

Experimenting With Storytelling *Report for the Biochemical Society*



'Making Butter'



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Introduction

Between January and April 2015, 12 workshops were run at four primary schools in East London and Northamptonshire, with the support of a Biochemical Society Outreach Grant.

The aim of these workshops was for primary school aged children (Key Stage 2 - aged 7-11), teachers and their parents to take part in after-school science sessions that brought together hands-on practical activities ('Experimenting') with a linked story ('Storytelling'). A few introductory PowerPoint slides with animated .gifs, visuals and media clips were also used.

The idea came about following my previous 'Pocket Money Science' afterschool science clubs in East London where cheap household materials were used to demonstrate topics in science. Whilst many such experiments are available online it seems that children, teachers and parents still find it difficult to access these, especially with English as a second language and to allocate enough time to peruse these sites. The chosen activities were led by the children's interests and mainly centred around biology and chemistry. With various research studies (ASPIRES) suggesting the need for 'science capital' and promotion of diverse, attainable role models, it seems there is a place for greater engagement at primary level, support for primary teachers and parents who may wish to support their STEM-interested children, but feel they cannot.

Within most primary schools around the country there are children from many different backgrounds, with some counting as many as 25 different languages being spoken by their pupils. For this reason it is important to promote cultural diversity (through the stories chosen and links to food and culture) and use examples that resonate with young people coming from such diverse backgrounds. Stories appeal to everyone, and ensured that anyone could take part; no previous experience necessary.

At a primary level, the children had little idea about what biochemistry was about, so after a short introduction to the world of biochemistry, who I was and how I like looking for science in places where we wouldn't usually think there was any...like in stories and folk tales, we kicked off with a short story which then led on nicely to a practical 'experiment' linked to that story.

It was good to see parents encouraging their children to ask questions and that they enjoyed working with their children in a practical setting. Some of them appreciated the moral values in the story. Others who were a little wary

of science soon felt at ease in the sessions and wanted to ask questions themselves.

Brief Session Descriptions

There were take-home elements in each activity, as the materials act as prompts for the children and parents to remember how to carry it out again in future, and to describe the activities to other family members. Some children didn't want to take items home with them, whereas others scooped up everything!

All activities are available as downloadable .pdfs from: <http://tinyurl.com/ExptWStory>. Only summaries of the stories are given, as a guideline. Personally I feel stories should be performed to be maximally engaging rather than being read out to children.

For further information, risk assessments and materials guidance please contact me on scienceclubs@saipathmanathan.com.



'Making Volcanoes'

Activity 1: Butter

Making Butter: Attendees made a small amount of butter that they could taste too (on a cracker), whilst listening to the Russian folktale about the Two Frogs who accidentally churned cream to make butter.

Activity 2: Volcano

Erupting Volcanoes: Attendees heard the stories about Pele, The Goddess of Fire, thought to live in the volcanoes of Hawaii. Her movements follow the geological timeline of the volcanic island formations. All participants had the chance to make their own mini cone volcano too.

Activity 3: Displacement

Displacement of Water: Attendees listened to the Aesop's Fable about a crow's inventiveness to make water in a pitcher rise, and about Archimedes' 'Eureka!' moment. They tried out the water level experiment and noticed how the level of water displacement related to the volume of the object displacing the water.



'Displacement of Water'

Activity 3 was a little more exploratory, as in one school I was working with just Year 5s and 6s and their parents. This gave them an opportunity to use the various objects and think about volume, density, floating and sinking.

This activity also led onto a few demonstrations that were passed around and tried out, where dyed water was poured over the denser, clear salt solution and the chance for attendees to play with 'cornflour slime' to watch it compress when tapped (i.e. unlike water).

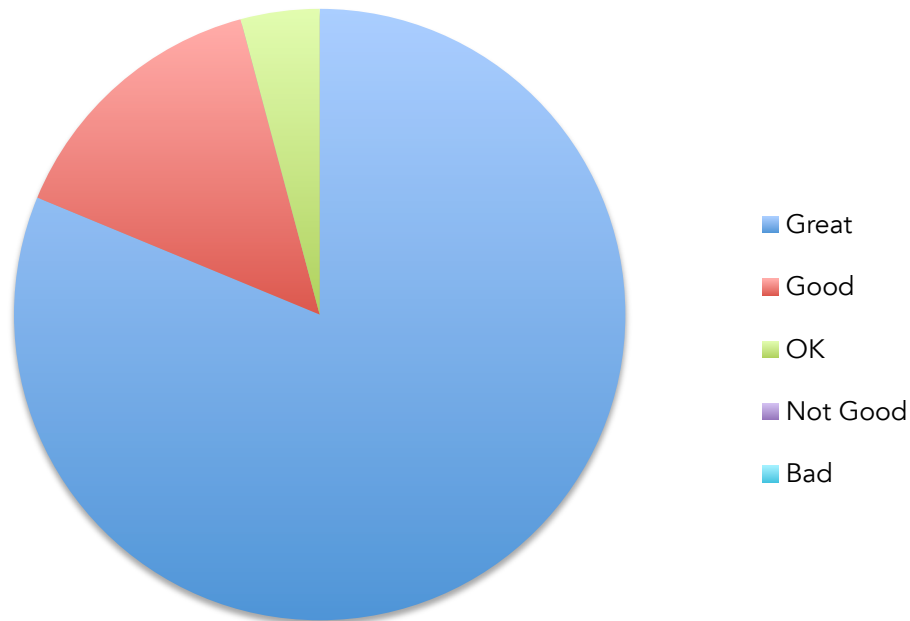


'Salt water density'

