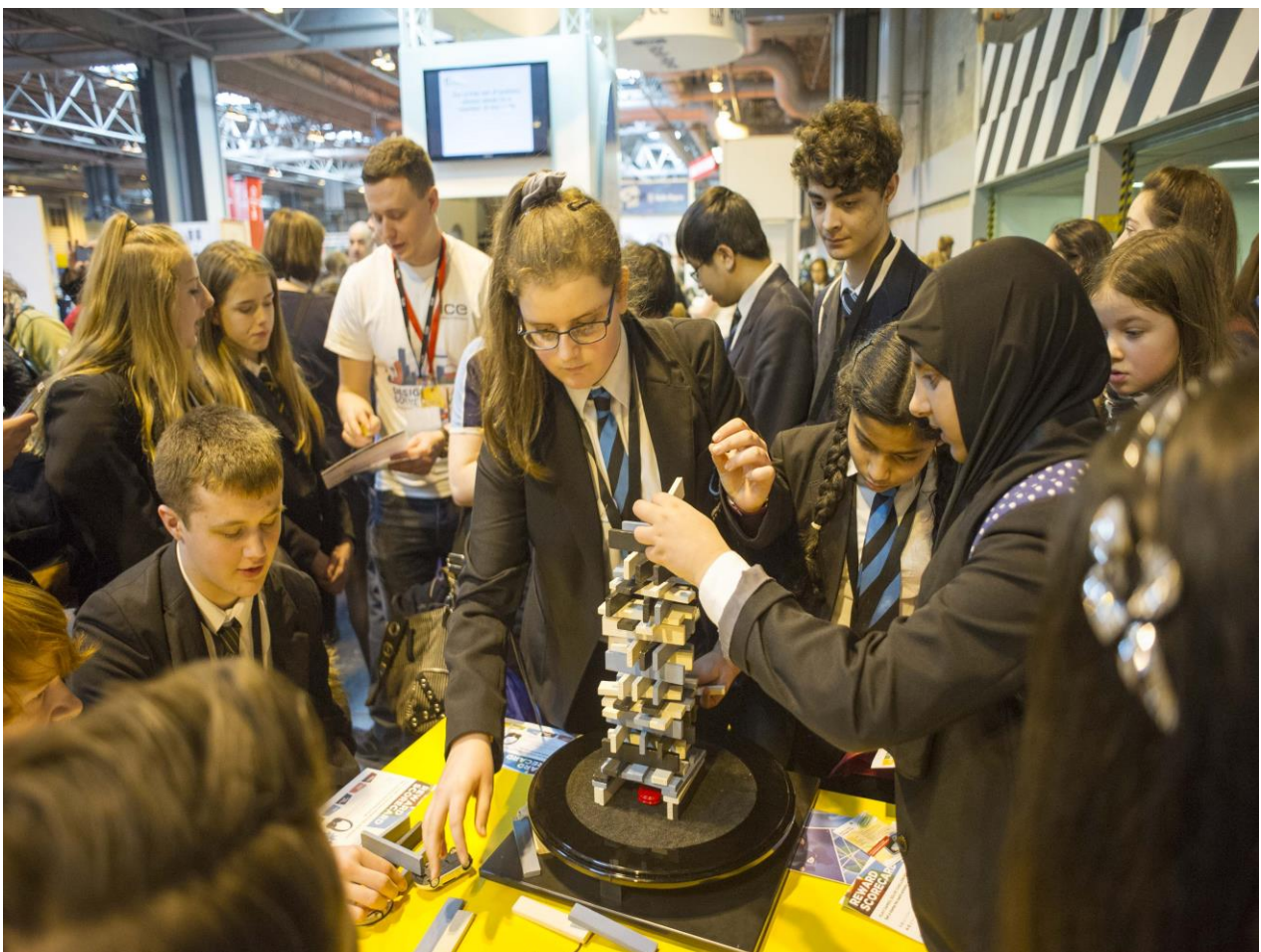


Bridge Challenge

Activity booklet



What does a civil engineer do?

Bridge Challenge

In your team, your challenge is to use the plans available to cost the building of a new bridge.

To do this you must think about the costs you will incur in building it, making decisions that will impact on the length of the project.



The activity will be divided into two stages:

1. Exercise
2. Results

Exercise

You will be given **20 minutes** to review the two types of bridge design

During this stage you must:

- Decide on a name for your team.
- Review the designs
 - Materials
 - Measures
- Determine where to place the Bridge on the **Development Site Plan**.
- Complete your **Cost Report**, calculating how much you think your bridge will cost and the expected length of the project. Read the cost table for additional cost that must be included.

Results

Once you have decided on the best suitable bridge type and have completed the **Cost Report** you will then present to the class.

Good luck!

At the end of the activity, please place all drawings and booklets on the front desk.

Construction Costs

Your team will have to pay for the following items to design and build your bridge:

- **Land** – The development site is a ‘brownfield’ site which has had a mix of industrial and commercial uses in the past. A full site survey has been undertaken and the costs to buy each plot have been calculated. You must choose a location for your building on the available development land, purchasing the whole of each plot either built on or built over.
- **Construction materials** – You will need to buy the materials to build your bridge. The more materials you use, the more you will spend but it must be safe.
- **Wages and equipment hire** – You will need to pay the wages of the contractors who build your structure and you will need to hire the necessary equipment. The longer you take to build your bridge, the more you will spend.
- **Design and management fees** – You will need to pay for the design and management of your project, including the engineers, architect, project manager and quantity surveyor. This is a fixed fee per project.

Building Income

Your team will receive an income from the following items:

- **Construction time bonus** – You are being given an incentive to construct your bridge as quickly as possible.

Costs and Income Table

Land Costs – per square meter		Cost
	Heavily contaminated plot with buildings <i>Building demolition & intensive ground treatment required</i>	£500
	Lightly contaminated plot with buildings <i>Building demolition & some ground treatment required</i>	£250
	Existing buildings on plot <i>Building demolition required</i>	£200
	No buildings on plot <i>No demolition or ground treatment required</i>	£50
Additional Costs		Cost
Cost per project day	Welfare unit (per 15 staff)	£50
	Onsite office and site manager cost	£800
Wages and Equipment Hire		Cost
Cost per day- 1 person can construct 20 square meters per day. However only 1 meter in height can be constructed safely in 12hrs to allow for setting of materials.		£300
Design and Management Fees		Cost
Fixed design cost per project		£500
Health and Safety officer- 1:10 staff ratio		£600/day
Construction Time Bonus		Bonus
Completed within	21 days	£30000
	24 days	£25000
	28 days	£15000
	34 days	£10000
	35 days	£5000
	More than 35 days	£0

What have you learned by doing this project ?

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What skills have you developed during this challenge ?

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Do you think you would like to be a civil engineer ? explain your answer .

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Can you think of 3 other jobs linked to Maths

1

2

3

Can you complete the acroncym highlighting why maths is important – e.g M =Most jobs
need maths – (you cant use this one !)

M

A

T

H

S