ISSUE 03 SUMMER 2018

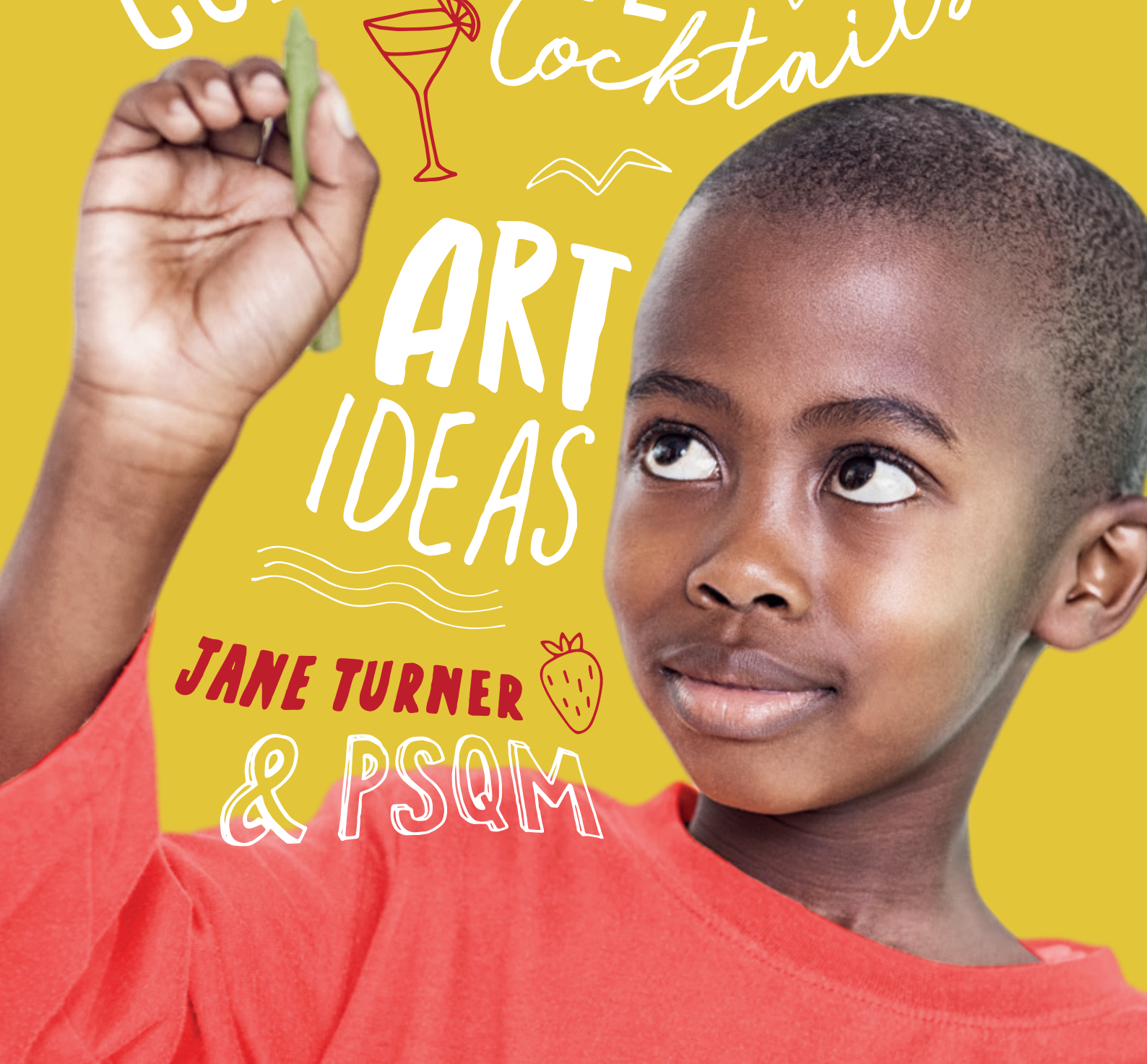
CLEAPSS

EXPLORE

SCIENCE, D&T AND ART

COLOURFUL Cocktails

ART IDEAS



JANE TURNER & PSQM

CLEAPSS COMMENT

Summer is here and with it comes a season full of colours, fun, and opportunities for exciting practical work.

We love the summer as the sunny days put us in the mood for exploring new practical activities to share with you. In this issue of EXPLORE we have focussed on colour, a topic that always engages children. This term's teaching idea is a multi-coloured activity using household liquids. Our Doing Things Safely article, which is about primary-secondary transition activities also includes some colourful ideas.

