Learning Journey: An Icy Adventure

Age :3-4
Learning activities: gathering evidence, making connections and explaining evidence while investigating
Creative dispositions: collaboration, taking risks, making connections
Synergies: play and exploration, dialogue and collaboration, teacher scaffolding and involvement
Contextual factors: group work, providing free flow activities to explain evidence

Background information

School setting: Inner city 2 form entry school with an outdoor space and a nearby park
School science policy: The school follows the programme of study outlined in the National Curriculum 2015. Planning in Science is carefully matched to the topic for each term. Where this is not possible, some Science learning takes place in discrete sessions.
Curriculum links Early Years Foundation Stage

- answer how and why questions about their experiences
- builds up vocabulary that reflects the breadth of their experiences
- explain why things occur and talk about changes
- take a risk and engage in new experiences and learn by trial and error

Setting the scene

Focus

The focus of this project was to enhance children's play and exploration & develop children's dialogue and collaboration. I aimed to pose scaffolding questions to encourage involvement and language for thinking. Using aspects of sustained shared thinking, I aimed to prompt the children to: pose scientific questions, form hypotheses, and plan investigations to draw conclusions.

Rationale

As the weather got colder, the theme became very relevant and children were incredibly eager to explore ice cubes. The children gathered evidence, noticing changes in ice cubes and the temperature of their hands. They were beginning to listen to each other's comments and share ideas. I wanted to provide stimuli to encourage dialogue and exchange of ideas through partner talk. I noticed the children were beginning to pose questions for example, 'Where has the ice gone?'

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The implications for my planning and teaching

My aim was to support the children in articulating their questions and in collaborating by listening to each other in order to make connections. I noticed that the children were making observations and I wanted to foster their investigation and exploration through opportunities that would build on their exploration. I achieved this through setting up science provision during free flow activities and scaffolding children's conversations.

Outline of learning activities and resources

Starting point: Assessment for learning.
Providing free flow opportunities to explore ice in order to elicit children's ideas and assess their understanding
Children's responses: The children want to smash ice to free the toys.

Activity 1: Further investigation of ice and providing problem solving opportunities.
I fostered the children's discussion by scaffolding their dialogue and tuning into the process of sustained shared thinking.
Children's responses: The children have an idea to use the warmth of the sun to melt the ice.

Activity 2: **Developing dialogue and creative dispositions.**
I aimed to scaffold the children's conversation by eliciting their ideas to highlight the connection between heat and melting.
Children's responses: The children would like to speed up the process of melting

Activity 3: **Providing extra resources for the children to scaffold thinking skills and enable predictions.**
The children used hot water to speed up the process of melting.
Children's responses: Children reflect on their activities and check the results of their investigations.

Activity 4: The children draw pictures of their favourite parts of their activities.
They check the results of their investigations. The children make connections.
Children's responses: Coming back to the children's idea to use the warmth of the sun to melt the ice.

Activity 5: **The children place the ice cubes in different places to find out the impact of the sunshine and the shade on ice.**

Developing the learning journey

Starting point

Building on free flow play I provided opportunities for children to explore ice and the process of melting. The children were highly intrigued by ice cubes in a tray. The children were puzzled by a problem they encountered. Small plastic animals were

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trapped in ice. The children began exploration of ice showing curiosity, which was a starting point for inquiry and prompted a discussion. This provided opportunities to access additional resources to support further investigation.

Rationale

The purpose of this activity was to motivate the children and foster a dialogue. The children were intrigued by the objects hidden in the ice and believed that the only way to free the toys was to smash the ice. They used mallets and banged the ice on the tray.

Children's responses

Children explored the objects and began to pose questions,
'It's very, very cold'
'There's something inside my ice!'
'How can we save the penguins?'
'Can we make an experiment to free the trapped penguins?'

Photo 1: Smashing the ice

The children suggested conducting an investigation. They started a discussion about the freezing temperature of ice and the effect it had on their hands.

