Constructing

The students create models of bridges from paper.

Divide the class into 4 groups. Each group builds a model of a different bridge.
Provide each group with the appropriate print-outs and instructions, on the basis of which the students should prepare their model bridges.

Decide whether each group should prepare supports and elements from printed templates or make them themselves using A4 construction paper and following specific instructions (you can find templates for printing in tabs).

Group I – a Slab Bridge:
- two supports,
- one sheet of A4 construction paper.

Group II – an Arch Bridge:
- a component of the arch bridge,
- a sheet of A4 construction paper.

Group III – a Corrugated Beam Bridge:
- two supports,
- a component of the corrugated beam bridge model.

Group IV – a Truss Bridge:
two supports,
template for the truss bridge.

If you print out the instructions for the groups in one color, you should also show the groups slides with photos of the models.

Analyzing

Strength testing of paper constructions.

Materials:

- model of the bridge the group built earlier,
- model railcars or wooden blocks
- Plasticine and/or old coins
- worksheet.

After preparing their models, the groups formulate hypotheses as to how many railcars their bridge will be able to support and write these hypotheses down on the worksheet.
Then the groups arrange all models next to each other.
Next they fill the model cars (or wooden blocks) with the Plasticine or old coins, arrange railcars on each bridge and test how many railcars the bridge will support – they then note down the results of their tested hypothesis on the worksheet.

Compare the results.

It is important to be aware of the fact know that you cannot unambiguously determine which bridge is the strongest, since it depends on many factors. The strength of a bridge depends on, among other things, the materials it is made of, the span of the bridge and how it is used.