



Curriculum Materials

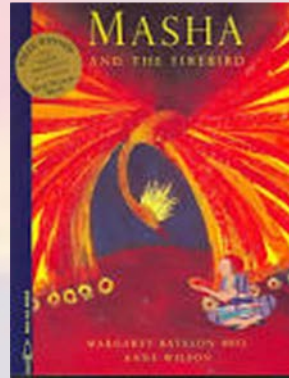
Learning Journey

Investigating Materials



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Learning Journey

Investigating materials

Becs Blasco
Middle Street Primary School , UK

Setting the Scene

Focus

The primary synergy I focused on was developing children's **collaboration and dialogue**.

Rationale

As a school, we are part of the Working With Others (WWO) Project. The aim of this project is to teach children the core skills they need to be able to work with others successfully. Having carried out observations both in my own class and across the school, I noted that while most children were effective communicators they were yet to develop the skills of responding and building on each others' ideas. In addition, I wanted to give the children more **agency** in their learning, allowing them to **generate questions** and then respond to them.

The implications for my planning and teaching were to foster **collaboration and dialogue** by discretely teaching the skills of active listening in order to respond and the skill of disagreeing politely. I promoted **agency** by offering a range of opportunities for children to develop their questions and ideas through active investigation, and for recording and reflecting on their learning in a variety of ways.

Background

School setting: One form entry, inner city primary school (including a nursery). Year 1 children - Age: 5-6

Curriculum links: National Curriculum

- Describe the simple physical properties of a variety of everyday materials.
- To ask simple questions.
- To identify and classify.
- To perform simple tests.
- To gather and record data to help in answering questions.

Context

Our term's curriculum learning journey: **Ice and Fire**.

Core English texts:



Context: At the start of half term we discovered a Firebird's nest in our classroom. The Firebird has been sending us messages which has been the motivation behind our learning.

Learning activities: Designing and planning investigations / Gathering evidence

Creative disposition:

Ability to work together

Synergy: Collaboration and dialogue/ agency

Contextual factors: Group work

Overview of Learning journey

Starting point: To develop dialogue and collaboration, we played 'agreeing' and 'disagreeing' games and discussed 'absorbent' and 'non absorbent' materials

Children enjoyed the games and our scientific discussions

Learning activity 1: Raising questions
We raised questions linked to our learning journey *Ice & Fire* and then voted for our favourite question to investigate

Children are given agency to generate questions that they would like to explore. They got motivated and curious as their questions were related to our Firebird

Learning activity 2: Investigating questions 1
We first focused on 'Which material would be best for cleaning up the Firebird's wee?'

Children are motivated to explore different materials. They make connections, collaborate and build on each others' ideas

Learning activity 3: Investigating questions 2
Then we focused on 'Which material would be best for making our Firebird's nest waterproof?'

Children made nests out of lego and could choose any six materials from our classroom or around the school environment. They decided what materials they were going to test and why.

Learning activity 4: Recording our findings
I asked the children to write down their findings.

Children were happy to see that they can record their prediction, experiments and conclusions.

Learning activity 5: Independent activities
These activities were designed to further the children's understanding of waterproof materials and absorbency.

To develop **dialogue and collaboration** across the curriculum we played many games over a week with a strong emphasis on disagreeing politely. Before every activity my teaching assistant and I modelled how to share our ideas using a set script “I think... because...” And the counter argument “I disagree because...”

Ice Cream Vs chocolate:

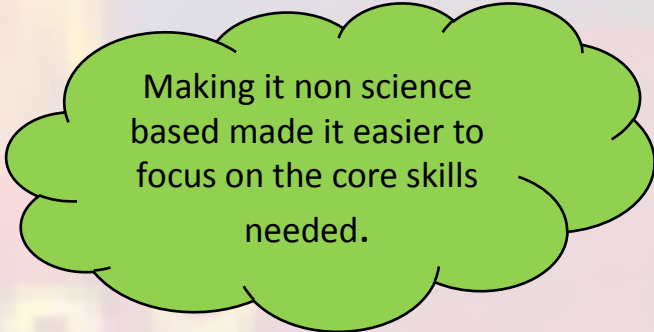
The children were randomly paired and were given the statement ‘chocolate is better than ice cream.’

