

Teacher Notes

Rationale

Mathematics investigations open students' minds to the possibility of multiple approaches, multiple outcomes and multiple solutions. When linked to the world in which they live, open-ended investigations can help students see the relevance of mathematics within their lives. They also provide wonderful opportunities for differentiation, enabling students to feel confident and successful as they engage with tasks at their own individual level.

Overview

This mathematics investigation requires students to apply their knowledge and understanding of measuring mass to a real-world situation.

Objective

To use a scaled measuring instrument to measure the mass of their classroom waste.

Duration

Approximately two 60 minute lessons

Prior Learning

Before commencing the investigation, students should be familiar with:

- the standard units used for measuring mass
- how to read and interpret measuring scales
- how to represent and interpret data in a column graph.

Differentiation: Supporting Students

Less capable students could be supported in their learning by providing additional assistance to read the measuring scales. Teachers could also model how to draw a column graph, or this could be completed as a guided group activity.

Differentiation: Extending Students

Challenge more capable students by asking them to calculate the total mass of waste produced by all classrooms in the school. Encourage students to explore different graph types (with and without the use of digital technologies), then identify the method which best represents the results of the investigation.



Monitoring Student Understanding

Due to the open-ended nature of this investigation, students' responses will vary significantly. For this reason, no answer sheet has been provided. Teachers must therefore check that each student has completed the investigation according to the task requirements. This could be done by:

- asking strategic whole class or individual questions
- observing student participation during the investigation
- recording student progress on a checklist
- annotating student work
- facilitating whole class or peer feedback sessions
- encouraging student self-reflection.

Opportunities for Future Learning

In addition to the activities contained in this resource, students could extend the investigation by:

- brainstorming ideas about how to reduce classroom waste
- designing and creating a poster to share the 'reduce waste' message with other classes
- measuring waste disposal over time and monitoring the progress of waste reduction.





The Scenario

Did you know that disposing of waste has huge environmental impacts and can cause serious problems? The average time for a plastic bottle to decompose is at least 450 years!

Your principal, Mrs. Eco, has decided to take action. She is determined to reduce the amount of waste that is being thrown away by your school. In order to achieve this goal, Mrs. Eco has asked your class to investigate the situation further.

Your job is to measure and record the daily classroom waste for each class in your school. You will then present this data to Mrs. Eco for further analysis.

The Task

Measure and record the classroom waste for each class in your school. Present your data as a column graph.

Create an informative poster to help students reduce the amount of waste thrown away in their classroom.

The Materials

- Measuring scales
- Coloured pencils or markers
- Gloves (optional)

Instructions

1. Follow the instructions on the Collecting and Recording Data Worksheet to estimate, measure and record the mass of the waste in your classroom bin.
2. Collect the bins from each classroom in your school (or a sample of classrooms) and repeat the process outlined in step 1.
3. Draw, colour and label a column graph on the Displaying Results Worksheet to represent the data you collected during the investigation.
4. Discuss the information you collected as a class. How might you help students to reduce the amount of waste thrown away in their classrooms?



Name _____

Date _____

Collecting and Recording Data

Collect the bins from each classroom (or a sample of classrooms) in your school.

In the table below:

- estimate the mass of the waste in each bin
- record the mass of each full bin
- record the mass of the empty bin
- use written methods to calculate the mass of the waste.

