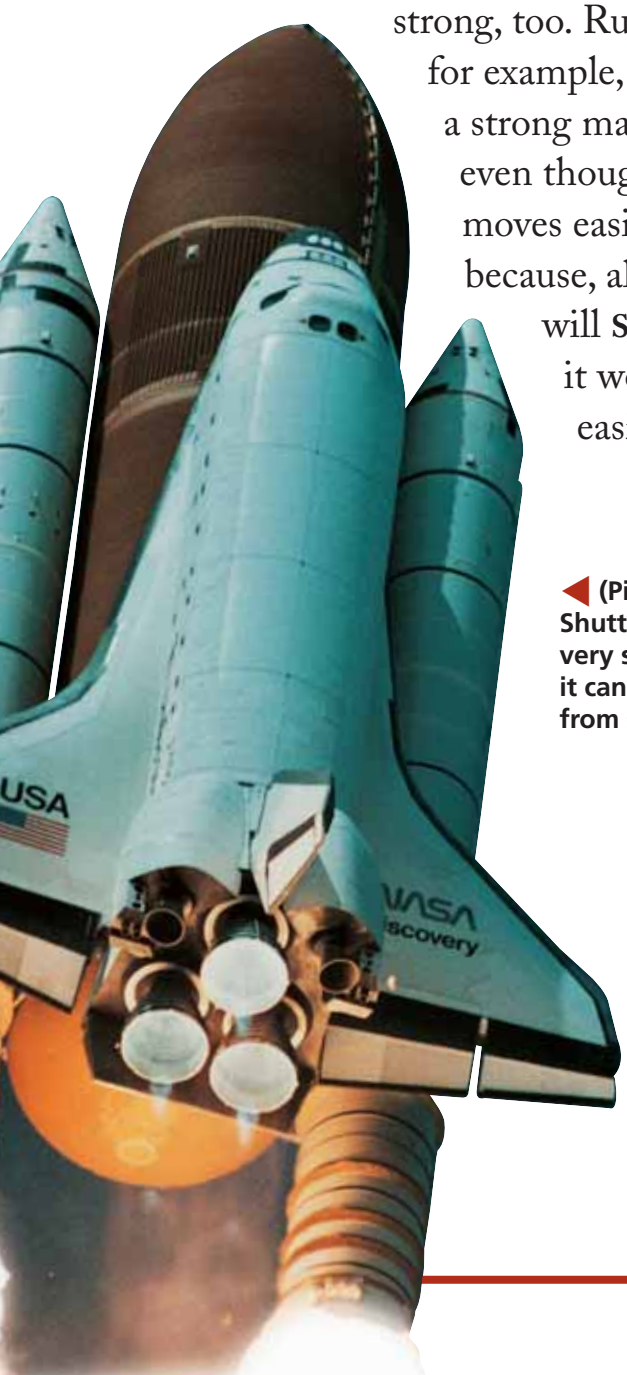
3 Strong materials

A STRONG material won't BEND, TEAR, CRUSH or SHATTER easily.

It takes a lot of effort to break a strong material. All kinds of materials can be strong (Picture 1). Stone is a strong material that can be used to make tall buildings. Steel is a strong material that can be used to make motor cars.

Some, more surprising, materials are strong, too. Rubber, for example, is also a strong material, even though it moves easily. This is because, although it will **STRETCH**, it won't break easily.



◀ **(Picture 1) The Space Shuttle has to be built using very strong materials so that it can successfully fly to and from space.**

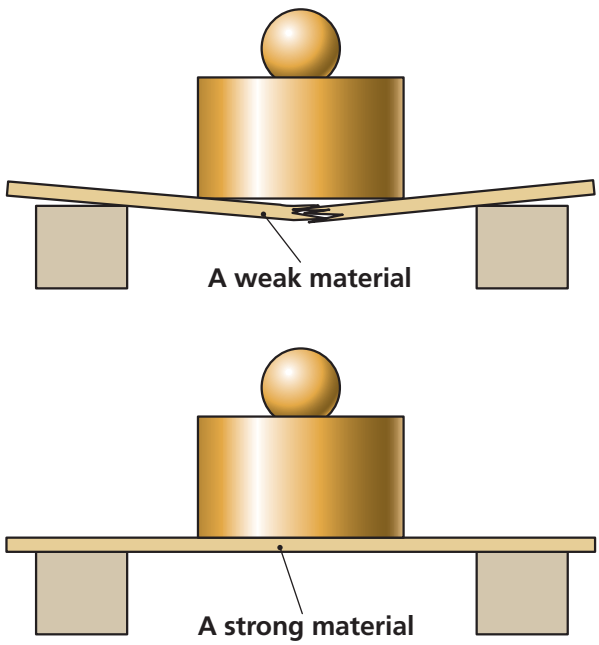
Testing for strength

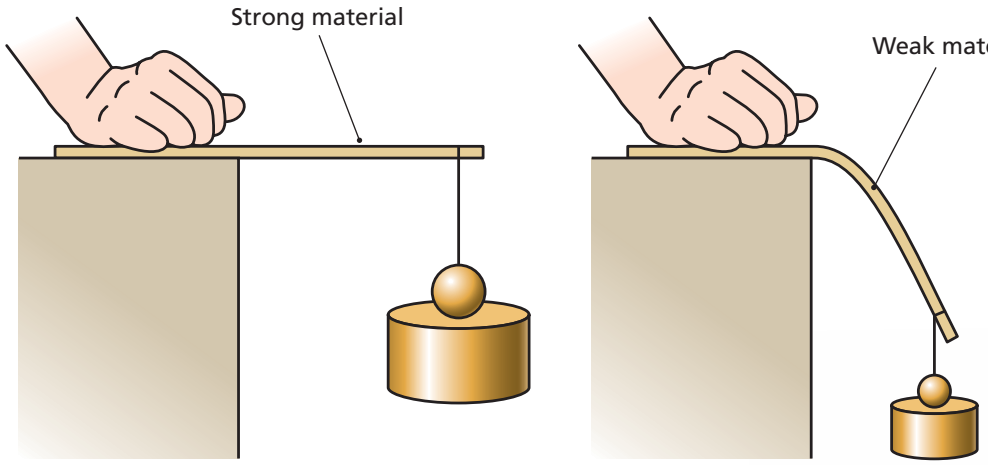
There are many ways you can find out if something is strong enough for your needs.

