SPARKLAB AT QUEENSLAND MUSEUM

Australian Curriculum Links for Years 5-6

Term 1, 2020

SparkLab is a Sciencentre experience at Queensland Museum. Refer to the Exhibition Guide for an overview of the interactive exhibits and programs.

SparkLab exhibits and programs link to the Australian National Curriculum specifically in the learning areas of Science, Technologies and Mathematics, and support students to develop their general capabilities in Literacy, Numeracy, and Critical and Creative Thinking.

General capabilities relevant to SparkLab

Direct links	
Literacy	**Critical and Creative Thinking**
Comprehending texts through listening, reading and viewing.	Inquiring – identifying, exploring and organising information and ideas.
Text, word and visual knowledge.	Generating ideas, possibilities and actions.
Numeracy	Reflecting on thinking and processes.
Recognise and using patterns and relationships.	Analysing, synthesising and evaluating reasoning and procedures.
Using spatial reasoning.	
Using measurement.	

Science

	Knowledge and Understanding	Science as a Human Endeavour and Science Inquiry Skills	Sample of linked *SparkLab* exhibits and programs
Year 5	Chemical sciences (ACSSU077) Solids, liquids and gases have different observable properties and behave in different ways.	Nature and development of science (ACSHE081) Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena. Use and influence of science (ACSHE083) Scientific understandings, discoveries and inventions are used to solve problems that directly affect people's lives. Questioning and predicting (ACSIS231) Pose questions to clarify practical problems or inform a scientific investigation, and predict what the findings of an investigation might be. Planning and conducting (ACSIS086) Plan appropriate investigation methods to answer questions or solve problems. (ACSIS087) Decide which variable should be changed and measured in fair tests. Processing and analysing information (ACSIS218) Compare data with predictions and use as evidence in developing explanations. Evaluating (ACSIS091) Suggest improvements to the methods used to investigate a question or solve a problem. Communicating (ACSIS093) Communicate ideas, explanations and processes in a variety of ways.	**Science Bar: Under pressure** Students select and observe how different materials (solids, liquids and gases) behave and change in a vacuum chamber – where the air pressure is decreased and increased. They consider if this change is reversible. This program is facilitated by a Learning Officer. **Science Bar: Mix master**: Students predict and observe what happens when a variety of household products are mixed together. What are the clues that a chemical change has occurred? Students describe the properties of the new products. This program is facilitated by a Learning Officer. **Science Bar: Will it float?** Students predict and observe what happens when various objects are placed in different liquids. Students explore density and suggest changes to solutions to alter the density and change the outcome. This program is facilitated by a Learning Officer. **Watch water freeze:** Students use the heat from their hand to melt solid ice into liquid water and watch the water refreeze and ice crystals grow through special polarising lenses. Each crystal grows in a unique way. **Flowing mist:** Students play with mist (gaseous air with tiny droplets of liquid water) as it flows down a ramp and see how it flows, changes shape and 'disappears' when heated. **Cloud rings:** Student apply a changing force onto a rubber membrane, which forces mist or a little cloud out of a circular hole. What shape does the

			cloud take as it rises to the ceiling? Can students change this shape or how this cloud moves?
	Earth and space sciences (ACSSU078) The Earth is part of a system of planets orbiting around a star (the sun).*		**Science on a Sphere: Planets** Students can select a number of presentations on our 1.8 m sphere, including close up views of the Earth, the Sun, planets and various moons. **Speedy planets:** Students roll a number of balls around the edge of a large double gravity well. As the balls roll around the holes they behave like planets orbiting a star (or a pair of stars).
	Physical science (ACSSU080) Light from a source forms shadows and can be absorbed, reflected and refracted.		**Frozen shadows**: Students explore leaving shadows behind on a phosphorescent coated wall. How do the properties of this material enable the wall to absorb the light from the large flash unit and to glow to create these shadows? How can you change the shape, size and sharpness of your shadow? **Coloured shadows:** Students block one or more primary colours of lights and create a number of coloured shadows on the white light wall. What happens when all of the light is blocked or when one or more colours of light mix together? **Science Bar: Lights, colour, action!** Students explore and observe how we can use light and colour to change the way things look. As part of the investigation white light is split into colours and light is mixed, blocked and passed through coloured filters. This program is facilitated by a Learning Officer. **Seeing colour:** Students look closely at objects illuminated under one of the three primary colours of light: red, green and blue. Do the objects appear to change colour and what colour would the object

