

POEMS

**A science investigation pack for
teachers of 5-7 year olds**

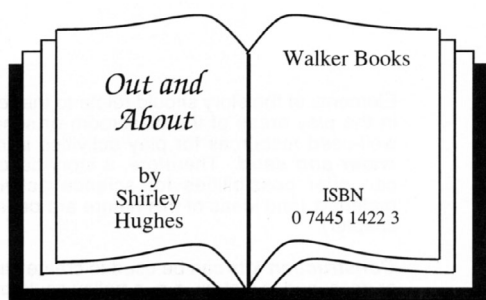


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EDUCATION COLLABORATION

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Introduction



This resource is based on the beautifully illustrated poems by Shirley Hughes in 'Out and About'. It shows how the poems can be used as a starting point for children's explorations and investigations.

BOOK CHOICE

This book consists of eighteen beautifully illustrated poems which also introduce children to a rich use of language. All the poems have a strong environmental theme and involve a sister and brother in exploring their surroundings throughout the year. The first poem is set in spring and the final one in winter. Of the eighteen poems, eight are used as the stimulus for science and technology activities, and these are summarised below. Although not described in this book, the poems can provide interesting starting points for other activities, such as work on the seasons, the weather, and growing plants.

SEQUENCE OF ACTIVITIES

Activity	Poem	Description
Mud exploration	Mudlarks	Investigating soil and water mixtures, using a variety of soil types
Simply sand	Sand	Investigating sand and water 45 mixtures
Sand everywhere!	Seaside	Making and testing containers to keep sand out Making a fixed-position deck chair from construction materials
Wet weather wear	Wet	Testing fabrics for waterproofing
Arm bands	Water	Making arm bands (water wings) for a doll
Light and water	Squirting rainbows	Effect of light on water
Ice balloons	Cold	Investigating ice in water
Market stalls	Feasts	Making a market stall using construction materials

1. Mud and sand

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

I was very impressed with the activities. I had never thought of using poetry as a starting point for science. I now find myself looking at poetry in a totally different way!

*teacher of 3-4 year olds
Wakefield*

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

*teacher of 5 year olds
Rosyth*

I brought in 3 types of soil (from a woodland, a garden and a river bank) and gave the children pictures of where I had taken them from.

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.

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 (page 43) 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.

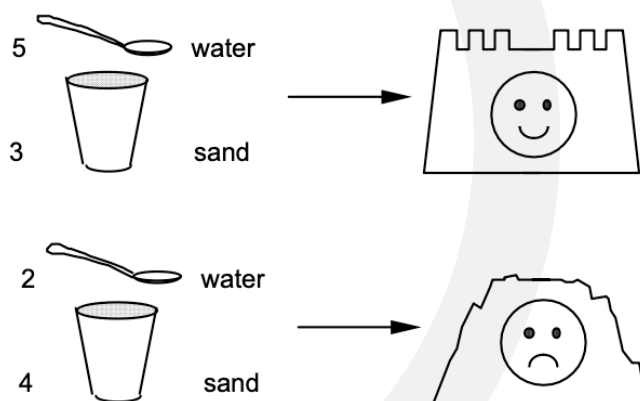
Resource ideas:

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



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.

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.

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

[ACTIVITY DETAIL]

2. Water and ice

The first two investigations consider how to overcome some of the challenges created by water. The third activity is an exploration of ice.

OBJECTIVES

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

WET WEATHER WEAR

Key ideas:

- Special clothing is worn to keep dry when it is raining
- The clothing is made from material which will not let the water pass through.

The stimulus poem for this activity is 'Wet'. When you have finished reading the poem, discuss both the poem and the accompanying illustration with the children. Ask the children to spot as many things as possible which protect people from the rain. The picture shows rain coats, rain hats, pushchair covers, Wellington boots and umbrellas.

Show children the selection of materials. Ask them to test the materials out in the water tray, to find which ones will not let water go through and which will keep a doll or a teddy dry.

Depending on the independence of the children, they could be left to explore the different materials in the wet area. More able children can be asked to keep a record of what they find out. This can be done by sticking fabrics to a sheet and putting a tick or cross beside them to show whether they let the water through or not.