Reflections and implications

I aimed to elicit the children's ideas in order to plan the sequence of activities following the children's interests and their needs.
I wanted to provide opportunities for the children to

- collect evidence and collaborate by listening to each other's ideas
- take risks and observe the reversible process of melting and freezing in order to make connections
- expand children's range of scientific vocabulary

Developing the Learning Journey:

Activity 1: Toy animals trapped in ice blocks

A group of children were highly interested in exploring ice and suggested conducting experiments to ' rescue the trapped penguins and a polar bear'.

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Rationale

The purpose of this activity was to foster dialogue and collaboration, play and exploration and making connections. Children were just beginning to listen to each other's ideas. I aimed to tune into children's dialogue to scaffold their understanding.

Following children's suggestions I set a problem solving activity ' animals trapped in ice' to foster dialogue and collaboration during children's play and exploration.

Children's responses

Initially the children were focused on smashing the ice to free the toys. I modelled thinking aloud to help make connections between ice, temperature and dripping water.

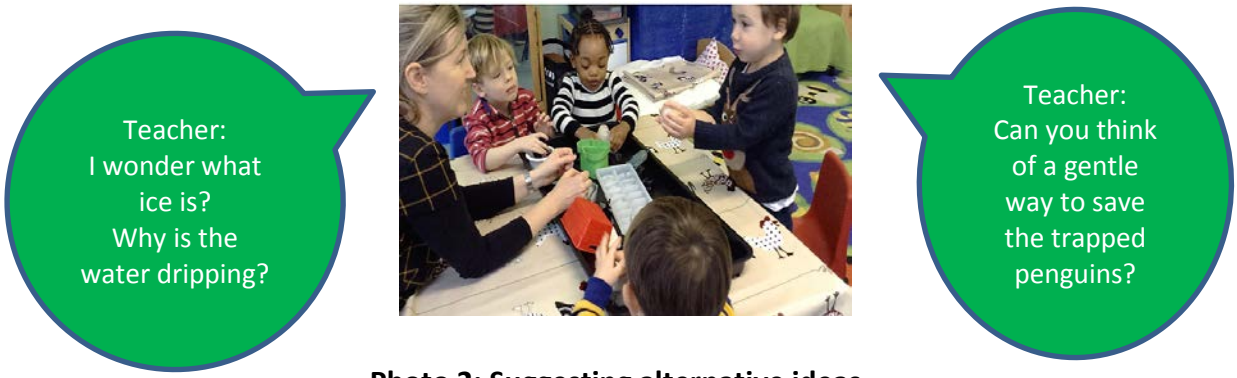

Photo 2: Suggesting alternative ideas

Dialogue 1

Jonathan: How can we get the penguins out of the ice?
Leo: You can tip this ice out of the pot!
Naryah: It's really cold.
Zack: It's hurting my fingers!
Leo: It's really hard, you need to smash it together!

Dialogue 2

Zack: Ice it's water! Very, very cold water.
Zack: Because it's made of water. It's very cold water!
Jonathan: The ice is melting because of warmness!
Leo*:* The nursery is hot but when I touch it (the ice) it feels cold!

Dialogue 3

Naryah: We have to cut the ice!
Zack: We need big knife to cut it into half!
Jonathan: But you may cut your finger!
Leo: You can by accident chop the toy and you wouldn't like to do that!

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Reflections and implications

By the end of the activity the children were much more aware of each other's opinions. Leo helped Naryah to tip her ice out of a pot. They took part in a discussion taking turns.

