

# Newspaper bridge

This short-term challenge comes from the Creative Challenge guide entitled "Relevez le défis", published by the Conseil de développement du loisir scientifique (CDLS)

All secondary-school students

Key words: resistance of materials

Space: Outdoor activity

## Your mission

Your little brother and cousin were given brand new trucks to play with in the sandbox this summer. They want their trucks to be able to travel from one sandbox to another sandbox. What better way than to build a bridge that connects the 2 sandboxes? Unfortunately, they have only newspaper to build their bridge. Can you help?

## The challenge

You have 30 minutes to design and build a bridge 60 cm long x 30 cm wide x 50 cm high, using 50 sheets of newspaper and toothpicks, that will allow a truck to travel from one sandbox to another. The truck will carry a load of sand weighing up to 1 kg.

## Materials

- Newspaper (maximum of 50 sheets)
- 1 box of toothpicks (approximately 1000)
- 1 tape measure
- Shoeboxes to support the ends of the bridges (2 per bridge)
- 1 truck or another small vehicle no larger than 20 cm x 20 cm x 20 cm (including the sand bags)
- A balance
- 1 kg of sand (divided up into 100-g bags)
- 30 cm of string

## A few rules

- You can only use newspaper and toothpicks.
- The ends of your bridge must rest on shoeboxes (10 cm at each end).
- The truck AND its load must be no larger than 20 cm x 20 cm x 20 cm.
- Attach a string to the front of your truck to pull the truck across the bridge.

## Testing

- Place an initial 100- or 200-g load on your truck to test the strength of the bridge.
- Pull the truck across the bridge.
- If your bridge withstands the load, add 100-g bags of sand one at a time, pulling the load each time across the bridge with the string. Test the strength of the bridge until the bridge collapses or up to 1 kg.
- If you compete with friends, the bridge that withstands the heaviest load will be declared the winner.
- You can also award points for the most esthetic bridge.

## Calculation of points

100 g of sand = 20 points

200 g of sand = 20 points

300 g of sand = 30 points

400 g of sand = 40 points

500 g of sand = 50 points

600 g of sand = 60 points

700 g of sand = 70 points

800 g of sand = 80 points

900 g of sand = 90 points

1 kg of sand = 100 points

## Scientific principle

This challenge requires imagination, spontaneity and teamwork rather than scientific knowledge. It is an excellent introduction to a discussion on the resistance of materials.

## Want to know more?

Make a library or on-line research using the Key words at the beginning of this challenge.