Clues on Cards

Task Description

In small groups, students reconstruct data from a set of clue cards based on an understanding of the terms *mean, mode, median, range*, and *frequency*.

Length of Task

50 minutes

Materials

- Clue cards

Using the Activity

Introductory task

The *Seven people went fishing* task is used as an introductory task for this activity. *Seven people went fishing* assists students in revising their understanding of the terminology of mean, mode and median. Revising other terminology, such as range and frequency, may be necessary before commencing the main activity.

Students write their definition of the key terms in their mathematics journal.

Main Activity

The teacher places children in groups of 6. Each child is given a clue card that contains a piece of information that assists the group in reconstructing the data.

Before reconstructing the data, the students break off into 'expert' groups with students from other groups who have a matching symbol in the bottom right-hand corner of the card. These cards focus on similar data, e.g. mode. The students discuss the meaning of their card and what information it provides their group.

The students return to their original group, read and process the data. Students record the reconstructed data and check clues for accuracy.

The whole class comes together to share the process they undertook in their groups to reconstruct the data. The teacher asks students to reflect on what they have learned through doing this task.

Students return to their mathematics journal and individually redefine their understanding of the key terms. The teacher asks the students to share how their current definition compares with their previous held understandings.

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Key Mathematical Concepts

- Data interpretation.
- Vocabulary of data terminology such as, mean, mode, median, range, and frequency.

Prerequisite Knowledge

- Exposure to the terminology of mean, mode, median, range, and frequency.

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.
Working mathematically (Level 4)	Students pose and solve mathematical problems using a range of strategies (for example, make a list, find a pattern, and work backwards). They solve new problems based on familiar problem structures.

Assessment

To be working at level 4, students should be able to:
- Define the key terminology mean, mode, median, range, and frequency.
- Employ problem-solving strategies to organise these data and complete the task.

Extension Suggestions

For students who would benefit from additional challenges:
- Students use previously developed data, such as sporting scores or weather temperatures over time, to develop a set of clue cards. These new clue cards are given to a different group of students to solve.
- Students create a 'mystery story' to match the reconstructed data. Students aim to incorporate the clues within the text of the story to help others piece the mystery together.

Teacher Advice and Feedback

Have a mathematics dictionary on hand for students to look up the meanings of forgotten terminology during the reconstruction of data phase.
The teachers who trialled this task found that it was important to ensure that you have students with a range of capabilities in each group. Students who are having difficulty accessing the task will benefit from the input of more mathematically capable students.

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Potential Student Difficulties

Students may have difficulties with piecing the information together. Teacher prompts may include:

- What do you already know about the problem?
- What numbers do you have and what can you do with these numbers?

The clue cards could be simplified to include some of the information. For example:

- The range of the scores is 4, from the numbers 1 to 5.
- What could Robyn's data be?

Robyn's Data
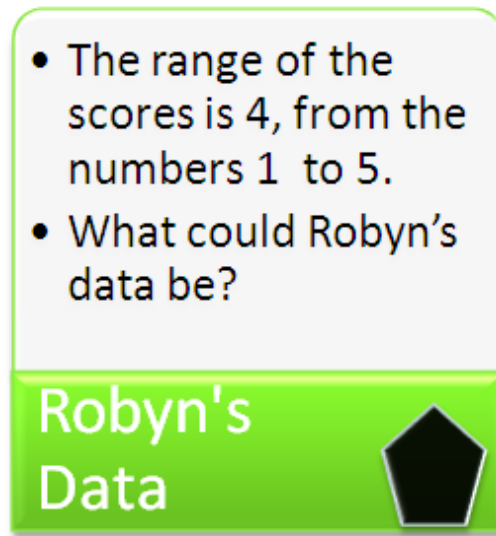
Source

Gould, P. (1993). *Cooperative problem solving in mathematics*. Mathematical Association of New South Wales.

Acknowledgements

Thank you to the teachers and students from Timbarra Primary School for providing valuable feedback on the use of this activity.

Clues on Cards

- There are five scores and they are integers bigger than zero.
- What could Robyn's data be?

Robyn's Data

- The mean of the scores is 2.
- What could Robyn's data be?

Robyn's Data

- The median of the scores is 1.
- What could Robyn's data be?

Robyn's Data

- The range of the scores is 4.
- What could Robyn's data be?

Robyn's Data

- The mode of the scores is 1.
- What could Robyn's data be?

Robyn's Data

- Only one of the scores is even.
- What could Robyn's data be?

Robyn's Data

Clues on Cards

- The sum of the scores is 48.

- What could Peter's data be?

Peter's Data ■

- The mean of the scores is 8.

- What could Peter's data be?

Peter's Data ●

- The median of the scores is 7.5 and all the scores are positive integers.
- What could Peter's data be?

Peter's Data ▲

- The range of the scores is 3.

- What could Peter's data be?

Peter's Data ⬠

- The mode of the scores is 7 and it has a frequency of 3.
- What could Peter's data be?