Activity 2: Toy animals still trapped in ice blocks – a discussion

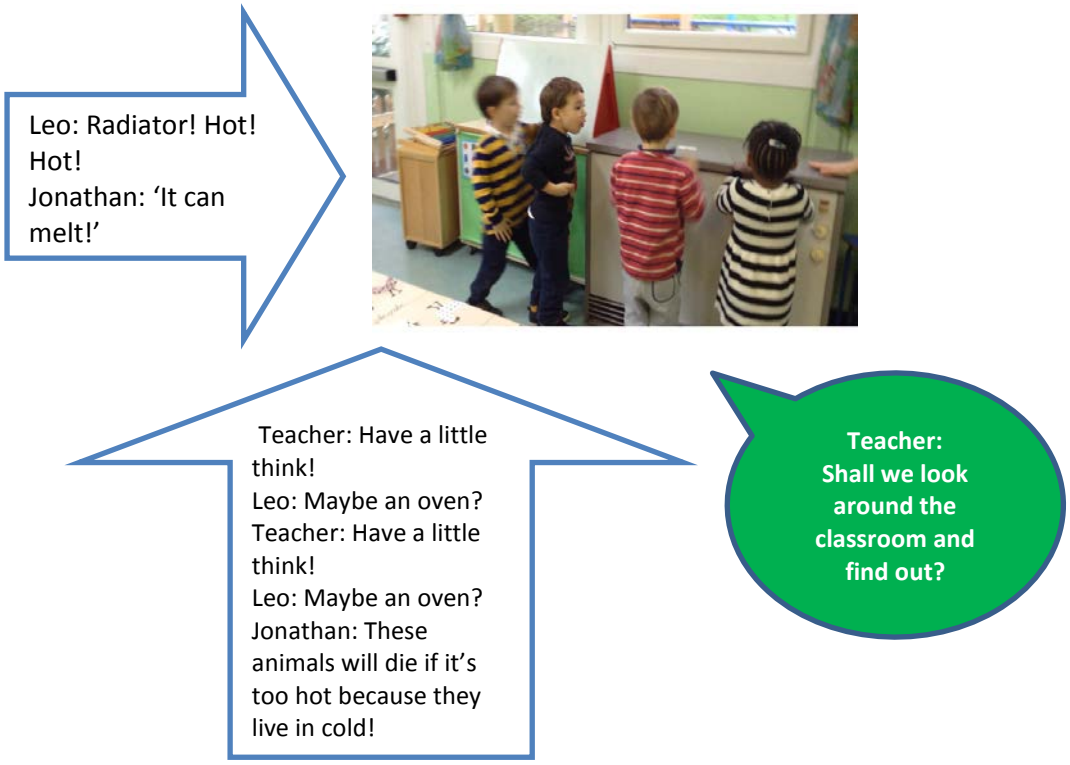
A group of children were invited to discuss their ideas of rescuing the frozen animals in a gentle way.

Rationale

The purpose of this activity was to foster children's dialogue and collaboration in order to develop creative dispositions especially thinking skills, sense of initiative, ability to come up with something new and ability to make connections. Whilst the rules for dialogue were established I aimed to scaffold a conversation to encourage the children to think of other sources of heat. I asked ' What makes the nursery hot? ' What is there in the classroom that is hot?'

Children's responses

Photo 3: What in the classroom is hot?



The children were highly motivated and excited found a hot radiator!
The children were able to make connections and are very eager to put their pots on the radiator. The children were fully in control taking on initiative!

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Following the children's inspiring moments

- Zack ' The sun can melt ice'
- Leo ' The nursery is hot and the ice is cold'
- Jonathan ' Because of warmness'

I decided to elicit their ideas to about connections between heat and melting

Photo 4: Waiting for the ice to melt.

Leo: It's melting but it's taking ages! It's very slow!

Zack: I know let's shake the pots and see happens

Reflections and implications

The chjldren shared their developing thinking. They showed an ability to come up with something new.I decided to provide extra resources to encourage alternative ideas.

Activity 3: Toy animals are rescued by pouring hot water over ice cubes.

The children access extra resources and draw conclusions that hot water aids in melting ice quicker. They defrost the animals trapped in ice in a quick and gentle way. They plan their next investigation.

Rationale

The purpose of this activity was to make observations, take risks, make connections and enable further investigations. I fostered collaboration by suggesting listening to each other's ideas and sharing resources.

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Children's responses

Children made their own investigations, Leo and Jonathan mixed ice cubes with water in a pot, Zack put a toy in a pot without any water and Naryah put a toy in a pot and poured water over it. They then placed their pots in a freezer.

