How to help children learn

- **Try to see things from their point of view.** Understanding how children see the world will help you to help them as they learn.
- **Let children be children.** A skilled five year old grows from a busy four year old, a curious three year old, a cuddled two year old, an adventurous one year old and a communicative baby.
- **Be a playful companion.** You can enjoy childhood with the children as well.
- **Feelings matter** – both the children's emotions and your own are part of any situation with young children. It is very helpful to be aware of your own moods as well as the children's when enjoying yourself with them and during difficult moments.
- **Don't expect to be perfect.** Everyone does something they don't mean sometimes. Children can be forgiving as long as we are thoughtful most of the time and are ready to say sorry when we should.

Science all around

Jillian Harker

Children's curiosity about the world around them is apparent from the day they are born. Babies quickly use all their senses to explore themselves and their surroundings as they start to make sense of the world. Long before they can talk they will be investigating, asking questions, solving problems and making choices as they eat, play and interact with all the family.

Supporting your children as they learn

Some young children are confident as they investigate the world around them, and may enjoy exploring on their own or with a sister or brother, a friend or an adult. Others need more help and encouragement to take risks in a secure, supportive environment. The ideas in this leaflet are designed to help you provide a range of opportunities for children to find out about the world through first-hand experience, and to build their skills as confident learners. Make time to have conversations with your children while they play. Listen to their ideas and encourage them to talk about what they are doing. Children have their own ideas which may not always be based on scientific reasoning but they are valuable because they make sense to your child at that moment.

Encouraging children to talk about their ideas, and listening carefully to what they say, helps them to develop their creative and thinking skills. It also provides an ideal opportunity to increase their vocabulary. Young children are fascinated by words, and helping them to use the correct 'scientific' words such as 'gears', 'liquid' or 'compost' to describe their ideas will build their knowledge and self-confidence.

Children aged three to five enjoy working by themselves but still appreciate a little help on occasion. This can be a difficult situation to manage – when do you stand back and watch, and when do you step in? Watching children carefully and listening to their conversations (with other people and with themselves) will help you to recognise when they are inviting you to join in and help.

As children become involved in their investigations, they will often concentrate on them for long periods of time. Some of their explorations may continue for days, weeks or even months. At other times, they may wish to come back to an activity again and again, to build on their ideas. Try to prepare for this by keeping anything they have made or collected as part of their investigations, so these can be returned to at a later date.

In order to explore confidently, children need to be curious, open-minded, willing to concentrate and to feel that their ideas are worth investigating. While the world is familiar to you, your children are experiencing its wonder for the first time. Your enthusiasm for finding out about the world will be infectious – and will help them want to learn. Take a look at some of the books on things like liquids, materials, weather, the natural world and technology in the children's section of the library, or at some of the websites at the end of this leaflet. They will help to remind you just how much science is around us all the time and give you an idea of the sort of questions that young children have about the world.

Ideas for exploring together indoors and out

Here are lots of ways for children to learn about the science and technology that is all around them in their everyday lives.

In the kitchen

The kitchen is an ideal place to investigate heating and cooling, melting and dissolving, the properties of materials and simple machines. Here, children also begin to appreciate the dangers of fire, gas and electricity.

- Children can investigate mixing, sifting and sorting by using an assortment of dry ingredients such as rice, flour, dried peas and lentils. Provide some small containers and a range of kitchen utensils with which they can investigate the mixture – sieves, strainers, spoons, tongs and chopsticks work well. Encourage them to sort and separate the mixture in different ways.
- Help children to investigate the different reflections made by shiny surfaces in the kitchen – on pans, spoons, mirror tiles and metal containers. Try turning a spoon over – what happens to your reflection?
- Cornflour is a wonderful substance for exploring texture. Put some cornflour into a bowl or small flat tray. Suggest that children add some water to the cornflour – a little at a time – mix it together and see what happens. Encourage them to put their hands in the 'gloop' and talk about what it feels like when they press it, then what it feels like when they let go. How does the mixture change? Try it yourself.
- Look closely at different fruit and vegetables, outside and inside, and talk about what you both see. Cutting fruit and vegetables open reveals the internal structure and invites a conversation about seeds, pips, leaves and roots. With your help, let children cut open a sprout, apple or onion.
- Let your children investigate objects from the kitchen drawer (do not include sharp objects, of course). Talk with them about the different tools, what they are made of, what they are for and how they work. Cogs and gears in a hand whisk and levers in a garlic press or nutcracker are good examples of simple technology.
- Let children investigate hot and cold, melting and freezing by investigating how water is turned into ice in a freezer. Let them try filling unusual shaped containers with water and then freezing them – balloons work well. What happens when the ice melts? How quickly does it melt?

In the bathroom

The bathroom provides lots of opportunities for investigating hot and cold, wet and dry, floating and sinking, and moving things using water power.

