



Curriculum Materials

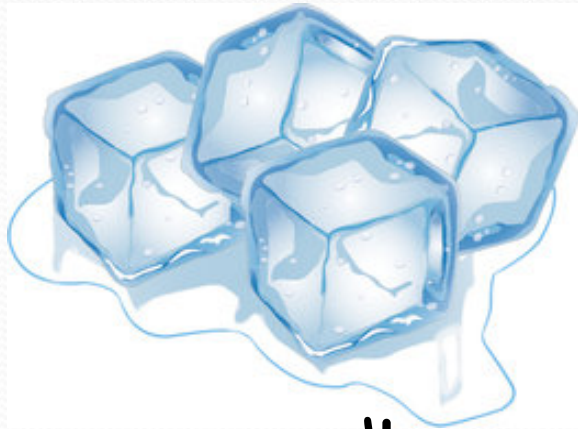
Learning Journey

An Icy Adventure



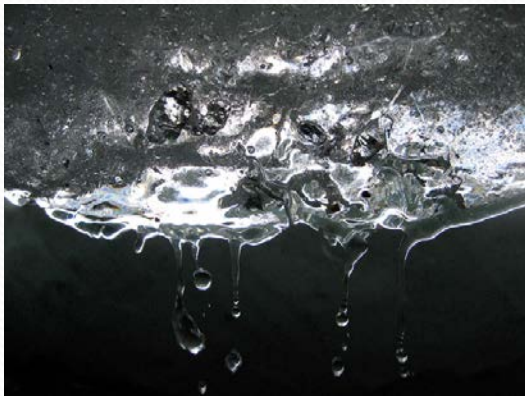
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'Learning Journey An icy adventure'

Edyta Kotska
Fairlawn Primary School



An icy adventure

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?'

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

Age :3-4

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



Background

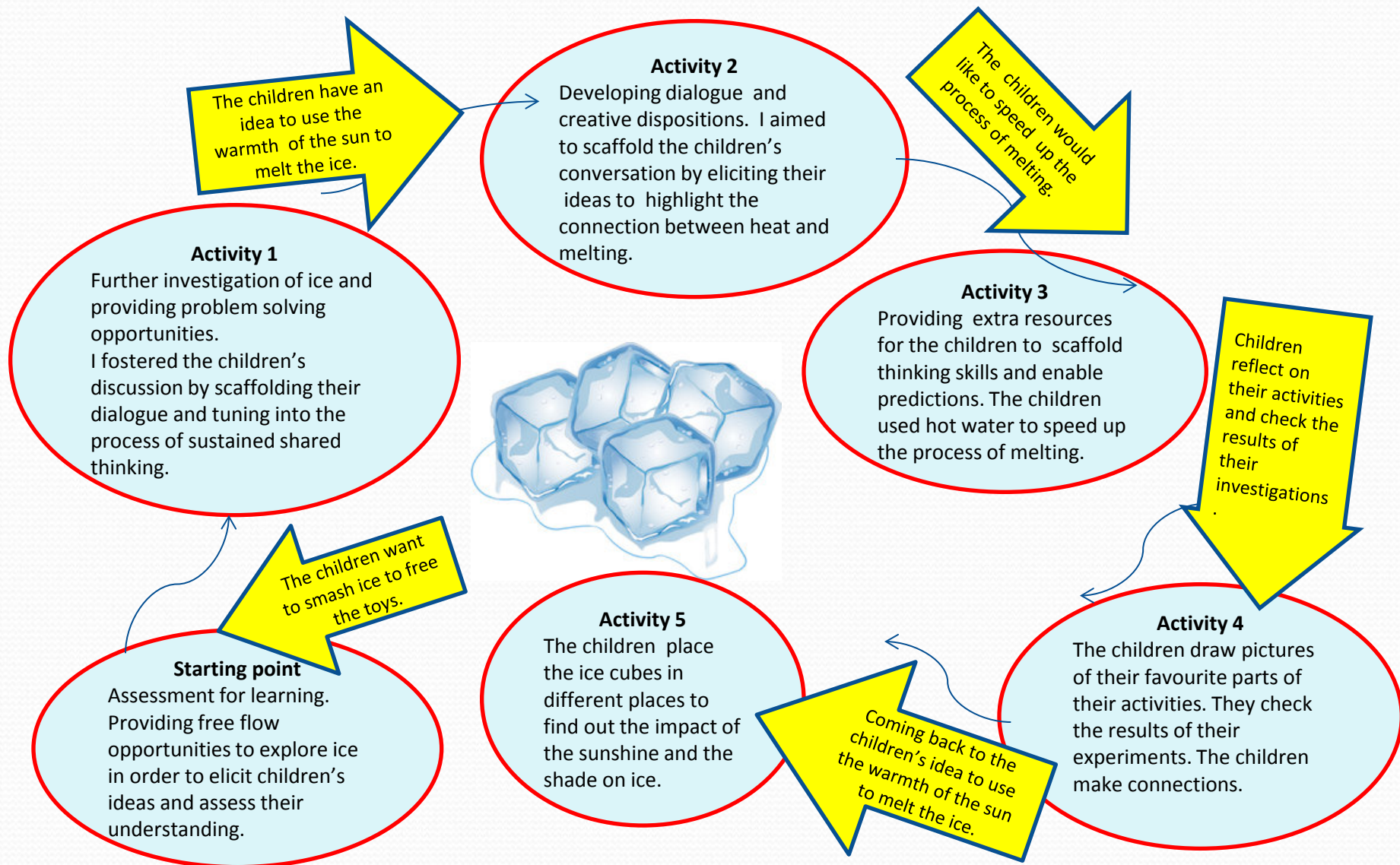
School setting: Inner city 2 form entry school with an outdoor space and a nearby park

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 EYFS

- 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

Overview of sequence of activities



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 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.



