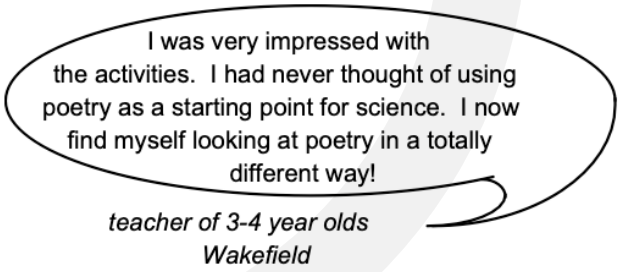
1. Mud and sand

These three investigations explore the properties of sand, soil and mud.



OBJECTIVES

- To identify and names a variety of everyday materials
- To describe the simple physical properties of a variety of everyday materials.

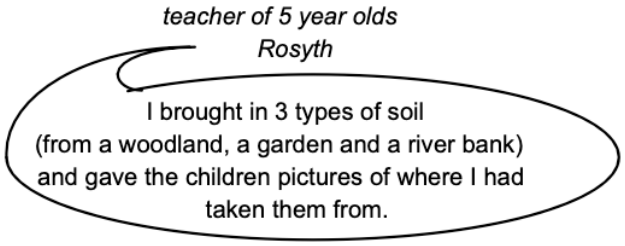
MUD EXPLORATION

Key ideas:

- Soils have different textures and appearances
- When different soils are mixed with water, the resulting mixtures feel and look different

Resource ideas:

range of soils, e.g. sandy, chalky and clay soils commercial compost water selection of plastic containers plastic aprons spoons yogurt pots or disposable cups sieves/ colanders plastic drinks bottles



The stimulus for this activity is the poem 'Mudlarks' in which the sister and brother duo play with mud. Initial discussion of the poem can focus on the words used (slippy, sloppy, etc.) and also on the clothing the children wear to explore this messy mixture. Also discuss the safety aspects of handling mud and washing hands afterwards, and the reasons for this.

A soil collection is used for the practical activity. This can be made up of samples brought from children's gardens, or a collection of soils made by the teacher, which can represent clay, sandy and chalky soils, and commercial compost. You must decide how many different soils the children should be presented with in one activity.

Safety Note

Children must wash their hands after handling soil.

Note: *If asking children to bring soil from home, send a note to parents stating that soil must not be gathered from an area that a dog or cat uses as a toilet, due to the germs which may be present. The soil should be collected from as 'clean' a site as possible.*

Label and display small quantities of the soils on a table-top. The children use the remainder of the labelled containers for exploration in the wet area.

Children wear aprons to carry out this activity. Encourage them to look at, feel and smell (but not taste) the different soils. Ask them to describe their observations. Develop a word bank and display this above the table of soils.

The first **independent** activity is carried out with dry soils. Children look for the components in the soil, by picking out leaves, twigs and larger stones, and then by sieving the different soils to see what they can find. The different components are placed in yogurt pots.

Children try to categorise the things found. Categories are decided by the children, and may include some of the following:

- stones
- leaves
- large lumps of soil
- small lumps of soil.

Depending on their ability, children can record this categorisation pictorially or in writing, or the products of sieving can simply be discussed with the teacher before moving on to the next part of the activity.

Ask the children:

- Which type of soil will make the best mud pie?

Children can give reasons for choosing a type of soil. Keep a record of these choices and reasons for later discussion. Discussion at this point should include what a 'good mud pie' is like, e.g. it is firm or solid enough to keep its shape when turned out of a beach bucket, plant pot or plastic cup.

Depending on the ability of the children, they can be asked to keep a recipe showing the amount of water and soil mixed, as well as the type of soil chosen from the selection.

Children can be left to experiment independently with the soil and water. Allow children 5-10 minutes to explore the soil and water in their own way before asking them to build mud pies. In dry summer weather, the activity can be done outdoors. It is important to establish ground rules about the exploration allowed. These rules may be similar to those normally used for the water and sand trays, or the painting area.

As an **additional activity**, mix a few tablespoons of each soil with water in separate transparent drinks bottles. Label each bottle according to the soil type. Leave these on the display and allow children to shake the bottle and observe the settled contents. They should notice that the soils separate into different layers according to the soil type. These bottles can be shaken and settled repeatedly to see if the settled samples always look the same.

SIMPLY SAND

Key ideas:

- Mixing differing amounts of sand and water results in different consistencies of mixture
- If sand and water mixtures are left to stand, the water will dry out of them
- Sands have different textures and appearances when dry or mixed with water.

