

Younger children should have spent time experiencing some testing of the simple properties of materials. The activities offered here try to build on that experience and give the opportunity to develop the skills of investigating, whilst tackling the testing of properties. Certain materials have properties that are appropriate for specific uses and by comparing these, the idea is introduced that whilst some materials are reasonable for the use, others might do the job better.

Some materials can be changed in shape, a property suited to specific uses

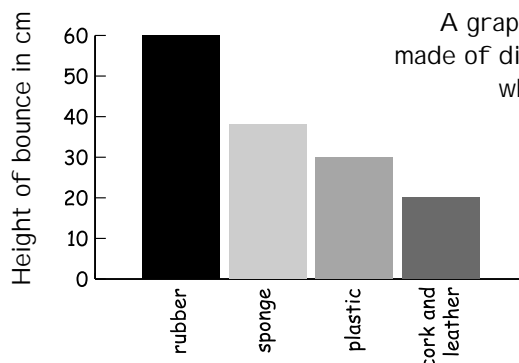
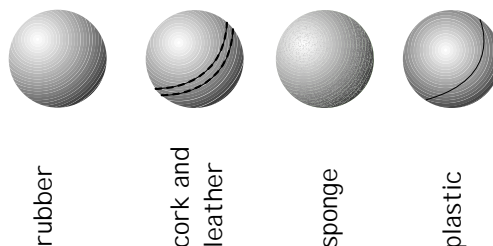


Graphing package

(a) **Balls are made from a variety of materials Investigate**

Which is the bounciest ball? Look at balls made from a variety of materials and discuss the different uses and properties, including sizes. The children can decide what they want to test eg, 'the bounciest football', 'the bounciest small ball'. What do they think 'bounciest' means? A ball that bounces the highest, or one that bounces for the longest time? The possibilities and variables are numerous, so they need to be made more specific. This is where the children learn to plan. The results will make a good bar graph.

Choose balls that are the same size. How high did they bounce?



A graph to show the height balls made of different materials bounce when dropped from 1 metre

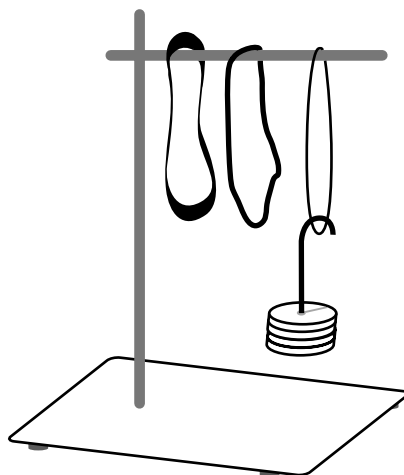
Materials from which the balls were made

## Safety!

- Goggles should be worn when testing elastic bands.
- Care should be taken when using weights.

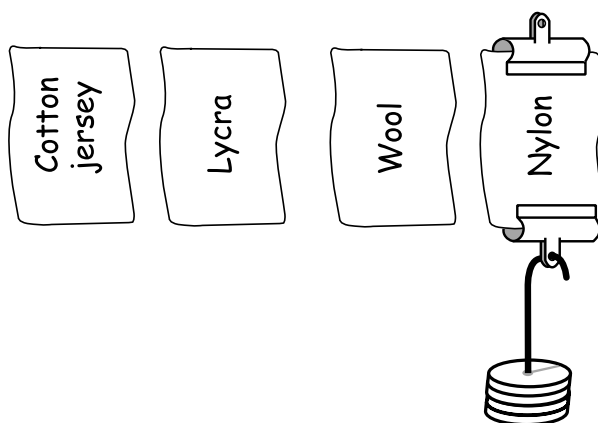
- (b) **Elastic bands** Investigate elastic bands with older children. Stretching them to their breaking point is too dangerous! Try comparing different thicknesses of the same band circumference with a fixed weight eg 500 gram. Carry out this experiment on the floor. Hold the band and weight against a ruler to see which stretches the most.

Testing different thicknesses of rubber bands with weights



- (c) **Stretchy materials** Sometimes we want a material (fabric) to have some elasticity because of the garment it will be used to make, for example, a pair of tights. Different fabrics can be tested for this, but pupils must remember that we want the fabric to return to its original shape and size. Strips of fabric can have weights hung onto them. What length is the fabric at the start? To what length does it stretch? What length does it return to? Use bulldog clips to support the weights or cut a hole in the fabric to hang the weights through.

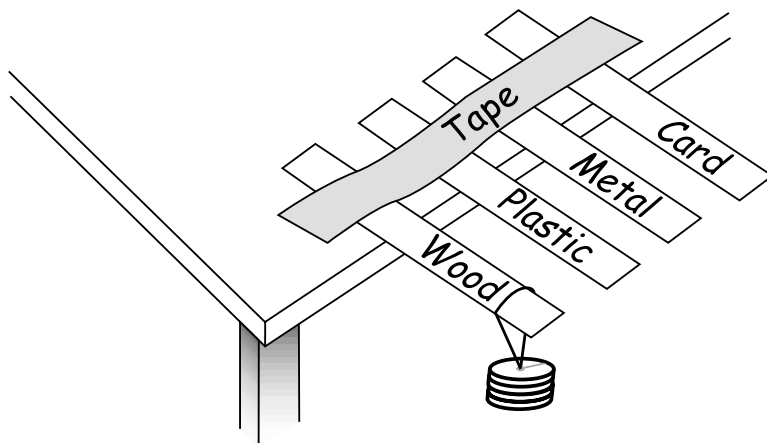
Testing fabrics





Spreadsheets

- (d) **Flexibility** Some usually rigid materials need to be able to 'give' a little and not break, to accommodate different situations for example a bridge carrying heavy traffic. Different materials can be tested eg identical lengths of wood, plastic, metal (use rulers) and card to **investigate** how much they will bend by hanging weights from string onto the end or sticking weights on the top with Blu-Tack<sup>®</sup>. Since the intention is not to break all your material samples, use a light weight and **investigate** 'which material bends the most using a 100 gram weight?' Measure the distance that each ruler bends. Another consideration is the way the material is formed. A card tube, for example, is less flexible than the same card unrolled. Children can **investigate** one material in different forms. Cut the card from both sides of a cereal packet to test the card flat, rolled the long way, the short way and folded zig-zag, then put the weights on the top.



I predict that the card will break and the plastic will be most flexible.