GREAT GLIDER SHARE

Does the way we make the glider affect how far it travels?

AGE RANGE: 7-11 years

OVERVIEW

Pupils will be inspired by Rosa, a young engineer, in the story 'Gary Vity' by Jules Pottle. Rosa is curious and explores the effects of gravity on objects around her. In this enquiry, pupils consider how the Earth's force of gravity acts on a glider and how different forces affect its flight. The key idea behind this investigation is for pupils to discover that even when effort has been made to ensure variables are controlled, there will be differences in results. Much discussion will arise as to why results can vary in what they perceive to be a fair test. The key teaching point is that although scientists and engineers try to limit human impact on results, there will always be a degree to which this can't be controlled.

▶ **'Gary Vity' Story Read**

▶ **Enquiry intro video**

▶ **Great Science Skills Starters for 7-11 year-olds**

LEARNING OBJECTIVES

- To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- To identify the effects of air resistance and friction, that act between moving surfaces

WORKING SCIENTIFICALLY FOCUS

Pattern seeking
www.fascinate.manchester.ac.uk

- To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- To report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results

RESOURCES

FOR EACH GROUP (2/3 pupils)

- 1 x glider frame made from foamboard or cardboard
- templates for gliders
- construction material
- 2 x rubber bands per group
- ballast weight: 5g for A4, 10g for A3 - this can be Blu-tack or paperclips (1 standard paperclip is 1g)
- glue gun
- cutting board
- craft knife
- 1 x launcher (optional - this is tricky to make)
- measuring equipment: metre rulers, trundle wheel/measuring tape

TO SUPPORT TEACHING

- Book: 'Gary Vity', by Jules Pottle, ISBN 978-1-7399399-2-2 (recommended, optional)
- Video – 'Gary Vity' story read
- Video – 7-11 enquiry
- Supporting teaching slides deck
- 7-11 Conclusion Creator

Use recycled materials for your gliders. Collect cereal boxes, shoe boxes and other materials
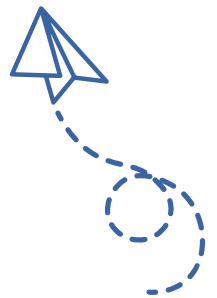
KEY WORDS

See Slide 12 of the teaching slide deck

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

13 CLIMATE ACTION

SKILLS DEVELOPMENT

Pupils will be investigating the effect of variables on results by conducting an investigation in which they try to control all variables.

Engage the pupils using the **story narration of 'Gary Vity' by author Jules Pottle**, and using the Slides 4-6 of the teaching slide deck.

Planning

Demonstrate the glider in action and challenge pupils to think about the forces acting on it and the factors that might affect how far it will travel (talking pairs supported by slides in presentation). Pupils collaborate in groups to make a glider using the construction instructions.

Gathering evidence

Encourage each group to test their gliders first and decide how they will gather and record their results in a table.

Then, they can launch their gliders. Discuss the need to repeat their test in order to improve the reliability of results. Pupils will measure how far their glider travels to the nearest cm.

Note: To launch the gliders you may wish to use the school hall, or outdoors. Encourage pupils to control variables, such as launching their glider in the same way for each test - you may wish to make a launcher to do so (see construction instructions).

Provide a range of measuring equipment (ruler, measuring tape, metre sticks, trundle wheels) and ask the pupils to select the most appropriate for measuring the distances.

Analyse and interpret

Pupils evaluate the results to identify patterns. They were all asked to make the same glider, using the same template and the same materials. The key learning point of this enquiry is that despite controlling variables, there will be variation in results. Encourage the pupils to describe what their results are showing and to start to reason why.

Drawing conclusions
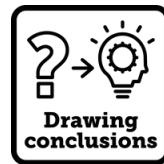
The **GSSfS Conclusion Creators** will enable pupils to develop conclusions to answer the scientific question: **Does the way we make the glider affect how far it travels?** Reinforce the vocabulary around variables and encourage pupils to suggest why the results vary. They may question the slight difference in measurements, the force exerted when launching etc.
Can pupils suggest improvements should they repeat this investigation?

Share

Provide time for pupils to share their investigation and conclusions with new audiences. Ben would like pupils to send aerial photos (see slide 10 of the teaching slide deck) of their glider landing to **https://tinyurl.com/Great-Glider-Share-Uploader**. Pupils could write letters to Ben to inform him about their investigation, or they may prefer to do a:
- letter to Rosa with advice on how to control an investigation
- presentation in a class assembly
- video for your school website
- Tweet **@GreatSciShare** #GSSfS2023

Questioning

Extend the enquiry by encouraging pupils to talk with their families and carers about their investigation with the gliders. What other questions could lead to an enquiry? What enquiry questions would they like to ask or suggest to Ben - the aerospace engineer?