

## SCIENCENTRE AT QUEENSLAND MUSEUM

### Australian Curriculum Links for Years 7-8 - Term 3, 2017

Sciencentre exhibits link to the Australian National Science Curriculum specifically in the strands of Science Understanding and Science Inquiry Skills. Links to general capabilities and other learning areas may also be relevant.

Direct links below indicate content that is directly covered within the exhibition, while indirect links indicate content that is dependent on how people use and facilitate various exhibits.

#### General capabilities relevant to Sciencentre exhibits

Direct links	
<p><b>Literacy</b> Comprehending texts through listening, reading and viewing.</p> <p><b>Numeracy</b> Recognise and using patterns and relationships.</p>	<p><b>Critical and Creative Thinking</b> Inquiring – identifying, exploring and organising information and ideas. Generating ideas, possibilities and actions. Reflecting on thinking and processes. Analysing, synthesising and evaluating reasoning and procedures.</p>

#### [Action Stations - Sciencentre](#)

Get hands-on with everyday science. Science is everywhere - at home, school, work and play. Discover what makes everyday things tick.

	Direct link	Indirect link	Sample exhibits that support the curriculum
<b>Year 7</b>	Physical sciences (ACSSU117) Change to an object's motion is caused by unbalanced forces, including Earth's gravitational attraction, acting on the object.	Questioning and predicting (AC SIS124) Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge.	<ul style="list-style-type: none"> <li>Feel the force – feel the push of the magnetic force acting between the discs. The force is balanced with gravity acting on the weight of the discs so they float. Add your own force, can you push them together?</li> <li>What next? – this wacky pendulum has</li> </ul>

			<p>lots of unbalanced forces acting upon it and its motion is unpredictable.</p> <ul style="list-style-type: none"> <li>• Newton's cradle – the balls remain at rest until a force acts upon them. Try swinging two balls at once and describe what is happening in terms of forces.</li> <li>• Speedy planets – as the balls travel around the funnel shape, their motion changes.</li> <li>• Spinning chair – change the forces acting on the spinning chair by moving your body to speed it up or slow it down.</li> </ul>
<b>Year 8</b>	Physical sciences (ACSSU155) Energy appears in different forms, including movement (kinetic energy), heat and potential energy, and energy transformations and transfers cause change within systems.	Questioning and predicting (AC SIS139) Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge.	<ul style="list-style-type: none"> <li>• Create a current – transform your own kinetic energy into electrical energy using the hand crank, which is then transferred and transformed to switch on a light.</li> <li>• Splashes of sound – sound energy is transformed into kinetic energy causing the liquid to vibrate.</li> <li>• Lighting ladder – some electrical energy is transformed into light energy (and so is visible) as it is transferred through the air from one rod to the other.</li> </ul>

### Body Zone - Sciencentre

Your body - like you've never seen it before. Challenge it, move it, re-assemble it, confuse it. Collect your vital statistics. For a total hands-on, minds-on, body-on experience – jump in!

	<b>Direct link</b>	<b>Indirect link</b>	<b>Sample exhibits that support the curriculum</b>
<b>Year 7</b>	Physical sciences (ACSSU117) Change to an object's motion is caused by unbalanced forces, including Earth's gravitational	Questioning and predicting (AC SIS124) Identify questions and problems that can be investigated scientifically and make	<ul style="list-style-type: none"> <li>• Bullseye! – apply a force to the ball in your hand, a small force gives it a slow speed and a large force gives it a fast speed.</li> <li>• Biking with Boney – you apply a force to</li> </ul>

	attraction, acting on the object	predictions based on scientific knowledge.	the pedals to make them turn, the pedal transfers a force to the gears, the gears transfer the force to the wheels making them turn.
<b>Year 8</b>	Physical sciences (ACSSU155) Energy appears in different forms, including movement (kinetic energy), heat and potential energy, and energy transformations and transfers cause change within systems.	Questioning and predicting (AC SIS139) Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge.	<ul style="list-style-type: none"> <li>• Biking with Boney – you apply a kinetic energy to the pedals to make them turn, the pedal transfers kinetic energy to the gears, the gears transfer kinetic energy to the wheels making them turn.</li> <li>• Ten meter dash – you use muscular kinetic energy to run the course, some of this is transformed into heat energy as you warm up your body.</li> </ul>

### [Mathamazing - Sciencentre](#)

Until 3 September 2017

*Mathamazing* encourages students to playfully explore maths concepts through 22 hands-on exhibits, five floor-based Mega Maths Puzzles and sixty Puzzle Placemats. Each *Mathamazing* experience will inspire mathematical curiosity and confidence, and build greater understanding of mathematical concepts. These concepts all link to real world experiences. For example:

- Where can we see the strong catenary arch shape in natural structures and buildings?
- What is the shape of the orbits of planets around our Sun? A shape where the sun is located on one of two focal points.
- How can you measure the distance to objects or places that are far away?
- Why do you need to collect more data to get a more accurate result and make better predictions?

