

# Shells and other vessels

First Nations people use and modify shells and other vessels using processes of design, technology and engineering. Shells are useful for food and water gathering, and are still today often decorated with art to share stories. Their contents are a source of food and evidence can be found in the shell middens located around the country.

In Mathematics, shells and other vessels can be used in measurement. There are applications for shells and vessels in all areas of STEM.



Indigenous Knowledges	Connecting Indigenous Knowledges and Mathematics	Connections to the Australian Curriculum
<p>Matt Burns (Quandamooka Traditional Custodian from North Stradbroke Island) shares his knowledge of coolamons: a traditional carrying vessel used on Quandamooka country. Coolamons are made from bark carved from trees. They are used for gathering, preparing and serving food, holding babies, ochre, and carrying a fire torch.</p>	<p><b>Share Indigenous Knowledge of traditional carrying vessels</b> Students:</p> <ul style="list-style-type: none"> <li>draw the shape of the Coolamon and how it is carved from tree trunks</li> <li>compare and use informal units to measure the amount of liquid or solid carried in a variety of traditional vessels</li> <li>compare and order vessels according to amount held or mass</li> <li>justify their reasoning for ordering different vessels.</li> </ul>	<p>In Year 1, students:</p> <ul style="list-style-type: none"> <li>compare directly and indirectly</li> <li>order events using attributes of duration, communicating their reasoning</li> <li>could investigate times where First Nations people estimate, compare and communicate measurements, for example, The capacity of traditional carrying vessels (AC9M1M01).</li> </ul> <p>In Year 2, students measure and compare objects based on length, capacity and mass using uniform informal units and smaller units for accuracy when needed (AC9M2M01).</p>
<p>Jason Smith (Palawa man from Lutruwita) shares his knowledge of the marineer shells for body decoration and traditional necklace design made by the Palawa women. Jason relates the health of Country to the diversity of shells available on Country.</p>	<p><b>Share Indigenous Knowledge of shells used for decoration</b> Students:</p> <ul style="list-style-type: none"> <li>draw the shapes of shells Jason presented</li> <li>use objects observed on Country to continue and create repeating patterns</li> <li>draw a pattern for a traditional necklace and describe the repeating pattern used in their design.</li> </ul>	<p>In Year 1, students:</p> <ul style="list-style-type: none"> <li>recognise, continue and create repeating patterns with numbers, symbols, shapes and objects, identifying the repeating unit</li> <li>consider how making traditional shell or seed necklaces includes sorting shells and beads based on colour, size and shape, and creating a repeating pattern sequence (AC9M3SP02).</li> </ul>
<p>Bart Pigram (Yawuru man from Broome) shares his knowledge of using pearl shells for body decoration and their value for Yawuru people in trading. He discusses the pearl shell as a commodity which First Nations people traded. He shares knowledge of well-travelled trade routes across Country.</p>	<p><b>Share Indigenous Knowledge of pearl shells used for trading</b> Students:</p> <ul style="list-style-type: none"> <li>draw a picture of trading pearl shells for another resource found on Country</li> <li>recognise trading of natural resources by First Nations people as a form of economy and alternative to using coins or money</li> <li>role play trading natural resources</li> <li>explore land maps or cultural maps to find traditional trade routes</li> <li>explain and justify the bartering/trading system they designed.</li> </ul>	<p>In Year 3, students:</p> <ul style="list-style-type: none"> <li>recognise the relationships between dollars and cents and represent money values in different ways (AC9M3M06)</li> <li>interpret and re-create – in 2 dimensions – familiar environments, locating key landmarks and objects relative to each other</li> <li>explore land maps or cultural maps used by First Nations people to identify and find important landmarks such as waterholes (AC9M3SP02).</li> </ul>
<p>Bart Pigram (Yawuru man from Broome) shares his knowledge of the molluscs on Yawuru Country. He discusses the cockle, an edible marine bivalve mollusc that has 2 symmetrical shells.</p>	<p><b>Share Indigenous Knowledge of molluscs found on Country</b> Students:</p> <ul style="list-style-type: none"> <li>draw the lines of symmetry of shells shown by Bart</li> <li>recognise line symmetry using objects observed on Country such as shells</li> <li>represent the results of their findings indicating the line of symmetry</li> <li>identify objects with symmetry and those that are not symmetrical.</li> </ul>	<p>In Year 4, students:</p> <ul style="list-style-type: none"> <li>recognise line and rotational symmetry of shapes</li> <li>create symmetrical patterns and pictures, using dynamic geometric software where appropriate</li> <li>explore the natural environment on Country to investigate and discuss patterns and symmetry of shapes and objects such as in shells, flowers, plants and landscapes (AC9M4SP03).</li> </ul>
<p>Jason Smith (Palawa man from Lutruwita) shares his knowledge of bull kelp (a type of seaweed), used to design and make water-carrying vessels on Palawa Country. He acknowledges this is the traditional role of women. Jason relates the health of Country to the abundance of kelp.</p>	<p><b>Share Indigenous Knowledge of kelp: a type of seaweed</b> Students:</p> <ul style="list-style-type: none"> <li>draw the kelp and describe its properties</li> <li>investigate using different materials to design and make a water carrying vessel</li> <li>create an object by designing the net of the object</li> <li>explain how they made the net.</li> </ul>	<p>In Year 5, students:</p> <ul style="list-style-type: none"> <li>connect objects to their nets</li> <li>build objects from their nets using spatial and geometric reasoning</li> <li>could investigate objects designed and developed by First Nations people (AC9M5SP01).</li> </ul>
<p>Bart Pigram (Yawuru man from Broome) shares his knowledge of the middens on Yawuru Country created over thousands of years. He draws attention to the midden which is the largest in Broome, WA.</p> <p>Matt Burns (Quandamooka Traditional Custodian from North Stradbroke Island) shares his knowledge of middens on Quandamooka country. Matt describes the types of shells found and talks about the passage of time.</p>	<p><b>Share Indigenous Knowledge of middens created over time of shells left over from eaten shellfish</b> Students:</p> <ul style="list-style-type: none"> <li>draw a midden based on Bart's description of how it was created</li> <li>model ways to estimate the number of shells that create a midden</li> <li>share models and give feedback on each other's model, including how well it mathematically models the process of a midden's development and size over time.</li> </ul>	<p>In Year 9, students use mathematical modelling to:</p> <ul style="list-style-type: none"> <li>solve practical problems (including financial) involving direct proportion, rates, ratio and scale</li> <li>formulate the problems and interpret solutions in terms of the situation</li> <li>evaluate the model and report methods and findings (AC9M9M05).</li> </ul>