



Sample Lesson Plan
The Big Bus Activity: Other Worlds



**Other
Worlds**

Title

Using *The Big Bus Other Worlds* to explore simulations and modelling in a problem solving environment

Introduction

This adventure into time provides the opportunity to explore simulations and develop thinking skills through mathematics.

Following a trail of clues and puzzles in an attempt to find the missing professor, children are challenged with a series of mathematical and logic problems.

In this lesson

The children undertake the challenge to rescue Professor Brain from his prison in a cave. They are introduced to the controls of the grenade launcher, and then have to adjust three variables to find a combination that will successfully blast past a series of locked doors within the cave system.

Age Range: 9 – 11 years

Lesson Plan

Learning objectives

Having completed this activity most children will have developed their ability to:

- Recognise patterns within simulations and make and test predictions
- Estimate angles up to 90 degrees.

Technical preparation

Install *The Big Bus* CD-ROM on to the computer. After a short opening sequence select the button to take you to **Explorers' World**. Open the notebook index and scroll through the available activities. Select **Other Worlds**.

Previous experience

If the children are undertaking this activity within the context of the Adventure, this will add to their enjoyment. Experience of estimating angles and previous experience of modelling simulations, along with a systematic approach will help them gain the greatest benefit from this activity.

Introducing the activity

Gather the children around a large computer monitor or interactive whiteboard.

If the children are aware of the Adventure story so far, recap it briefly to remind them of the context. Otherwise, explain that they need to use their skills to set a grenade launcher to rescue a scientist who has been imprisoned in a cave by dangerous creatures.

Click on **Start the activity** and then the arrow on the title page to reveal the menu of starting places. Click on **Rescuing the Professor**. Read the first three screens with the children, until you reach the first **set up** page.

Explain that they need to launch explosive grenades from the launcher so they explode as close as possible to the doors. They will need to avoid the obstacles on the way. Ask the children what they think will happen to the grenade if it is fired in its current position. Click **Take Cover!** to see what happens.

Now click on the **Setup the Launcher** button. On this screen, explain the controls to the children, show them how to change the angle, power and fuse delay, estimating a set of commands that will blow open the door. When the children are happy, **try the launcher**. Watch the flight of the grenade and the timing of its explosion, then discuss with the children how they might change the controls to get closer to the door. Ask them to consider whether they should change all the variables, or would it be a good idea to change just one and see how that affects the outcome. What would happen if they just increased the power? Reset and re-launch until the door is blasted open.

After the initial demonstration, and if more than one computer is available, the children could now break into working groups and undertake the activity for themselves. Give each group a copy of the **Record Card** supplied and show them how to record their attempts, both to avoid repetition and to see if a pattern develops.

Allow the children about 20 minutes to complete the activity, and then gather them back together to discuss how they got on. What techniques did they use to find the solution? (For example changing just one variable and recording the difference it made to their result each time). Did the Record Card help? Could they predict the outcome of their changes?

Classroom management

A single classroom computer running *The Big Bus*, using a large monitor or interactive whiteboard, is an effective whole class teaching resource. Introduce the activity to the whole class before pupils break into their groups.

If you have access to a computer suite this activity can be completed as a whole class lesson.

If you have access to only one or two computers, pupils will need to complete the activity on a rotational basis.

Duration

Each group of children will require approximately 20 minutes of computer time. The teacher introduction and follow-up time will take approximately 15 minutes and 10 minutes respectively.

Differentiation

- There are three caves to break through. It is possible to differentiate the activity by challenging the children to enter just the first or second cave. The third cave which requires two steps could be undertaken as a class challenge once the children have been gathered together again.

Extending the activity

- Ask the children to design their own record sheets to suit their particular method of finding a solution.

***** Solutions*****

There is more than one solution to each challenge.

The following should help.

	Angle°	Power	Time
Cave 1	55	85	15.2*
Cave 2	32	160	20.8*
Cave 3 Pt 1	70	90	3.8*
Cave 3 Pt 2	65	100	10.8*

* Fuse delay may vary from machine to machine.

Curriculum Information

QCA Scheme of work (ICT)

Unit 3D Exploring Simulations.

The National Curriculum in England for Mathematics (KS2)

Ma3: 1c, 1g, 3a, 3b.

Problem solving.

The Scotland 5-14 Guidelines for ICT

Controlling and Modelling: Level B, C.

The Scotland 5-14 Guidelines for Mathematics

Problem-solving and enquiry.

Shape, position and movement: Level B, C, D, E.

Number, Money and Measurement: Level B.

The Northern Ireland Curriculum for Science and Technology (KS2)

Planning: b, d. Interpreting and Evaluating:

b, g.

The Northern Ireland Curriculum for Mathematics (KS2)

Processes in Mathematics: Using

Mathematics: e, f.

Communicating Mathematically: a, c.

Mathematical Reasoning: a.

Shape and Space: Exploration of Shape: a, c.

Position Movement and Direction: a.

The National Curriculum in Wales for Information Technology (KS2)

IT: 2.1, 2.2.

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