

Figure 1 Linking number and science in the context of the bugs from Mr Twit's beard!



Emma Vanstone offers engaging activities and links with key stage 1 and early years maths and science – enjoy supporting learning in both subjects with these inspiring activities



Cornflour gloop and fizzy potions

... making counting count!

As a parent who is passionate about finding new and exciting ways to inspire children in STEM subjects (science, technology, engineering and mathematics), I am also always searching for ideas to link science to maths and English in my investigations at home and with children in the classroom. Children find science-based activities so engaging that it seems a shame not to capture that enthusiasm and use it to inspire other areas of the curriculum.

Science investigations often have a natural key stage 1 (ages 5–7) maths element, such as measuring the volume of liquids, recording times or measuring distances travelled. These can easily be extended by collecting class data, analysing it and considering whether to display results using a table, graph or both.

Consider a very simple investigation of a car racing down a ramp. Children can first think about how they will measure the distance travelled. Will they use a ruler? What size ruler? Would using non-standard measuring tools such as hand span or Duplo® blocks work? Once the data are collected, children can compare results and calculate the difference made by changing inclines or cars, thus linking their maths to a real-life situation and giving it purpose.

More examples of maths for science

Writing numbers

Make number-writing practice more fun by adding a simple science and sensory angle.

Fill a sealable sandwich bag with hair gel or cornflour gloop. Children

can draw numbers using their fingers. If extra guidance is needed a sheet with printed numbers can be placed under the bag and the number traced.

Freeze a sheet of ice and ask children to paint numbers on the ice, once one child has finished the paint can be wiped off and the ice used for the next child.

Numbers can be written on filter paper with felt tips and then water dropped onto the filter paper using a pipette, allowing children to watch as the colours spread through the paper. These can then be left to dry and used to make butterflies or for other crafts.

Identify one more and one less

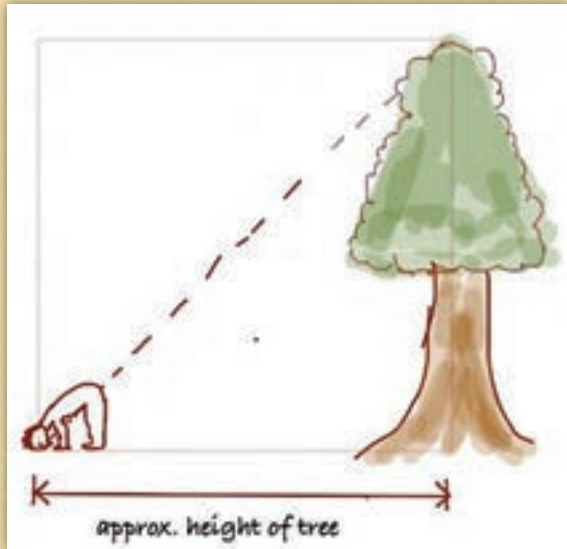
Use the slime bags again for this one, but add 10 small items (plastic bugs, coins, etc.) and a masking tape line down the centre (Figure 1). Children

Key words: ■ Engagement ■ Enquiry skills ■ Types of activity



Figure 2 Dissecting a flower as a prelude to multiplication

Figure 3 Measuring the height of a tree



can squish the bag to move the items around so there is one more on one side than the other. This is also great for reinforcing number bonds to 10.

Number – multiplication and division

Dissect flowers and, after identifying the component parts, use the petals to make arrays as a wonderful visual and sweet-smelling demonstration of multiplication (Figure 2).

Measurement

Find the height of a tree by bending over and looking through your legs. Move forward until you can see the top of the tree; the distance you are from the tree is the height of the tree (Figure 3)!

Another fun activity is to measure arm span and then work out if it is equal to your height.

Make an easy lollystick catapult and record the distance a ping-pong ball travels (Figure 4).

Compare using different-sized catapults, different size and weight balls or using more or less force. Children can use a tape measure, ruler or non-standard objects such as Duplo® or

Lego® blocks to measure the distance the balls travel.

Measurement – time

A teddy zip-wire is a great fun activity that can also be used to measure time. Children can compare the speed at which different size and weight teddies or small figures descend a zip-wire. This can be extended to compare the effect of different inclines on the speed.

Another fun investigation is to time how long the colour takes to dissolve into water from coloured sweets (e.g. Skittles, Figure 5), how long a paper spinner takes to reach the ground, or how long hard-boiled eggs covered in different materials take to roll down the same-length ramp (Figure 6).

Properties of shapes

A brilliant way to introduce 3D shapes to children is to create paper columns in triangle, square and circle shapes and then test their strength by adding books or other items to the top to see which is the strongest. This activity also gives the opportunity to weigh the items and record how much weight each paper column can hold before collapsing.

Measurement – capacity and volume

Making a fizzy potion using baking soda, washing up liquid, food colouring and vinegar is a great way to get children to follow instructions and measure the volume of liquid accurately in a fun and hands-on manner (Figure 7).

A density jar or lava lamp also makes a great introduction to capacity and volume. Different-sized containers can be used to demonstrate visually to children that the same volume of liquid looks different depending on the container it is in. They can

also be used to demonstrate simple fractions: fill a jar with half water and half oil to demonstrate halves, or use water, oil, golden syrup and treacle to demonstrate quarters.

Link with weather by making a simple rain gauge and recording the amount of rainfall collected over a period of time.

Drawing a scale on the side of the gauge is great for reinforcing place value too. Results recorded over time could be linked to seasonal changes in weather and displayed in table format.



Figure 4 Lots of measurement involved in making and using lollystick catapults



Figure 5 Timing how long it takes the colour to dissolve from Skittles sweets



Figure 6 Measuring and recording how long hard-boiled eggs covered in different materials take to roll down a ramp



Figure 7 Making a fizzy potion to learn about volume

Statistics

Sort through small items to test whether they are, for example, magnetic or non-magnetic, waterproof,

absorbent, and so on, and use the results to create a simple table, Carroll diagram or pictogram based on the properties of the materials sorted.

Symmetry

Baking biscuits provides great weighing and measuring practice; the biscuits could then be decorated so they are symmetrical. Symmetry can also be found in nature: ask children to look at flowers, leaves and insects to search for symmetry.

Position and direction

A treasure hunt is a good way to learn about position and direction. Secret messages and instructions could be written using lemon or lime juice or a white crayon, and different concentrations of tea or coffee to 'age' white paper for drawing maps (Figure 8).

Conclusion

Overall, the links between science and maths are there to be explored and just need some teasing out. The impact of undertaking practical work as a means of underpinning learning in both areas deepens understanding and allows



Figure 8 Writing secret messages and ageing paper for a treasure hunt

for independent exploration around the topic, offering the opportunity to challenge more able children and reinforce new ideas for those who need more support.

Emma Vanstone is the author of Science Sparks (www.science-sparks.com), a website full of creative science activity ideas to carry out at home and in school.
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