Photo 5: Suggesting ideas

The children pour hot water over the ice blocks and closely observe the effect it has on it. Zack offers his jug to Leo suggesting collaborating as he notices a larger jug is more effective. He suggests shaking the pots
Zack: Maybe we can shake it! We can take it out! We can do this!
Children move the pots from side to side.

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Zack: When you put the ice in hot water, the water gets colder because the ice is cold!

Mine is very warm! Mine is cold! Mine is hot!

Photo 6: Making observations

Teacher: Can you think of a quicker way to melt the ice and save the animals?

Mine is breaking ! Mine is already gone!

Reflections and implications

The children are highly motivated and very excited – jumping and chanting: 'Get ! Get!' I decided to give children time to reflect on their investigations, draw their favourite parts and make connections.

Activity 4: The children's reflections.

The children were invited to draw their favourite part of their scientific enquiry and explain their findings.

Rationale

The purpose of this activity was to draw conclusions and make connections about what the children have learnt so far and what they would like to find out next. I wanted to find out what evidence the children had gathered so far.

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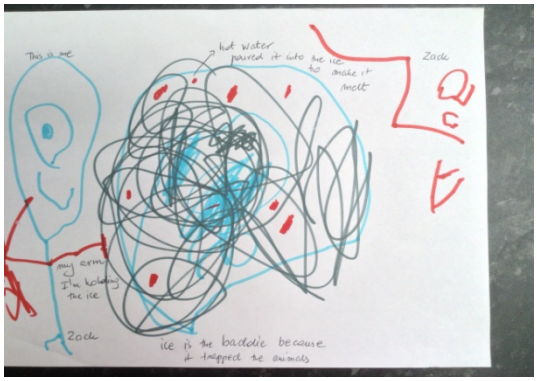
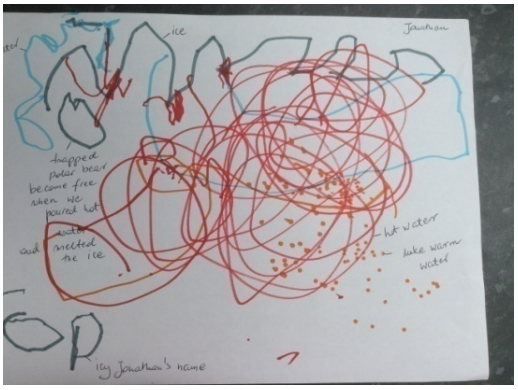
Photos 7-10: Children's recording and reflections



Ice is the baddie because it trapped the animals Hot water poured it into the ice to make it melt



Trapped polar bear became free when we poured hot water and it

Lukewarm water because cold ice changed it

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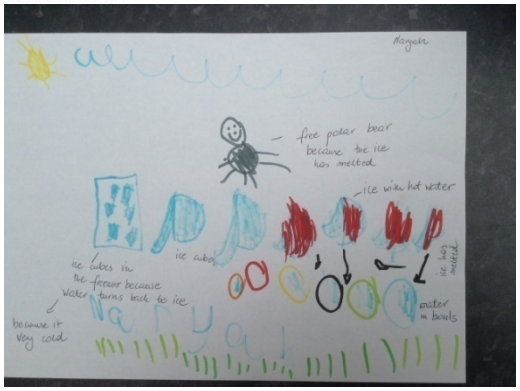

Ice cubes back in the freezer because water turns back to ice

Ice with hot water – free polar bear because the ice has melted .

Trapped penguins
Red is all the hot water.
t's making it melt.

Reflections and implications

The children are able to explain their evidence, thy also analysed the effects of their experiments and noticed that if there is no water there is no ice. The children are learning about the reversible process.

I decided to further **investigate** one of the children's idea and to check the effect of the sun warmth on ice.

Activity 5: The children place pots with ice outside the nursery in places of their choice.

The children place their ice in the sunshine and the shade to find out what kind of impact it has on their ice cubes.