In our centre spread, Jane Turner talks about Primary Science Quality Mark. She explains how this professional development science leadership programme works, and how you and your school would benefit from getting involved.

Our art article explains how to use a colour wheel to better understand complementary and harmonising colours, along with some ideas about how to use one.

It's not too late to take part in our **No more cabbage!** competition which encourages your children to research, test and trial natural products in our epic search for a better indicator, yet more colour! The deadline for entering is Monday 16th July 2018, so why not give it a go?

Don't forget, your new log-in details were in the last issue of EXPLORE (Issue 2 Spring 2018), if you can't find it ask your Science Leader about your school's copy or just give us a call.

Finally, we will be delivering a workshop at the ASE South-East Region Conference, University of Surrey, Guildford on Wednesday 20th June 2018. Then later in the year we have a specialist primary CPD course running in Southampton on Wednesday 14th November (search **courses** for full details).

As always don't forget you can call us on the Helpline **01895 251496** or email us via **primary@cleapss.org.uk**

Enjoy the sun and don't forget to put on sun cream, search **UV beads** on our website for a great practical to remind your children about sun safety.

Dave

Design & Technology and art adviser at CLEAPSS

RAINBOW Cocktails

OVERVIEW

Prepare different liquids to be tested including coloured water, baby oil, glycerine, washing up liquids, sunflower oil.

Children use 5ml syringes to carefully run the liquids down the side of a plastic 'martini style' glass.

Summer is here and what better way to relax after a hard week than by enjoying a colourful cocktail or mocktail (non alcoholic) in the sun.

But why do those layers settle in different places? Can you just put a selection of different coloured liquids in a glass and make a layered cocktail?

Our new, colourful **Density cocktail** activity provides the ideal context for your children to explore what happens when different liquids are carefully poured onto each other. It will also help your children develop their manipulative skills i.e. the precise use of a syringe and practise of observation skills. Note, this activity is not suitable for drinking!

Density is the reason materials sink or float. Density is the amount of substance packed into a certain volume (space). Materials, including liquids, that are more dense e.g. glycerine will sink below liquids that are less dense. If you have a variety of liquids with different densities, the least dense material will float on top. In our example this is the baby oil. Once they have syringed all the liquids in to their martini glass your children will see that the liquid layers rest at different levels depending on their density.

Children could extend this activity by exploring different liquids or by adding small pieces of various solids.

For full details search **Density cocktail.** An alternative activity to introduce density or for younger children is **Floating liquids.** To find either, simply search **density.**

Having explored the science of density, why not extend the activity at the end of term to make real mocktails to taste? You will need: clear colourless disposable cups, small ice cubes, 2-3 non-alcoholic juices/syrups that have different sugar contents for example, grenadine syrup, orange juice, pineapple juice, lemonade or water, a dessert spoon and a straw.
Put the ice in the cup and pour a small amount of the liquid with the highest sugar content (look on the packaging) into the cup (grenadine works well). Slowly pour a liquid with a lower sugar content (e.g. orange or pineapple juice) over the back of a spoon into the cup, repeat with either water or lemonade. Add a straw and enjoy!

If you want to know what ASK

Jane Turner is Director of PSQM and a passionate advocate for knowledgeable, aspirational and reflective teachers of primary science!

Have you come across the term 'elevator pitch'? It's business talk for a short explanation of an idea that can be understood in the time it takes to travel between floors in a high-rise building. This is my elevator pitch for the Primary Science Quality Mark (PSQM).

PSQM – great science teaching and learning led by knowledgeable, aspirational and reflective primary teachers!

Underpinning the PSQM programme is a very simple idea: primary teachers know what high quality science teaching and learning look like.

PSQM is a highly successful, unique award programme to develop and celebrate the profile of science teaching, learning and leadership in primary schools. Science leaders join a local PSQM hub where they gain invaluable professional development for science leadership and are supported to achieve the PSQM award, PSQM Gilt award or PSQM Outreach award for their schools.

In every school that has gained a PSQM award, (over 3000 so far) teachers have sat together and talked about what makes great science teaching and learning. They've thought about the lessons that have gone well, the ones where children's questions have sparked skilled investigative activity, where children were so absorbed that they didn't want to go out to play, and where children made a significant personal step in understanding a phenomena or concept.

Teachers have shared memories about the parents who have come into school to tell them that Anna has talked all weekend about what she found out about ice last Friday, or that Mustafa insisted the whole family spent the weekend counting the birds that visited their garden.

PSQM is a developmental accreditation programme enabling primary schools in the UK to improve science education through effective science leadership and supported school self–evaluation. Find out more at www.psqm.org.uk

makes great primary science: A TEACHER!

