EUREKA! SCIENCE + DISCOVERY

Building Bridges Workshop

Information for teachers and group leaders

What will the workshop involve?

Building Bridges is an interactive workshop that provides your students with the opportunity to think like inventors and engineers! It starts with an introduction to the topic of bridges and explores the types of forces that engineers have to overcome to design and build bridges that are fit for purpose. We cover different types of bridge design and the pros and cons of each. Afterwards, students will work in teams to design, build, test, and improve their own bridges using a finite number of craft-based resources. Students are encouraged to think about their own skills and strengths in the team, and reflect on their inherent STEM skills they are using during the making challenge.

Please note that the show may contain elements of the curriculum not yet covered by some pupils but nonetheless will still provide an interesting and informative experience for the children.

Is there anything I need to do to prepare the children before the visit?

Not particularly. An understanding of what a force is would be useful, but this is covered in the session. During the design and making workshop, the students will be required to work in groups, so please let us know on arrival if you have preferred teams already in mind.

Risk assessment

- Please visit our website education.eureka.org.uk/resources to download both the general museum risk assessment and the one for your chosen session.
- We advise you to make a preview visit to carry out your own risk assessment for the overall visit.

Evaluation

Eureka! Science + Discovery constantly aims to improve its programmes for school groups and feedback from adults and children is an essential part of this. We value all comments made and will always try our best to act upon them. You will

be sent a link to an online survey following your visit and we'd be extremely grateful if you could complete and return as soon as possible after your visit.

Additional resources & information

The following pages outline the aims and objectives of the workshop and their learning outcomes.

Building Bridges Learning Outcomes

Aims and objectives – by the end of their visit children should have learned:

- What forces act upon bridges.
- Examples of different types of bridge and their designs.
- Engineers have to work together to solve problems and often don't get things right first time.
- Teamwork, creative thinking, problem solving, and improving are all key skills of scientists and engineers.

Overview: Through a series of powerpoint presentation, design and making activities, and discussion, children will learn about the forces that engineers have to overcome to design and build bridges, and recognise that they have some of the same key skills as engineers.	
Activities	**Learning Outcomes**
Introduction to what a bridge is and their purpose	Bridges are used to connect things and are a vital part of everyday life.
What is a force and different examples of forces.	That a force is a push or a pull and the main forces acting on a bridge at any given time are compression and tension.
Introduction to and review of the pros and cons of 3 types of bridge; beam, arch, and suspension.	Bridge design takes into account the purpose the bridge will fulfil, the location, environmental conditions, materials available, and cost amongst many other things.
Demo to show the strength of triangles and trusses.	That the triangle is the strongest shape and trusses are seen in many types of construction and engineering.

Design and making challenge – work in teams to design and build your own bridge using a finite number of resources.	That teamwork is vital for the success of any project. Failure is normal and engineers have to constantly test, adapt, and improve their designs.
Wrap-up presentation	That we all have the skills and mindset to think like inventors and engineers. There are many different types of engineer.