Peter's Data ✚

- Exactly two of the scores are even.

- What could Peter's data be?

Peter's Data ★

Clues on Cards

- All the scores are positive integers and there is an odd number of scores.
- Help your group find Linh's data.

Linh's Data

- The mean of the scores is 8.
- Help your group find Linh's data.

Linh's Data

- The median of the scores is 5.
- Help your group find Linh's data.

Linh's Data

- The range of the scores is 6.
- Help your group find Linh's data.

Linh's Data

- The mode of the scores is 7.
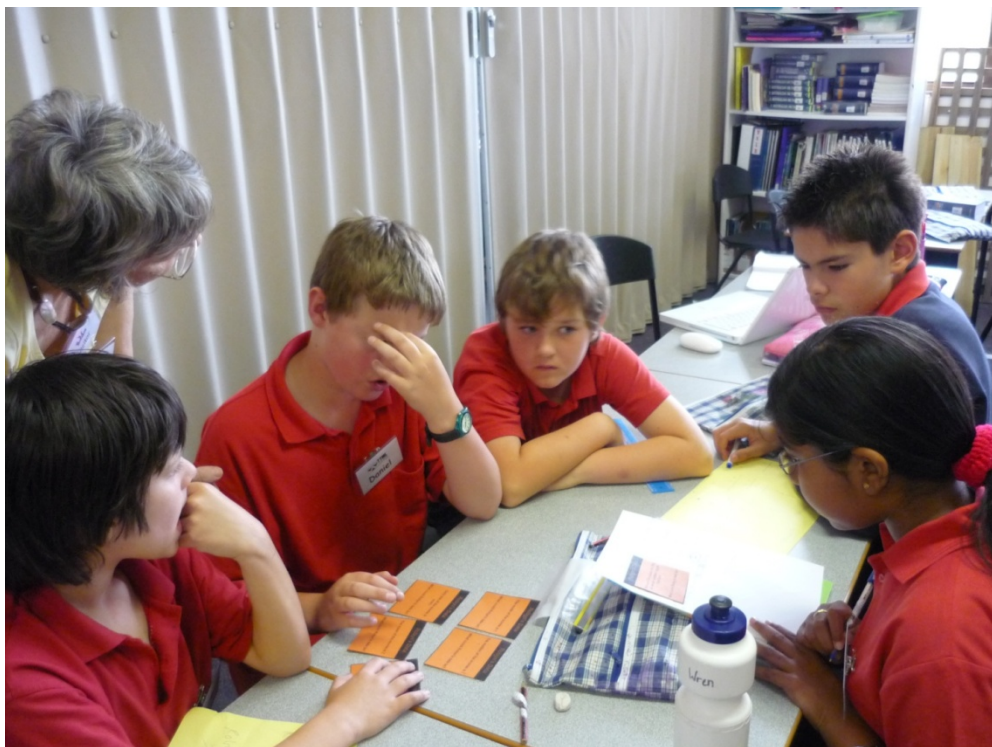- Help your group find Linh's data.

Linh's Data

- The biggest score in Linh's data is 7.
- Help your group find Linh's data.

Linh's Data

Clues on Cards

**Students are working cooperatively to reconstruct data**

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Students' Work Samples

Example 1: Working at Level 4

Students are working systematically through the clues to reconstruct the data. The students have demonstrated an understanding if the terminology in this task, e.g. median – the students placed 7 and 8 in the central positions to produce a median of 7.5.
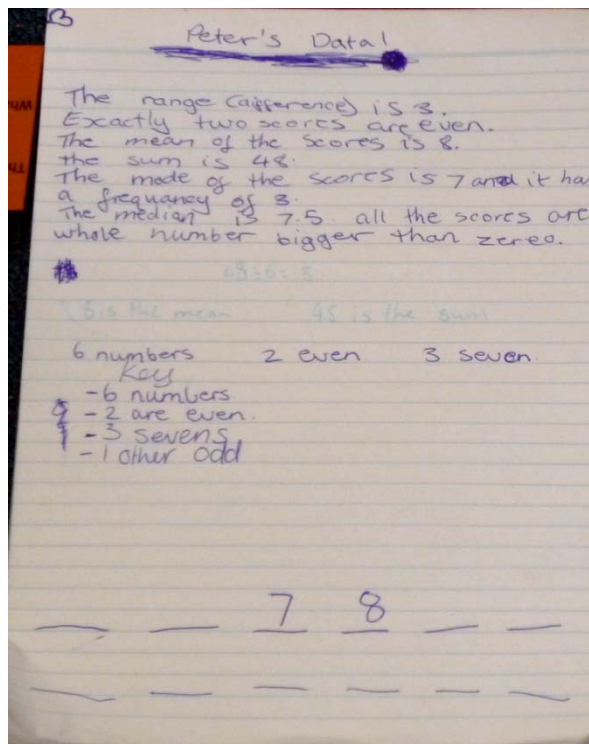
Clues on Cards

Whole class are sharing strategies for reconstructing data