Teachers have talked about articles they have read about science projects in other schools that they'd like to emulate, reminisced about strategies they learnt when training, and compared experiences of field trips and outdoor learning.

PSQM teachers are also remarkably candid about when science lessons haven't been so great: The ones that were repeats of previous years "Why are we planting cress again Miss?" Or where so much time was spent on planning the fair test that no one had time to find anything out. The lessons where there was not enough equipment for everyone to have a go, or it was faulty "the batteries are always flat Sir", "these magnets don't work".

What would be on your list of features of a good science lesson? I am confident that you'll have lots of ideas, and that if you had the time to research where they came from, and trust me, I have, you'd find that they were backed by good research evidence suggesting they were likely to improve science learning.

And once you've gathered a list, you'll have your elevator pitch for great science in your school! That's just what you need to shape your Science Action Plan:

- **Does the scheme of work reflect the features you agreed?**
- **What CPD would help less confident or experienced colleagues?**
- **Is the outdoor space accessible for science lessons?**
- **How are parents involved?**
- **Do you have enough of the right equipment to teach great lessons?**

Teachers in PSQM schools report that developing a shared set of principles for science teaching and learning is an extremely powerful tool for leading change, and PSQM awards displayed by successful PSQM schools are certainly great evidence of that.

'PSQM is the reason so many of us learnt how to be a science leader and PSQM signposted us to the amazing community of support that exists in primary science... Best CPD I ever did...' *Claire Seeley Jan 2018*

So, go on, have a go. What's your science elevator pitch?

Research carried out at the University of Hertfordshire is showing what is understood by good science learning, teaching and leadership in primary school, for those involved in PSQM.

See more at www.go.herts.ac.uk/primaryscienceresearch

KEEP THE BUNSENS in the CUPBOARD!

Transition is a great opportunity to collaborate with your secondary colleagues. To find out how, read on....

Transition and outreach days can be very exciting but often secondary science teachers feel under pressure to wow your children with big bangs and chemical reactions. We've no problem with this type of theatre but for transition it's neither appropriate nor necessary.

It's the science teacher's ability to help children understand the nature of science, rather than just scientific knowledge, which you and your children need to exploit e.g. scientific processes, problem solving or generating and testing ideas. Our CLEAPSS primary website has a number of teaching ideas and transition activities that are safe, trialled, age appropriate and perfect to use with primary aged children. Search **transition** or browse the Teaching Ideas section for inspiration. Also, see pg. 8 for some ideas about how you could use our activities to study the nature of science.

Alternatively online you will find a variety of suitable, ready-made, primary focussed, open-ended/challenge activities. For instance, Practical Action challenges (https://practicalaction.org/stem) are free, child-led and use equipment familiar to primary children.

We would also encourage you to read Carole Kenrick's (Ogden Trust) excellent article in School Science Review (ASE) Vol 99 No 367. She explains how she inspired KS2 children to wonder about science with the aid of little more than toilet roll tubes (and no, they are not banned).

Secondary science teachers will often have limited experience of primary aged children. They may not appreciate how the children's strength, dexterity, clumsiness, lack of awareness of their surroundings and other people will impact on their ability to use scientific equipment safely.

At the same time, your children are likely to be oblivious to common science hazards. Even more reason to avoid activities that require hazardous chemicals, complex methods and unfamiliar equipment like Bunsen burners. Finally, how big are your children? Lab benches and stools might just be too high for them.

Top tips to help your secondary colleagues on a transition day:

- **Reassure them that your children do not need 'whizz-bang' science to be engaged and motivated.**
- **Explain that you want your children to explore the nature of science.**
- **Offer examples of the sort of thing you think your children would benefit from.**
- **Explain the limits of your children's experience and abilities.**

Help your fellow teachers out, tell them you'd rather they save the Bunsen burners and knowledge for when your children come to them for real.

TURN YOUR HAND to COLOUR

Colour is fundamentally important to how we see, think and feel and yet the effect of its presence, or absence, can so easily be overlooked and underestimated.

The primary colours are red, yellow and blue. These can't be made by mixing other colours, but we can mix them in different ways to make any other colour we see. Mixing two primary colours together makes a secondary colour.

A colour wheel is a tool that includes both primary and secondary colours. It is designed to help you use colours effectively. Colours close to each other on the colour wheel are called harmonising colours, and are often put together as 'matching', colours. You can see this in, for example, home or workplace decoration and car interiors.

Colours opposite each other on the wheel are called complementary or contrasting colours. Using complementary colours next to each other makes each colour look brighter. Hence, complementary colours are used to make things stand out, e.g. signage, and for identifying items such as switches or controls.