Feedback

During the sessions, parents were asked to fill out a form giving feedback. 144 forms were returned, and a selection of responses to each question is given below, with original spellings and punctuation retained:

Question 1: What did you think of the activity?



Question 2: Do you think your child enjoyed the activity? Why?

'Fun' and 'hands-on/messy' featured a lot in the feedback, and the butter activity went down particularly well as it produced a result that was edible.

Yes - liked to see the results (and eat the cracker and butter!)

Yes. It's important for children to understand how things work.

Yes, because they had fun! and they learn something new!

My child enjoyed the activity because he loves stories and science - the combination is good.

Yes, certainly wasn't expecting the cornflour to behave like that.

We enjoyed the activity because we realised making (a small amount) butter was quite a simple process. seeing the change and tasting (!!) the end result was excellent.

Yes. Enjoyed getting messy.

Yes: Because they became scientist during the activities.

Yes I think she enjoyed turning cream into butter it was a new experience, I think we will enjoy doing it at home.

My children really enjoyed the activity it kept them well engaged and they wanted to do more.

Yes - talked about what happened when he put things in the water.

Question 3: Did you (and your child) like the **storytelling** in the session? What did you like/not like about it?

Yes, He found the volcano Goddess story very interesting.

She said I like the frog they didnt give up so I try not to give up.

Yes, story of Archimedes was interesting, and how the crow is very clever.

Yes but she found it a bit boring.

The story related well to experiment.

Yes - learned some good facts and involving. Could've been a bit longer?

My son loved hearing about the legend of volcanoes.

Was very captivating and made sense to the Topic of the experiment.

I enjoyed the science and the folklore behind it. Also tells a moral story.

yes we liked it. The story about the frogs help you to remember

It is a fun way to explain what we are going to do.

Yes, related well to topic, relevant + interesting.

Liked the story and it was one I had never heard before.

Yes very well thought out

Loved it - took me back to my childhood - a new one for my son.

Yes, relevant to activities and encouraged discussion

YES - it made it easier to relate it to science

Yes, interesting how the crow figured out how to make the water rise.

Question 4: When was the last time you and your child took part in an activity like this? Was it a science activity?

Most of the attendees hadn't taken part in any joint activities (science-based or otherwise) with their children before. Very few mentioned museums, scouts or other non-school events/organisations. Naturally, in subsequent weeks some mentioned the previous week's session with me.

We never took part in a science activity.

last year at Museum of Childhood

Yes, there was a science activity during the summer at the Museum Gardens which my children enjoy very much

Never done an activity like this (although we now have a book at home which has activities like this). We are going to do more!

We read together at home but this is the first time since nursery that we have taken part in a group situation

Some stuff at the Science Museum.

My child does a lot of experiments including making butter with the cubs/scouts.

Yes - end of last year in school - science afternoon.

Mad science

YES (last month) - fingerprints!

CAN'T REMEMBER. I THINK THIS IS THE FIRST TIME.

Making bird boxes at scouts

last weekend we cooked a waffle

Making mycostume.

We done Table tennis at school it was a sport activity.

LAST WEEK THAT WAS ART SCHOOL

Last week with you.

Question 5: What do you think about **science**? Would you be interested in more of these science activities?

We are interested in more of these science activities like this.

Yes my child would like to come back he had so much fun

yes very much. I am a visual learner I loved it it very much - enjoyed the fun process. teaches children alot from practical experiments.

Science is great and we would like more activities

IT WOULD BE GREAT, IF THERES A CLUB

Science is a very important subject and it would be inclusive and available to both genders.

Love Science! Would love to join in with further sessions.

I would like my kids to do more science-based activities because we are not a very 'scientific' household.

science gives answers to every day life questions -> very importante.

I love science, we watch a lot of documentaries at home.

Love it! Great to be able to relate to everyday things to enhance understanding.

REALLY VERY MOTIVATING. AND WOULD BE GLAD IF MORE OF THESE SCIENCE ACTIVITIES ARE REGULARLY HELD.

I love science and try to get the children involved. We would love more of these, it is a great way to get the children more interested.

Iv always Been sceptical of science and will looked forward to doing more.

I think it good activity astory in the memory. Yes.

