Seven People Went Fishing

Task Description

Students explore the terminology of *average* through the open-ended question, 'Seven people went fishing. The mean number of fish caught was 5, the median was 4 and the mode was 3. How many fish did each person catch?'

Length of Task

30 - 35 minutes

Materials

- Unifix blocks or counters for those students who require the support of hands-on materials.

Using the Activity

Teacher poses the following open-ended question to the class.

> SEVEN PEOPLE WENT FISHING.
>
> THE MEAN NUMBER OF FISH CAUGHT WAS 5, THE MEDIAN WAS 4 AND THE MODE WAS 3.
>
> HOW MANY FISH DID EACH PERSON CATCH?

The students may require clarification the terminology of *mean, median* and *mode* before commencing the task. The teacher encourages the students to think of ways to remember each term, e.g. the *median* strip is in the *middle* of the road.

Students are encouraged to work on the problem individually. The teacher shares that there is more than one possible answer to this question.

Whole class: The teacher draws the students together to share their approaches and responses to the question. Some students may have commenced with calculating the total number of fish caught (35) from the mean (5) i.e. 5 (mean) x 7 (people fishing) = 35 fish.

Other students may have created 7 spaces in a row, and entered the 4 (median) in the middle place (4th) of the 7 spaces.

$$\underline{\quad} \ \ \underline{\quad} \ \ \underline{\quad} \ \ \underline{4} \ \ \underline{\quad} \ \ \underline{\quad} \ \ \underline{\quad}$$

A third possible approach may see students commence with placing two or three 3s for the mode along their line of 7 spaces.

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____ __3__ __3__ ____ ____ ____ ____

The teacher encourages students to share any difficulties they have encountered with the task and their methods for overcoming them. A discussion of incorrect responses will assist in developing students' understanding of the terminology of average.

The teacher prompts students to consider and share situations when knowing the mean, median and/or mode is useful.

Key Mathematical Concepts

- Data analysis and interpretation.

Prerequisite Knowledge

- An understanding of the terms mean, median and mode.
- Experience with open-ended problem solving.

Links to VELS

Dimension	Standard
Measurement, Chance and Data (Level 4)	Students calculate and interpret measures of centrality (mean, median, and mode) and data spread (range) for ungrouped data.
Working mathematically (Level 4)	Students develop and test conjectures.

Assessment

To be working at level 4, students should be able to:
- Provide an accurate series of numbers to match the requirements of the task.
- Describe the terms mean, median and mode.

Extension Suggestions

Extension questions related to this task are:
- What if 8 people went fishing? ... or 6 people? Does this make a difference to the result?
- What is the maximum number of fish an individual person might have caught?

For students who would benefit from additional challenges:
- Ask students to create open-ended questions that incorporate the terms *mean, median* and *mode*. The students provide a series of possible responses to their questions. Students share their questions with fellow classmates to trial their open-ended questions.

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Teacher Advice and Feedback

Teachers noted that the students had difficulty with getting started on this task, as they were unsure how to approach the problem. When these students worked out the total number of fish that were caught, they were able to build on this part of the problem to work through the mode and median parts and provide a solution to the question.

Potential Student Difficulties

Prompts for students experiencing difficulty:
Pose the questions in separate parts.

> Seven people went fishing. The mode of the number of fish caught was 3. How many fish did each person catch?
> Seven people went fishing. The mean of the number of fish caught was 5. How many fish did each person catch?
> Seven people went fishing. The median of the number of fish caught was 4. How many fish did each person catch?

Some students may misunderstand the term median. While they may successfully place the 4 in the middle of the seven numbers, the numbers may not be in order from lowest to highest. For example students may submit the following numbers 2, 7, 3, **4,** 3, 10, 6 instead of 2, 3, 3, **4,** 6, 7, 10. Students must understand that the median is the middle number when numbers are ordered from *lowest* to *highest*.

Sources

Sullivan, P., & Lilburn, P. (2004) *Open-ended maths activities: using 'good' questions to enhance learning.* Melbourne: Oxford University Press.

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Acknowledgements

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Student Work Samples

Example 1: Working at Level 3–4

This student has an emerging understanding of the terminology of mean, mode and median. The initial confusion with ordering numbers from lowest to highest is evident. It has taken several attempts to answer correctly the three aspects of the question. Contrary to the most common approach by students, the mean appears to be the last aspect attended.
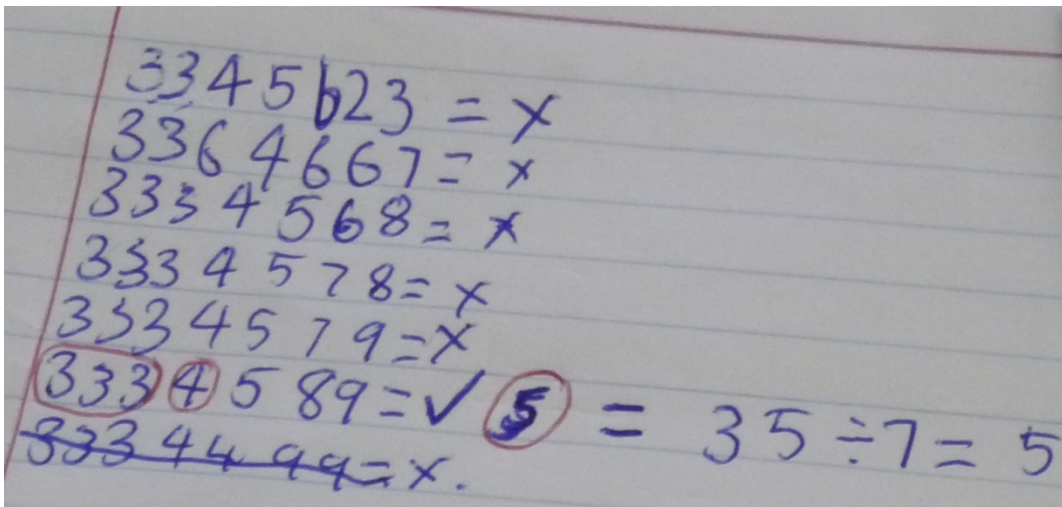
Example 2: Working at Level 4

Three students shared their results with the class. Note that the absence of ordering the numbers for two students has not affected the end result in these cases.