Rationale

The purpose of this activity was to make observations, to gather evidence, make connections and enable further investigations. I fostered collaboration by suggesting listening to each other's ideas and comparing results.

Children's responses (photos 11-14)

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The children eagerly make predictions.
Teacher: What will happen if we put it in the shade!‘
Child: It’ll stay solid’
Teacher: What’s the weather like outside?
Child: ‘It’s sunny- the ice will melt easily’

It’s melting quickly because it was in the sun.

It’s melting slowly because there is a lot of it and it’s in the shade.

Reflections and implications

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The children are able to observe, draw conclusions, make links and use a wide range of scientific vocabulary. My role was to scaffold the children's learning to keep them children motivated and show that there is scope for further investigation. The children discussed what they had learnt:
'You can eat ice.'
'It is crunchy.'
' It's made out of water.'
'Ice melts into water'.
'Water turns into ice in the freezer because it's super cold.

In the next activity the children are given time to reflect on their activities, to draw their favourite parts of investigations and draw out connections to science concepts.

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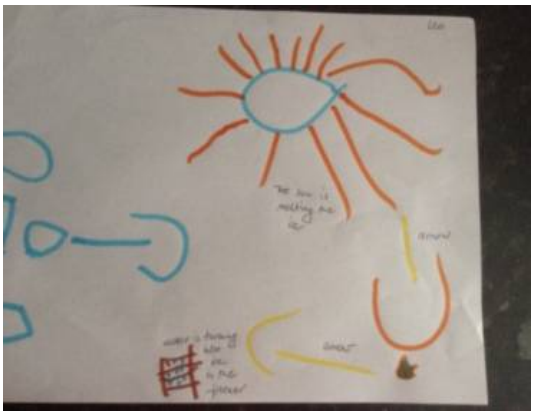
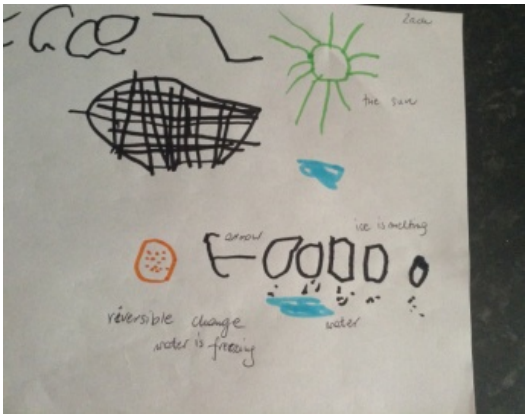
Children's progress (photos 15-20)



Leo explained his picture.
' The blue squares are the ice blocks, floating ice blocks. The sun is melting the ice. The fridge is making ice blocks. What happens if we put ice in the shade? It still melts but slowly. Where is the shade? – Outside!



Zack explained his picture.
' The ice cubes are melting by the sun. Ice cubes are in the freezer they get all into pieces. It's water and in turns into solid because it's reversible change! Zack decided to draw another picture and made a prediction stating And in space it's also very cold and our experiment would crack!

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Jonathan explained his picture.
‘ This is the ice and it’s melting. The sun is melting the ice. The dots and splats are solid and are inside the freezer, because it’s reversible it means solid, liquid, solid, liquid. It’s hard in the freezer it’s melting in the sun. What makes the change? –Temperature!

Overall Reflections

Learning activities: gathering evidence, making connections and explaining evidence while investigating
Creative dispositions: collaboration, taking risks
Synergies: play and exploration, dialogue and collaboration, teacher scaffolding and involvement
Contextual factors: group work, providing free flow activities to explain evidence

Children’s progress

During this learning journey the children were given opportunities to:

