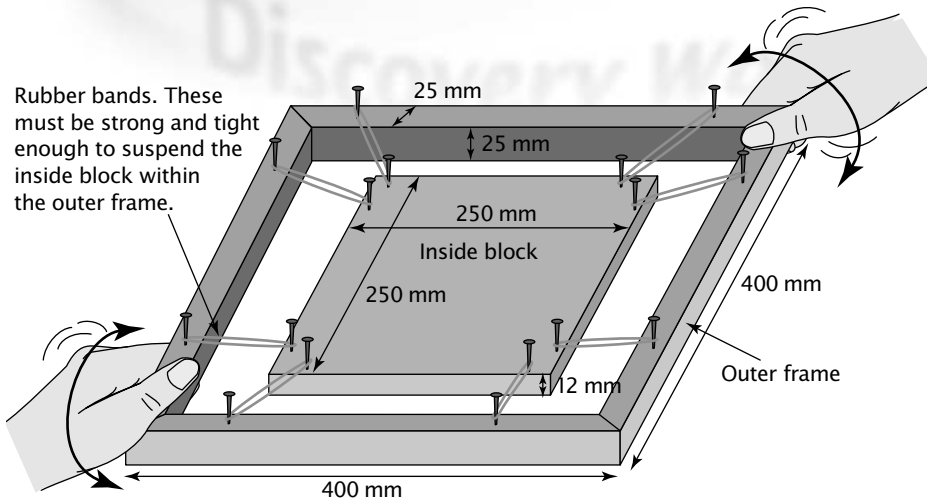


# Discovery Worksheets

## Design an earthquake-proof house

This worksheet asks you to build three model houses and test them in an earthquake machine! You may already have one of these 'machines' in your house — an automatic washing machine.

However, it will only work if it shakes in a regular way when on the spin cycle. If it's a very smooth operator (and barely trembles) or shakes so violently it follows you out the door, you've got a problem! In this case, you might like to build your own earthquake machine (detailed on the left).



- Earthquake simulator. Place the simulator on a firm table and hold the opposite corners of the frame as shown. Shake in a 'rotating' fashion.

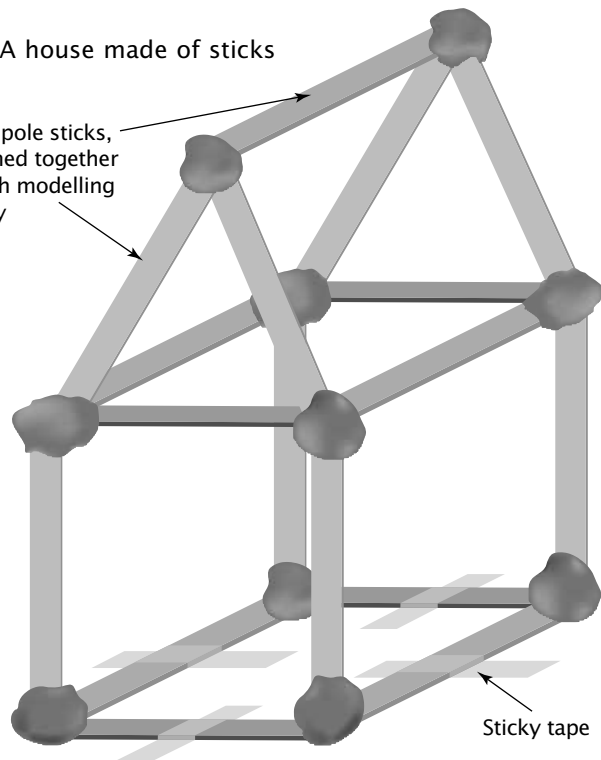
### Build your three houses

You'll be testing three types of house in this experiment: one made from wood, one from 'bricks' and one from 'steel'.

The wooden house is made from icy pole sticks stuck together with clay. Use the clay when it is moist but wait until it is dry and hard before the earthquake test. Join your sticks together in the shape shown here, or use your own simple design.

