

Big Feet

Purpose:

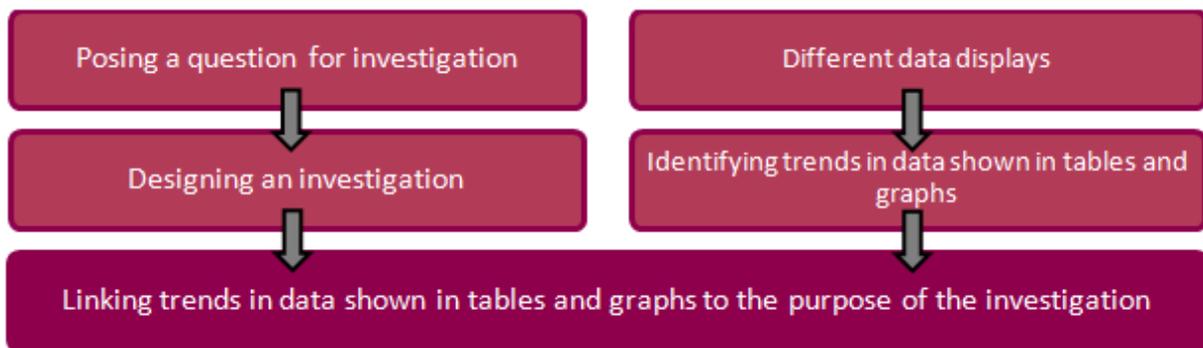
The purpose of this activity is to engage students in sorting data and identifying pattern and trends.

Achievement Objectives:

S3-1: Conduct investigations using the statistical enquiry cycle: gathering, sorting, and displaying multivariate category and whole-number data and simple time-series data to answer questions; identifying patterns and trends in context, within and between data sets; communicating findings, using data displays.

Description of mathematics:

The background knowledge and skills that should be established before and/or during this activity are outlined in the diagram below:



Posing a question for investigation

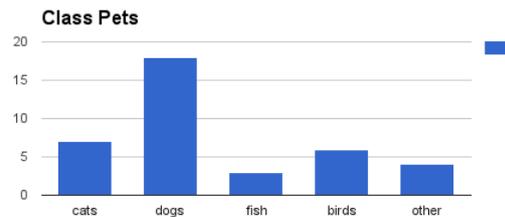
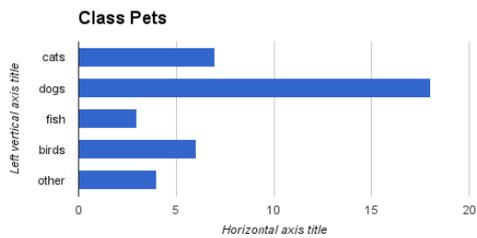
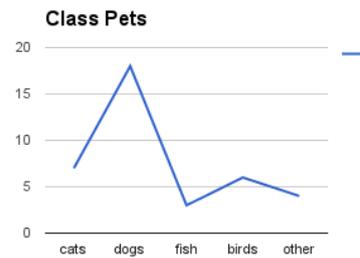
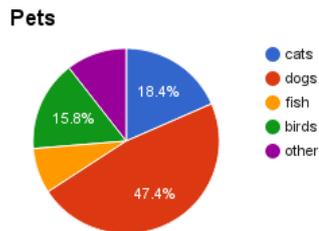
A student wants to find out how many people in her class drink at least one glass of milk per day. Write this as a question for investigation.

Designing an investigation

A student wants to find out what people in her school drink in a typical day. Plan a suitable investigation for the student, including the sample to be surveyed, the questions to pose and how this will be carried out.

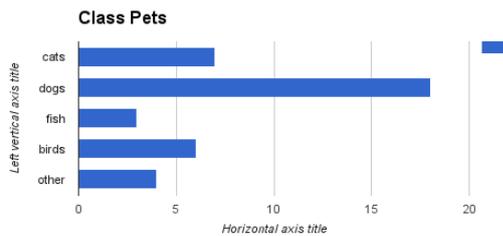
Different data displays

Label each of the following as bar graph or column graph or line graph or pie chart.