In the final discussion, ask questions such as:

- How many materials let the water through?
- What are these materials like? (describe them, e.g. any holes, etc.)
- How many materials kept the water out?
- Why do you think the water didn't go through?
- Which materials will make a good hat, coat or umbrella? (as well as waterproofing, children can think about the material being bendy, warm, easily stitched, looking nice, etc.).

Resource ideas

selection of materials, such as cotton, nylon, polythene, wool, old umbrella fabric, old shower curtain, paper, card, etc. water tray cups and jugs small doll or teddy bear



As an additional activity, children could make a hat for the doll or teddy from the material they think is most suitable.

ARM BANDS (WATER WINGS)

Key ideas:

- Some materials float and some sink
- Arm bands must be made from a material that is waterproof and can be easily attached around arms
- Arm bands have air in them to make them float well.

Note: Depending on the children's previous experience, you may want to do some preliminary work on floating and sinking.

The stimulus poem for this activity is 'Water'. The poem is illustrated with a scene from a swimming pool, and this picture should be discussed once the poem has been read.

Ask children if they can spot the two things in the picture which are helping children float (arm bands and an inflatable, or 'rubber', ring) and what is the same about these two things. Children may talk about them being plastic and filled with air.

Challenge the children to make a pair of arm bands for a doll. Attach weights around the doll with string so it sinks without the arm bands, to represent someone sinking below the water.

Show children the range of materials they have to use and then leave the children in the wet area to explore the materials themselves, before they make the arm bands. The arm bands are most easily held in place on the doll's arms with elastic bands.

Note: Children will need help to blow up balloons. These should be only slightly inflated.

Once children have made their arm bands, these can be tested on the doll in groups or as a class activity. Focus the discussion on the properties of the arm bands that held up the doll, e.g. was the material waterproof, was there air inside, how did they stay on the doll's arms, etc. Ask children how they think they could improve their arm bands if they had time to make them again.

All the arm bands can be displayed for other children to try on the doll in the wet area.

Children draw their arm bands and some can write about what happened when the doll wore them, and why they think this was. Place emphasis on the 'finding out' element of the activity and the properties of different materials, rather than the importance of a successful pair of arm bands.

Resource ideas:

cotton fabric wool fabric
sponge bubble wrap
balloons polythene
bags polystyrene sheet
wrapping plastic cups
Sellotape doll - to put in
the water tray plasticine -
to weigh down the doll



*teacher of 5-6 year olds
Gawcott*

Water wings were displayed on
the doll, with real water wings beside her.
This caused further discussion and observation
when the balloons went down little by little,
but the real ones didn't.

LIGHT AND WATER

Key ideas:

In bright light ...

- Sunlight and a spray of water are needed to see a rainbow
- Waves in water make patterns and shadows
- Reflections can be seen in water.

The stimulus poem for these activities is 'Squirting Rainbows', in which the children play in a paddling pool and with a hose pipe on a hot, sunny day. The first of the following three activities can only be carried out in bright sunshine, but the other two activities can be done with a bright torch instead, if necessary.

A rainbow, as illustrated in the book, can be observed on a sunny day through a fine spray of water. To observe a large rainbow for a reasonable length of time, create the finest spray possible with a hose pipe in the playground.

Children can try the same thing using a plant sprayer outdoors, though the rainbow is smaller, and can only be seen for the 1-2 seconds of squirting time.

Ask children to name the different colours they can see. Also ask them what the weather is like when a rainbow is seen in the sky. Discuss the spray of water (or 'rain') and strong sunshine needed to make a rainbow.

The second activity can be done outside on a sunny day, or can be done inside using a tidy tray and a bright torch. The torch should be fixed above the tray of water, so children do not handle it. Ask them what they see on the bottom of the tray, as they ripple the water with their fingers. The waves will create shadows on the bottom of the tray. Children then independently explore the different wave shadows they can make by tapping different shaped objects on the surface of the water. Tapping a ruler lengthways on the surface will result in straight line shadows, whereas dipping the end of a finger will produce circular shadows. Other 3D shapes from the maths equipment can be used, e.g. cubes, cones, etc. The vocabulary of shape is developed in this activity - by using words such as straight, curved, round, cube, cone.

