SparkLab SCIENCENTRE

AT QUEENSLAND MUSEUM

Australian Curriculum Links for Years P-2

Term 1, 2023

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.	

Science V 8.4

	Knowledge and Understanding	Science as a Human Endeavour and Science Inquiry Skills	Sample of linked *SparkLab* exhibits and programs
Prep	Physical sciences (ACSSU005) The way objects move depends on a variety of factors, including their size and shape.	Nature and development of science (ACSHE013) Science involves exploring and observing the world using senses. Questioning and predicting (ACSIS014) Respond to questions about familiar objects and events. Planning and conducting (ACSIS011) Explore and make observations by using the senses. Processing and analysing information (ACSIS011) Engage in discussions about observations.	**Speedy planets:** Students observe and *recognise* how the shape of the well changes the path the balls take as they roll. **Flight test:** Students *create* and *use* flying machines made from paper in a fast-moving column of air. Test what happens when they change the shape of their paper flying machine? **Gravity run:** Students work together to *create* a long ball run out of tubes and wheels. *Investigate* how to make a faster or longer gravity run. **Science Bar: Going down hill** Students *select* materials for testing as they *investigate* how they can change how something moves down a ramp. This program is facilitated by a Learning Officer.
	Chemical sciences (ACSSU003) Objects are made of materials that have observable properties.		**Science Bar: Mix Master**: Students *recognise* and *identify* the properties of a variety of household products and *recognise* and *explain* the changes when different products are mixed together. This program is facilitated by a Learning Officer.
	Earth and space sciences (ACSSU004) Daily and seasonal changes in our environment affect everyday life.		**Science on a sphere:** Day/Night Terminator (single day): Students *explore* the rotation of the Earth and how part of the Earth is in darkness (night) as another part is light (day). Blue Marble with clouds: Students *explore* a dynamic 3D model of the Earth and cloud movements. This can be linked to how we dress and modify our behaviour for different conditions.

			Bird Migration: Students *explore* how some birds migrate to warmer areas during winter and return to their original location during summer. There are over 40 presentations (datasets) on the free-choice kiosk and a Learning Officer can access over 500 datasets via an iPad.
Year 1	Physical sciences (ACSSU020) Light and sound are produced by a range of sources and can be sensed.	Nature and development of science (ACSHE021) Science involves asking questions about, and describing changes in, objects and events. Questioning and predicting (ACSIS024) Respond to and pose questions, and make predictions about familiar objects and events. Planning and conducting (ACSIS025) Participate in guided investigations to explore and answer questions, manipulate materials and test ideas. Processing and analysing information (ACSIS212) Through discussion, compare observations with predictions. Evaluating (ACSIS213) Compare observations with those of others.	**Coloured shadows**: Students stand in front of spotlights of red, blue and green light. Combined, these primary colours of light make white light. By blocking one or two of these lights students *create* a number of coloured shadows. **Frozen shadows:** Students pose in front of a phosphorescent wall and after a bright flash, step away leaving behind their shadow. Similar to glow in the dark stickers, the light energy causes the wall to glow, except for the part of the wall you block with your body. **Sound studio:** Students use a rubber thong to hit different length pipes (Thongophone) to *investigate* how to make a sound and how changing the length of piping changes the pitch of the sound. **Science Bar: Lights, colour action!** Students *select* coloured lights, filters and various objects to change the way something looks. They observe and *describe* what happens when light is mixed together. This program is facilitated by a Learning Officer. **Science Bar: Good vibrations** Students *describe* ways to make a sound. Students *select* different materials and *describe* and *compare* how these different materials make differing sounds. This program is facilitated by a Learning Officer.

	Chemical sciences (ACSSU018) Everyday materials can be physically changed in a variety of ways.		**Science Bar: Mix master**: Students observe and *identify* the properties of a variety of household products and *identify* any physical changes when they *select* different products to be mixed together. This program is facilitated by a Learning Officer. **Science Bar: Under pressure:** Students *select* different objects and *identify* any physical changes that happen when the object is placed in a vacuum. This program is facilitated by a Learning Officer. **Maker Space: Take a seat** Students *investigate* how they can physically change cardboard to *create* and *construct* a mini chair. *Select* and *test* materials and *describe* what shapes and structure will make your chair strong and stand up.
	Earth and space sciences (ACSSU019) Observable changes occur in the sky and landscape.		**Science on a sphere:** Clouds real time: Students *explore* a dynamic 3D model of the Earth and the cloud movements over the past several days. Day/Night Terminator (single day): Students *explore* night and day as the Earth rotates on its axis. Land Surface Temperature – Real-time: Students *explore* how the temperature of the land on Earth changes across different months of the year and how part of the Earth's land is hotter than others. There are over 40 presentations (datasets) on the free-choice kiosk and a Learning Officer can access over 500 datasets via an iPad. **Spinning Earth:** Students *recognise* day and night on a large rotating Earth and also *identify* the orbit of the moon around the Earth.

