

## Learning Journey: Bath bombs

**Age:** 3-5 years old

**Learning activities:** Designing and planning investigations; Gathering evidence; Making connections

**Creative dispositions:** Ability to work together; Thinking skills; Ability to make connections

**Synergies:** Dialogue and Collaboration

**Contextual factors:** Group work

## Background Information

**School setting:** It is a rural Free Flow kindergarten adjacent to woodland (in England).

**School policy for science:** Froebelian ethos linked to the work of Freidrich Froebel.

*“To have discovered a quarter of the answer to his own question is of more value to the child than to hear the whole answer, half-understood from another” (Freidrich Froebel)*

**Curriculum links:** Development matters in the early years foundation stage (Early Education, 2012), Early years (under 5s) foundation stage framework (DfE, 2014)

Characteristics of Effective Learning:

- Playing and Exploring
- Active Learning
- Creating and thinking critically
- Question why things happen and give explanations. Asks e.g. *who, what, when, how*

## Setting the Scene

### Focus and Rationale

The focus of my second action research cycle was to develop children’s creative thinking in science through profiling their *dialogue and collaboration*. I aimed to provide opportunities for children to *make connections* and develop their *thinking skills* through *working together*.

Since my first Action Research cycle, the children in my mixed age class have continued to show confidence in freely accessing resources which they use to pursue their own ideas and explorations in our free-flow environment. On reflection, I think that in cycle one, the children were more motivated to explore scientific concepts in their play and to *take initiative* when I capitalised on their prior interests, by providing interesting and stimulating resources linked to these. Therefore, for this second Action Research cycle I decided to provide specific materials linked to the children’s interests which I felt would increase their participation, talk and *collaborative working* through wanting to explore shared interests.

I noticed from my first cycle that when *working together* some children were beginning to build on each other's thinking to develop ideas. Leading on from this I aimed to increase their collaborative learning and explicit talk in the area of science. One of my focus children in particular (Reuben) already clearly demonstrates his scientific understanding and uses some scientific language and vocabulary both in his self-initiated play and exploration, and during more focused science activities. In contrast other children, in both contexts, tend to be less explicitly 'scientific' in what they say and in the language they use. I wanted to focus on highlighting the way in which children learn from each other, so during my second Action Research cycle I aimed to highlight and capture Reuben's creative thinking in science to enable other children to build on his ideas and thinking, thus furthering their own understanding and ability to make connections.

Reflecting upon my first Action Research cycle, I realised that by purposefully standing back and allowing the time and space for children to explore and test out ideas, without directly imposing a teacher directed activity on to them, they were more willing to explore and sustain their participation. Going forwards I therefore planned to provide adequate time and space for children to build on each other's ideas, and *collaborate* through listening to and adding to each other's scientific ideas.

### Implications for planning and teaching

- To provide interesting and stimulating resources specifically linked to the children's interests to increase their *participation, talk and collaborative working* through wanting to explore shared interests.
- To highlight and capture one child's creative thinking in science to enable other children to build on his ideas, thus furthering their own understanding and ability to *make connections in their thinking*
- To provide adequate *time and space* for children to talk and *collaborate* together to enable them to listen to and add to each other's scientific ideas

### Outline of learning activities

#### Starting point:

One child's interest led to exploring bath bombs and how they react in water.

#### Activity 1a: Invitation to exploration

Children were invited to play with a bath bomb. Children added the bath bomb to water.

#### Activity 1b: Making bath bombs

I then planned to make bath bombs with the children. This was an adult directed activity with elements of the children being able to *'wallow' and ponder over ideas*.

#### Activity 2: Testing with other materials

I facilitated this by providing a wide selection of ingredients and apparatus for children to freely explore.

### Activity 3: 'Aromatherapy'

I provided essential oils, olive oil and water, fresh and dried herbs, and pots and sticks to mix 'lotions and potions'.

## Developing the Learning Journey

### Starting point

**Rationale:** One focus child, Alice, who has in the past shown less initiative to engage in scientific activities, shared with me her excitement at receiving bath bombs for her birthday. I then brought in a bath bomb for her to explore with a group of children, anticipating that perhaps she would pursue her exploration and be encouraged to work collaboratively, as the opportunity was directly linked to her interest and prior knowledge and experience.

**Activities:** Following this starting point I planned a sequence of related activities around, and developing from, Alice's interest in bath bombs, which led to exploring materials and their changes, exploring fizzing, dissolving and making potions.