Children can try dipping two objects at the same time (e.g. pencil points or their fingers) and observe what happens when the waves meet each other. They should see that the waves do not keep their smooth shape when they meet, but that the waves interfere with each other and make new patterns.

Children record their observations in drawings or paintings, to show the shapes of the wave shadows produced by different objects.

In an **additional activity** children can observe the effect of prisms on light as, again, rainbows are created.

Resource ideas:

water play tray tidy trays
(light and dark coloured)
plant sprayer hose pipe
(optional) bright torch ruler
3D shapes, e.g. cubes,
cones, etc.



ICE BALLOONS

The ice balloons must be made the day before doing the activity. To fill the balloons, push the balloon over the spout of a tap or watering can and hold in place whilst gently pouring in the water. Fill 4-5 balloons **with differing amounts of water**. Fill 2-3 balloons with coloured water from a watering can. Knot the balloons and leave in a freezer compartment overnight. Cut the balloons away, revealing a smooth, round 'balloon' of ice which is an appealing shape for children to handle and explore. Bring the ice balloons into the classroom immediately prior to putting them in the water. If transferring balloons from a home freezer to a freezer compartment of a school refrigerator, ensure the balloons will fit into the smaller space!

Resource ideas:

balloons water food
colouring water tray or
plastic tank freezer scales

I involved the children
in making the ice balloons so that
they could predict what might happen
to the water.

teacher of 4-5 year olds
Newgate

Key ideas:

- Ice is frozen water and is very cold
- Ice floats on water
- Ice melts in a warm place.

The poem 'Cold' is set on a cold, frosty winter's day, and discussion can initially focus on children's experiences and feelings about cold winter days. The discussion can then move onto the effect of cold weather on water, e.g. icy roads, frozen puddles and ponds, hail stones, and snow.

Tell the children that you have some 'ice balloons' which you are going to put into the water tray. Ask them:

- What do you think ice balloons will be/look like? (then show the children)
- How do you think I made them?
- What do you think will happen when I put them in the water?
- Are they heavy or light? Can we measure their mass?

Safety Note

Children can feel the ice, but must not hold it.

Once the ice balloon preparation has been discussed, and predictions have been made, add the smallest ice balloon to the water. If the children are quiet, they will hear the cracks forming in the ice as it is surrounded by the warmer water. Children will also be able to see these cracks. Before adding each balloon, ask the children what will happen, and particularly whether it will float or sink. By the time the last balloon is added, children may realise that the size or mass of the ice balloon does not determine whether it will float, but that it floats because it is made of ice. Ask children to decide how much of the ice balloon is above the water, and how much is below. They should notice that the majority of the ice is below the water, but the ice is still floating.

Allow the children to independently explore the ice balloons in the water. They can feel the ice by moving their hands over the surface. This will give them an idea of how much colder the ice is than themselves.

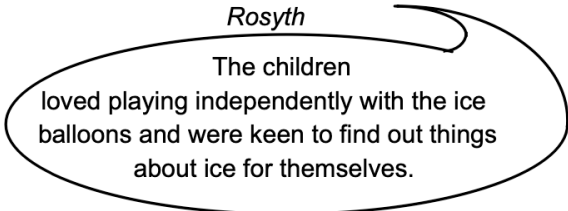
Tell children not to hold the ice, because it is so cold. Relate the temperature of the ice to that of snow - children who have made snowmen or snowballs will realise how cold this is. They can also push or spin the ice balloons, feel the water near to and far away from the ice, try and sink them, add warm water and observe the melting. The water will feel colder close to the ice, as this water has recently melted, and is slowly mixing with the surrounding warmer water. The coloured ice balloons will produce coloured water around the ice, which shows it is melting.

The ice balloons can take 5-45 minutes to melt (depending on their size, the amount of touching, the temperature of the surrounding water, and the amount of warm water added), so each group of children will require a new set of ice balloons, unless this is done as a class activity.

After the exploration, discuss the children's observations. Suitable questions to ask the children are suggested below:

- What did the ice balloon feel like?
- What happens when you touch the ice balloon?
- What was the ice balloon like when you started?
- What was it like when you had finished?
- Were all the ice balloons the same at the start?
- Were all the ice balloons the same when you had finished?
- What will the ice balloons be like after playtime/in the afternoon/tomorrow?

