Tales of discovery

How better to bring science into your setting than with your children's favourite storybooks, say **Jennifer** and **Steve Smyth**...

Once upon a time, a group of practitioners asked whether it was possible to link science and literacy. "Why, yes," came the reply. "It was a dark and stormy night..."

"How can we make it dark?"

"We can turn out the lights"

"Or make a space behind some chairs and put a curtain over the top."

"How can we make a storm?"

"We need some wind."

"We could all blow together."

"We need more wind than that."

"Here's a big piece of cardboard. If we move that up and down, it will make a wind."

"How does that work?"

"It makes all the air in the room move. When the air moves we feel it as wind."

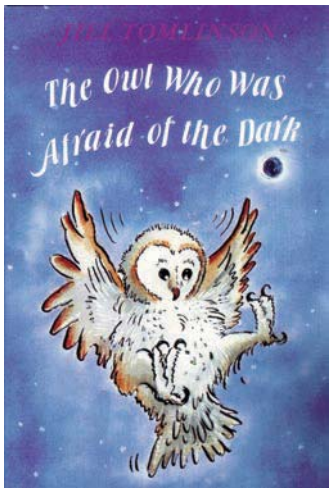
"We need some rain as well."

"Let's screw up some kitchen foil and drop the pieces on to a metal plate. That will sound like rain."

"And thunder?"

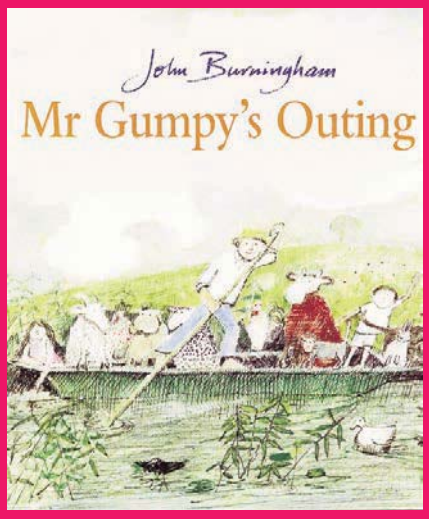
"We need a drum to bang!"

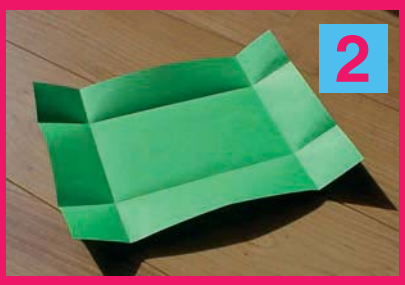
Okay, so not many stories for early years children actually use the dark and stormy night cliché. But many of the stories we tell are wonderful starting points for science investigations, because they describe phenomena that children are familiar with. Stories can give contexts to investigations that make the science come alive. Here are a few of our favourites...

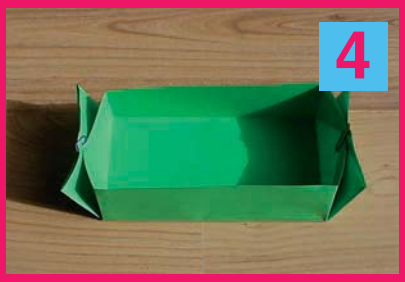


Light fantastic!

The idea of investigating darkness is suggested by two familiar storybooks, *Can't You Sleep Little Bear?* by Martin Wadell (Walker Books) and *The Owl Who Was Afraid of the Dark* by Jill Tomlinson (Egmont). Both suggest investigations where children find out about illuminating dark spaces. In such investigations children have traditionally tried torches and battery-operated lanterns of varying sizes. In the last few years battery operated lights have been supplemented by cheap wind-up torches, which can be bought for as little as £2 each. These latter provide light depending on how much they are wound up (some are squeezed), so giving some interesting further investigations. How long does the light last if you wind the handle five times? How many times must you turn the handle to give 10 minutes' light?







Take to the water

Mr Gumpy's Outing by John Burningham (Red Fox) is a well-known book providing a context for early investigations. Mr Gumpy's generosity in offering lots of animals a ride in his boat brings about the inevitable disaster of a sinking. So let's away to the water table and see what could have been done to help. We can sink some of the small boats that exist for water play. Or, even more scientific, we can make our own. The method we use for making paper boats is shown in the pictures here.

You can hold the corners with sellotape or a paper-clip, then, when your boat is floating on the water, you can add passengers. Younger children could just add toy animals, or you could use animals made from plasticene. Alternatively, try marbles – as the marbles are all of uniform size, just counting them will give an indication of how much weight it takes to sink the boat. (You'll probably be as amazed as the children at how many marbles one sheet of A4 paper can hold – around about 100, depending on the type of paper and which way it is folded!)

Perhaps the children can suggest to Mr Gumpy some higher sides for his boat. Or some of the other things they discover from their investigation.

