

Aligning curriculum, pedagogies and assessment

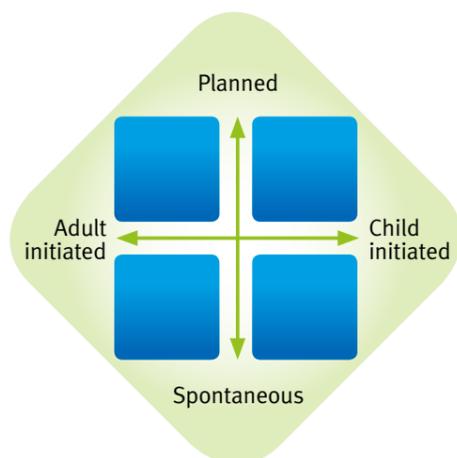
An example of practice in Prep Inquiry learning - 'Spot What'

Australian Curriculum - Mathematics

Sequencing teaching and learning

How do I teach it?

Achieving range and balance*



Approach

- Inquiry learning

Practices

- Whole class inquiry
- Teacher initiated
- Child interest

Strategies

- Using picture books as stimulus
- Provision of open-ended materials
- Provision of neutral book page template

Characteristics of age-appropriate pedagogies*

- Active
- **Agentic**
- Collaborative
- **Creative**
- **Explicit**
- Language rich and dialogic
- Learner focused
- Narrative
- Playful
- **Responsive**
- **Scaffolded**

*See over for an explanation of approaches, practices and strategies, and the characteristics of age-appropriate pedagogies evident in this Example of practice.

Our students

Working together to ensure that every day, in every classroom, every student is learning and achieving

This is an example of how one teacher incorporated **inquiry learning** into her program by adapting C2C Unit 1 - Mathematics Year Prep (V3.0) Lessons 11-25 and implementing the associated Monitoring task *Number Watch*, across a four week period. This inquiry learning sought to answer the question, 'What do we know about the numbers one to ten?'

The teacher noted the children's engagement with the *Spot What* series (Bryant and Summers 2005), that were available in the class library. The teacher decided to use this engagement to allow the children some agency in accessing the mandated Mathematics curriculum.

Having used the picture books as a stimulus, the teacher explained that each child would be designing and creating a page for inclusion into a class *Spot What* number book. Each child was asked to choose a number for inquiry. The teacher then explained, modelled and demonstrated what was expected, and co-constructed a *Spot What* number page with the children, before the children had the opportunity to demonstrate their mastery by independently designing their own *Spot What* number page.

The children were provided with open-ended materials, including realistic, symbolic and unstructured resources, and a neutral book page template to design and create their page. They were encouraged to show all that they had discovered about their chosen number including real-life examples of their number, the use of concrete materials to model their number, numerals, number words, subitising, counting sequences and part-part whole.

This inquiry learning took place during indoor learning time, where the children were given opportunity for sustained inquiry as part of regular Maths activities. Maths activities occurred four days per week within a 90 minute uninterrupted block. The children signed into the inquiry, as a way of tracking their participation, and worked independently on their page, although interacting and discussing with their peers and teacher throughout.

On completion of the inquiry, the children photographed their number page layouts. These were then inserted into a PowerPoint template, printed, laminated and compiled into a class *Spot What* number book, which was taken home and shared with the children's families to support parent/carer engagement in their children's learning.

Assessment

What do my students already know? How well do they know it?

Assessment **for learning** - data from Early Start On-entry to Prep Numeracy task, C2C Unit 1 - Mathematics Year Prep (V3.0) - Monitoring task, children's *Spot What* number book pages

Assessment **as learning** - teacher feedback during classroom activities

Assessment **of learning** - there was no summative assessment task attached to this inquiry learning

Making judgments

How will I know how well my students have demonstrated the Achievement Standard?

Although there was no summative assessment task attached to this inquiry learning, by monitoring the children's learning through the use of assessment **for** and **as** learning, and providing feedback to the children, decisions could be made by the teacher relating to:

- what the children knew and understood
- what strengths, misconceptions and misunderstandings were evident

- what were the next steps for learning.