Lunch date:

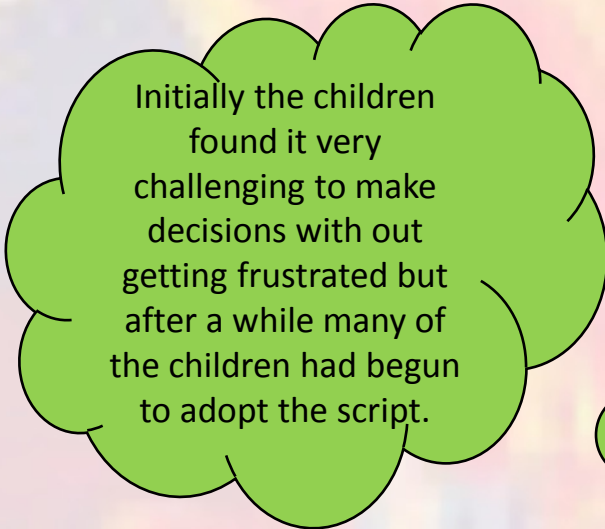
In randomly selected groups of three, the children had to decide who they would go for pizza with out of a section of given character. They had to provide a reason for their choice and justify this to the rest of the class.

Best animal in the world:

In randomly selected groups of six the children had five minutes to decide on the best animal in the world. They had to provide a reason for their choice and justify this to the rest of the class.



Making it non science based made it easier to focus on the core skills needed.



Initially the children found it very challenging to make decisions with out getting frustrated but after a while many of the children had begun to adopt the script.

Developing the learning journey: Starting point

The children were randomly grouped into groups of 3. Each group were given a bag containing four objects and two key scientific vocabulary cards inside, e.g. 'absorbent and 'not absorbent'. The children discussed which card matched which object. The adults stood back and observed, giving the children space to discuss and build on each other's ideas. After three or four minutes the children moved onto the next bag until they had explored and discussed each of the objects in the ten bags.



Adults all stood back and observed.

Teacher: Are all materials with holes in them absorbent?

E: That paper sucks up water.
J: Yeah, like my juice.
E: This (waffle bricks) might suck up water too, it's got holes.
M: No! It's plastic, so it can't be absorbent. It should go here.
E: I think you're not right actually because holes do really suck up water.

This was the first time I had observed E responding to other children's ideas.



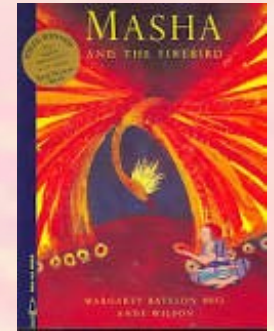
H: This one is quite hard, so it might not actually be bendy.
E: It does. Look! I can bend it right in half. He's a bendy croc!

As well as observing **dialogue and collaboration** the sorting activity provided an opportunity for me to observe what the children already knew and spot any scientific misconceptions. At this stage it was beginning to become apparent that there was some confusion between absorbency and waterproof. I made a note to explore this further.

While the children were not sticking to the script, there is evidence of E responding to H when he states "it does."

Developing the learning journey: Activity 1 - Raising questions

We raised questions linked to our learning journey *Ice & Fire* and then voted for our favourite question to investigate.



What material would be best for cleaning up a Firebird's wee?

Which material would make our nest cosy?


Which material would make our nest waterproof?

Can we race the Firebird's eggs? How can we make them speedy?

I wanted to explore absorbency first so I ordered the children's questions accordingly.

Developing the learning journey: Activity 2 - Investigating question 1

‘Which material would be best for cleaning up the Firebird’s wee?’



L: This feels funny.

A: It's a sponge. My Mum uses sponges at home to suck up our spills.

I: We do that too. It's really spongy and drinks up the water quite fast.

L: Oh, I didn't know it was that.

This was an opportunity for children to further explore which materials are absorbent. I reminded children that the adults in the room were going to act as observers and that we would only be stepping in if we were really needed. children were encouraged to build on each other's ideas and to actively respond to each other.

The children were given time to discuss and self-select the objects that they wanted to test from anywhere in the classroom. I did however ensure that each group included an object with holes into challenge Eden's prediction that objects "with holes in suck up water."

I was now witnessing the children making connections, actively collaborating and building on each others' ideas.



K: We should choose this one. It will certainly suck up the wee.

L: I agree with you K, it's kind of spongy isn't it?

E: Yes, but look at this too. This is sucky isn't it? (holding up a small plastic box.)

K + L Noooooo!

K: That one can't.

L: No, no. That one definitely can't but we can check it if you really want E.

E: Yes, I do.

E: Oh, you were actually right.

This was one of the first times that I was aware of any of the children adopting part of the script, e.g. "I agree with you K" without being guided by an adult. The children are actively listening and responding to each other.

