MATERIALS: SHAPING UP

INTRODUCTION

In this module children are introduced to different ways of changing the shapes of objects made from different materials. They identify materials that can be changed by the actions of squashing, bending, twisting and stretching, and link these actions with the properties of the materials that allow them to be changed. They discover that some materials have different properties according to how they are shaped and what they are made into, and choose materials for uses according to their properties. They also learn that pushes and pulls can cause movement or a change in shape. Children apply their knowledge by making clay models and catapults. This module builds on Module 3 in Year 1, which introduces materials and their properties, and links to Module 3 in Year 2, where children link a range of other properties to the uses of materials.

When working scientifically children carry out identifying and classifying enquiries and comparative tests. They record using photographs, labelled drawings, Venn diagrams, tables and bar charts. They have opportunities to measure using non-standard or standard measures and to compare their findings with those of other children.

National Curriculum:

Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses

Working Scientifically:

Using observations and ideas to suggest answers to questions

Performing simple tests and recording data

Observing closely, using simple equipment

Scientific Enquiry:

Grouping and classifying

Carrying out simple comparative and fair tests

Key vocabulary:

twist, squash, bend, stretch, squashing, bending, twisting, stretching, push, pull, pushing, pulling, roll, pinch, press, smooth, flexible, rigid, stretchy, squashy, elastic, stiff, properties, suitable, stretchiness, weight, catapult, frame, missile, strong, table, column, Venn diagram, set, sort, label, measure, record, bar chart

FACT FILE:

There are many technical terms that are used to describe the properties of materials, which relate to how these materials can be changed in shape. In this module only a few simpler terms are used:

Flexible: able to be bent or twisted into a different shape.

Rigid: the opposite of flexible.

Squashy: able to be squashed or pressed into a new shape that has the same volume. The focus is on a change of shape, not whether a material can be compressed. Compressing involves reducing the volume of the material and this is only possible for gases or materials, such as sponges, which have air spaces.

Stretchy: able to be stretched into a longer, thinner shape that has the same volume.

Elastic: the property of material which, when stretched or squashed, allows it to spring back to its original shape.

Stiff: unable to be changed by squashing or stretching. The term ‘stiff’ can also be used as the opposite of flexible, but in this module ‘rigid’ and ‘stiff’ are used with separate meanings to avoid confusion.

Pushes and pulls can cause objects to move away from or towards whatever is applying the force. If there is an opposing force on the object, for example, another hand applying a force in the opposite direction, or a fixed object such as a table surface or wall preventing movement, the push or pull can change the shape of the object. The various actions which children learn in this module all involve pushing or pulling to cause a change in shape. In most cases the pushes and pulls are

linear movements, but pushes or pulls (or combinations of the two) that involve circular movement cause objects to twist.