



<b>Sample assessment task</b>	
<b>Year level</b>	Pre-primary
<b>Learning area</b>	Technologies
<b>Subject</b>	Engineering principles and systems
<b>Title of task</b>	What floats your boat?
<b>Task details</b>	
<b>Description of task</b>	Students explore the process involved in creating a boat that floats (and supports a small cargo to be determined by the class), including the principles of investigating, designing, producing and implementing, and evaluating.
<b>Type of assessment</b>	Summative
<b>Purpose of assessment</b>	To assess students' ability to identify which objects float and their ability to evaluate their design
<b>Assessment strategy</b>	Observation and self-assessment, and evaluation
<b>Evidence to be collected</b>	Photographic evidence of the boat and written or recorded comments from the student
<b>Suggested time</b>	5 x 1 hour lessons
<b>Content description</b>	
<b>Content from the Western Australian Curriculum and Assessment Outline</b>	<p><b><i>Knowledge and understanding</i></b>  <b>Engineering principles and systems</b>            Ways in which objects move: push, pull, bounce, slide, fall, spin, float</p> <p><b>Materials and technologies specialisations</b>            Characteristics of materials can be explored using senses</p> <p><b><i>Processes and production skills</i></b>  <b>Evaluating</b>            Use personal preferences to evaluate the success of simple solutions</p>
<b>Early Years Learning Framework (EYLF)</b>	<p>Outcome 4: Children are confident and involved learners</p> <p>Children develop a range of skills and processes such as problem solving, inquiry, experimentation, hypothesising, researching and investigating</p>
<b>Connected Curriculum</b>	<p><b>Science – Physical Sciences</b></p> <p>The way objects move depends on a variety of factors, including their size and shape</p>
<b>Task preparation</b>	
<b>Prior learning</b>	Students have participated in extensive play investigating materials, toys and pieces of nature in a variety of water receptacles, including puddles, water trolleys and basins. Students have participated in shared, sustained thinking about why various materials float, effective shapes of materials, what they like about certain toys or materials, whether materials can support cargoes such as seeds, washers, stones, leaves, coins ...
<b>Assessment differentiation</b>	<p>Teachers should differentiate their teaching and assessment to meet the specific learning needs of their students, based on their level of readiness to learn and their need to be challenged.</p> <p>Where appropriate, teachers may either scaffold or extend the scope of the assessment tasks.</p>

<b>Assessment task</b>	
<b>Assessment conditions</b>	<p>Outside natural environment and classroom</p> <p>Whole-class experience producing individual boats</p>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Container with sufficient water to demonstrate floating and sinking adequately</li> <li>• Toys/materials (to be sourced from the environment by students)</li> <li>• A variety of materials which can be used for the project, including waterproof materials such as, foil, plastic, metal ...</li> <li>• Scissors, tape, staplers ...</li> </ul>

## Instructions for teacher

Strategy	
<b>Inspire/inform</b>	<p>Students gather around a suitable container with water.</p> <p>Explore the properties of materials which float and sink by asking all students to choose one item from the inside/outside environment to investigate.</p> <p>Make some predictions about which materials will float or sink.</p>
<b>Show</b>	<p>Select three or four examples and put them in the water.</p> <p>Focus observations on the properties which enable the examples to float or not float.</p> <p>Draw some conclusions.</p> <p>Add some suggested items to be the cargo.</p> <p><i>What happens when cargo is added?</i></p>
<b>Tell</b>	<p>Explain to the students that their task will be to design a boat which can float.</p> <p>Tell the students what materials are available.</p> <p>Tell the students what equipment (scissors, tape...) is available for this task.</p> <p>As a class, negotiate the cargo which will be used as the standard for all students.</p>
<b>Apply</b>	<p>Students draw a design.</p> <p>Make their design.</p> <p>Try their design (add the cargo).</p> <p>Modify their design, as necessary.</p>
<b>Reflect</b>	<p>Students reflect on the success of their models and evaluate the designs.</p> <p>Ask the students: <i>What do you like about it? Does your design hold the cargo without sinking? How can it be improved?</i></p> <p>Record the design in the water with photographic evidence and either record or scribe students' responses to the questions.</p> <p>Students contribute ideas to a PMI (Plus, Minus or Interesting) and reflect on the processes and production skills involved in this task.</p>

## Sample marking key

### Engineering principles and systems

Ways in which objects move: push, pull, bounce, slide, fall, spin, float

*Assessment Key I = Independent SS = Some Support LS = Lots of Support*

Student names	Can identify when an object floats	Evaluates design based on personal preferences	Comments

## Making connections across learning environments

### NQS: Quality Area 1 - Educational program and practice

Element 1.1.2 Each child's current knowledge, ideas, culture, abilities and interests are the foundation of the program.

Element 1.2.2 Educators respond to children's ideas and play and use intentional teaching to scaffold and extend each child's learning.

	<i>Provocation/activity</i>	<i>Resources</i>
<i>Inside spaces/environments</i>	<b>Freight Weight:</b> Students explore how different materials and their weight (freight) affect the boats' ability to float. Students can experiment with having more or less of one load to keep the equilibrium.	A number of boats of different sizes. Materials, such as seeds, coins, stones, gum nuts ... (to weigh) Small plastic basins approx. 10L capacity
	<b>As cold as ice:</b> Students place large ice blocks in the basin or receptacle and regularly observe what happens over the day as the ice melts and releases frozen items. Students can predict and observe which items will float and which will sink. Students may sort the items into these groups at the end of the day.	Large ice blocks (2L icecream size), a variety of heavy and light materials to freeze in water (shells, plastic dinosaurs, straw, toy cars, gum nuts, spoons, coins ...), a large deep basin, preferably white
	<b>Collapsing colours:</b> Students experiment with oil floating on water in an experiment in which water is added to a jar, followed by some oil. The food colouring is then dropped in slowly and students can observe what happens as the weight of the food colouring gradually breaks through the oil layer and drops to the bottom of the jar.	Several large glass jars, eye droppers, oil, food colouring, water
<i>Outside spaces/environments</i>	<b>Go nuts!</b> Students collect items from the natural environment and explore their properties in terms of floating and sinking. Students can sort these items accordingly.	Water trolley, a variety of nature items collected from your natural environment (leaves, stones, sticks, nuts...)
	<b>Who Sank The Boat by Pamela Allen:</b> Students recreate the story by using the toys in a basin (lake). Use the book to read through and all join in refrain, "Do you know who sank the boat?"	Copy of the book Basins or tubs large enough to hold plastic toy boats, plastic versions of the animals in the story (or alternative animals)
	<b>Bubble befuddle:</b> Explore and experiment with bubbles in the outdoors. What colours? Where does the wind take them? Shapes? Size and wonder?	Bubbles - bubble mix, and a variety of bubble wands (commercial or child-made) Make an extra-large bubble wand (YouTube)