			appear under white light? The colour we perceive is the colour of light reflected into our eye. **Mirror, mirror and Confusing mirror:** Students explore reflections with a series of repeated mirrors in **Mirror, mirror.** Students discover how their reflected image can be inverted or enlarged when standing at different distances away from a concave mirror.
Year 6	Chemical sciences (ACSSU095) Changes to materials can be reversible, such as melting, freezing, evaporating; or irreversible such as burning or rusting.	Nature and development of science (ACSHE098) Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena. Questioning and predicting (ACSIS232) Pose questions to clarify practical problems or inform scientific investigation, and predict what the findings of an investigation might be. Planning and conducting (ACSIS103) Plan investigation methods to answer questions or solve problems. (ACSIS104) Decide which variable should be changed and measured in fair tests. Processing and analysing information (ACSIS221) Compare data with predictions and use as evidence in developing explanations. Evaluating (ACSIS108) Suggest improvements to the methods used to investigate a question or solve a problem.	**Flowing mist:** Students play with mist (gaseous air with tiny droplets of liquid water) and see how it flows and how the liquid changes state into a gas when heated by the heat from your hand and arm. **Science Bar: Up in Flames** Students predict what will happen when paper soaked in different liquids is heated in a flame. Students make choices regarding what material to test and observe how burning is irreversible. This program is facilitated by a Learning Officer **Watch water freeze:** Students use the heat from their hand to melt solid ice into liquid water and watch the water refreeze and ice crystals grow through special polarising lenses. This process is reversible. **Science Bar: Mix Master**: Students predict and observe what happens when a variety of household products are mixed together. What are the clues that that a chemical change has occurred? This program is facilitated by a Learning Officer.
	Earth and space sciences (ACSSU096) Sudden geological changes or extreme weather conditions can affect Earth's surface.		**Science on a Sphere:** Students can select a number of presentations on our 1.8m sphere, showing information collected from satellites or ground based instruments. These include: Clouds real-time projected onto our Earth; Earthquakes over a period of time; Japan earthquake and

			tsunami 2011; Hurricane tracks; Drought risk, and more.
	Physical sciences (ACSSU097) Electrical circuits provide a means of transferring and transforming electricity. Physical sciences (ACSSU218) Energy from a variety of sources can be used to generate electricity.		**Circuits:** Students build simple circuits using conductive wires and explore switches, electrical energy transforming into light energy (bulbs) or movement energy (hand dryer fans), and how light sensors can complete a circuit and trigger an alarm. **Energy from the sun/wind circuits:** Students connect circuits to solar cells and wind turbines and use these alternative sources of energy to generate electricity and make a light glow or disc spin. **Science Bar: Human Circuits**: Students create a human circuit and predict and observe what happens when a variety of materials and objects are placed into the circuit. Will all the materials act as conductors and allow electrical energy to flow? This program is facilitated by a Learning Officer.

Technologies – Design and Technologies

	Knowledge and Understanding	**Design and Technologies Processes and Production Skills**	**Sample of linked *SparkLab* exhibits and programs**
Year 5-6	Examine how people in design and technologies occupations address competing considerations. (ACTDEK019)* Investigate how electrical energy can control movement, sound or light in a design. (ACTDEK020) Investigate characteristics and properties of a range of materials, components and equipment and	Select appropriate materials, components, equipment and techniques and apply safe procedures to make designed solutions. (ACTDEP026)	**Maker Space:** Use everyday materials to design and build a solution to the Maker Space challenge – ***Take a seat.*** Through design thinking and iterative prototyping, create a simple chair using repurposed materials. From swing seats to dentist chairs, choose who you are designing for and what is the purpose of each part of the chair. Explore concepts around material properties, strong shapes and structures and stability. Make a change to improve your design.

	evaluate the impact of their use. (ACTDEK023)		**Circuits:** Students build simple and extended challenge circuits and explore electrical energy transferring into light energy (bulbs) or movement energy (hand dryer fans), and how light sensors can complete a circuit and sound an alarm **Gravity run:** Students work together to make a long ball run out of tubes, wheels, corner pipes, swinging bells and balls. Problem solve to make a faster or longer gravity run and explore energy transfer and transformation.

Mathematics

	Number and Algebra	**Measurement and Geometry**	**Sample of linked *SparkLab* exhibits and programs**
Year 5	Fractions and decimals Investigate strategies to solve problems involving addition and subtraction of fractions. (ACMNA103)*	Shape Connect 3D objects with their nets and other 2D representations. (ACMMG111)* Geometric reasoning Estimate, measure and compare angles using degrees. (ACMMG112)*	**Shape maker:** Students use 2D shapes to construct 3D objects. 3D shapes can be combined into larger objects and students can describe the shapes, width, length and depth of the object.
Year 6	Fractions and decimals Solve problems involving addition and subtraction of fractions. (ACMNA126)*	Shape Construct simple prisms and pyramids. (ACMMG140) Geometric reasoning Investigate angles on a straight line, angles at a point and vertically opposite angles. (ACMMG141)*	**Shape maker:** Students use 2D shapes to construct 3D objects. 3D shapes can be combined into larger objects and students can describe the shapes, width, length and depth of the object.

* Indirect link