Students will leave the exhibition thinking that there is a lot more to maths than previously thought!

This exhibition is targeted at students in year 6 and over, but can be enjoyed by all year levels.

Five floor-based Mega Maths Puzzles are built to an oversized scale, so they have strong visual impact and they offer highly interactive maths experiences for groups and individuals and/or younger students.

[Learning resources](#) highlight the exhibition's main themes, identifies curriculum links and provides education materials which support pre, during or post a visit to *Mathamazing*.

Education materials have been developed for this exhibition. These include [Teacher Notes](#) with curriculum links and detail about each [exhibit](#) which covers:

- How the exhibit works
- Things to try or ask around the exhibit
- Background Science for the exhibit

Teachers may copy any material for educational purposes.

This exhibition supports the Australian National Mathematics Curriculum. Direct links to the curriculum exist for Measurement and Geometry including Shape, Geometric Reasoning, Location and Trigonometry (Year 6, 9), Statistics and Probability including Chance and Data Interpretation (Year 6, 7, 8), Number and Algebra including Patterns (Year 6, 8), Linear and non-linear relationships (Year 10).

The exhibition also supports Problem Solving and Reasoning Skills.

*Mathamazing*. Developed by Questacon – The National Science and Technology Centre, Canberra.

### [Fire and Ice Show - Sciencentre](#)

School show topic 10 July – 8 December 2017

From supercool liquid nitrogen to fireworks, things are heating up in the Sciencentre with the Fire and Ice Science Theatre Show. We will bring the temperature down as we rapidly cool, freeze and condense liquids and gases with some unexpected results. Things won't stay cool forever, as we burn our way through chemical reactions and hot colourful flames. This cool show will fire your imagination as we explore the science of fire and ice.

The Fire and Ice Show supports investigation of concepts in the **Chemical** and **Physical Sciences** sub-strands in the Australian Curriculum. Students will also apply **Science Inquiry Skills**, including questioning, predicting, observing cause and effect relationships and explaining.

The Fire and Ice Show is an interactive show where student volunteers are part of the show and students are encouraged share their observations, answer and ask questions and share their explanations.

Concepts explored in a Yr 7-8 show include:	Demonstrations and materials
States of matter – exploring properties and behaviours of solids, liquids and gases	<ul style="list-style-type: none"><li>• Liquid nitrogen</li><li>• Water vs ice</li></ul>
States of matter – changing state from a solid to a liquid and liquid to solid, physical change, reversible	<ul style="list-style-type: none"><li>• Instant ice blocks and challenge (liquid nitrogen)</li></ul>
Effects of low and high temperatures on materials - gas	<ul style="list-style-type: none"><li>• Shrinking dog balloon (liquid nitrogen)</li></ul>

Making changes to materials can be reversible or irreversible – combustion is a chemical change and irreversible	<ul style="list-style-type: none"> <li>• Sparkler OR</li> <li>• Magnesium burn</li> </ul>
Chemical reactions such as combustion	<ul style="list-style-type: none"> <li>• Burning paper</li> <li>• Coloured flames</li> </ul>

	Direct link	Indirect link
<b>Year 7</b>		<p>Questioning and predicting (AC SIS124) Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge.</p> <p>Planning and conducting (AC SIS125) Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed.</p>
<b>Year 8</b>	<p>Chemical sciences (ACSSU151) Properties of the different states of matter can be explained in terms of the motion and arrangement of particles.</p> <p>Chemical sciences (ACSSU225) Chemical change involves substances reacting to form new substances.</p> <p>Physical sciences (ACSSU155) Energy appears in different forms, including movement (kinetic energy), heat and potential energy, and energy transformations and transfers cause change within systems.</p>	<p>Questioning and predicting (AC SIS139) Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge.</p> <p>Planning and conducting (AC SIS140) Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed.</p>