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

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?'

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
- **to take risks** and observe the reversible process of melting and freezing in order to **make connections**
- to expand children's range of scientific vocabulary

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**.

Developing the Learning Journey: Activity 1



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**.

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'.

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!**

Teacher:
I wonder what ice is?
Why is the water dripping?

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 warmth!**
Leo: **The nursery is hot but when I touch it (the ice) it feels cold!**

Can you think of a gentle way to save the trapped penguins?

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!**

: 'The sun melt ice!'



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.

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.

Developing the Learning Journey: Activity 2

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**

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.

Leo: **Radiator !! Hot! Hot!**
Jonathan: **'It can melt!'**
Zack: **'It's hot just like the sun!'**

The children are **able to make connections** and are very eager to put their pots on the radiator.

The children are fully in control taking on **initiative!**

Developing **thinking skills.**

Have a little think!

Leo: **Maybe an oven?**

Jonathan: **These animals will die if it's too hot because they live in cold!**

The children highly motivated and excited found a hot radiator!



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

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

Showing ability to **come up with something new.**

Whilst the rules for dialogue were established I aimed to scaffold a conversation to encourage the children to think of other sources of heat.

'What makes the nursery hot?'
'What is there in the classroom that is hot?'

Teacher
Shall we look around the classroom and find out?

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.

I decided to provide extra resources to **encourage alternative ideas.**



Developing the Learning Journey:

Activity 3

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

Developing **thinking skills.**

Zack: *Maybe we can shake it!*
We can take it out!
We can do this!
Children move the pots from side to side.

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.

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.

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.



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.

Teacher: I've brought some jugs. Can you think what we could add to the jugs?

Teacher: What will happen if we add hot water?

Mine is breaking!
Mine is already gone!

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

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

The children are **highly motivated** and very excited - jumping and chanting: **'Get! Get!'**

Children drawing conclusions, **making connections.**

I decided to give children time to **reflect on their investigations, draw their favourite parts & make connections.**

Jonathan: **Hot water!**

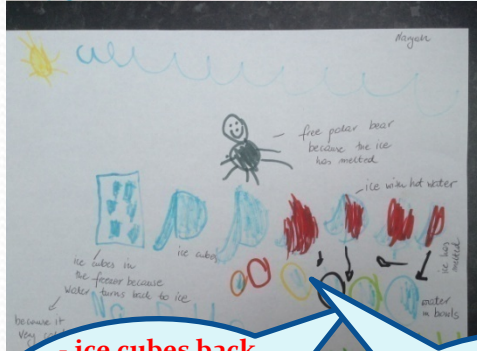
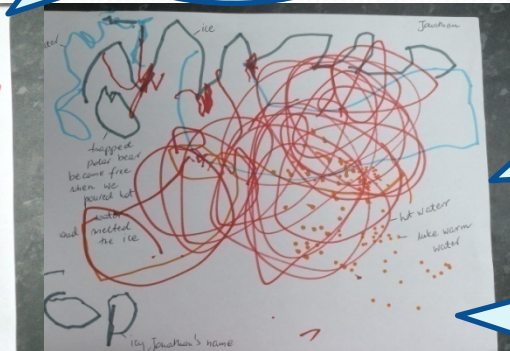
Jonathan: **It will melt!**



Developing the Learning Journey: Activity 4

Activity 4: The children's reflections.

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



- ice cubes back
in the freezer
because water
turns back to ice
because it's very
cold

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

-trapped penguins
-red is all the hot
water
- it's making it melt

- ice is the baddie
because it trapped
the animals
- hot water poured it
into the ice to make
it melt

The children are able to
explain their evidence,
they also analysed the
effects of their
investigations and
noticed that if there is
no water there is no ice.

- trapped polar
bear became free
when we poured
hot water and it
melted the ice

-lukewarm
water because
cold ice changed
it

The children
are learning
about the
reversible
process.

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.

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



Developing the Learning Journey: Activity 5

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.

The children are able to **observe, draw conclusions, make links** and use a wide range of **scientific vocabulary**.

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.

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 have 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.'

The children **eagerly make predictions**.

What will happen if we put it in the shade!

'It'll stay solid'

What's the weather like outside?

'It's sunny- the ice will melt easily'

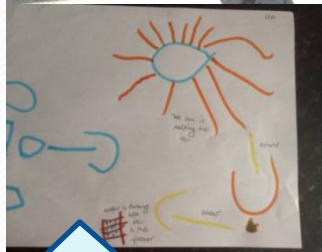
It's melting slowly because there is a lot of it and it's in the shade.

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

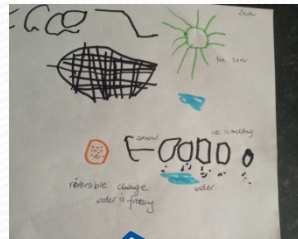
The children are given time to **reflect on their activities, to draw their favourite parts of experiments and draw out connections to science concepts**.



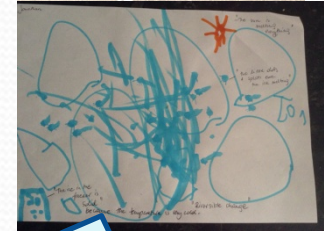
Children's progress



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!**



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!**

Reflections: Review of children's progress

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

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
 - 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.

Reflections: 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
- I made ongoing evaluations of activities, classroom provision and the children's involvement

Reflections: next steps

Possible 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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www.ceys-project.eu



The Open University



ELLINOGERMANIKI AGOGI



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