- raise questions ‘ How can we save the trapped animals?’, ‘ Use the oven?’, ‘ Can we freeze them without water?’
- make decisions ‘ bash the ice, think of other ways of rescuing trapped animals: melt the ice, speed up the melting, think of various alternatives; the sun, an oven, a radiator, the shade, warm water, cold water, warmth, gentle ways
- take risks freezing animals without water, suggesting conduction experiments and placing ice in different places, observing melting ice and watching it flooding ‘Small World’, thinking of ways to block the water
- unlock their creativity ‘ What’s the temperature in space?’ (Zack), ‘ What about dinosaurs and the ice age? (Jonathan), ‘ Ice is crunchy , you can eat it! (Jonathan – making ice lollies following the story of the ‘Frozen’ movie)
- collaborate, at the beginning of the project the children were learning to listen to each other’s ideas and take turns when speaking, this improved with time

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- play and explore through the practical nature of the activities, what helped them to make comments, plan investigations and draw conclusions
- inquire and investigate what led to expanding their scientific vocabulary and boosted their confidence and abilities
- improve knowledge, dispositions and attitudes towards science. The children began to make links during free flow activities, talking about ice in drinks, having ice lollies, changing the home corner into a 'Frozen' castle, blocking melting ice water from flooding the 'Small World' area
- have a critical approach, for example whilst watching a song from the movie ' Frozen' the children posed questions such as 'Why does a snowman never melt in the summer?'

The children noticed that their ideas and strategies to test their investigations were valued and taken into account .

Other unexpected outcomes for the children?

The whole class became highly engaged in the investigation activities. The children's collaboration and dispositions skills improved significantly. The children tested ice in different learning environments such as the water tray with cold water, the water tray with warm water, ice melting in the 'Small World' area and the most popular activity, which was making ice lollies.

My role

- It was an open-ended project for me as I needed to tune into the children's conversations and scaffold their ways of thinking and create a dialogue in order to foster their creative dispositions.
- I aimed to provide a stimulus to encourage dialogue through partner talk, taking turns, establishing rules for collaborating and exchanging ideas.
- I strived to be a careful and thoughtful facilitator in order to support the children in articulating their ideas and questions in order to achieve anticipated outcomes.
- I aimed to balance the amount of free choice activities and teacher's directed ones.
- I had to plan my questioning in order to elicit the information needed from the children, rather than telling them and explaining what to do.
- I noticed that the children were making observations and commenting what was happening to the ice whilst playing and exploring. I wanted to foster the children's investigation through opportunities that would build on their exploration. I achieved this through setting up science provision during free flow activities and scaffolding children's conversations.
- I encouraged the children to work in a small group and listen to each other in order to make connections and draw conclusions.

Classroom environment

- I enhanced classroom continuous provision by setting up a 'little explorer's corner' and a 'little inventor's corner', which proved highly popular
- I encouraged group work and observed the children allowing them to exchange ideas before initiating a new theme

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- I made on-going evaluations of activities, classroom provision and the children's involvement.

Next steps

- The children began to pose questions about other aspects related to ice such as, "Why did dinosaurs become extinct?' 'Was it because of the Ice Age?' *(Links to EYFS curriculum UW, CL, PSED)*
- During free flow activities the children explored the process of melting ice in the 'Small World' area, they decided to blockade the melting ice and water to stop it from overflowing –local, national and global issues of flooding climate change and global warming could be discussed and extended .
  (Links to EYFS *curriculum UW, CL, PSED)*
- Making ice lollies, adding ice cubes to drinks
  Links to EYFS *curriculum UW, CL, M, PSED)*
- The children showed interest in animals and their natural habitats, further inquiry would be beneficial with discussion about continents such as Antarctica, or islands such as Greenland and cold parts of countries such as Siberia, Alaska
  (Links to EYFS *curriculum PSED, UW, CL*)

Early Years Foundation Stage Curriculum in England:
Areas of Learning
(CL) Communication and Language
(PD) Physical Development
(PSED) Personal Social and Emotional Development
(L) Literacy
(M) Mathematics
(UW) Understanding the World
(EAD) Expressive Arts and Design

Reflection questions for the reader

- In what ways do you foster and build on children's play and exploration?
- How do you encourage children to share and discuss their ideas?
- What opportunities do you provide for children's extended engagement with an area of interest?
- How might you capitalise further on children's informal learning at home or in the school environment?

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