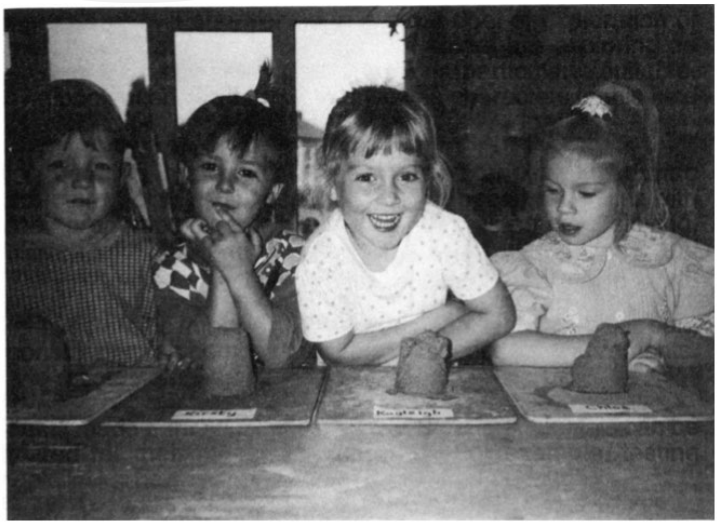
Resource ideas:

sand tray school sand builders sand - optional water tray plastic buckets & spades spoons plastic cups sieves, tea-strainers, colanders & funnels plastic aprons

The stimulus poem 'Sand' describes two kinds of sand, "the run-between-your-fingers kind" and "the build-into-castles kind". Ask the children what is the difference between these types of sand, i.e. the addition of water to 'stick' the sand together.

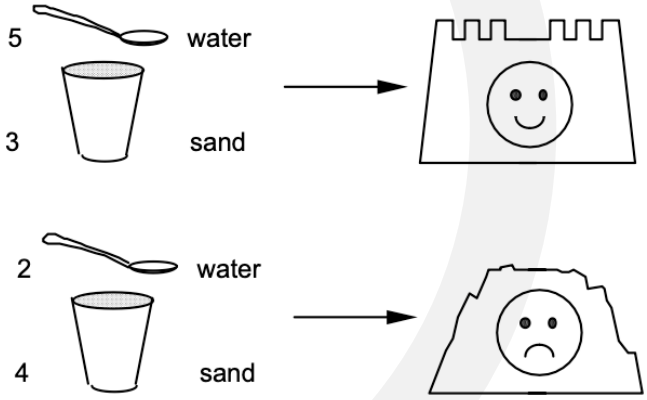
As in the mud activity children can begin by exploring dry sand using sieves, colanders, tea-strainers, combs, funnels, jugs, etc.

Before challenging the children to make sand castles, allow them some free exploration time with the water and sand. Then give the children time to work independently, to make different water/sand mixtures to form a castle.



Children of Dane Royd Junior and Infant School Nursery, Wakefield.

More able children can measure the quantities of sand and water used for each mixture, using spoons, plastic cups, buckets or other appropriate measures. They can record the different mixtures and their success in pictures (see the example overleaf).



When they have finished their exploration, discuss what difference too much or too little water makes to a sand castle.

Each child or group leaves one sand castle to stand for a day or two, to observe how the mixture changes as the water dries out of the mixture.

Note: The water evaporates from the mixture more quickly if left in a warm and/or sunny position.

SAND EVERYWHERE!

Key ideas:

- Sand is made up of tiny grains
- To keep sand out of food, the food must be kept in well-sealed containers

Use the poem 'Seaside' to introduce the idea of a seaside picnic, and the notion of sand getting into the tea and sandwiches. Children may be able to talk about similar experiences of their own when visiting the seaside.

Ask the children to put together a package which will keep sand out. Discuss how they could test their packages once made, e.g. bury in the sand pit, remove again, and then check the contents. Plasticine or blu-tack is inside each package, as sand that gets inside will stick and therefore be seen. Children will also be able to mould imitation food out of either of these materials.

Resource ideas:

paper bags plastic bags cling film Sellotape PVA glue paper card rubber bands food bag twisters paper clips blu-tack, plasticine or playdough

Using the resources listed opposite, children can make a wide range of packages. Here are just a few ideas:

- Paper bag sealed with a rubber band
- Cling film wrapped around plasticine food
- Plastic bag sealed with a twister or paper clip • cardboard box, sealed with Sellotape or glue.

The children choose one package which, when tested, proves to keep most or all of the sand out. Once all of the children have done the activity, test each package with the whole class, and discuss the good points of each one.

Possible improvements to each package can also be discussed, e.g. how easy are the packages to re-use?

Display all the final packages on a table top.