



Play-based Maths in the Early Years

Workshop 1 and 2

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Strand: Early Mathematical Activities	Strand Unit: Classifying	Strand Unit: Length
<ul style="list-style-type: none"> ● classify objects on the basis of one attribute, such as colour, shape, texture or size ● identify the complement of a set (i.e. elements not in a set) 		<ul style="list-style-type: none"> ● develop an understanding of the concept of length through exploration, discussion, and use of appropriate vocabulary ● compare and order objects according to length or height.
	Strand Unit: Matching	Strand Unit: Weight
<ul style="list-style-type: none"> ● match equivalent and non-equivalent sets using one-to-one correspondence 		<ul style="list-style-type: none"> ● develop an understanding of the concept of weight through exploration, handling of objects, and use of appropriate vocabulary ● compare objects according to weight
	Strand Unit: Comparing	Strand Unit: Capacity
<ul style="list-style-type: none"> ● compare objects according to length, width, height, weight, quantity, thickness or size ● compare sets without counting 		<ul style="list-style-type: none"> ● develop an understanding of the concept of capacity through exploration and the use of appropriate vocabulary ● compare containers according to capacity
	Strand Unit: Ordering	Strand Unit: Money
<ul style="list-style-type: none"> ● order objects according to length or height ● order sets without counting 		<ul style="list-style-type: none"> ● recognise and use coins (up to 5 cents) ● solve practical tasks and problems using money
Strand: Number	Strand Unit: Counting	Strand: Data
<ul style="list-style-type: none"> ● count the number of objects in a set, 1–10 		Strand Unit: Recognising and Interpreting Data
	Strand Unit: Comparing and Ordering	<ul style="list-style-type: none"> ● sort and classify sets of objects by one criterion ● match sets, equal and unequal ● represent and interpret a set of simple mathematical data using real objects, models and pictures
	Strand Unit: Analysis of Number	SKILLS
<p>Combining</p> <ul style="list-style-type: none"> ● explore the components of number, 1–5 ● combine sets of objects, totals to 5 <p>Partitioning</p> <ul style="list-style-type: none"> ● partition sets of objects, 1–5 <p>Numeration</p> <ul style="list-style-type: none"> ● develop an understanding of the conservation of number, 1–5 ● read, write and order numerals, 1–5 ● identify the empty set and the numeral zero ● subitise (tell at a glance) the number of objects in a set, 1–5 ● solve simple oral problems, 0–5 		<p>Understanding and Recalling</p> <ul style="list-style-type: none"> ● Recall and understand terminology <p>Implementing</p> <ul style="list-style-type: none"> ● Devise and mental strategies and procedures for carrying out mathematical tasks ● Use appropriate manipulatives to carry out mathematical tasks and procedures <p>Reasoning</p> <ul style="list-style-type: none"> ● Classify objects into logical categories ● Recognise and create sensory patterns ● Justify the processes or results of activities <p>Integrating and Connecting</p> <ul style="list-style-type: none"> ● Connect informally acquired mathematical ideas with formal mathematical ideas ● Recognise mathematics in the environment ● Recognise the relationship between verbal, concrete, pictorial and symbolic modes of representing numbers ● Carry out mathematical activities that involve other areas of the curriculum <p>Communicating and Expressing</p> <ul style="list-style-type: none"> ● Discuss and explain mathematical activities ● Record the results of mathematical activities concretely and using diagrams, pictures and numbers ● Discuss problems presented concretely, pictorially or orally <p>Applying and Problem Solving</p> <ul style="list-style-type: none"> ● Select appropriate materials and processes for mathematical tasks ● Select and apply appropriate strategies for completing a task or solving a problem ● Recognise solutions to problems
	Strand Unit: Extending Patterns	
<ul style="list-style-type: none"> ● Identify, copy and extend patterns in colour, shape and size 		
	Strand: Shape and Space	Strand Unit: Spatial Awareness
<ul style="list-style-type: none"> ● explore, discuss, develop and use the vocabulary of spatial relations 		
	Strand Unit: 3-D Shapes	
<ul style="list-style-type: none"> ● sort 3-D shapes, regular and irregular ● solve tasks and problems involving shape 		
	Strand Unit: 2-D Shapes	
<ul style="list-style-type: none"> ● sort and name 2-D shapes: square, circle, triangle, rectangle ● use suitable structured materials to create pictures ● solve problems involving shape 		
Strand: Measures	Strand Unit: Time	
<ul style="list-style-type: none"> ● develop an understanding of the concept of time through the use of appropriate vocabulary ● sequence daily events or stages in a story 		

