, 23, 23, 24, 26, 27, 28, 30, 32

- (b) Since there are an even number of values we need to look at the middle two and if they are not the same, find the number half way between them. What is this number? *23 cm*
- (c) This length is called the **median**. Do you think the median is a good estimate of the foot length of these students? Why or why not?

Answers will vary.



4. Another way to think of 'typical' is to imagine the total length of all of the feet shared out among the 16 students.
- (a) Cut strips of paper equal to the lengths of each foot and stick them together end-to-end with sticky tape.



For example, start with: 22 cm, 23 cm, 27 cm, 20 cm, 22 cm, 22 cm.

- (b) Fold the entire strip in half. Then fold it in half again, then again, and then once more for a total of 4 folds.
How many layers are there in the folded strip? *16 layers*
What is the length of the folded strip?

Should be approximately 24 cm ($384 \div 16$) but will vary depending on the accuracy of initial measurements and skill in cutting and taping.

- (c) Would this be a good estimate of the typical foot lengths recorded in the table? Why or why not?

Answers will vary.

5. Another way to find the total length of the foot lengths in the table would be to use a calculator to sum the lengths.

- (a) What is the sum? *384 cm*
- (b) If you divide the sum by 16, what is the number you get? *24 cm*
- (c) Is it close to the length you measured when you folded the long strip of paper? Why would this be the case?

Should be pretty close depending on accuracy.

- (d) This length is called the **mean** of the lengths in the table. We have 'shared out' the total of all of the 16 lengths so that they are the same for each student. Is this sharing out of the total length a good estimate of the foot lengths in the table?

Answers will vary.

6. (a) Summarise your estimates of the typical value of the foot lengths in a table.

<i>Mode</i>	<i>22 cm</i>
<i>Median</i>	<i>23 cm</i>
<i>Mean</i>	<i>24 cm</i>

- (b) What do you think is the best estimate of the foot length of the students? Why do you think this?

Answers will vary.

- (c) Create a stacked dot plot of the data. Does this help you decide what the best estimate of the typical foot length is? Explain.

