

Science, maths, engineering and technology (STEM)

Resource booklet for families



This resource booklet has been designed to accompany the learning from home resources designed for teachers. Each booklet covers a different learning area and is designed to be used by families in the home so they can offer play experiences that will support their child's learning in this area. It also unpacks some of the learning that will happen.

The learning outcome that links to this resource booklet is:

Learning Outcome 4: Children are confident and involved learners

- Children take an active role in projects, recognising the contribution they make to shared experiences.
- Children interact with others to explore ideas.
- Children engage in research to investigate, hypothesise and experiment. They collect and record data in simple ways, and are supported to interpret results.

The learning concepts covered in this resource are:

- Investigating
- Exploring how things work
- Using technology

When children explore materials and investigate how and why changes occur they are developing early scientific understandings. Early scientists use their own research to gain knowledge. They begin by predicting what might happen (hypothesis), then conduct experiments and observe what occurred. The results can then be explained and recorded.

Families are encouraged to investigate and explore play experiences incorporating local Aboriginal history and culture, when and where appropriate.

Investigating

There are many play experiences that can be offered in the home to support children's understandings and extend their learning in a range of ways. These experiences encourage children to engage with science, technology, engineering and mathematics (STEM) and see how these are apparent in many aspects of their lives.

Play experiences

- Making playdough
 - Playdough recipe: www.playdoughrecipe.com/cream-of-tartar-playdough-recipe/
 - Read the recipe together, gather each ingredient and talk about its texture, taste and smell. Think about what might happen when the ingredients are mixed together. What will happen when we add heat?

- What is eating our plants?
 - Research online to see which creatures eat the plant. Imagine the most likely culprit and design an experiment to find out.
 - Develop a theory. “I think it is a slug and we know they leave a trail, so let’s look for evidence”.
 - Record the evidence, such as photos of a slugs trail.
- Making a boat that floats
 - Roll a lump of playdough and put it in a bowl of water. Watch it sink.
 - What could make it float? Gather your child’s ideas and test them.
 - Draw their attention to boats that float and explore ideas of why they float.
 - Keep experimenting and refining the design.
- Making a new colour
 - Gather two small glass jars and fill them with water that is coloured with food dye. For example, yellow and blue. Place an empty jar between the two.
 - Roll up a piece of paper towel into a tube, and place it in the yellow jar, bend it so it is also in the empty jar. Do the same with the blue jar.
 - Sit it somewhere safe and watch what happens over time.

Questions to support your child’s learning

- Tell me what you think.
- What do you think might happen?
- Tell me what it looks like, feels like, sounds like, smells like and tastes like?
- Why do you think that happened?
- I wonder what might happen.
- I wonder why it happened.
- What else could we try?

What will your child learn?

- Learning how to research an idea by making predictions, testing ideas, observing what happens and recording results
- Engaging in scientific approaches to see how things work
- Actively contributing to shared experiences
- Knowing its ok if something doesn’t quite work out, we can celebrate ideas as well as successes
- Being reflective about why things happen and what can be learned from experimenting and trying things out
- Problem solving to extend thinking.

Exploring how things work

There are many play experiences that can be offered in the home to encourage children to explore and investigate.

Play experiences

- Engineering to build a structure:
 - Think about what materials are needed to create a building.
 - Trial different ways to complete the building and keep a record of its progress, challenges and successes.
 - Share a picture of your finished building with others.
- Explore the many uses for playdough. For example:
 - Make bricks and build with it
 - Sculpture (what happens when it dries in the sun)
 - Combine with raw spaghetti and try to make tall building
 - Let it dry, and experiment with adding water to make it pliable again. Does it work?
 - Add food colour, scents, textures
 - Make a scene for plastic figurines
 - Make a chair for a doll.

- Boats that float:
 - Collect items from around the house and yard that your child thinks will float.
 - Place them in a tub of water and see if your child's predictions were right.
 - Explore ways to propel your boats forward in the water.
 - Try blowing them with your mouth and then with a straw. What works best?
 - Try fanning them.
 - What else can make them go forward?

Questions to support your child's learning

- How else can you do it?
- Tell me how you did that?
- Why do you think . . . ?
- What could you do to make it stronger? More stable? Look more beautiful?
- Where else might we find that?
- How do you think that will work?
- How could we use that?

What will your child learn?

- Ways to problem solve and plan
- Interact with others to explore ideas
- Developing confidence to imagine and develop new ideas and possibilities.

Using technology

Play experiences

- Use a camera, phone or ipad to take photos of the steps in the project and the finished result.
- Keep a learning journal or investigations scrap book, with large enough pages for your child to contribute their own drawings, writings, artwork or collections of images.
- Write down your child's ideas as they are spoken and keep a record of the discoveries you are both making. These can be written down, typed out or recorded as audio on a device.
- Magazines, brochures or catalogues may be used to add images by cutting and pasting.
- Find and print images from the internet to illustrate your learning.
- Provide your child with a variety of writing and drawing implements so they can add their own writing, drawing or images. Celebrate their attempts.
- Give your child the confidence to write symbols of their own to represent writing and ask your child to read it to you.
- Make a book about one of the projects and read it to others. Try making an e-book using a book making app.

Questions to support your child's learning

- How do you think we can show other people what we have learnt?
- Let's think about what we have to record your learning. Would you like to use . . . ? (For example: the computer/printer, the ipad, a smartphone, a camera)
- What would you like to do? A drawing? Artwork? Some writing? Find some images on the internet? Let me help you.
- Can you describe your drawing to me?
- What did you write there? Can you please read it to me? Would you like me to type it out? Would you like to try typing this word?
- What would you like me to write under this picture?

What will your child learn?

- That there are a variety of ways to communicate with others.
- That texts have meaning.
- We can create different ways to organise, record and communicate ideas and concepts.