Bridge Challenge

A big storm has washed away part of the main road near your school. A child in the school is very ill and the ambulance can’t get through. We need your help – can you design and build a bridge that can carry the ambulance across the gap in the road?

Objectives and Topics: How to make structures more stable and withstand greater loads, how structures can fail when loaded and techniques for reinforcing and strengthening them. Structures, designing skills, forces, making skills, shape, space, measurements, presentations skills

Things to think about

How can you make your bridge really strong? Try out your ideas on a short bridge – does it break or sag in the middle? If so, how could you strengthen it?

Push down on the centre of the bridge – does it start to fail in any way? How can you prevent this?

Don’t be afraid to start again after you have tested your bridge – getting the best design is not easy.

When you are happy with your short bridge, extend it to 1 metre long and test it again. Can you improve your design even further?

Finally extend the bridge to 2 metres and test it. If it stands up ok, try adding books to the centre, one at a time (carefully!). If the bridge starts to bend or break – back to the drawing board!

Difficulty Level 1: Make a bridge which can span a 30 centimetre gap.
Difficulty Level 2: Make a bridge which will span a 1 metre gap without supports
Difficulty Level 3: Make a bridge which will span a 2 metre gap without supports which will also support the weight of a box of K’Nex or books in the middle.

Conclusion

Ask the pupils what they have learnt in the process of completing the challenge.
Ask them to compare the different bridges built by the class and assess the strengths and weaknesses of each. Pupils give a class presentation on their model and write up the experiment

Possible Lessons, projects and follow-up activities

- Types of bridges
- Bridges around the local area/UK/World
- Purpose and location of bridges
- Three-dimensional structures
- Symmetry
- Scottish/famous engineers
- Entrepreneurship – build a bridge within a budget. Rods and connectors are allocated a cost, eg red rods = 10p each. Pupils cannot exceed the budget. Who can build the strongest, most cost effective structure?