Strand: Number	Strand Unit: Counting	Strand Unit: Length
<ul style="list-style-type: none"> count the number of objects in a set, 0-20 		<ul style="list-style-type: none"> develop an understanding of the concept of length through exploration, discussion and the use of appropriate vocabulary compare and order objects according to height estimate and measure length in non-standard units select and use appropriate non-standard units to measure length, width, or height. Discuss reasons
Strand Unit: Comparing and Ordering <ul style="list-style-type: none"> compare equivalent and non-equivalent sets 0-10 by matching order sets of objects by number, 0-10 use the language of ordinal number: first, second, third, last 		
Strand Unit: Analysis of Number <p>Combining</p> <ul style="list-style-type: none"> explore the components of number, 1-10 combine sets of objects, totals to 10 <p>Partitioning</p> <ul style="list-style-type: none"> partition sets of objects, 0-10 use the symbols + and = to construct word sentences involving addition <p>Numeration</p> <ul style="list-style-type: none"> develop an understanding of the conservation of number, 0-10 read, write and order numerals, 0-10 identify the empty set and the numeral zero estimate the number of objects in a set, 2-10 solve oral and pictorial problems, 0-10 		Strand Unit: Weight <ul style="list-style-type: none"> develop an understanding of the concept of weight through exploration, handling of objects and the use of appropriate vocabulary compare and order objects according to weight estimate and weigh in non-standard units select and use appropriate non-standard units to weigh objects. Discuss reasons for choice
		Strand Unit: Capacity <ul style="list-style-type: none"> develop an understanding of capacity through exploration, and use of appropriate vocabulary compare and order containers according to capacity estimate and measure capacity in non-standard units select and use appropriate non-standard units to measure capacity. Discuss reasons for choice
		Strand: Data Strand Unit: Recognising and Interpreting Data <ul style="list-style-type: none"> sort and classify sets of objects by one and two criteria represent and interpret data in two rows or columns using real objects, models and pictures
Strand: Algebra <ul style="list-style-type: none"> identify, copy and extend patterns in colour, shape, size and number (3-4 elements) discover different arrays of the same number recognise patterns and predict subsequent numbers 	Strand Unit: Extending Patterns	Understanding and Recalling <ul style="list-style-type: none"> Recall and understand terminology Implementing <ul style="list-style-type: none"> Devise and mental strategies and procedures for carrying out mathematical tasks Use appropriate manipulatives to carry out mathematical tasks and procedures Reasoning <ul style="list-style-type: none"> Classify objects into logical categories Recognise and create sensory patterns Justify the processes or results of activities Integrating and Connecting <ul style="list-style-type: none"> Connect informally acquired mathematical ideas with formal mathematical ideas Recognise mathematics in the environment Recognise the relationship between verbal, concrete, pictorial and symbolic modes of representing numbers Carry out mathematical activities that involve other areas of the curriculum Communicating and Expressing <ul style="list-style-type: none"> Discuss and explain mathematical activities Record the results of mathematical activities concretely and using diagrams, pictures and numbers Discuss problems presented concretely, pictorially or orally Applying and Problem Solving <ul style="list-style-type: none"> Select appropriate materials and processes for mathematical tasks Select and apply appropriate strategies for completing a task or solving a problem Recognise solutions to problems
Strand: Shape and Space <ul style="list-style-type: none"> explore, discuss, develop and use the vocabulary of spatial relations 	Strand Unit: Spatial Awareness	
Strand Unit: 3-D Shapes <ul style="list-style-type: none"> sort, describe and name 3-D shapes: cube, cuboid, sphere and cylinder combine 3-D shapes to make other shapes solve tasks and problems involving shape 		
Strand Unit: 2-D Shapes <ul style="list-style-type: none"> sort, describe and name 2-D shapes: square, circle, triangle, rectangle combine and divide 2-D shapes to make larger and smaller shapes solve problems involving shape and space give simple moving and turning directions 		
Strand: Measures <ul style="list-style-type: none"> develop an understanding of the concept of time through the use of appropriate vocabulary sequence daily and weekly events or stages in a story read time in one-hour intervals 	Strand Unit: Time	
Strand Unit: Money <ul style="list-style-type: none"> recognise coins up to 20 cent and use coins up to 10 cents solve practical tasks and problems using money 		