Later in the year, evidence of the children's achievement was collected using a range of assessments. Each child's assessment folio held evidence of learning for the reporting period. The evidence showed patterns in learning and levels of performance in relation to the Mathematics Foundation (Prep) Year Achievement Standard.

Feedback

What do my students already know? What do my students need to learn next?

The teacher used data from Early Start On-entry to Prep Numeracy task, C2C Unit 1 - Mathematics Year Prep (V3.0) - Monitoring task, and observations of the children creating their *Spot What* pages to inform feedback.

The feedback provided the children with progress on their learning to date (*Emily, I noticed that when you were collecting shells for your Spot What page, you counted out four. One, two, three, four*), and gave specific information about what to do next (*Remember, if I ask you how many shells you have, you don't have to count them again. You can just remember the last number that you counted. Four*).

Ongoing, informal verbal feedback was embedded in classroom activities throughout this inquiry learning.



Curriculum intent

What do my students need to learn?

Australian Curriculum - Mathematics

Foundation (Prep) Year Level Description

The proficiency strands, understanding, fluency, problem solving and reasoning are an integral part of mathematics content across the three content strands: number and algebra, measurement and geometry, and statistics and probability. The proficiencies reinforce the significance of working mathematically within the content and describe how the content is explored or developed. They provide the language to build in the developmental aspects of the learning of mathematics. The achievement standards reflect the content and encompass the proficiencies.

At this year level:

- **understanding includes connecting names, numerals and quantities**
- fluency includes readily counting numbers in sequences, continuing patterns, and comparing the lengths of objects
- problem solving includes using materials to model authentic problems, sorting objects, using familiar counting sequences to solve unfamiliar problems, and discussing the reasonableness of the answer
- reasoning includes explaining comparisons of quantities, creating patterns, and explaining processes for indirect comparison of length

Foundation (Prep) Year Content Descriptions
(as applicable to this inquiry learning)

- **Establish understanding of the language and processes of counting by naming numbers in sequences, initially to and from 20, moving from any starting point (ACMNA001)**
- **Connect number names, numerals and quantities, including zero, initially up to 10 and then beyond (ACMNA002)**
- **Subitise small collections of objects (ACMNA003)**
- **Compare, order and make correspondences between collections, initially to 20, and explain reasoning (ACMNA289)**

Foundation (Prep) Year Achievement Standard

By the end of the Foundation year, students make connections between number names, numerals and quantities up to 10. They compare objects using mass, length and capacity. Students connect events and the days of the week. They explain the order and duration of events. They use appropriate language to describe location.

Students count to and from 20 and order small collections. They group objects based on common characteristics and sort shapes and objects. Students answer simple questions to collect information and make simple inferences.

Characteristics of age-appropriate pedagogies evident in this example of practice

Throughout this Inquiry learning, the children were given voice through the ability to select their own number for inquiry. The inquiry encouraged investigation and artistry in the creation of a *Spot What* number page. The children were encouraged to utilise new ways of representing their chosen number and made conscious of the skills and understandings that they needed to display in the creation of their *Spot What* number page. Learning was made explicit through modelling, demonstration and joint construction. The inquiry was responsive in that required curriculum content was delivered using *Spot What* as a vehicle, which had been identified by the teacher as an area of high interest and engagement amongst the children. The inquiry was scaffolded throughout, through the use of modelling, giving feedback and teacher/child reflection.

Although only five of the characteristics of age-appropriate pedagogies have been highlighted here, opportunities for each of the eleven characteristics to be embedded were evident.

Characteristics of age-appropriate pedagogies

Creative

Inviting children to consider “What if?” They encourage investigation, inquiry and artistry to explore new possibilities and ways of thinking.

Narrative

Acknowledging the important role that personal, written, oral and digital stories play in all our lives. They support both the production and comprehension of narratives through active processes, especially play.

