2 Build a Newton's cradle

Explore time and motion with this classic physics gadget.

What you need

- 16 jumbo craft sticks
- Hot glue gun
- String or thread
- Scissors
- 6 marbles
- Sticky tape
- Pencil

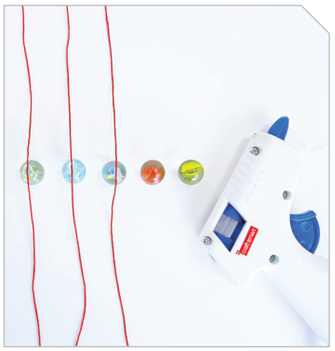
How does it work?

Newton's cradle is named after the English scientist Isaac Newton. The gadget demonstrates a fundamental principle of physics called the conservation of energy – energy can't be created or destroyed, but it can move from one store to another. You give the first marble energy by lifting it up against the force of gravity. As it falls, the energy is transferred to a kinetic (or movement) store. When the falling marble hits the stationary marbles, the energy is transferred to the ball at the other end of the line. In theory, this process could go on for ever but in reality energy is lost from the system – through friction, heat and the click-clacking sound waves – and the toy gradually comes to rest.

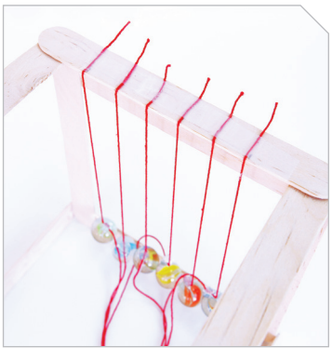
WARNING! Ask for an adult's help when using a hot glue gun.

This experiment is from *STEAM Play & Learn* by Ana Dziengel. Published by Walter Foster Jnr (RRP: £11.99)

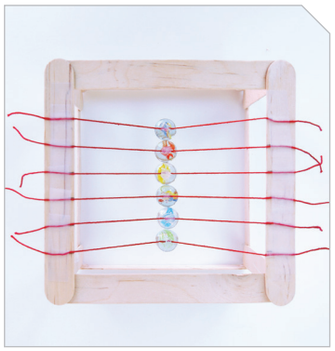
1 Glue four craft sticks together at the corners to make a flat square shape. You'll need a grown-up to help you if using a hot glue gun. Make a second square and, when dry, connect both squares together with craft sticks to make a cube.



2 Cut six 20cm-long pieces of string or thread. Glue a marble in the centre of each one. Next, make six small marks, centrally and 1cm apart, on a craft stick. Copy the marks across to a second stick and glue them to the top of your frame.



3 Hang a marble from the top of the cube frame, lining up the string with your first pencil mark. Fix with sticky tape. Repeat with the other five marbles, making sure that they all hang an equal length from the top and are touching.



4 Fix the loose ends of each string to the pencil mark opposite it. Make sure that the marbles line up when viewed from above. Glue craft sticks over the tops of the strings. Now, set the gadget in motion by pulling back a marble and letting it fall.

ANA DZIENGEL - COURTESY WALTER FOSTER JR