



Amazing Triangles



Activity

EQUIPMENT	Box of cocktail sticks, Bag of marshmallows, mini-marshmallows or any soft sweets.
PREPARATION	None.
BACKGROUND INFORMATION	The triangle is a strong shape and is used to support structures. Under a heavy load, a square distorts easily – it ends up looking like a parallelogram. If you put a brace diagonally across the square, you create two triangles and a much stronger shape. In fact, the triangle is the only shape that cannot be deformed without changing the length of one of its sides. Because it is not easily deformed, the triangle is an extremely popular building shape.
TRIGGER QUESTIONS	What shapes do you know? Can you pick out any shapes in this room? If you look at a bicycle (or a picture of one) can you pick out any shapes? What shapes help the bicycle move? (Circles, wheels) What shapes make the bicycle strong? (Triangles in the frame). How would you make a corner stronger on a bench or a table? (Add a strut across the corners to make a triangle.)
CONTENT STRANDS	Forces, Materials and their properties.
SKILLS	Experimenting, Designing and making, Investigating, Observing, Analysing.



Amazing Triangles

Activity



ACTIVITIES

1) Squares and Cubes

(This takes 8 sweets and 12 cocktail sticks). Take 4 cocktail sticks and 4 sweets. Poke the cocktail sticks into the sweets to make a square with a sweet at each corner. Poke another cocktail stick into the top of each sweet. Put a sweet on top of each cocktail stick. Connect the sweets with cocktail sticks to make a cube.

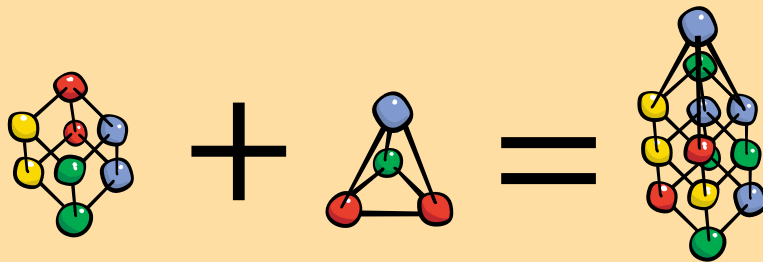
2) Triangles and Pyramids

(A triangular-based pyramid takes 4 sweets and 6 cocktail sticks). Make a triangle using 3 sweets and 3 cocktail sticks. Poke a cocktail stick into the top of each sweet, and bend these 3 into the centre; now poke them into the 4th sweet to make a pyramid. Now make a square-based pyramid by first building a square base and then 4 triangular sides.

Press down on these shapes. Which shape is the strongest?

3) Construction challenge:

(When you make a structure that uses both triangles and squares you can make large structures). Set the rules: limit the number of cocktail sticks available per person or per pair, and decide on the criteria for winning, e.g. it could be the tallest structure (skyscraper) or the strongest structure (i.e. the one that can take the most weight), the one that most resembles a famous building such as the Eiffel tower, etc. A time limit may be set if you wish.



SAFETY

Careful with points of cocktail sticks.

FOLLOW-UP ACTIVITIES

Look up pictures of different structures – e.g. bicycles, Eiffel Tower, truss bridges, etc. Can you find triangles in them? Can you make strong structures with straws and split pins/paper fasteners?

USEFUL WEBSITES

For another approach to the activity see

http://www.planet-science.com/about_sy/index.html?page=/about_sy/news/ps_101-125/ps_issue114.html

For more activities on shapes and structures have a look at

<http://www.professorbeaker.com/sample-lab.pdf>

Build a structure – this is a class activity on building shapes using triangles. Teachers can find instructions at

<http://www.architectureweek.org.uk/education/buildastructure.asp>