The Smallpeice Trust

ENGINEERING @HOME

13

The Aqueduct Challenge

Sponsored by South West Water

#EngineeringAtHome

Suitable for ages:	Time needed:
6+	1hr+

smallpeice
Dare to imagine

Curriculum links: Maths – shapes, measurement; Science – materials, experimentation; D&T – design, make, evaluate

Skills learnt: Design, building, testing, evaluation

smallpeice
Dare to imagine

South West Water

Since our Smallpeice team can't visit schools, we've decided to challenge each other to make an aqueduct which you can test at home.

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Objectives

Build a working aqueduct to span a 2m gap.

Select from a wide range of materials.

Waterproof the trench to optimise your design.

Evaluate your designs.

Topics Covered

WATER & CLASSICAL CIVILISATIONS
https://bit.ly/2BmfGKi

CIVIL ENGINEERING
https://bit.ly/313I0Mx

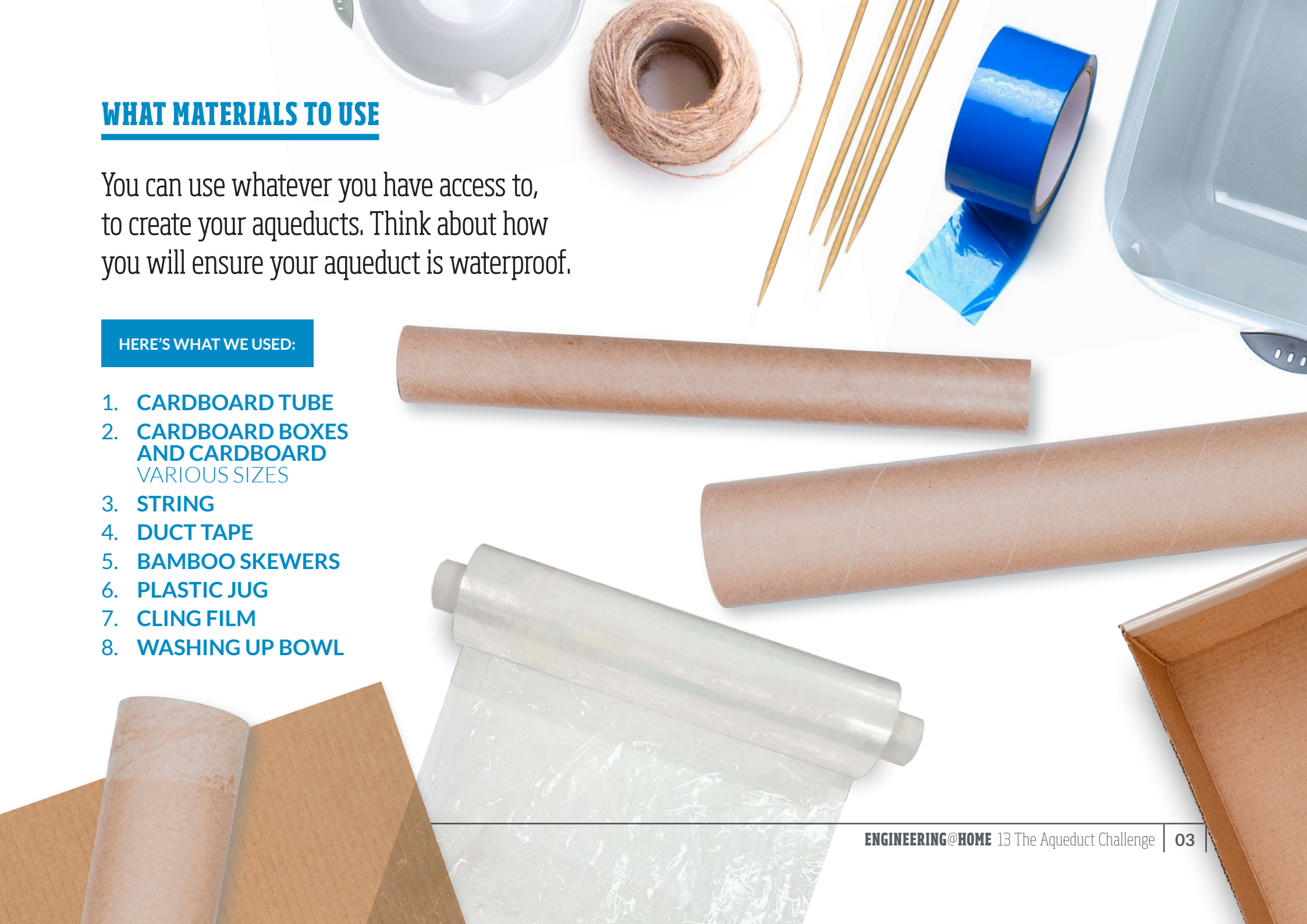
MODERN DRINKING WATER TREATMENT
(Mayflower)
https://bit.ly/2AIlmyx