P Pick a theme	
L Learning outcomes (strands and skills)	
A Add maths language	
N Name a	Picture Book
	Game With Rules

Games with Rules

Ready, Set, Go - Maths

- Change Please (p.33)
- Guess My Secret (p.45)

PDST Measures Manual

- Suggested Picture Books (p.274)
- Introducing Tokens (p.275)
- Sequencing Events in a Story (p.221)

PDST Data Manual

- Three Block Towers (p.30)
- Missing Piece (p.34-35)

PDST Shape and Space Manual

- Secret Shape Folders (p.45)
- 2-D Shape Bingo (p.46)

Circle, Square, Triangle



What is still going around in your head?



What is squared away?



What 3 activities will you use in your classroom?

Planning for Play-Based Maths (Child-led)¹

Child-led play for up to an hour per day is a methodology promoted in Aistear (NCCA, 2009) for infant classes. This play is shaped and influenced by the resources made available by the teacher. In this way, the teacher has a critical role in the ‘behind-the-scenes’ work in resourcing and organising the play environment. This process is known as the pedagogical framing. The planning framework for play supports teachers in ‘doing’ this important framing work.

A **variety of play areas** should be used to engage children and cater for different learning opportunities. Some suggestions for areas are provided in the table below. In the case of each area, some examples of resources are provided².

Suggested play areas	Play Type	Description
Socio-dramatic play e.g. supermarket, pet shop, garden centre)	Pretend	Pretend, dramatic, make-believe, role, and fantasy play involves children using their imaginations. It includes pretending with objects, actions and situations. Children act out real events and they also take part in fantasy play about things that are not real, such as fairies or heroes. Children try out roles, occupations and experiences in their pretend play. Early Literacy and numeracy are evident in this type of play, e.g. children make lists and menus and pay for items purchased. They also get the chance to play with different forms of ICT such as mobile phones, keyboards, cameras and calculators.
Small world (e.g. doll’s house, model animals, people, cars and train sets)	Physical	Constructive play involved building something using natural and manufactured materials. As children develop, this type of play can become more complex and intricate.
Construction (e.g. large wooden blocks, shoes-boxes, hard hats, clipboards)		
Sand (e.g. sand-tray, sieves, jugs, scoops, buried objects, water added)		Exploratory play involves children using physical skills and their senses to find out what things feel like and what can be done with them. Children explore their own bodies and then they explore things in the environment
Water (e.g. tubing, funnels, jugs, scoops, buckets)		
Play-dough (e.g. range of colours of play dough, rolling pins, cutters)	Creative	Creative play involved children exploring and using their bodies and materials to make and do things and to share their feelings, ideas and thoughts. They enjoy being creative by dancing, painting, playing with junk and recycled materials, working with play-dough and clay, and using their imaginations
Junk art (e.g. cardboard boxes, tubes, yoghurt pots, scissors, cellotape)		
Permanent literacy and maths table (e.g. range of papers, pens, pencils, measuring tapes, weighing scales, calculators)	Supports literacy and numeracy in all play areas	The permanent area(s) provides children with opportunities to read, write and use math in ways that are related to the play topic.