From a scientific standpoint, it was also interesting to note that through their own explorations and the children's dialogue and collaboration none of the children observed, left the session still thinking that holes in an object automatically makes it absorbent.

Developing the learning journey: Activity 3 - Investigating question 2

‘Which material would be best for making our Firebird’s nest waterproof?’



The children made nests out of lego and could choose any six materials from our classroom or around the school environment to line the nest with to make it waterproof.

I is asking A for confirmation, She has her own idea but she is actively seeking A's opinion.

A: No! It's not absorbing now so it won't absorb later.

E: Well, this is not absorbent, is it A?



Before testing...

M: Felt is not waterproof. Hmm. I'm actually not sure.

E: I agree with M. It's quite sucky uppy so it probably isn't waterproof.

L: I agree with you E.

H: So do I E.

After testing...

H: I think the felt is absorbent.

E: I think it's both actually, some water is going through and there is some on top. Look on the bottom, it's soaked.

The children are becoming more responsive to each other and engaging with what each is saying. The dialogue above shows the children collaborating and sharing their ideas. They are adopting the script of "I agree with you" and justifying their thinking.

We decided to leave a variety of materials in the water tray so that children could carry on with their investigations.

M: I actually think this (stuffing) is not waterproof.

E: You have to explain why M.

M: Well, I don't think it will protect the nest.

L: Do you know nothing about sponges M?
This is like a sponge, it will suck up water.

H: I don't think it's waterproof, it doesn't feel like a sponge at all.

L: Can I feel it? It feels cloudy. It is waterproof because it looks spongy.

E: Shall we try it?



I was excited to hear E reminding M to explain his thinking here. M didn't fully expand his thinking however he did respond positively, which was a step forward for him.




F: I think the paper towel is waterproof because it will soak up the water.

W tried to show F that it soaks up water.

F: But now the table is dry.


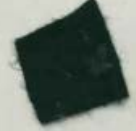



The children are clearly collaborating here and W is trying to help move F's thinking on but F obviously has a misconception here that is proving difficult to shift.

Developing the learning journey: Activity 4 - Recording our findings

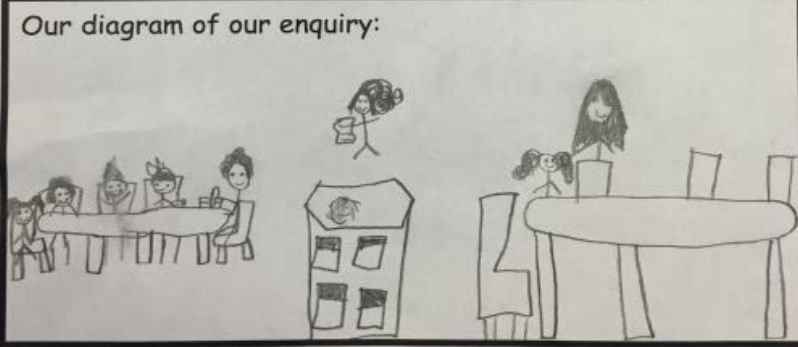
Our question: Which material is best for making our Firebird's nest waterproof? 

We predict that: *the felt and stuffing are Not Water Proof.*

We tested:

- 
- 
- 
- 
- 

Our diagram of our enquiry:



The best material was "*sound card*" because *it's plastic and plastic is water proof*"

Further investigations of waterproof materials

A: I agree because plastic is definitely waterproof.

M: Yes, that is what is happening but not to my coat! Look! It's wet inside!

F: Your coat is not waterproof then L!

F: So the water is not going in because it's waterproof.

A: I agree because plastic is definitely waterproof.

I: Yeah and water can't get through plastic.



F: Because it's plastic and that is waterproof.

Teacher
I wonder why F's coat is dry on the inside?

To develop the children's understanding of the word 'waterproof' on a rainy day we went outside in our coats to play.

When we came back in we inspected our coats to see if any water had soaked through to the inside. I targeted F and his coat in order to tackle his previous misconception.

Not only is F actively listening to and learning from what he is seeing and hearing around him but the other children are engaged in their own dialogue about what they have just experienced.

Me: What do you think would happen to M's tummy if she wore this fluffy jumper outside in the rain?

L: Her tummy would get really, really soggy and wet.

E: I agree with L.

M: So I do because that furry stuff will never be waterproof.



Developing the learning journey: Activity 5 - Independent activities

These activities were designed to further the children's understanding of waterproof materials and absorbency and encouraged to identify new questions to challenge their thinking

Activity 1: Children were free to access any materials and test them in the water tray.