| Class Name | Estimate of waste | Mass of full bin | Mass of empty bin | Mass of waste |
|------------|-------------------|------------------|-------------------|---------------|
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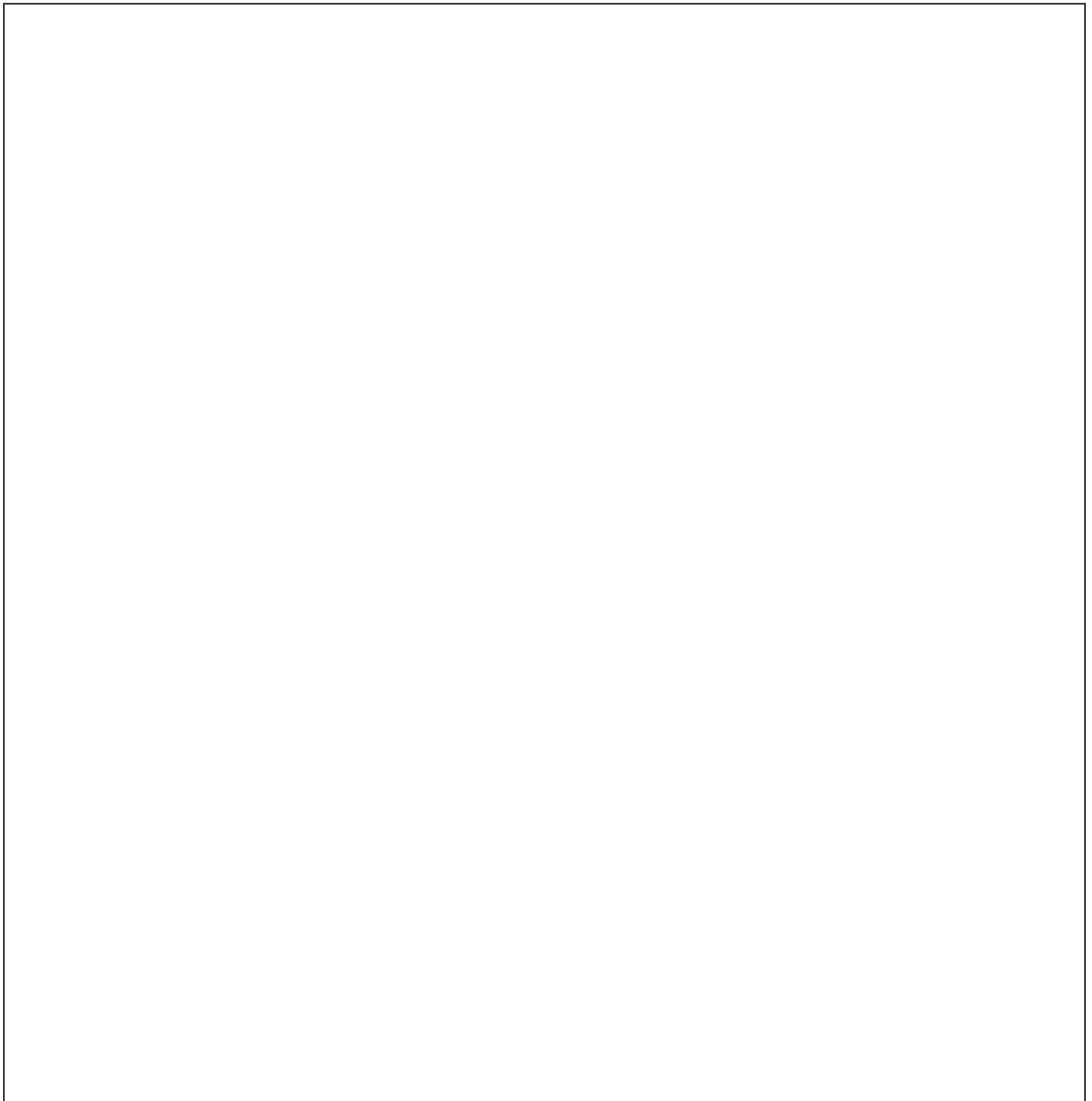
Name _____

Date _____

Displaying Results

In the box below, draw and colour a column graph to show the mass of the waste for each class. Don't forget to include:

- an appropriate title
- labels for the x and y axis.



Name _____

Date _____

Reflection

1. Did you enjoy working on this investigation? Give reasons to explain your answer.

2. Were the results of your investigation as you expected? Give reasons to explain your answer.

3. How could your results be used to reduce the amount of waste produced by your school?

4. What new knowledge and skills did you learn by completing this investigation?

5. Circle the statement that best suits how you feel about measuring mass.

- a) I feel very confident measuring mass.
- b) My understanding of measuring mass is improving.
- c) I still need some help when measuring mass.