Photo 1: Alice and others exploring a bath bomb

## Developing the learning sequence

### Learning activity 1a – Invitation to exploration

**Rationale:** A group of children, including Alice, were invited to play with a bath bomb and experience it through all five senses.

All the children were keen to smell it and feel it, some crumbling it between their fingers. Some of the children were vocal during this activity, expressing their thoughts about what the bath bomb smelt like. They soon chose to add it to water, deciding amongst themselves how much of the bath bomb they should put in. Most children at this stage felt comfortable to speak and readily shared their observations with one another, whilst a few observed closely, listening to others without yet speaking themselves. I could see how some children's thinking was already being extended as they listened to each other's comments and bounced ideas off each other. For example one child commented "it's fizzing quickly" to which another child,

Fabian, responded “because it’s hot”. He showed a prior awareness of substances perhaps dissolving more quickly in hotter liquids. Alice then explained “when I had it at home it wasn’t so green...because we had more water” to which Fabian replied “if we put it in the water tray we will have more water...but it won't be as strong...we can add stuff to make it stronger!” Alice had noticed that the bath bomb was more concentrated in a smaller amount of water and it was evident through their dialogue and collaboration that they enabled each other to make new connections as to how to make the bath bomb water less “green”.



When I had it at home it wasn't so green...because we had more water.

**Photo 2: More children joining the activity**

Another child, Agnes who until this stage had simply been observing, picked up on Fabian’s comment about “adding stuff” to make it stronger and suggested adding spices, in particular turmeric. We looked in the cupboard but did not have any turmeric. Agnes happily decided to add cinnamon instead! She was interested in how the mixture could be changed. Her creative idea and the connections she made in her thinking, developed from the talk and collaboration of others, were celebrated and acted upon and this has I think led to her feeling more confident to share her ideas with others.

If we put it in the water tray we will have more water...but it won't be as strong...we can add stuff to make it stronger!



Yay! Turmeric, can we add some?

**Photo 3: Building on each other's ideas**

### Reflections

Through their *dialogue and collaboration* children enabled each other to *make new connections* such as how to make the bath bomb water less “green”. I also noticed that the children *commented on the volume and temperature of the water*, and noted this for follow up activities and exploration. The children were happy to *share their thoughts and ideas* in the knowledge that an adult would be available to help *facilitate further exploration*.

### Learning activity 1b – Making bath bombs

**Rationale:** As the bath bomb interest evolved, I decided to make bath bombs with the children to extend their exploration.

I provided bicarbonate of soda, citric acid and olive oil in addition to the children freely accessing garden herbs to fragrance the bath bombs. We loosely followed a recipe however the children were able to experiment with how to achieve the desired consistency. This was an adult directed activity however there were certainly elements of the children being able to ‘wallow’ in their exploratory play as they observed changes and pondered over ideas, talking together to make connections and develop their thinking. For example Leo wondered aloud “what if we added water? It would go fizz, pop, bang!” Other children were also interested in what would happen so we tested our bath bombs in the water tray. The children were highly motivated to observe the changes to the materials they had put together and eagerly gathered around the water tray, keen to see together what would happen. Isabelle dipped the bath bomb in the water then looked overjoyed to see it beginning to fizz. She commented “it’s so fizzy to touch!” to which Matilda replied “it feels like a crumbly cake!”. One child noticed “it feels cold fizzing in the water” to which another responded “yeah but it feels hot in your hand!” The children then compared the two experiences. This collaborative working was sustained for quite a few minutes until each bath bomb had dissolved.





It feels like a crumbly cake!  
It will fizz when you put it on  
a sponge!

**Photo 4: Experiencing the ‘feel’ of their bath bombs**

**Reflections:** The children each wanted to experience the feel of their bath bomb in the water and their exclamations and language used prompted other children to make connections and to express their ideas and thinking.

### Learning activity 2: Testing with other materials

**Rationale:** I wanted to enable the children to further explore their interest in making “things that fizz and fuzz!” so I provided another opportunity for them to work collaboratively to create various bath fizzers, potions and mixtures.