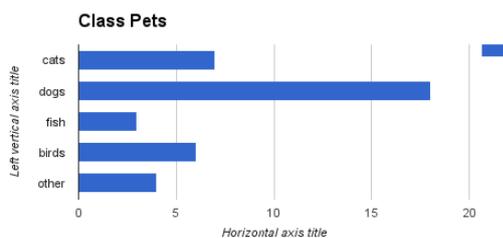
Identifying trends in data shown in tables and graphs.

What are the most popular pets, within the sample surveyed?



Linking trends in data shown in tables and graphs to the purpose of the investigation.

A student wanted to find out whether there were more cats than dogs as pets? They surveyed the class and showed the data collected on a bar graph. Use this to suggest findings for the investigation.



This activity may be carried out with step by step guidance, or by allowing the student to follow their own method of solution. The approach should be chosen in sympathy with students' skills and depth of understanding.

Activity:

When a student suggested that boys have bigger feet than girls and another student said it was just a matter of how tall you are if your feet are bigger, the teacher decided to launch an investigation.

The class collected data from all their year group. They made response cards on coloured paper to allow them to sort and do make graphs of the results. Using these cards, can they say that boys feet are bigger than girls feet? Or, is foot size related to height?

Choose one of these questions to investigate. You may use the data provided, or survey/measure your own class.

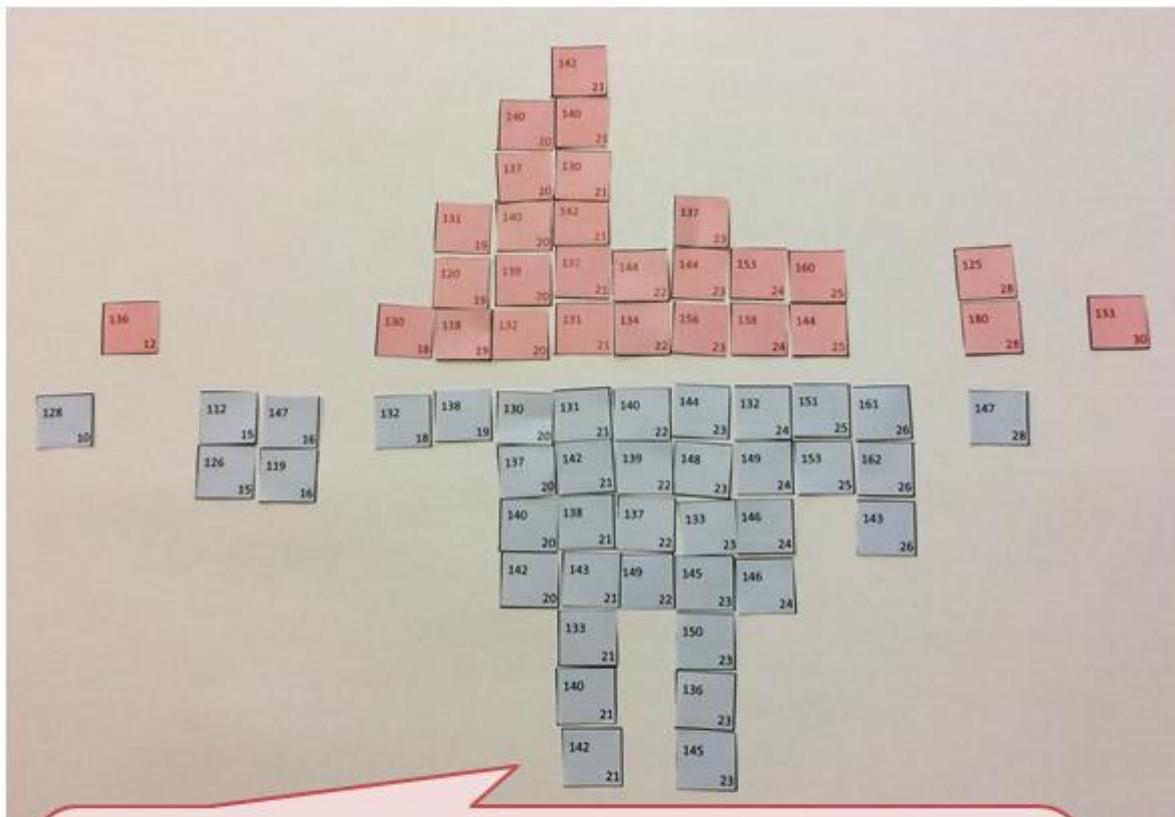


The procedural approach

The student is able to design an investigation, using the enquiry cycle.