For example, you could place the material you want to test on two supports (Picture 2). You could then put heavy weights on it. If the material breaks when just a small weight is added, then it is **WEAK**. But if it will stand up to a heavy weight, then it is strong.

You can perform a similar test to see how well a material will resist bending (Picture 3).

▼ **(Picture 2) Testing to see if a material will break.**





(Picture 3) Testing for strength. This test uses two rods of the same size, but made from different materials. The same weight is hung on each rod. The weaker material bends or breaks.

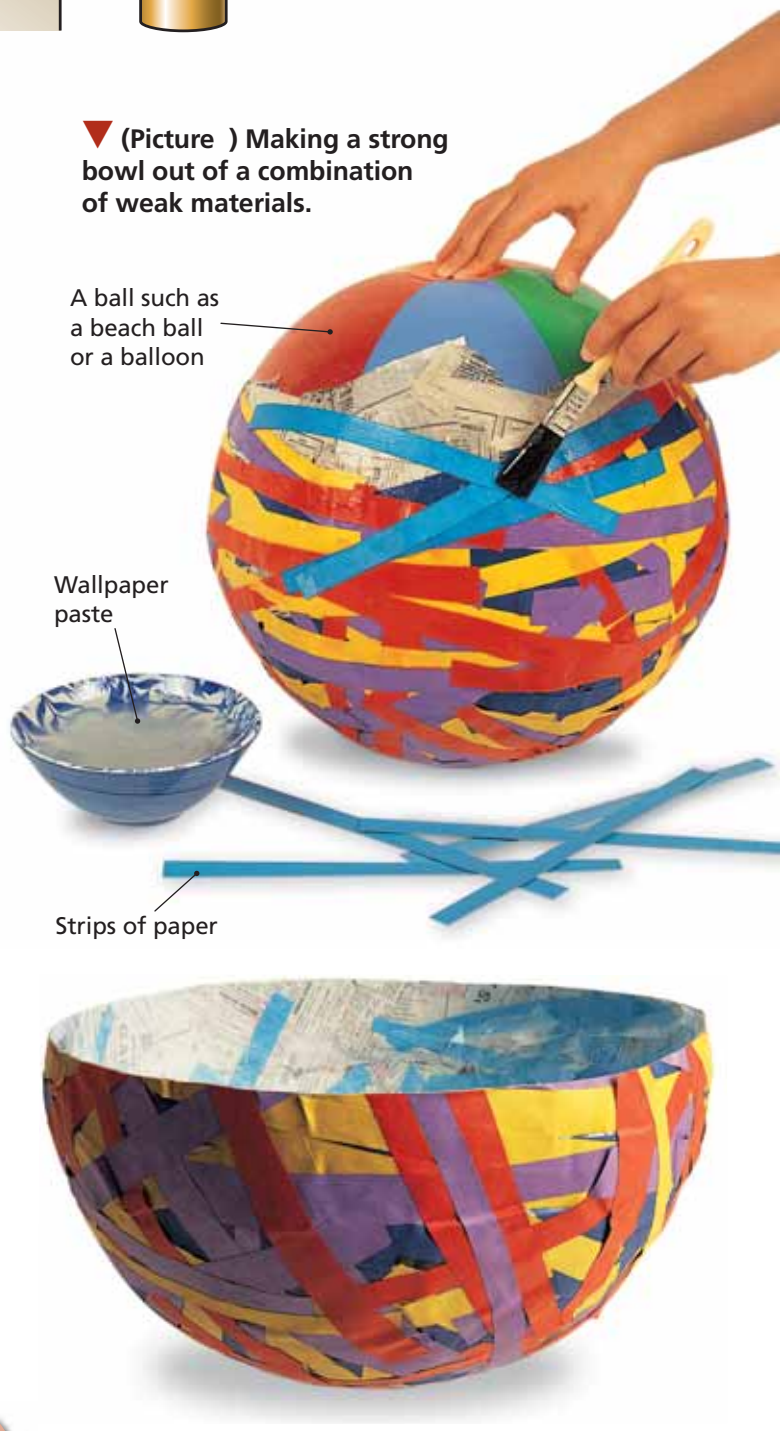
Combining materials makes them stronger

Many materials can be made stronger by combining them with other materials. A bowl, for example, can be made of strips of paper and wallpaper paste. Wallpaper paste and strips of paper are both too weak to support anything. But they can be combined to make a strong bowl.

The paper is cut into strips and the strips are pasted together. In Picture 4, an inflatable ball has been used as a support for the bowl until the paste has set.

When the paper and paste have dried, the air is let out of the ball and it is removed. The dried paper and glue have now been changed into a new material – one strong enough to keep fruit and other heavy objects in.

(Picture) Making a strong bowl out of a combination of weak materials.



Summary

- **Materials are strong if they don't break or change shape without warning.**
- **Weak materials can often be made stronger by combining them.**

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