

Play, science and assessment — the winning combination

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I have been an early years ambassador for 30 years, teaching in a variety of contexts including state preschools, C&K centres, Prep and primary settings and University. In recent years I have been an early years writer on the C2C Science team — an Education Queensland project developing support materials for the implementation of the Australian Curriculum. My passions are teaching exciting and accurate science; and designing and developing high quality curriculum materials. I believe exciting science teaching using inquiry-based learning is commensurate with excellent early years pedagogy. In stark contrast, I also believe that teaching and assessing young learners in terms of the Australian Curriculum poses significant challenges for early years teachers.

The greatest challenges, I have found, as an early years teacher in a primary school setting are two-fold. First is holding on to the principles and practices that I know to be appropriate for young children. Second is finding methods to make the range and depth of a young child's learning visible. Once capturing this evidence of learning, I can carefully plan my next teaching strategy in alignment with the curriculum I must implement. Easier said than done. These challenges represent two opposing forces — the character and complexity of early learning and the top-down pressures for point-in-time data.

One of the areas I feel I have most success in meeting these challenges is in the teaching of science. Inquiry-based (not literacy-based) science provides wonderful opportunities for adhering to the fundamental principles of the Early Years Learning Framework (EYLF) in a prep or primary classroom and teaching the Australian Curriculum too. Science can legitimise play for those who are feeling pressured to limit play in their class programs. It can also provide wonderful opportunities for teachers to observe and assess students in ways that Froebel, Piaget, Vygotsky and Issacs have taught us are appropriate for young learners. An inquiry-based, hands-on science unit can include opportunities for children to:

- use play to investigate, imagine and explore ideas;
- follow and extend their own interests with enthusiasm, energy and concentration;
- initiate and contribute to play experiences emerging from their own ideas; and
- participate in a variety of rich and meaningful inquiry-based experiences.

These statements are from the EYLF and directly mirror statements in the Australian Curriculum including:

Students can experience the joy of scientific discovery and nurture their natural curiosity about the world around them. In doing this, they develop critical and creative thinking skills and challenge themselves to identify questions and draw evidence-based conclusions using scientific methods.

<http://www.australiancurriculum.edu.au/Science/Rationale> (accessed May 12, 2013)

Accepting that science provides the means to employ time-honoured early childhood learning

and development principles, we then need to meet our second challenge — how do we make the learning visible and organise it into a record for reporting which accurately reflects the emerging young learner. This is where a science journal and a well-written guide to making judgments can be invaluable.

Keeping a science journal

In keeping a science journal, young students need to be taught to see this as not just another scrap book for pasting sheets into and then forgotten about. They need to be told that this is a thinking tool and scientists always look back at the notes they have written in the past. This should also be modelled using the class science journal. First and foremost, the entries are always date-stamped by the students, if even somewhat exuberantly in the beginning. Of course, there will likely be some sheets to glue in but even young students can be encouraged to make other types of entries too. For example, drawing things they observe or describing their observations to an adult who scribes their ideas are both important types of journal entries. Early picture graphs and graphic organisers like story boards are also important ways for organizing their observations and explaining change. Photos taken and printed out, or screen shots/print-outs of computer activities which are then annotated, can be other sources.

The most significant factor in the success of using science journals is that teachers then need to make time to have conversations with students about what they have drawn, what they have learnt and if they have unanswered questions.