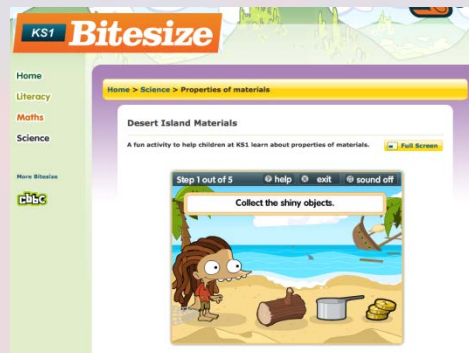


N: Yes, I did. It's not plastic that one.

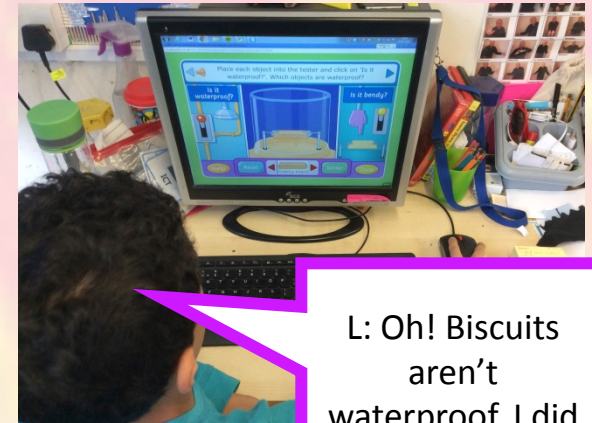
O: The water has gone through it, so it's not waterproof. I thought that. I was right! Did you think that N?

The children enjoyed learning through play and many have started questioning their friends.

Activity 3: On the computer, children had to follow the instructions to collect the correct materials according to their properties, to make a raft.



Activity 2: Children had to sort test materials to see if they were waterproof.



L: Oh! Biscuits aren't waterproof. I did not know that.

Some children are still not secure on the difference between absorbent and waterproof. We will revisit this throughout the year.

Children's Progress



Ebie has become **more reflective** about in response to other children's ideas. "I agree with M. It's quite sucky uppy so it probably isn't waterproof."

Ebie is **adjusting his ideas based on what he observes** and inline with ideas of the other children. Initially he said "I agree with M. It's quite sucky uppy so it probably isn't waterproof." Following the test he said: "I think it's both actually, some water is going through and there is some on top. Look on the bottom, it's soaked."



Morgan has developed **a greater curiosity** in science and has begun to **formulate his own questions**, M: "What I actually really want to know is would a purse be waterproof?"

Morgan is showing more inclination to join in with a group and contribute his ideas, without being prompted.

Reflections: Children's Progress

Children are increasingly building on each other's ideas, using the given script to create new science based ideas and connections.

Increased ownership of and agency within the science activities.

More enthusiastic and motivated – they LOVE science (and great feedback from parents too).

Reflections: Teacher's Role

- I provided for a lot more science happening in the classroom now. I have raised the profile of science.
- I taught the core skills of active listening to provide children with the language and the script that they needed in order to build on each others science based ideas and create connections to their existing scientific knowledge.
- I observed the children during science activities and intervened with judicious questioning where appropriate.
- I allowed the children to generate their own questions to increase motivation and engagement.

Classroom environment

- The Year one classroom is set up in the style of an early years foundation stage classroom, for example, a role play area, a writing area, sand and water play etc. with children able to engage in child initiated learning activities.
- There is always quality science provision on offer and often a choice of options. This has given children the opportunity to follow up their investigations, collaborate and practise the skills they have learned.

Next steps

- To investigate the children's additional questions:
Can we race the Firebird's eggs? How can we make them speedy? Which material would make our nest cosy? How can we make them speedy?

Longer term next steps

- Continue to develop children's reasoning skills so that they can justify and explain their ideas to each other in greater depth.
- Continue to link science to our learning journey, to give children greater agency and ownership and for the adults to stand back!

Reflection questions for the reader

- How do you encourage children to discuss and build on each others ideas?
- Is there any key language that you model to support effective dialogue and collaboration?
- What do you do to ensure that the children are motivated and engaged in their learning in science?

Resources

- A tray with glittery water (to act as the Firebird's wee).
- Every day classroom objects (self selected by the children).
- 3 boxes of different fabrics, e.g. leather, plastic, felt etc.
- Lego for building the nests.
- Teat pipettes.
- Beakers for water.
- Bags or boxes.
- Key vocabulary.
- A variety of every day objects for each group to sort



Acknowledgements

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www.ceys-project.eu



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