- A house made of sticks

Icy pole sticks, joined together with modelling clay



Atlas of Discovery, pp. 5, 26–27;

automatic washing machine that vibrates appropriately (don't try to fit this in your school bag!) OR materials

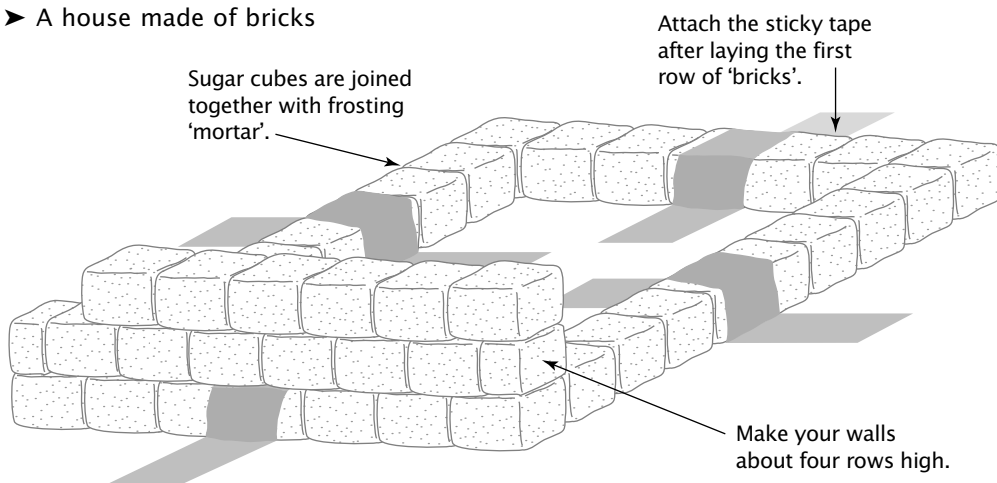
to make an earthquake machine (250 mm square block of 12 mm wood; long, thick rubber bands; hammer and nails; 4 × 40 cm lengths of 25 mm square pine); icy pole sticks and modelling clay; sugar cubes, icing sugar, egg whites and beaters; pipe cleaners and sticky tape





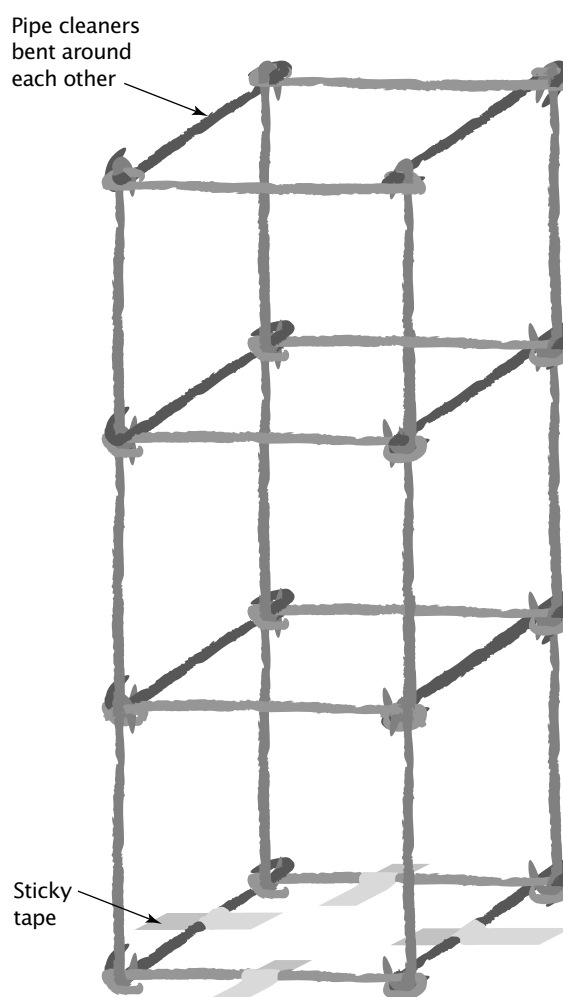
The brick house is made from sugar cubes using cake frosting as the mortar. Combine three beaten eggwhites with two cups of icing sugar to make this frosting. Lay the bricks in the correct pattern so that the joints between the bricks alternate (see following diagram). Once again wait until the mortar is dry before the earthquake test.

► A house made of bricks



The steel house is made from pipe cleaners (which are lengths of wire inside a felt-like cover). These represent steel girders and posts. Construct a two- or three-storey house. Bend (don't twist) the pipe cleaners around each other.

► A house made of steel



**The earthquake test**

Use sticky tape to firmly attach each of your house models, in turn, to your earthquake machine. (Buildings do not just sit on the ground; they are 'attached' or anchored to it by their foundations.) If you are using the washing machine, place the model on the lid when the machine is about to start the spin cycle for a load of washing. If you are using the earthquake machine you have made, simply shake it by hand for about two minutes. If some of your buildings break that's fine — this is an earthquake after all!

What happened? Which of your houses survived intact, and which did not? Why do you think this is the case? (You might like to use a wet day in the school holidays as an excuse to design and build an earthquake-proof ten-storey skyscraper to test on your earthquake machine.)