

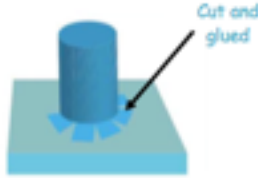
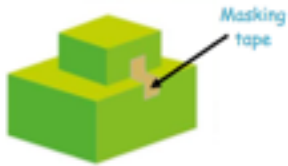
**Key Question:** Can you make a free standing model of the Iron Man with eyes that flash?

*Link to art: sculpture / Calder*

**Model attaching techniques:**

- Practice attaching tubes and boxes using different techniques e.g. splicing / slotting / tape / glue / flapping / interleaving.

Show children how to join sheet materials and reclaimed boxes together using different tapes and glues.

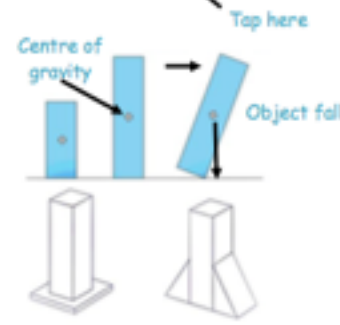
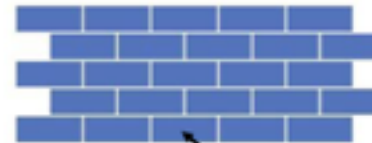


**Design:**

- Design their own Iron Man. Plan out from a collection of junk which boxes and tubes they will use. Draw a diagram labelling their resources and joining techniques.
- How will they make their structure free standing?
- How will they fix a circuit into the head and bulbs in the eye sockets?

**Technical knowledge and understanding**

Build walls with these different patterns. Tap away the centre brick in the bottom row of each wall in turn. What happens? Which wall is the strongest?

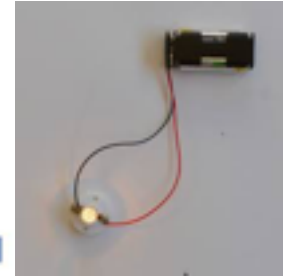


As a freestanding structure becomes taller its centre of gravity rises. Stability in a structure can generally be increased by making the base wider, making the base heavier or adding buttresses.

Ask the children to build and explore a variety of freestanding structures through focused tasks. Use a range of construction kits.

**Electric Circuit:**

- Revise making a simple circuit.
- Put a switch into the circuit and cover bulbs with red tissue / cellophane.



**Make:**

- Follow their design and methods of attaching to make a stable, freestanding model.

**Vocabulary:**

- structure
- stable
- buttress
- brick bonding
- circuit
- switch
- flange
- brace
- slot
- tab

**Test and Evaluate:**

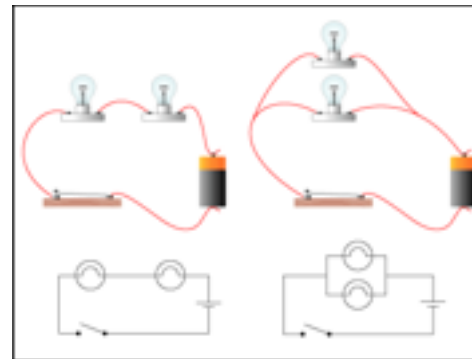
- Test the final product - did it meet the criteria?
- What worked well?
- What adjustments were needed?
- How could it be improved?

**Investigating Stability 1:**

- Use the large brick from playground or small lego if in groups in class. Build wall from stacks of bricks in columns. What happens when we push the wall?
- Remake the wall by interleaving the bricks.

**Investigating Stability 2:**

- Build a tall tower. How easy is it to knock down?
- Add bases and buttresses to lego towers to lower the centre of gravity. How easy is it to knock down now?
- Make labelled drawings of their work.



**Glossary**

- **Freestanding structure** - a structure that stands on its own foundation or base without attachment to anything else.
- **Frame structure** - a structure made from thin components e.g. tent frame.
- **Shell structure** - a hollow structure with a thin outer covering.
- **Stability** - in relation to a freestanding structure, the extent to which it is likely to fall over if a force is applied.
- **Buttress** - a structure added to a wall, tower or framework to make it more stable and/or reinforce it.
- **Brick bonding** - arranging bricks in a wall to improve the performance of the structure or improve its appearance.
- **Mock-up** - 3-D representation of a product.