WHAT MATERIALS TO USE

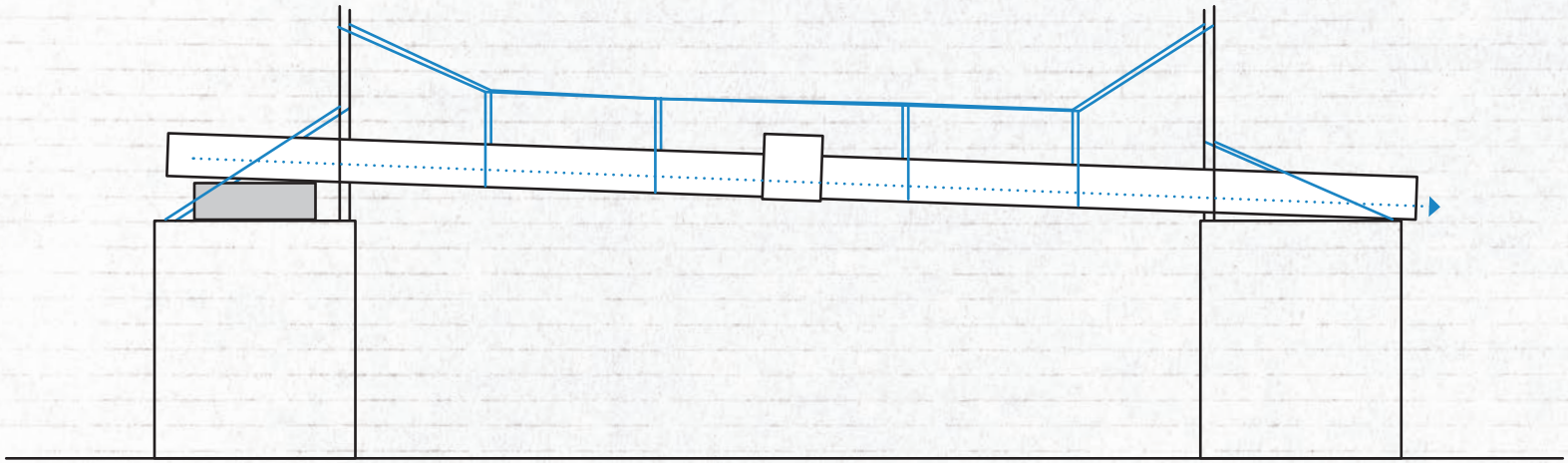
You can use whatever you have access to, to create your aqueducts. Think about how you will ensure your aqueduct is waterproof.

HERE'S WHAT WE USED:

1. **CARDBOARD TUBE**
2. **CARDBOARD BOXES AND CARDBOARD** VARIOUS SIZES
3. **STRING**
4. **DUCT TAPE**
5. **BAMBOO SKEWERS**
6. **PLASTIC JUG**
7. **CLING FILM**
8. **WASHING UP BOWL**



BUILDING THE AQUEDUCT



1. Design your aqueduct.

2. Create supports for your aqueduct.

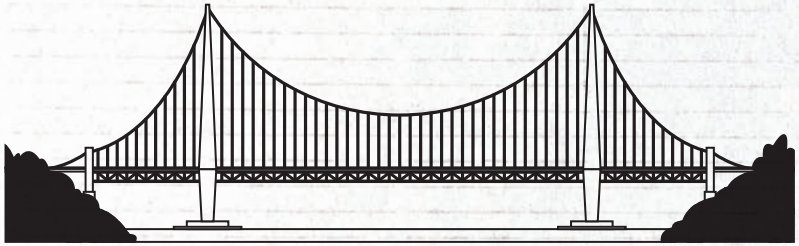
3. Build the deck – this will contain the channel which the water will flow through.

4. Add in support beams or cables to reinforce the weight of the aqueduct and the water.

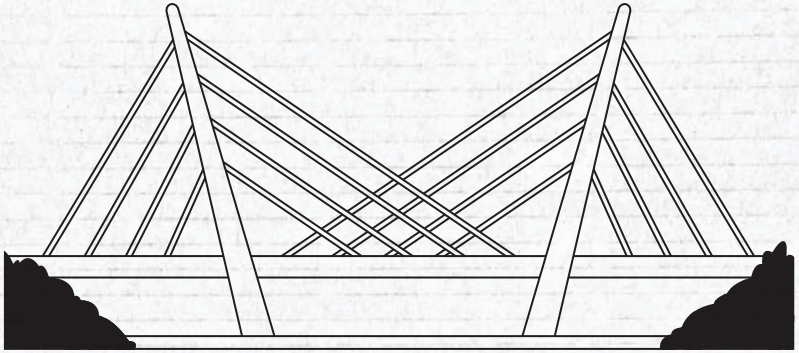
5. Angle the deck so that water can flow from one end to the other.