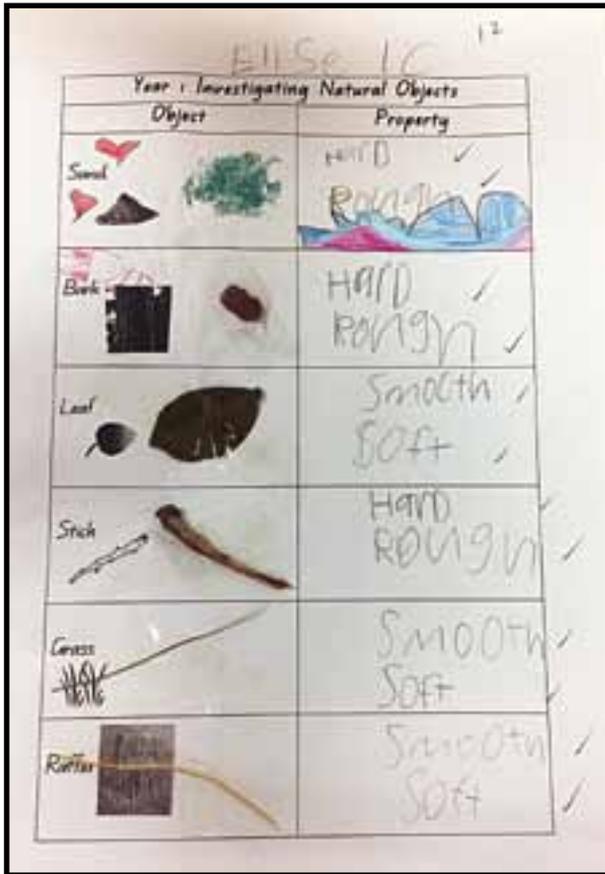
We know that what a young person can draw or write is rarely a true indicator of the depth of their knowledge.



Science journal entry

Conversations and observations of students engaged in hands-on activities are of course a major source of information when teaching young children. However, capturing the enormous number of significant observation moments that occur in any one day is a huge challenge. A really valuable technique is to record observations with a digital recording device, as writing these down can be difficult during an activity. Also, taking photos can capture an important moment and trigger the recall of an important observation. It is important to explain to a class what you are doing when you are speaking into a small device and why you are taking photos of them. Young children can even be taught how to talk into a recording device themselves – for example, to describe something they have made from different materials and why. Sometimes, without a teacher's questions to direct the conversation, it can give new insights into a young learner's thinking.

When discussing, scribing and interviewing about a task which you have deemed significant for monitoring and assessment, it is highly valuable to have a marking guide on hand. It is again important to briefly explain to students why you are recording on this document – for example, to write about what they know and can do. A well-written marking provides excellent structure to the questions you ask and the information you look for. Guides are very effective when written in a continua style rather than a rubric. When reading and using the guide, start from the



Making hands-on learning visible

bottom and read upwards so that you are identifying what the child can do. Placing a mark, brief comment and/or activity name and the date will then give you a starting point for the next time you use the guide with a child and, over time, will build up a picture of not only where they are at but where they have come from. The dates on the guide can then be matched to an anecdotal record, recorded observation, or science journal entry as evidence of the mark. Guides using language stating a frequency of performance such as 'sometimes, often, always' should be avoided as this is far too subjective. When you are teaching at least 25 students, trying to document how often someone does something is near impossible and it may not, in fact, indicate actual understanding.

In modern primary school settings, many traditional early years practices are threatened, largely because of the accountability measures that engulf us. Achievement in literacy and numeracy, a mandated National Curriculum

and increased sociological diversity all result in time constraints and top down pressures which make it difficult to include play-based, child-directed learning in our classrooms. If you have not been taught how to foster and map these in the first place through completing a specific early childhood qualification, it can be especially difficult. Inquiry-based science, science journals and well-written marking guides can be a big part of the solution.

Swaffield, S., 2011 Getting to the heart of authentic Assessment for Learning, *Assessment in Education: Principles, Policy & Practice*, 18:4, 433-449 <http://dx.doi.org/10.1080/0969594X.2011.582838>

Australian Curriculum, Assessment and Reporting Authority, *The Australian Curriculum*, <http://www.australiancurriculum.edu.au/Science/Rationale> (accessed May 12, 2013)

ECTA's submission to the Productivity Commission's Inquiry into Child Care and Early Childhood Learning

Last year, the Australian Government requested the Productivity Commission to commence an inquiry into child care and early childhood learning. The Inquiry is focused on developing 'a system that supports workforce participation and addresses children's learning and development needs'.

In response, ECTA made a submission to the Commission in February. It acknowledged the importance of kindergarten participation and supported the current staff qualifications and ratios under the National Quality Framework (NQF). It also suggested streamlining current regulatory requirements under the NQF and the processes involved in providing appropriate support for children with additional needs.

You can read ECTA's submission in full at: http://pc.gov.au/__data/assets/pdf_file/0019/133624/sub192-childcare.pdf