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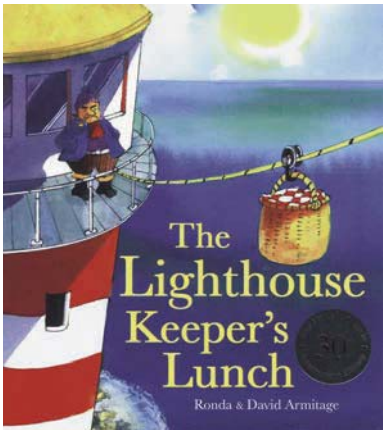

Seagull science

My favourite book for linking with science is *The Lighthouse Keeper's Lunch* by David and Ronda Armitage (Scholastic). There are a huge number of contexts for science within the story, and the story itself is an illustration of how science works. For the unitiated, Mr Grinling is a lighthouse keeper, working in a lighthouse just off shore. He and his wife live in a cottage, which is connected to the lighthouse by a wire. Each day Mrs Grinling sends lunch out to the lighthouse using a pulley connected to the wire.

Problems arise when seagulls realise how tasty the food being sent to the lighthouse is, and the story unfolds as an exercise in problem-solving. Mrs Grinling comes up with a succession of ideas (hypotheses) which are tested on successive days. The first two ideas are not successful (helping children to realise that science is about trying ideas, and that not every idea will work), but eventually she succeeds. (Another excellent touch to the story is that it is the female character who comes up with the ideas – it's never too early to start counteracting societal stereotypes of science and technology being male domains!)

When we have used the book as a starting point for science, we've looked at five areas:

- Making a lighthouse with a light that flashes.
- Making a ship that moves across the seascape.
- Making a buzzer for the ship, allowing it to 'toot' to Mr. Grinling.
- Making a pulley system to communicate

findoutmore

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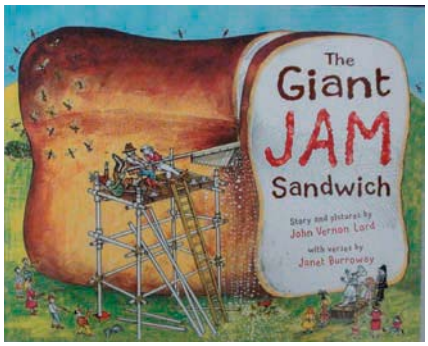
between the cottage and the lighthouse.

- **Making a gull with flapping wings.**

The wings and the buzzer, are mentioned elsewhere, so let's look at the others. Firstly, the base, which could just be a piece of card painted blue. Or, if you can get hold of some corriflute (a plastic that looks and behaves like cardboard), grab some blue pieces for the sea, and glue on smaller brown pieces to represent rocks. For a ship, make a paper boat and fix paper clips or fasteners at the bottom. Then use a magnet underneath your 'sea' to move the boat about – you can get ceramic magnets which are smaller and more powerful than traditional metal horseshoes, and children can sellotape them onto a stick so that they can move their boat from a distance. One nice further investigation is to find out through how many layers of card or corriflute the magnet can still influence the boat.

To make the flashing light you will need to make an electric circuit, with a battery, bulb and three wires connecting them all. Switching the circuit on and off will make the light flash.

Finally, to make the pulley system, you will need two pulley wheels that can rotate on a piece of dowel, with a loop of string running around both. Get two children to each hold a dowel and walk backwards until the string is tight. Pulling the string will cause the loop to move across the gap between the children – so you can tie a toy basket to the string to move it from cottage to lighthouse and back.



A real buzz

The Giant Jam Sandwich by John Vernon Lord and Janet Burroway (Macmillan Children's Books) is full of possibilities for scientific investigations. Making some delicious, wasp-attracting strawberry jam offers a wonderfully messy prospect with paints and glue. Building four million wasps is a daunting task, but a few representatives can be made, with wings of card that flap as suggested in our earlier discussion on wind. And that flapping makes a buzzing sound – reproducible with a comb and tissue paper.

Alternatively, you could try a battery-powered buzzer. Two batteries inserted in a plastic holder will power such a buzzer – the wires only need to be touched to the round terminals on the battery holder, giving a very simple electrical circuit. This will give a very satisfactory hum (but be warned – three or four going at once can drive even the calmest staff member to distraction!).

Perhaps the most interesting context from *The Giant Jam Sandwich*, though, is to build a vehicle to move the gigantic load. Obviously you can adapt toys, but you could also build something from cardboard boxes – in which case, the following technique may also be useful:

- **Collect some plastic wheels with 4mm holes, and some round dowel of 4mm diameter.**
- **Put the dowel through a jumbo drinking straw, then push the wheels onto the dowel.**
- **Once the wheels are in place you can then sellotape the straws onto the underside of a piece of cardboard or corriflute.**

If you cut the cardboard base and the wooden dowel beforehand, even very young children can assemble such vehicles, given a little help with the sellotape. They can then load their carts with wooden bricks and see how well they move. Or, you can compare the carts by seeing how far they go when they run down different slopes.

The resource trolley

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