Active

Requiring physical and embodied engagement across all areas of learning. Whether this is indoors or outdoors, activity is essential in order to activate children’s full potential. Their focus, concentration, motivation and self-regulation are enhanced through moving, doing and interacting within a range of learning environments.

Explicit

Making conscious for both learner and educator the relationships between the learning purpose and processes employed and the skills and understanding these processes support.

Playful

Encouraging children to make connections through imagination and creativity to explore alternate worlds and ways of thinking. These worlds, not bounded by reality, offer the freedom children need to innovate and enact new possibilities.

Agentic

Ensuring that children have voice in their learning. Their ideas and interests initiate, support and extend learning possibilities in order to build on their real-world understandings and experiences.

Language rich and dialogic

Ensuring that learning occurs in environments where rich language is modelled and employed by both children and educators. Meaningful dialogues between children, as well as between children and educators, are created to support thinking, learning, engagement and imagination.

Responsive

Incorporating a willingness to be flexible, to ensure that learning is always child, context, content and discipline appropriate. To achieve this, educators will balance opportunities for structure and spontaneity, open-ended and specific tasks, and child-led and educator-led learning.

Collaborative

Being social and co-constructed. Children and educators work together to identify ways of learning and understanding through sustained shared thinking and action.

Learner focused

Recognising that all children learn in different ways and that learning is a highly individualised process. They also acknowledge differences in children’s physical, intellectual, cultural, social and personal experiences and perspectives.

Scaffolded

Including such actions as modelling, encouraging, questioning, adding challenges, and giving feedback, provide the support needed to extend children’s existing capabilities. Effective scaffolding by both educators and other children provides active structures to support new learning; it is then progressively withdrawn as learners gain increasing mastery.

Approach - Inquiry learning

Practices*

Whole class inquiry

Each child was made responsible for the design and production of a page for a class *Spot What* number book. The children supported each other in their endeavours, comparing and contrasting their pages throughout the inquiry, offering each other ideas and advice.

Teacher initiated

This inquiry was initiated by the teacher in response to the [Australian Curriculum](#) Mathematics content descriptions and the school’s requirement to complete the Monitoring task *Number Watch*, linked with C2C Unit 1 - Mathematics Year Prep (V3.0).

Child interest

The children’s interest and engagement with the *Spot What* books was harnessed by the teacher to bring a clear and real purpose to the investigation of number.

**These are examples of the Practices implemented, and not intended as a finite list.*

Strategies*

Using picture books as stimulus

Spot What picture books were used as a stimulus for this inquiry when the teacher noticed the children’s engagement with these texts during class time. Children in the class had also been bringing their *Spot What* books from home.

Provision of open-ended materials

The teacher provided the children with a variety of open-ended materials, including realistic, symbolic and unstructured resources for use in the design and production of their *Spot What* number page. The open-ended

materials, which may not have seemed mathematical at first glance, allowed the children to be divergent in their expression of their number knowledge. The open-ended materials included feathers, puppets, flowers, dolls, lids, shells and toy cars. These resources were bolstered by resources collected by the children at home (cutlery, empty boxes and nuts and bolts).

Provision of neutral book page template

A neutral book page template was provided for the children to scaffold their *Spot What* number page creation.

** These are examples of the Strategies implemented, and not intended as a finite list.*

Questions for teacher-based reflection

- How is an array of effective pedagogies ensured?
- How are holistic development and academic goals balanced?
- How is a balance between child-initiated and adult-initiated learning experiences fostered?
- How are positive personal relationships with children nurtured?
- How is playfulness in learning and teaching interactions embedded?
- How are high-quality, verbal interactions encouraged?
- How are interactions to scaffold cognitive challenge and develop higher order thinking incorporated?
- How are real-life, imaginary, spontaneous and planned experiences integrated?

Questions for school-based reflection

- How is the provision of training, resources and support considered?
- How are the professional demands on teachers, and the lead-in time required to establish new approaches, recognised and supported?