¹ Adapted from: Aistear: Guidelines for good practice: Learning and developing through play (NCCA, 2009, p.54-55)

² See Appendix 1 of Aistear: Guidelines for good practice: for examples of resources to support children’s learning and development in different play areas (NCCA, 2009)

The planning framework for play focuses on:

- The **topic** being used to guide the play. This can emerge from the children’s own interests, a class discussion, a story read aloud by the teacher, an upcoming event etc. The topic facilitates curriculum integration through play. The teacher also uses the topic in timetabled subject curriculum area lessons.
- The **timeframe**. A ‘typical’ timeframe could be 2-4 weeks.
- The **language** and **maths** taught in discrete lessons that children will have the opportunity to use in the play areas.
- The **number of play areas**. Using five play areas can help the teacher ensure that all children have an opportunity to play in each area in a given week. However, the number of areas and the extent to which each links to the topic will vary from one topic to another.
- How each area is **resourced**. Key resources change to support the play topic but not all the resources in each play area have to ‘fit in’ to the play topic.
- Links to children’s **learning across the primary school curriculum** (integration).
- The **teacher’s reflections** on the use of the play methodology.

Play topic:		Timeframe:	
Language (taught in discrete lessons):			
Maths (taught in discrete lessons):			
Play area	Key resources	Curriculum integration	Teacher reflections



Task

- Nominate a facilitator and scribe.
- Using the video as a stimulus create five sound bites that a teacher may use to extend the pupils' mathematical understanding. You may wish to draw on the 'Five finger rule'.

Five Finger Rule

- For every question asked you must make four comments.

Open-ended Comments

- 'I love the way patterns look using the beads.'
- 'I wish we could record our work today, so I can remember what we did'

Open-ended Questions

- 'I wonder what would happen if we ...?'
- 'I wondered why you had ...?'
- 'Have you seen what X has done – why?'

Modelling Thinking

- 'I don't know how to fill this bucket, maybe, if I fill the smaller cup first...'
- 'Hmm, I want to stick wings on my airplane. I wonder if I used cello tape instead of glue...'

Recapping

- 'So you think that ...'
- 'John made a long red snake and Jean made a short blue caterpillar'

Drawing on Experiences

- 'I remember when my friend, Sue got more sweets than me...'
- 'My birthday always seems ages away, but this weekend I'm going to the cinema...'

Build on Feedback

- 'I really want to know more about this'
- 'Tell me more about how you built a taller tower'

Positive Affirmation

- 'That's an interesting idea. You've really made me think.'
- 'I've never thought about that before.'



10 Minute Contract / Promise

"Every day, the teacher sits with one group for at least 10 minutes. Some call it the '10-minute contract', but you and the children can come up with your own title. The teacher and the children make an agreement, in advance, that for 10 minutes (or more), the teacher will have uninterrupted playtime with a particular group. It can help the children to keep to this if they know that their group will get a turn to play with the teacher as well, and you can tell them in advance when that will be."

(Primary Language Curriculum Support Material English Stage 1, NCCA 2016 p.5)

³ Adapted from Aistear: Practitioners and children talking and thinking together (NCCA) and 'Quality Interactions in the Early Years' (Training Advancement and Co-operation in Teaching Young Children, 2005)

Creative Play and Skills Development⁴

Task

- Nominate a facilitator and reporter.
- Decide on and plan the construction of an artefact using a selection of the materials available.
- 2/3 people carry out the plan as a focus for discussion of the following points:

The variety of learning opportunities (curriculum and beyond) afforded by the activity and the materials:

How might the activity support the development of maths language?

What maths skills might the activity require of pupils?

What was the relationship between your original plan and the finished project?

How might the pupil's learning and engagement with this activity be assessed and recorded?

⁴ Adapted from Dr. J. Fallon, NCCA, PDST Workshop



Approaches to Observation

Observation involves watching and listening to pupils and using the information gathered to enhance their mathematical learning and development. Teachers may use a variety of observations depending on what he/she wants to find out. Observations can be recorded using anecdotal snapshots (short notes), detailed notes, diary entries, photographs, videos, checklists, etc. The following illustrates a variety of approaches to observation.



Pretend Play and Assessment

Task

- Create a 'pretend play classroom environment' adopting the following roles:
 - Pupils (2-3)
 - Teacher,
 - Observers (2-3).
- Using the suggested assessment tool the teacher aims to ascertain pupils learning, being mindful of the plan for teacher-led play (see slide)
- Observers focus on the richness of the data gathered, the role of interactions and the skills observed.

Observations

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-
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-