I facilitated this by providing a wide selection of ingredients and apparatus for children to freely explore, including substances such as spices, salt sugar, cocoa, hydrophobic sand and water. This activity was set up for the children to freely access and explore and the materials were left out for the whole afternoon. I chose to stand back and observe, listening particularly for children’s dialogue and collaboration and sensitively intervening to provide further opportunities to make connections where appropriate. For example Alice was exploring the hydrophobic sand, trying to mix it into water. She began to recognise it was not mixing with the water, exclaiming “this sand doesn’t mix in”. Another child, Reuben, suggested she “try mixing it with cocoa, it might mix”. They tried this together and noticed that the cocoa also floated on the surface of the (cold) water and was difficult to mix it. He then suggested “stir it fast to make it mix better” to which she responded “blenders cut stuff up so tiny. I’m spinning it fast like a blender, make it like a smoothie!” The hydrophobic sand remained resolutely un-mixed so I then stepped in and suggested taking some of the hydrophobic sand out and dripping water on to it. Alice did so and noticed the water ran off the surface, she concluded “it just doesn’t like the water!”



The cocoa powder is not really mixing in. It's a bit powdery in the water



**Photo 5 and Photo 6: Making potions**

Another group of children decided to try and make a fizzy potion. Leo asked his peers “what will make it fizz like a bath bomb?” to which Fabian responded “vinegar, it’s got acid in”. Leo then built upon Fabian’s suggestion adding “yeah if we add more vinegar it will grow right to the top. I think because it’s got lots of gas”. Another child then added that “gas is fizzy”. The children were therefore able to make connections between certain liquids, their properties and the reactions that can be made.



**Photo 7: Adding materials**

We mixed all of our chocolate fizzies together and it exploded!

What will make it fizz like a bath bomb?

Vinegar, it's got acid in it.



Photo 8: Exploring vinegar and making connections

Yeah if we add more vinegar it will grow right to the top.

Watch it swirl underneath, you can see it better.



Photo 9: Experimenting with different materials

Additional examples of children's conversations:

**Fabian:** The tea leaves didn't dissolve. Ok we've got very thick bubbles!

**Leo:** It's bubbling, it's growing! What makes it bubbly, vinegar or tea? Add more water, see if it gets bigger..... The tea still didn't mix in.

**Matilda:** The salt mixed in. Tea made it smell like candies!



**Leo:** The water has gone green! I think that's dissolved my mixture because it's made it all bubbly again (has combined his mixture with Alice's).

**Reflections:** Through their talk children were able to *make connections* between certain liquids, their properties and the reactions that can be made.

### Learning Activity 3: "Aromatherapy"

**Rationale:** I decided to prompt further dialogue and links to home knowledge and experience

I followed up the sequence of activities by again drawing on children's home knowledge and experience, for example one family have a background in homeopathy and aromatherapy. In this activity I wanted the children to continue to explore complex materials which I anticipated would be highly motivating, and promote children's curiosity and desire to explore together, to further encourage dialogue and collaboration. I provided essential oils, olive oil and water, fresh and dried herbs, and pots and sticks to mix 'lotions and potions'. The children were able to choose ingredients freely, with adult support given to dispensing essential oils due to their strength. It was evident that their prior experiences of exploring and talking together enabled the children to make connections in this activity. For example, having mixed together a potion a child decided, without any provocation or adult input, to pour it into the water tray. The child commented "it's making swirlies on the water; it looks like it's running away". Reuben, who had previously been involved with Alice in attempting to mix the hydrophobic sand with water, commented "I think oil doesn't mix with water you know!"



Photo 10: Oil and water

It's making swirlies on the water, it looks like it's running away!

I think oil doesn't mix with water you know

**Reflections:** Prior experiences of exploring and talking together enabled the children to *make connections*.

## Overall Reflections

### Children's progress

Following a particular child's experience and ideas from home I was able to develop a learning sequence that enabled the development of dialogue and collaboration by providing experiences through which children could explore materials and their changes. Firstly we explored a bath bomb, as a follow up activity the children freely explored related materials alone, and in the final activity the children were further encouraged to explore materials as part of a group. By providing adequate time for children to become highly involved and engaged, and to therefore 'wallow' in their learning, several children voiced new ideas and discoveries. I was able to extend and develop their ideas through sensitive interventions at the appropriate time, for example when Alice and Reuben were encouraged to further test the properties of the hydrophobic sand by taking it out of the water and instead pouring water over it.