6. Make suitable adjustments to the support beams / cables.

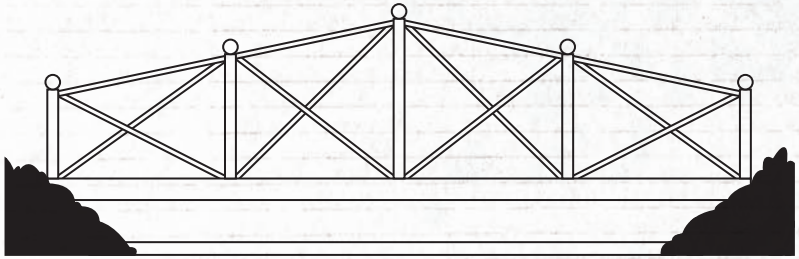
DESIGN INSPIRATION



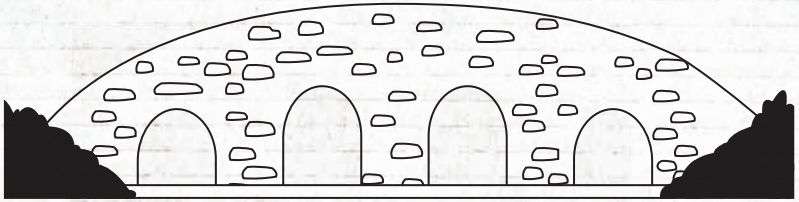
SUSPENSION BRIDGE



CABLE-STAYED BRIDGE

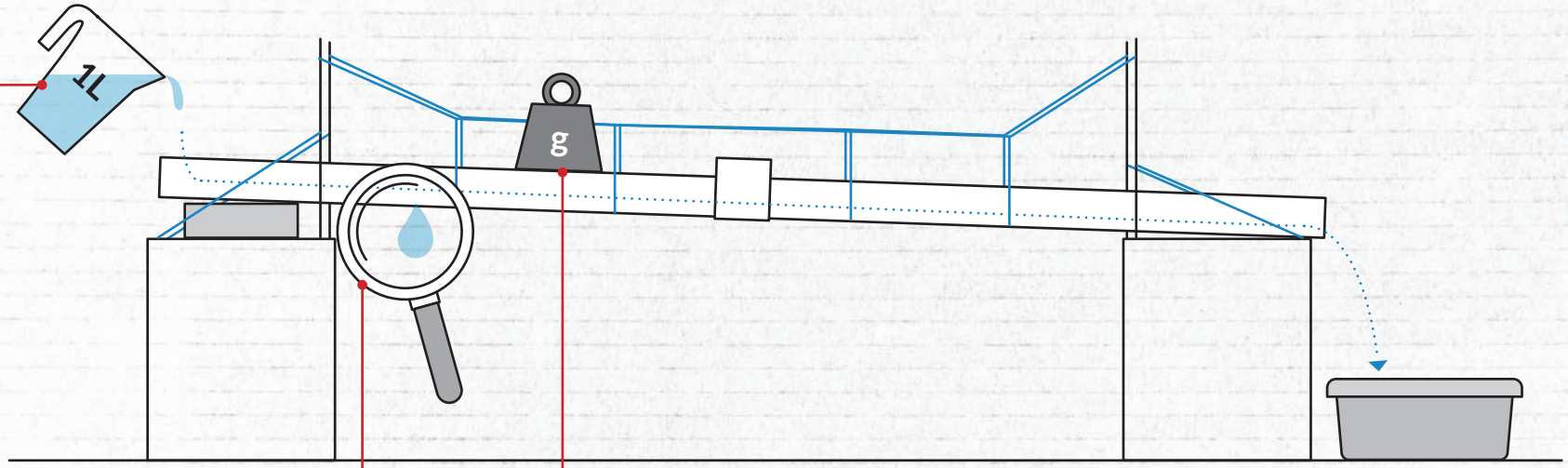


TRUSS BRIDGE



ARCH BRIDGE

TESTING THE AQUEDUCT



1. Pour 1L of water into the water channel of your aqueduct.

2. Observe leakage and make any fixes if needed.

3. Slowly add weight and (optional) test your aqueducts to destruction. Record your observations in the table shown.

TEST NUMBER	WEIGHT ADDED (g)	OBSERVATIONS

NEED A CHALLENGE?

To extend the activity and challenge yourself further:

1. **Try a wider gap than 2m.**
2. **Add extra weight to test the strength of your aqueduct.**
3. **Draw a force diagram on the aqueduct.**
   You may need to do some additional research.
4. **Film a video and send it to us!**

Thanks again to South West Water for sponsoring this week's video.

For more information on South West Water, visit **www.southwestwater.co.uk**

Also check out this video (click to link)

South West Water

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