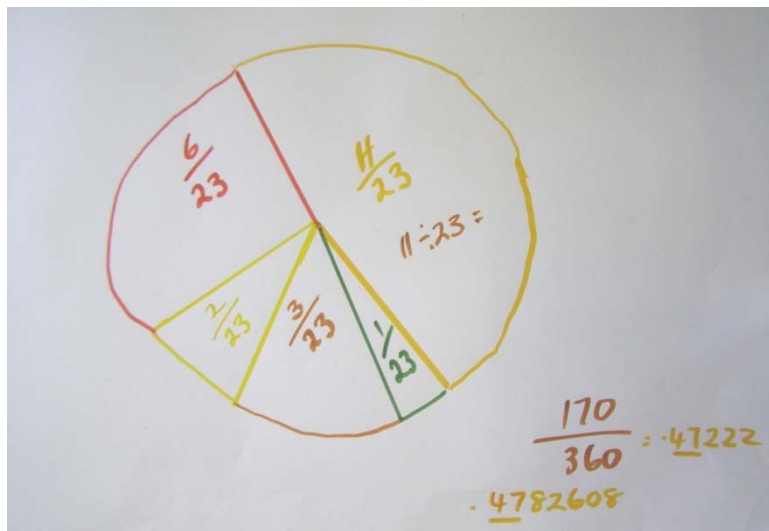


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Task Description

Students explore transferring data from strip graphs to pie graphs. The teacher introduces the students to creating a 1m long strip graph from classroom generated data, such as 'Favourite confectionery'. Students divide the strip evenly to represent each child in the class and their preference. The teacher demonstrates how to wrap and fasten the strip into a circular shape to create a pie graph. Each entry represents a fraction of the whole. The students draw and label the graph, converting fractions to percentages on the pie graph.



Length of Task

1 hour and 45 minutes

Materials

- 10 (2cm x 1m) long strips of card – allow a couple of cm each end of the strip graph to fasten into a circular shape.

Using the Activity

Introduction to focus the investigation

The teacher outlines the task: to convert strip graphs to pie graphs. Can anyone provide examples of where they have seen a strip graph or pie graph? What are the features of a strip graph? Pie graph?

The teacher invites the students to suggest survey questions to ask the class to generate data. One example, might be, 'Favourite confectionery'. Students offer sub-

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categories, e.g. chocolate, lolly pops, chewy lollies, sour lollies. The teacher surveys the students on their preferences and the result is expressed as a fraction.

Main Activity

The teacher introduces the students to making a strip graph. The teacher asks the students how these data might be presented in a 1m long strip graph. "How might I divide my 1m strip into 28 parts?" (28 is representative of the number of students in the class). 'How long will each of the parts be?' The students offer ways to divide the strip, .e.g. 25 goes easily in 100, 28 is close to 25, so each part is a little less than 4 centimetres long. Students may wish to use a calculator to discover the exact answer. This process may introduce 'rounding' to the discussion. The teacher proceeds in dividing the strip based on the students' suggestions. Each category is identified thorough shading and labelling on the strip.

The teacher asks, 'How might we turn this strip graph into a pie graph?' The teacher fastens the ends together to create a circle. The cardboard circle is placed on paper and a circle is drawn. Each category is traced from the circumference to the centre of the circle. Each segment of the pie graph is labelled with the fraction recorded e.g. Chocolate $\frac{5}{28}$. The teacher draws the students' attention to converting fractions to percentages for labelling on a pie graph. How might we convert the class data from fractions into percentage? A percent is a fraction of 100. So if we use a calculator, $\frac{5}{28}$ of 100 = 17.9. As a percentage it is 17.9%.

The teacher reveals to the class plastic pockets with attached survey questions. The students answer the question by placing their preference on a slip of paper and into the plastic pocket. Suggested categories are:

- Favourite colour
- Favourite ice-cream
- Favourite pet
- Favourite tv program
- Favourite sport
- Number of people in family
- Lapathon results

Students gather into groups, and sort, count, and record the information in the plastic pockets. The students transfer these data to a strip graph and commence creating and labelling a pie graph.

The groups present and share their findings in a whole class discussion. Students share their interpretation of the findings. Were they surprised by the results? Why? Why not? Why do they believe the class responded in this way to the survey question? Was there a more appropriate graphical representation to use for these data?

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Key Mathematical Concepts

- Developing an understanding of the formation and value of a pie graph
- Data collection, presentation, analysis, and interpretation.

Prerequisite Knowledge

- Gathering and collating data.

Links to VELs

Dimension	Standard
Measurement, Chance and Data (Level 4)	Students organise and present grouped and ungrouped data using displays such as simple frequency tables.

Assessment

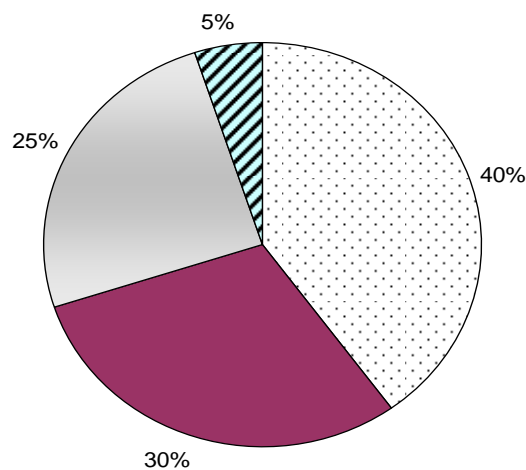
To be working at level 4, students should be able to:

- Collate, organise and present data into a pie graph.

Extension Suggestions

For students who would benefit from additional challenges:

- Provide the students with the graph below. Students to create a short story to match the data. Ensure students describe the survey question and the total amount of people who may have responded to the survey. Students are to create a strip graph based on the information in this pie graph.



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Teacher Advice and Feedback

When collecting classroom generated data, one or more categories may not be selected by the students and result in zero data being recorded. A zero cannot be represented in a pie graph. The teacher could ask the students to share examples of graphs that do allow for zero data to be identified, e.g. bar, histogram, line. A comparison of a pie graph and an alternative graph may be useful for further discussion about this issue of 'zero' data.

Potential Student Difficulties

Students may have potential difficulty in converting fractions to percentages. Employing a 100 bead loop would be useful in assisting students in converting pie segments to percentages. This visual aid may help students who are having difficulties in understanding the link between a fraction of the class total (e.g. $\frac{5}{28}$) as a percentage.

Source

Lowe, I. & Lovitt, C. (1984). *RIME lesson pack [kit]: Reality in mathematics education teacher development project*, pp. 45 – 50.

Acknowledgements

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

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Steps to transforming a strip graph into a pie graph.

The teacher carefully measures the segments for the strip graph.



The students colour code the segments.



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The strip is wrapped and fastened into a circular shape. The students trace around the circular shape and note each category.



The teacher assists drawing the segments of the pie graph to the centre of the circle.



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Students' Work Samples

Example 1: Working at Level 4

Students are creating a strip graph from the information gathered about the classes' preferences. The students delineated each portion of the graph evenly and colour coded the categories.

