SparkLab SCIENCENTRE

AT QUEENSLAND MUSEUM

Australian Curriculum Links for Years 5 - 6

Term 1, 2022

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 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.	

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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 *recognise* 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, however the investigation is directed by the students. **Science Bar: Mix master**: Students *predict* and *recognise* what happens when a variety of household products are mixed together. *Consider* if a chemical change has occurred. Students *describe* the properties of the new products. This program is facilitated by a Learning Officer, however the investigation is directed by the students. **Science Bar: Will it float?** Students *predict* and *recognise* what happens when various objects are placed in different liquids. Students *explore* density and *decide* changes to solutions to alter the density and change the outcome. This program is facilitated by a Learning Officer, however the investigation is directed by the students. **Air flow:** Students move different shaped objects into a stream of fast- or slow-moving air. Students observe and recognise how fluids can flow and move over objects and explore patterns of turbulence in the air. **Cloud rings:** Students *apply* a changing force onto a rubber membrane, which forces mist or a little cloud out of a circular hole. *Describe* what shape

			the cloud takes as it rises to the ceiling. *Explore* ways to change the shape or how it 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. There are over 40 presentations (datasets) on the free-choice kiosk and a Learning Officer can access over 500 datasets via an iPad. **Speedy planets:** Students roll a number of balls around the edge of a large double gravity well and *compare* how they move. 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. They *predict* how the properties of this material enable the wall to absorb the light from the large flash unit and to glow to create these shadows. *Consider* how you can 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. *Explore* what happens when all the light is blocked or when one or more colours of light mix together. **Science Bar: Lights, colour, action!** Students *investigate* and *recognise* how we can use light and colour to change the way things look. *Infer* why white light is split into colours, how light is mixed and why some light is blocked or allowed to pass through coloured filters. This program is facilitated by a Learning Officer, however the investigation is directed by the students.

			Seeing colour: Students *examine* objects illuminated under one of the three primary colours of light: red, green and blue. *Infer* why 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 examine reflections with a series of repeated mirrors in **Mirror, mirror.** Students *consider* 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.	**Science Bar: Melting moments** Students *investigate* how we can change a way that a solid melts. Students *select* from a range of different solids and *generate* ideas for testing. Students *generate* questions, *recognise*, *predict* and *explain* their thinking. This program is facilitated by a Learning Officer, however the investigation is directed by the students. **Science Bar: Mix Master**: Students *predict* and *recognise* what happens when a variety of household products are mixed together. *Consider* if a chemical change has occurred by looking at the evidence. This program is facilitated by a Learning Officer, however the investigation is directed by the students.
	Earth and space sciences (ACSSU096) Sudden geological changes or extreme		**Science on a Sphere:** Students can *select* a number of presentations on our 1.8m sphere, showing information collected from satellites or

	weather conditions can affect Earth's surface.		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, Plate movement – 200 million years ago to today and more. There are over 40 presentations (datasets) on the free-choice kiosk and a Learning Officer can access over 500 datasets via an iPad.
	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 *create* simple circuits using conductive wires and *explore* switches, electrical energy transforming into light energy (bulbs) or movement energy (hand dryer fans), and *decide* 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: Snap, crackle, watt?** Students *predict*, *select* and recognise which materials, when rubbed together, will generate static electricity. Students then *investigate* how static electricity can be used to make something move. This program is facilitated by a Learning Officer.
	Biological sciences (ACSSU094) The growth and survival of living things are affected by physical conditions of their environment.		**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: Sea Surface Currents and Temperature, Great White Shark and Loggerhead Sea Turtle Migrations.

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 evaluate the impact of their use. (ACTDEK023)	Select appropriate materials, components, equipment and techniques and apply safe procedures to make designed solutions. (ACTDEP026)	**Maker Space:** *Use* everyday materials to design and *construct* solution to the Maker Space challenge – **Zip to it.** *Design* and *construct* a carrier to safely transport a precious object along a zip line. Be inspired by different applications for zip lines in the stimulus material. *Explore* the properties of different materials as you *select* materials for your design. *Decide* on who you are designing your carrier for and what they might need. *Consider* how the properties of the materials and the forces acting on your carrier will affect how it moves. *Modify* your initial design ideas to make your design as effective as possible. **Circuits:** Students *create* simple and extended challenge circuits and *explore* electrical energy transferring into light energy (bulbs) or movement energy (hand dryer fans), and *decide* how light sensors can complete a circuit and sound an alarm. **Gravity run:** Students work together to *create* a long ball run out of tubes, wheels, corner pipes, swinging bells and balls. *Investigate* how 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)* Location and transformation Describe translations, reflections and rotations of 2D shapes. Identify line and rotational symmetries. (ACMMG114)* 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

Cognitive verbs are italicised.