



In this activity you will use mathematical functions to model the number of people suffering from a cold over several weeks.

Information sheet

At the beginning of term it is noticed that many university students living in a particular hall of residence have a cold. The way the cold spreads is monitored by recording the number of students suffering from colds every five days.

The results are given in the table below, where t represents the number of days after monitoring began, and s represents the number of students with a cold.

t	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70
s	25	31	38	43	47	47	45	41	36	30	24	19	14	11	8

Think about...

- What shape will this data give on a graph?
- Which type of mathematical functions could give approximately the same shape?

Try this

Write a report about the rise and fall of the number of cases of colds.

1 Find:

- a** a trigonometrical function that can be used to model the full data set;
- b** a polynomial function that can be used to model the data for values of t between 0 and 50.

2 Compare your models with each other's and with the original data.

In your report you should:

- choose appropriate models;
- explain how you chose the parameters of your functions, referring to how they relate to basic functions of their type;
- show clearly the stages of your working when using algebraic or trigonometric techniques;
- use a graphic calculator or computer software to compare graphs of your functions with a graph of the original data;
- consider the effectiveness of each function as a model;
- use your graphs of functions to predict what will happen in cases for which you have no data.

Reflect on your work

What types of functions provided good models for the data?

Why does the number of students not start with a low number?

What problems would there be in collecting such data?

How might inaccuracies in the data affect your models?