

# Science at the Roman Baths - Forces

## Resources required:

- Audio-guides
- Forces activity sheet (either one each or in pairs)
- Something to write with
- Map of the Roman Baths to aid navigation

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Bath & North East  
Somerset Council

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## Links to the KS3 curriculum:

- Forces
- Adaptations
- Pulleys

## Instructions and Model Answers

Before beginning the task students should read the instructions in the booklet and be shown how to use the audio-guide.

Throughout the activity sheet, the aim is to get students thinking scientifically and applying their knowledge in a new, open, context. As such, there are not right or wrong answers but suggestions of possible responses. There is a separate bullet point for each question, in the same order in which they appear in the activity sheet.

### Forces on the statues

- Gravity should be shown with a downward arrow, upthrust with an upward arrow.
- 1. 3000N
- 2. Reaction force in the opposite direction, mass/weight of the statue, cantilever.
- 3. Hard, tough, resistant to compression, workable.

### Skeletal forces

- 1. Muscle/ skeletal muscle.
- 2. To allow movement, to create leverage.
- 3. Longer limbs increase leverage and power output/mechanical advantage.
- 4. Longer limbs are more prone to injury/fracture, larger organisms need more food and find it more difficult to hide.

### Forces and arches

- 1. Gravity should be shown to act downwards across the whole structure.
- 2. The arch would collapse inwards.
- 3. There are forces acting inwards from the bricks in addition to the force acting downwards from gravity.

### Forces and pulleys

- 1. a) The single pulley system.
- 1. b) The double pulley system

### The Lewis Device

- 2. The Lewis became wedged in the stone to allow lifting.
- 3. It allows the force from the rope to be used to lift the stone, it allows transmission of force.

### Supporting the floor

- 2. If the stack is leaning far enough, it will eventually topple, causing the floor to collapse.