USBORNE

BUILDING BRIDGES

Even though you can't see it, a bridge BENDS and SQUEEZES together whenever a vehicle drives over it.

WHAT'S HAPPENING?

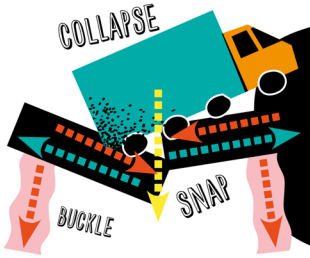
WEIGHT
from a vehicle pushes DOWNWARDS, causing COMPRESSION and TENSION.

COMPRESSION
(shown in RED)
SQUEEZES the top layer of the bridge inwards.

TENSION
(shown in BLUE)
STRETCHES the bottom of the bridge outwards.

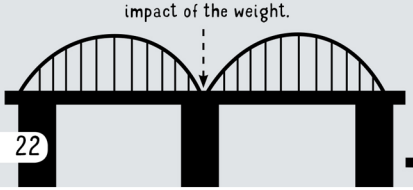
With a bigger weight, the tension and compression get BIGGER too.

But if the tension and compression become TOO BIG, the bridge will...

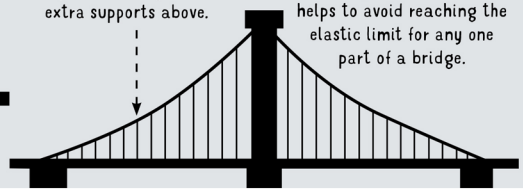


There's a LIMIT to how much tension and compression each part of a bridge can withstand. This is known as its ELASTIC LIMIT.

Some bridges have extra supports underneath to SPREAD OUT the impact of the weight.



Suspension bridges have extra supports above.



Adding extra supports helps to avoid reaching the elastic limit for any one part of a bridge.

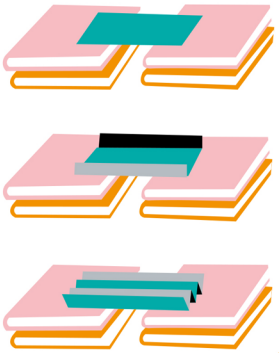
BUILD YOUR OWN:

Test some different paper bridge designs using the template below. You can copy it, or download it from the Usborne QUICKLINKS website.

Don't forget to record your results.

EXPERIMENT:

1. Place the flat template as shown in the diagram to the right. Load it with small objects of the same size (such as coins or toy bricks) one at a time, until it collapses. How many can it support?
2. Fold up the sides along the WHITE dotted lines and try again. How many of your item can it support now?
3. Fold along the remaining BLACK dotted lines to make a zigzag. How many can it support now?



BRIDGE TEMPLATE