

VIRAL CONTAGION



Lesson Plan 1

Main focus of activity:

- Explore the maths behind an outbreak of a biological virus

Learning objectives:

- To be able to predict next terms in sequences
- To be able to describe rules involving sequences
- To understand sequences involving powers
- To be able to construct a two way table to summarise data
- To be able to interpret graphs

Links to Maths curriculum:

- Sequences
- Predicting
- Interpreting graphs
- Communicating maths effectively

Suggested lesson activities:

Introduction

- Watch the 'London Daily News' - Video clip 1
- Split students into groups and ask them to report back on the best and worst case scenarios to local emergency services commanders.

The pupils need to remember that their audience may not understand all of the maths behind the outbreak so the information communicated needs to be as clear and concise as possible.

- The initial task is known to have an infection rate between 2 and 5.
For example, best case is 2 and worst case is 5.

Discussion point. *Can we have a fractional infection rate?*

Main Part of Lesson:

Teaching and Learning:

- The pupils need to work in groups to find the best case and worst case scenarios. The task will require communication of ideas. The class teacher may want to provide some scaffolding around this.
For example, how many people are infected after 5 days, 10 days and 20 days?

A two way table could also be provided for them to complete.

More able groups could not be given any form of scaffolding and allowed to come up with their own way of presenting the data.

There is an auto marking Excel resource available with this resource as well, if the ICT facilities are available. Graphing packages like Autograph could also be useful to demonstrate graphically what is going on.

Differentiation

- For **lower ability groups** it would probably only be realistic to ask them to work out the spread of the disease with an infection rate of 2. There could also be scaffolding to help them through, with key answers given at key points so the pupils know they are calculating correctly.
- For **middle ability groups** they will be expected to deliver the best case and worst case scenarios for the key points 5, 10 and 20 days.
- For **higher ability groups** the problem they can be expected to create a fractional infection rate leading to a fractional power problem. This can then lead to questions around how a fractional power behaves and if a fractional power can realistically be used for this model.

Plenary:

- Each group must present their best and worst case scenarios to their peers.
- They need to show their calculations and how many people they expect to be infected and what they think the government should do.
- The pupils can then be asked to rank the presentations based on some predefined criteria, such as mathematical content, communication of ideas and quality of presentation.

This is an excellent way of using comparative judgement to get the students to peer assess each other's work.