Warm colours are colours on the red side of the wheel, for example, red, orange, yellow and brown. Cool colours are colours on the blue side of the wheel, for example, blue, green and violet. Black and white do not appear on the colour wheel, as white is a mixture of all colours and black is the absence of colour.

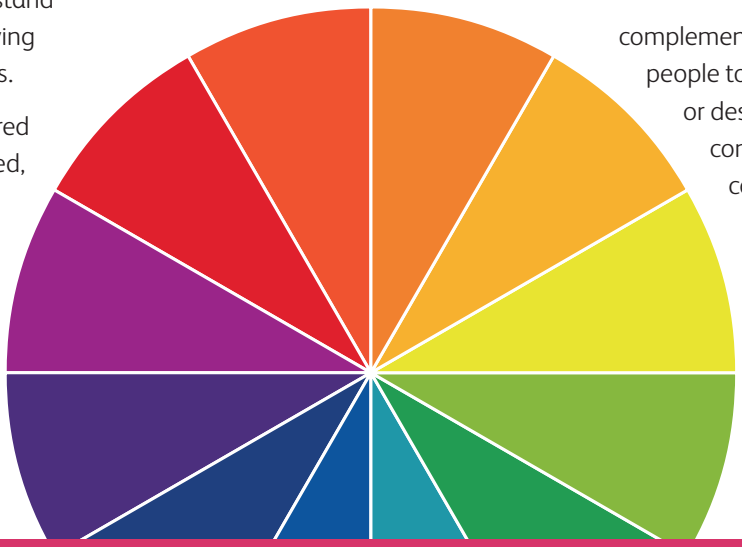
How could you use a colour wheel?

Draw a portrait or still life using just two complimentary colours for example red and green or blue and orange, etc. In these examples of children's self-portraits you can see that using complementary colours next to one another makes each colour appear brighter.

Thank you to Freddie, Millie and Abi from St Paulinus Primary School for allowing us to use their work.

In their portraits the children have coloured some areas lightly and in other areas, pressed hard on the crayon. The use of heavily coloured lines in the hair adds texture, adding a pattern to a shirt or background makes the portraits more interesting.

Other uses for a colour wheel include designing a clock face that uses complementary colours to enable people to read the time easily, or designing a sports kit using complementary or harmonising colours. Which kit do your children think looks best and why? Are they being influenced by something other than the colours?



Search **colour wheel** for more advice about using colour.

On page 6 we highlighted transition/outreach as an opportunity to learn about the nature of science and to encourage observation and problem-solving skills.

The following activities are ideal for use both in your primary classroom or on a transition visit.

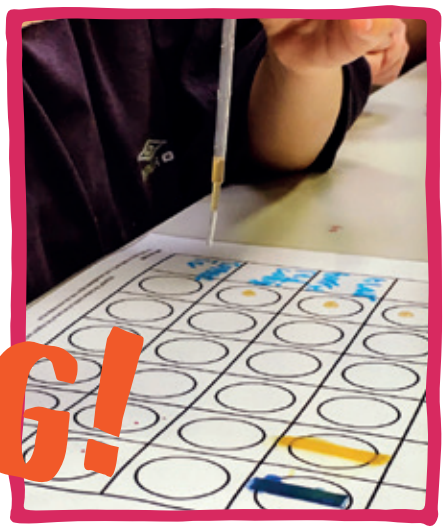
In **Testing food samples,** children are given a variety of different foods e.g. plant-based, dairy, meat and they observe what happens when they add a few drops of dilute iodine solution. In our activity, the concentration of iodine used is low enough that the children don't need eye protection. Do they notice any colour changes? Are they able to see any pattern? If so, what might be the reason? How could they test any theories they make? Encourage the children to think and problem-solve rather than telling them how to test for a food group.

For full details of our trialled method, search **Testing food samples.**

Investigating indicators is also well-suited to transition as it won't be long before your children are in secondary, studying acids and alkalis. Rather than using the activity to teach knowledge, consider using it to encourage wonder. You could allow the children to carry out the practical and see what they make of the results. What might they put the colour changes down to? What would they do next? And why? What else might they like to test? How about a selection of household products e.g. toothpaste, shampoo, sherbet dip etc?

You could use this as an introduction to our competition **No more cabbage!** as they may decide to look at a variety of natural substances to see what else makes a good indicator.

An essential part of any enquiry concerned with the nature of science, is making the time to focus on the doing and thinking. So, remember to include moments of reflection about why they have chosen to work in a certain way and why or how they've come to any conclusions, just like real scientists do.



Let's get DOING AND THINKING!