- Put together a collection of old scent bottles, soaps, scented candles, pot pourri and bath salts. Try putting them in a small basket and then encourage children to investigate the different scents and smells.
- Using bubble mixture, liquid soap or bath bubbles is an experience everyone enjoys, though it can get a little messy so choose a suitable place and time – perhaps when children are actually in the bath. Try blowing big piles of bubbles using a straw – what shape are they? Use pipe cleaners or garden wire to make different shaped bubble blowers of different sizes. Can you blow a square bubble?
- Plastic jugs, beakers, funnels and tubing are great fun for investigating water and how it can be moved. Using a short length of plastic tubing to siphon water from one container to another gives children an opportunity to experience some simple aspects of air pressure and vacuums.
- Encourage children to experiment with a range of different objects (wood, plastic, metal, cork, sponge), to find out which things float and which things sink.

In the garden

All around you is a wealth of natural materials – stones, pebbles, leaves, twigs, flowers and seeds, which are fascinating starting points for investigations and explorations.

- Put a layer of straw, bulb compost, sand, small pebbles or shredded paper in a large flat-bottomed container – a potting tray from the garden centre is ideal. Hide various interesting objects in it: polished stones, coins, shells, plastic models of insects, worms or frogs. Provide your children with some scoops or spoons to investigate with alongside using their fingers, and have on hand some simple reference books so they can identify their 'finds'.
- Go on a treasure hunt together – in your garden, along a tree-lined street, in a local park or at the beach. Collect interesting things you find and then bring them home to look at more closely. Encourage your children to sort the collection, look closely at the things they have found – try using a magnifying glass – and describe the different things in words, pictures or other ways that they enjoy.
- Find some suitable picture books and talk to children about plants and seeds. Try growing some cress seeds on damp kitchen paper. Encourage children to take responsibility for making sure the seeds are watered. Check the seeds every day to see how long it takes for the cress to grow. When it is fully grown, make sandwiches together using the cress as part of the filling.

Questions, questions Asking good questions

Asking a question is an easy way to begin a conversation with young children and to find out what they already know. But it takes a lot of thought and practice to ask a good question. Here are some points to help.

- Give children time to think and to answer. Don't fill silences with your own questions and comments.
- Listen to what a child says before asking the next question.
- Good questions, such as 'What do you think…?', are openended and invite children to express their own thoughts and ideas.
- Good questions also pose problems which invite further investigation. You might ask, for example, 'I wonder what would happen if…?' or "How could we…?'

Children's questions

It is not only important for you to ask questions, you also need to encourage children to ask their own questions. To do this,

- provide lots of opportunities for children to ask questions
- value their questions
- show them how you ask questions by thinking out loud yourself and saying things like, 'I wonder how I could make a bigger bubble?', 'I wonder what might be inside this box?' or 'What will happen if I use a different coloured piece of plastic to look through?

Encouraging children to look closely at things and to notice detail are important ways of helping them to develop their ideas. You don't need to know all the answers. It's far better you have fun finding out together.

Science all around

Useful publications

Sally Featherstone, ***Little books at home – 'In our kitchen'; 'In our bathroom'; 'In our garden'***, London: A&C Black

Ros Garrick (2006) ***Minibeasts and more: young children investigating the natural world***, London: Early Education.

Useful websites

Children's museum information and events www.show.me.uk. The National Virtual Museum – information about museums and events in your area: www.24hourmuseum.org.uk.

Useful contacts

All these science museums have galleries for children with many handson activities for everyone to enjoy, though not all have permanent exhibits that are suitable for young children.

at Bristol: www.at-bristol.org.uk
Eureka Museum for Children: www.eureka.org.uk
Glasgow Science Centre: www.gsc.org.uk
Natural History Museum: www.nhm.ac.uk
Science Museum: www.sciencemuseum.org.uk
Techniquest: www.techniquest.org
Thinktank at Millennium Point (Birmingham Science Museum) www.thinktank.ac
Intech Science Centre (Winchester) www.intech-uk.com
Whowhatwherewhenwhy (Belfast) www.w5online.co.uk

Linda Thornton has over 40 years' experience in education with an on-going interest in promoting active learning, exploration and investigation as a way of helping young children make sense of the world around them. Pat Brunton is a microbiologist by training and is the author of a wide range of articles and publications on supporting young children as explorers and inventors.

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Learning together series

The Learning together series of leaflets aims to help parents and other caring adults understand children's development, play an active part in their learning and enjoy the children they spend time with. The leaflets cover a wide range of topics, including life with babies and toddlers, children's behaviour, being outdoors, drawing and writing, reading, maths, ICT and equality – and more. The leaflets can be downloaded from the Early Education website www.early-education.org.uk

Early Education promotes the right of all children to education of the highest quality. It provides support, advice and information on best practice for everyone concerned with the education and care of young children from birth to eight.