*teacher of 5 year olds
Rosyth*



The children
loved playing independently with the ice
balloons and were keen to find out things
about ice for themselves.

Leave the ice balloons in the water tray until they have fully melted. The discussion can thus draw children's attention to some of the following points:

- The ice feels light in the water (i.e. the ice is being held up by the water)
- The ice feels cold, and melts into water when touched
- The ice melts in the water
- The coloured balloons melt into coloured water, which mixes in with the rest of the water
- Small ice balloons melt more quickly than large ice balloons
- All the ice balloons will eventually melt if left in the water tray.

3. Building and making

These two activities invite children to plan and problem solve as they make structures for different situations.

OBJECTIVES

- To identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, paper and cardboard for particular uses.

An **additional activity** can be carried out in which children **build deck chairs**. Challenge them to make a deck chair in a fixed position. More able children could try making a folding chair. You could also give a limited set of materials to each child or group, or ask the children to make a chair to seat a particular doll or teddy.

Children make the deck chairs using construction kits, lolly sticks or plastic art straws. Displaying a real deck chair in the construction area will allow children to look closely at its structure.

A piece of fabric is attached to the frame, using staples, glue or a needle and thread. Test the deck chairs with the whole class by seating the doll or teddy on each chair to observe the strength and stability. Any folding chairs can be adjusted to observe their effectiveness.

Display the deck chairs in a large tray of sand, along with other beach ware, such as balls, buckets, spades, etc.

Additional Resources

construction kits, such as Mobilo or Lego lolly sticks
plastic art straws PVA glue stapler needle & thread off cuts of fabric doll or teddy deck chair-optional

MARKET STALLS

Key ideas:

- A market stall must be stable
- A market stall must be strong.

The poem 'Feasts' is beautifully illustrated with a market stall heavily laden with all its produce. Discuss the market stall with the children, and the term 'market barrow' used in the poem. Although market barrows are rarely seen today, children may be familiar with wheel barrows, and be able to offer some suggestions about what the market barrows might look like and be used for.

Resource ideas:

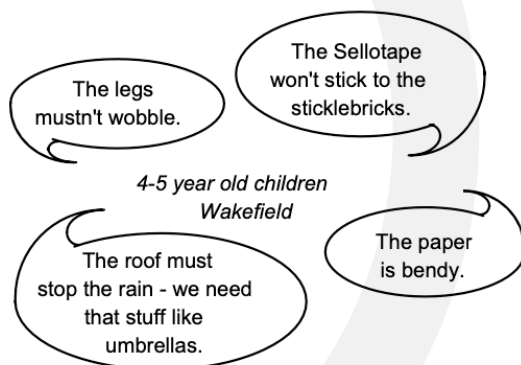
construction kits, such as Mobilo, Lego or Sticklebricks
wheels lolly sticks art straws PVA glue Sellotape off cuts of fabric plastazote plastic bags card (including boxes) plasticine, clay or playdough

Also discuss important properties of a market stall, including:

- Stability of the structure, to prevent the fruit and vegetables rolling off
- Strength of the structure, to hold a large amount of fruit and vegetables
- A roof to keep the market trader and the produce dry
- Wheels to allow the stall to be moved.

*teacher of 7-9 year olds
Shetland*

The stipulation that the chair should fold made this a suitable activity for my class. They quickly realised that making it fold was only part of the problem. How do you make a folding chair stand up?



Children then explore the materials available (which may be limited with younger children), before building their stalls. This exploration can be independent or an adult can be present to develop vocabulary, such as stiff, bendy, strong, weak, wobbly and stable.

Children can draw their ideas for using these materials to build a market stall. Drawings and construction of the market stalls are done individually or in groups.



Once the stalls are finished, discuss ideas for how they can be made stronger or more stable. For example, additional supports for the roof or table section, material added to existing supports to give more strength, or supports added to form triangular sections. The number of suggestions you offer the children will depend on their ability.

The strengthened stalls can be displayed with produce made by the children from plasticine, playdough or clay.




Children of Hawes Down Infant School, West Wickham.




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