



Sample Lesson Plan The Big Bus Module: Rocket Challenges



Rocket Challenges

Title

Using *The Big Bus* **Rocket Challenges** to experience simulation and modelling.

Introduction

Rocket Challenges is an adventure program presenting the user with a series of challenges to tackle using their compressed air powered rockets. Adjust up to three variables to see "What If". Each challenge is slightly harder than the last, calling for the further development of logical thinking.

In this lesson

The children are introduced to the rocket set-up controls then challenged to pass on a message using rockets to transport it over obstacles.

Age Range: 7 - 11 years

Lesson Plan

Learning objectives

Having completed this module 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 visit **Explorers' World**. Open the Information Booklet index and scroll through the available activities. Select **Rocket Challenges**.

Additional Resources

- Record sheet (Prepared in advance)

Introducing the module

Gather the children around a large computer monitor or interactive whiteboard. Show the children how to start Rocket Challenges by clicking on the **Start the activity** button.

Work through the introduction to the module, involving the children by asking the children to identify the den and building up the storyline. Identify the first task for the children. They need to fire a rocket over the tree to land at the den.

Click on the **Set up rocket** button. This provides a close up of the machine and the controls used to adjust it. Show the children how the air pressure of the rocket launcher, the weight of the nose and the angle at which the rocket launcher is pointing, can be changed. Point out to the children the scale behind the rocket launcher, looking like a protractor, which helps them to estimate the angle they want.

Select an arbitrary power and angle, and then click on the **Try the rocket** button. Click on **Take off!** Tracer spots show the route taken by the rocket. Leave these displayed whilst you discuss with the children "What went wrong?" Consider any changes in power, nose cone weight or angle, which might help with accuracy. Click on **Set up rocket** to move back to the set-up screen, make any adjustments and try again.

Allow a few random changes to the settings, and then ask the children how they could be more methodical in the changes they make. Should they change all three variables each time? ... or always the same one?...if so, which one? Can they think of a way of recording which combinations they have tried, so they don't repeat them?

Keeping a record sheet of the settings used may help the children to see patterns and refine their attempts rather than making random changes. Ask the children for suggestions of how to draw up a record sheet, then either allow them time to create this for themselves, or provide a previously created one.

If more than one computer is available, the children could now break into working groups and undertake the module for themselves. Encourage them to discuss their changes to the settings. Provide them with a record sheet to fill in as they work.

Allow the children about 20 minutes to solve the problem, and then gather them back together to discuss how they got on. If different approaches have been used, discuss the merits of one over another. Did luck enter into it? Was there more than one correct combination?

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 module to the whole class before pupils break into their groups.

If you have access to a computer suite this module can be completed as a whole class lesson. If you have access to only one or two computers, pupils will need to complete the module on a rotational basis.

It is desirable for the children to work in small groups as discussion and justification of their predictions is a valuable aspect of this lesson

When the whole class has been gathered together again to consolidate their learning, revise the language and concepts. Discuss the object of the lesson **Exploring Simulations**. Using a computer has allowed them to try out ideas that would have been impractical in "real life". Discuss how using simulation software helps in industry with design and safety issues. Ask the children for their ideas of other situations where a simulation is safer, cheaper or quicker than a practical experiment.

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.

Extending the Module

Allow the children to move on to the second challenge, which revises the same principles, whilst developing the adventure storyline.

- Further lessons can be based upon this lesson plan to take the children through to the end of the adventure
- Older children may be able to create their record sheet using a spreadsheet package.

Curriculum Information

QCA Scheme of work (ICT): Unit 3D

Exploring simulations.

The National Curriculum in England for Mathematics (KS2)

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

The Scotland 5-14 Guidelines for ICT

Controlling and Modelling: Level C, D.

The Scotland 5-14 Guidelines for Mathematics

Number, Money and Measurement: Level B

Shape, Position and Movement: Level C.

The Northern Ireland Curriculum for Science and Technology (KS2)

Interpreting and Evaluating: b.

The Northern Ireland Curriculum for Mathematics (KS2)

Using Mathematics: e, f. Mathematical Reasoning: a, b, c.

The National Curriculum in Wales for Information Technology (KS2)

It: 2.1, 2.2.

The National Curriculum in Wales for Mathematics (KS2)

Ma1: 1.1, 1.3, 1.4, 2.3.

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