By initially providing the bath bomb (based on one child's interest stemming from her birthday present) several children were motivated to take initiative, participate and became engrossed in playful exploration.. Through this they began to talk excitedly about this sensory experience, stating what they could see and what they observed. The initial child Alice related what she observed at this point to the bath bomb she had experienced at home. Her comment prompted talk and creative ideas from other children and through their initiative-taking, dialogue and collaboration they were able to develop each other's scientific learning. Unexpectedly a much younger child made the comment about adding spices to add to make the mixture stronger, compared with previously when she did not seem so confident to share her ideas with others. Through working together, making connections and voicing their thoughts, they developed their creative dispositions.

### Teacher role

I sought to develop the children's creative thinking linked to science by providing sufficient time for them to 'wallow', think, ponder and wonder over what they experienced, choosing the opportune moment to sensitively intervene, and scaffolding their learning. I did this through using explicit scientific language when the children involved me in their talk and discussion and modeling this vocabulary through my prompts, as well as through asking thought-provoking 'what if...' questions to develop their ideas and extend their learning.

I ensured that I profiled and really celebrated the children's voices and ideas by drawing other children's attention at the time and then following up by including ideas and children's creative thinking within the 'floor book' I began. I shared photographs and observations within the floor book, encouraging children to reflect on their engagement .

I kept my focus children in mind, developing their autonomous working and creative thinking and sought to enable other children to learn and benefit from this through

providing opportunities for children to talk and work collaboratively, sharing their ideas.

I have also begun to make children's creative ideas in science explicit to parents. For example by making links to the synergies and by sharing observations and anecdotes linked to their creative thinking in science. I plan to keep working on this and to develop some resources that can be shared with families to further develop the children's creative thinking in science at home. I am not certain how this will work in terms of promoting dialogue and collaboration however I am interested to look further into the role of dialogue and collaboration between children and adults, linked to the work of Janet Moyles'(1989) "spiral of play". Moyles explained that "rather like a pebble on a pond, the ripples from exploratory free play extend through directed play and back to enhance and enrich free play, allowing a spiral of learning spreading ever outwards into wider experiences for the children and upwards into the accretion of knowledge and skills."

### **Classroom environment**

Rich resources were provided that linked to children's home backgrounds and their previous interests and experiences. Alice's experience of receiving a bath bomb for her birthday generated the beginnings of a learning sequence linked to exploring materials and their changes. Her continuing interest in bath bombs was evident when I provided these within the classroom, and proved to be magnetic in drawing her peers into working together in a collaborative way. The ongoing materials I provided enabled children to continue on their journey, testing other materials and processes and continuing to learn from each other through their talk and sharing creative ideas and thinking. Towards the end of this learning sequence I developed a scientific exploration area with scientific provision that can be explored independently, similar in a way to our mud kitchen yet providing more explicitly scientific equipment and resources. I envisage that this will continue to develop as a regularly changing area for scientific exploration which would demonstrate respect for what the children want to know and test, which will encourage children to explore, talk together and provide the space to wallow and tinker. So far the materials are as open-ended as possible to enable the greatest range of use, including: pipettes, funnels, measuring jugs, spoons, pestle & mortar, garden herbs, filter paper, magnifying glasses, feathers, shells, leaves and petals.

### **Next steps for learning and teaching**

To create 'request' slips for children to suggest resources they would like to have included in our independent science provision, enabling them to take some ownership and responsibility.

To develop our 'floor book' in order to promote children's dialogue through reflecting upon scientific play and experiences.

To run a parent workshop to make scientific learning explicit to parents and to highlight the value of play, exploration and dialogue.

To foster parental contribution by developing science-based exploration prompts and resources (for example scientific story sacks or lending resource kits) to enable children to further develop understanding at home.

### Reflection questions for the reader

How could you provide enough time and space within your science curriculum for the children to 'wallow', wonder and ponder in their playful exploration?

Where, when and how could you use one child's prior interest to develop a learning sequence with a scientific focus?

In what ways do you capture and record the essence of children's creative thinking and ideas through listening to their talk?

### Practical Information

#### Resources

#### Learning activity 1a

A bath bomb, a chopping board, bowls of water, wooden spoons  
(Spices later chosen by a child from our cooking ingredients)

#### Learning activity 1b

Citric acid, bicarbonate of soda, olive oil, herbs from our garden)

#### Learning activity 2

Spices, salt, sugar, cocoa powder, hydrophobic sand, herbs, tea leaves

Water, vinegar (requested item)

Bowls, spoons, sieves, measuring jugs

#### Learning activity 3

Essential oils, olive oil, fresh herbs from the garden, dried herbs, mixing pots and sticks (the children then decided to add their mixtures to the water tray)



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