#### Bridge Building Workshop



(For use in classroom)

PetersRailway.com

#### What are bridges for?



#### Bridge Building Workshop



# Bridges carry a load over an obstacle

Bridges are built to carry some sort of load over an obstacle.

The load might be people or cars or trains.

The obstacle might be a river or road.

This is Tower Bridge in London, it carries a road over the River Thames.

(This bridge has a special opening section to allow tall ships to pass under.)



#### There are lots of different types of bridges...











#### **Girder Bridge**

#### This Girder Bridge carries a railway across a river



#### **Concrete Bridge**

Made by pouring liquid concrete into a moulded shape. There are steel bars inside the concrete for extra strength.



#### Arch Bridge

Made from blocks of stone, the rounded arch shape make it very strong. Not so good for very long bridges.



#### The Forth Railway Bridge

Made from steel tubes. It was built super-strong after the disaster of the Tay Bridge which blew down in a storm.



#### **Suspension Bridge**

Suspension bridges are very good at crossing wide gaps and using very few materials



#### **The Clifton Suspension Bridge**

This is a much older suspension bridge, in Bristol. Again, a long and strong bridge is made with few materials.



#### What is this bridge made from?!

It looks as though it is made from Lego, but it is really made from concrete beams.



#### Your challenge today is to build a bridge.

#### The bridge will span a gap between two tables

You are going to work in teams and each team will have two tables with a gap between them. The gap will be 60 cm

#### It is a competition to see which team can make the strongest bridge.

## What are your bridges to be made from?

# You will be provided with:

Some string, a roll of sticky tape and 10 drinking straws.

## What will the bridge carry?

As much a possible!

The load will be hung from the middle of the bridge.

The bridge which carries the heaviest load before it collapses or "fails" will be the winning bridge.

# The Rules of the Competition

- 1. The tables will all be set 60 cm apart
- 2. The bridge is built to span the gap
- 3. No part of the bridge can be below the level of the table-tops.
- 4. The load is hung from the middle of the bridge IE the mid-point between the tables
- 5. The load will be placed in a bag which is hooked onto the bridge. weights will be added until the bridge fails.
- 6. IMPORTANT The bridge has failed when any part of the bridge dips below the level of the table-tops.
- 7. There can be no supports built up from the ground! Enjoy building your bridges....

# Do not show the following page until after the competition

Here are some pictures of winning bridges at schools in the Isle of Man.

One of them carried a load of over 5 kg before it failed. Maybe one of your bridges has beaten it?!



This bridge was so strong that it carried a bag full of books and sticky tape. Then more books had to be balanced on top. It failed at over 5 kg load.

Maybe one of your bridges has beaten it?!



#### PRIZES



If one of your bridges carried a load of more than 5 kg, please write to Chris Vine for a prize of some books !...



# **Real bridges sometimes collapse**

# This YouTube clip shows a real life bridge which collapsed spectacularly in America.

Nobody was hurt, so enjoy!!...

https://petersrailway.com/schools/tacoma-narrows-bridge-collapse/