Yes - he enjoys the messy activities.

Question 6: Any other comments.

Parents and their children seemed to really enjoy the sessions and would like more, but in particular they seemed to enjoy the fact that they were working together:

Nice to work with my child.

My son really enjoys science and he enjoys it when I come into school to do things with him.

Would like to see more active sessions for parent + children.

Good that parents are invited too - as the children grow up you seem to get left out and its good to still be able to share this and to do at home.

Other final comments were about what they felt in general and what they're going to do next:

Thanks and we will make our own butter. No more Tesco or Asda's

Fun and educational. Thank you.

Good that it is something that can be done again at home.

All aspects - story/practical come together really well with tooting!

MORE PLEASE :)

Thank you to make the science fun for children.

And although the feedback was primarily gathered from parents, their children also wanted to give their feedback, verbally and written:

It was the best thing I have ever done in the world

yes because it was messy and exiting

Because we got to play :)

Science is my favriot subJect because you can do new things.

yes. Because I have never ever made butter in my life.

yes bease he din't give up [about the frogs story]

becase it was fun story tellig

I Lik the making stuf it is owsome

Yes I liked the way the cornflower was a solid and a lickwid

I liked the story. I liked the teamwork in it.

I like the story very very much

it was so asome

I liked every think. 100%, I did not like = 0%

good when the crow put rock's in side

Yes intereses tring how the crow fighred out how to make the walter

I do like science and I think that science is awesome!

science is really good because we can discavor things

science was fantastic today.

ofcors! OFCORSE! [about wanting more science activities]

Yes I love It and I will love to have more of it

It was lovly.

It was great !!!!!!

everthing WOW good

Some children even came up with other ideas they'd like to do in future sessions:

To make electricity from a potato

egg experiment

look at a telescope

BLOW UP SOMETHING!!!!!!

sola sistem!

coke bottle and mento !!

My Final Thoughts

All in all, I feel this project was a huge success, with children, parents and teachers all very keen and enthusiastic and asking for more of the same. The fact that children remembered the stories and experiments of previous sessions, and also told me about what they had done at home with their parents and siblings, showed that the interest to continue experimenting had been sparked.

After the first session, I soon realised the activity had to come after the story, as the materials and results of the activity were too distracting and no one was paying much attention to the story. By introducing the story first, sometimes the moral fitted so well with the activity. For example, in the butter activity some children were a little impatient, saying their arms were aching (from shaking the shot glasses of cream), at which point I could say, 'but the frogs in the story never gave up, did they?' Also describing the cutting of the balloon in the same activity: 'so that you end up with something that looks like a swimming cap for frogs'...raised a few giggles.

Whilst I hoped to run separate CPD sessions with the teachers, it actually worked out better with teachers and teaching assistants attending (some of them with their children) as participants. Verbal feedback from the teachers was very positive. They (and other parents) liked the moral messages in the stories, but also the simplicity at which science could be done using cheap materials: plastic shot glasses, 'plastic test tubes that stand up' from the *PoundShop* and ingredients lurking in the back of their kitchen cupboards.

Some children were much cheekier with their parents present. This was a new experience for me having previously only run sessions during school hours or

outside of school hours without parents. Talking to parents about this they said, 'it's because they think they're at home'. Still, the parents were a great source of help when teachers were unavailable. There were a couple of children who just wanted to 'get messy' and wanted to do rather than listen to the stories, or complained, for example, that their volcano wasn't hot. Having their parents there to explain to them was extremely helpful, especially when working with much larger groups in the school hall.

Audience interaction was useful for getting them all engaged and at ease, for example asking children to come and point out where Etna was on the map, and encouraging everyone to ask questions – getting them thinking like scientists. In one school we had no whiteboard system for projecting the visuals. This made the children use their imagination more during the storytelling element – which resulted in more questions ('Frogs don't just hop, they burp too don't they?').

We even had younger siblings (0-6 year olds), who were mesmerised by the activities and listened attentively to the stories; and sometimes aunts, uncles and grandparents attended as children's accompanying adults. One grandparent used to be a biochemist and a mother worked on a dairy. Allowing them to share their expertise was useful too.

Children were quite interested in where I was from, what school/university I went to and where I worked now. The more I talked about my previous background in the lab, the more they wanted to take their 'experimenting' further, for example, wanting to measure the displacement of the water, using measuring jugs they found in the classroom.

It was great to see how appreciative the children and adults were, and how many enjoyed the way the stories worked with the hands-on experimenting. It worked! The project showed them that science is everywhere, even in the folk tales and stories from other cultures, and how accurate the science behind them is. It also promoted a cultural understanding, that everyone knows something we don't and that different people believe in different things. And that's not always a bad thing.

Acknowledgements

I would like to thank all the staff at the four schools, but most of all to all the children in Years 1 to 6 and their parents! And of course, to the Biochemical Society for supporting the project, allowing me to pilot this idea.

THANK YOU!