Year 2	Physical sciences (ACSSU033) A push or a pull affects how an object moves or changes shape.	Nature and development of science (ACSHE034) Science involves asking questions about, and describing changes in, objects and events. Questioning and predicting (ACSIS037) Respond to and pose questions, and make predictions about familiar objects and events. Planning and conducting (ACSIS038) Participate in guide investigations to explore and answer questions, manipulate materials and test ideas. Processing and analysing information (ACSIS040) Through discussion, compare observations with predictions. Evaluating (ACSIS041) Compare observations with those of others.	**Air cannon:** Students pull down on a rope, lifting up a heavy bowling ball. As they let it drop, the bowling ball pushes air through a tube, pushing a lighter tennis ball way up high. Students *compare* the effect of changing how high they lift the heavy ball. **Lift a fridge**: Students *investigate* a giant lever and *compare* the effect of pulling down on ropes located at different positions on the lever. **Magnetic pendulum:** Swing the magnetic pendulum across the table and *recognise* how the pendulum is pushed and pulled in different directions by magnets in the table. Physically feel this force by holding onto the pendulum. **Science Bar: Under pressure** Students *predict* and *explore* observable changes to various objects in a vacuum chamber - when the objects no longer have the push of air acting on them. This program is facilitated by a Learning Officer.
	Chemical sciences (ACSSU031). Different materials can be combined, including by mixing, for a particular purpose.		**Science Bar: Mix master**: Students observe and *identify* the properties of a variety of household products and *identify* any changes when they *select* different products to be mixed together. 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
Prep – Year 2	Identify how people design and produce familiar products, services and environments and consider sustainability to meet personal and local community needs (ACTDEK001) Explore the characteristics and properties of materials and components that are used to produce designed solutions. (ACTDEK004)	Explore needs or opportunities for designing, and the technologies needed to realise designed solutions. (ACTDEP005) Use materials, components, tools, equipment and techniques to safely make a designed solution. (ACTDEP007) Using personal preferences to evaluate the success of design ideas, processes and solutions including their care for environment. (ACTDEP008)	**Maker Space:** *Use* everyday materials to design and make a solution to the Maker Space challenge – **Take a seat.** *Create* and *construct* a mini chair. *Recall* real world examples of different types of chairs and the different parts of a chair. *Select* and *test* different materials, shapes and structures and see how this makes your chair strong and stable. Who are you designing your chair for and how might they use it and what might they need? **Balance bridge:** Students *construct* different shaped bridges across ever widening gaps in a river. *Decide* if the bridges will be high enough for a boat to pass underneath?

Mathematics

	Number and Algebra	Measurement and Geometry	Sample of linked *SparkLab* exhibits and programs
Prep – Year 2	<u>Number and place value</u> Connect number names, numerals and quantities. (Prep - ACMNA002) Recognise, model, read, write and order numbers. (Yr 1 - ACMNA013) <u>Fractions and decimals</u> Recognise and describe one-half as one of two equal parts of a whole. (Yr - ACMNA016) Recognise and interpret common uses of halves and quarters of shapes and collections. (Yr 2 - ACMNA033)	<u>Using units of measurement</u> Use direct and indirect comparisons to decide which is longer, heavier or holds more and explain reasoning in everyday language. (Prep - ACMMG006) Measure and compare the lengths and capacities of pairs of objects. (Yr 1 - ACMMG019) Describe duration using months, weeks, days and hours. (Yr 1 - ACMMG021) Compare and order several shapes and objects based on length, area, volume and capacity. (Yr 2 - ACMMG037) <u>Shape</u> Sort, describe and name familiar 2D shapes and 3D objects. (Prep - ACMMG009) Recognise and classify familiar 2D shapes and 3D objects using obvious features. (Yr 1 - ACMMG022) Describe the features of 3D objects. (Yr 2 - ACMMG043)	**Spinning Earth and Science on a Sphere:** Students *investigate* the rotation of the Earth, *recognise* various changes on the Earth's surface and *consider* and discuss days, hours, weeks, months and years. **Shape maker:** Students *recognise* familiar 2D shapes and combine them to *construct* 3D objects. **Maker Space: Take a seat** Students *recognise* familiar 2D shapes and combine them to *construct* a strong and stable chair. **Air cannon**: Students pull down on a rope, lifting up a heavy bowling ball. They can *measure* how high they lift the ball against a scale. As they let it drop, the bowling ball pushes air through a tube, pushing a lighter tennis ball way up high. They can *measure* and *compare* how high the tennis ball goes. **Giant arch:** Students work together to *construct* a giant arch with specific numbered blocks. After putting in the final keystone, the giant arch will stay up without any glue or nails. Knocking over the arch is as fun as building it.

* Indirect link

Cognitive verbs are italicised.