Prompts from the teacher could be:

1. Choose the question you will investigate.
2. What are the two variables you are looking at.
3. Cut out the response cards and sort these into order of ascending foot length.
4. Now do a second sort into either gender or order of height, depending on the variable that you are investigating.
5. Arrange the response cards suitably (this may be in the form of a column graph).
6. Look for any outstanding trends or features in the arranged response cards.



T: Tell me about this layout.

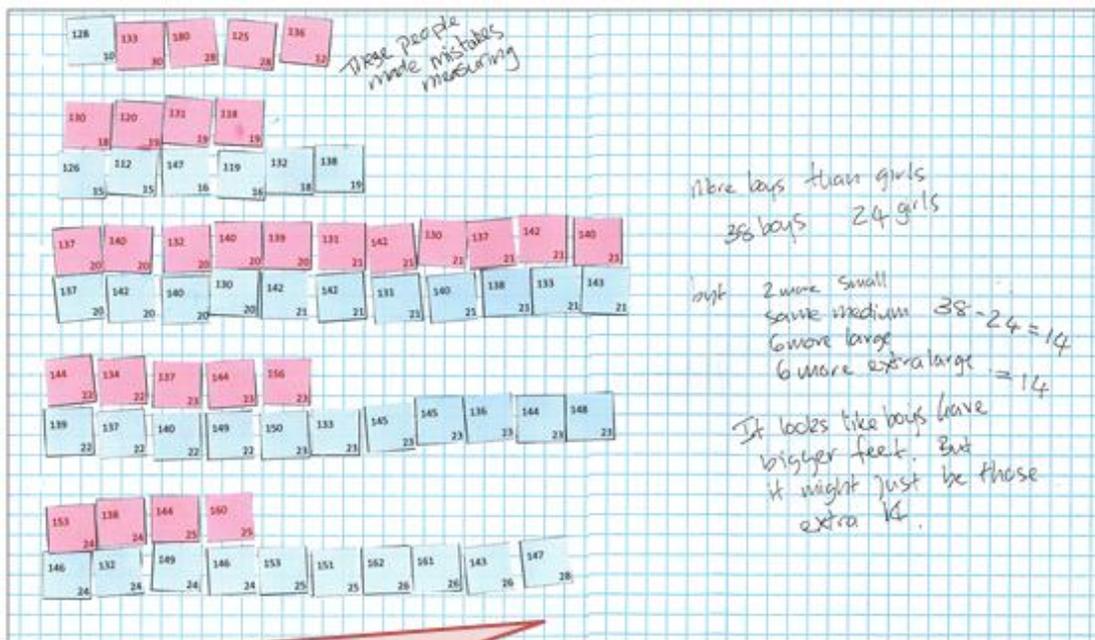
S: I'm looking at boys' feet versus girls'. I sorted the cards into a pile of boys and a pile of girls and then I made back to back bar graphs. The boys' feet are around 21 and 23 cm long mostly and the girls' are 20 and 21. So the boys usually have bigger feet.

The conceptual approach

The student is able to design an investigation that would lead to reliable results, using the enquiry cycle.

Prompts from the teacher could be:

1. Choose the question you will investigate.
2. What are the two variables you are looking at.
3. Cut out the response cards and sort these into a useful order or groupings.
4. Look at the extreme values (outliers). Are any of these likely to be mistakes measuring/recording rather than real values?
5. Arrange the response cards suitably (this may be in the form of a column graph).
6. Look for any outstanding trends or features in the arranged response cards.



T: How did you sort your data?

S: I did the colours first and then put them in order of foot length. But there were some stupid numbers that must be wrong.

T: Such as...?

S: Feet that are 10 cm long? That's like a baby, not someone from our year. And 30 cm long feet. I looked at the heights with those. And we don't have any kids at school who are 180 cm tall! And the ones who are like 133 and 125 don't have huge feet. So I figured there was something wrong with those measurements.

T: Unreliable data?

S: Yeah so I didn't use it.

T: And what about the grouping?

S: Oh, well I kind of did every two cm because each cm was too many different groups to look at. But then it was too spread out so I bunched up the very small and the very big. So I ended up with four sizes...small, medium, large and extra large.