



## Science Overviews Term 1 - 2023 Chemical Sciences

This term in the STEM Labs we will be focussing on the Australian Curriculum Science Understanding sub-strand of Chemical Sciences. The Chemical sciences sub-strand is concerned with the composition and behaviour of substances and how they can change and produce new substances by rearranging atoms.

For the first three weeks of the term we will focus on revisiting and further developing together an agreed set of values and expectations to guide and support our collaborative learning journey for the year. We will also explore the importance of scientific thinking (questioning and wondering in particular) and collaborative practices in the ongoing development of our science understanding through a range of hands on investigations designed to engage and excite.

Through discussion, team building challenges and personal reflection we will explore our school values and practically apply them to the science room (and beyond). With the ultimate goal of continuing to ensure a learning space where respect, resilience, consideration and diversity are expected and valued by all. Through engagement in hands on experiences and collaborative challenges, students will use and elaborate upon their own wonderings and questions to further develop their scientific thinking and understanding of the world around them.

During the term we will explore this year's South Australian Science Teachers' Association (SASTA), Sir Mark Oliphant Competition, which students from R-6 will be encouraged to enter. On-going guidance and support will be available each Thursday lunch time in the STEM room for those who choose to be a part of this exciting and rewarding competition. Entries have opened and most entries are due to be submitted for judging mid-year.

**“Somewhere, something incredible is waiting to be known.” Carl Sagan**

### Upper Primary

Our focus for inquiry this term will be the exploration of how the changes to materials can be reversible and irreversible. This will also include exploring physical and chemical changes and how these are directly related to reversible and irreversible changes.

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Through hands on investigations and fair testing methods, students will explore and further develop their science understanding of the effects of melting, evaporating, dissolving, applying temperature and separating have on the properties of different materials. Classifying different types of observable changes to materials and exploring how changes can be classified in different ways. Students follow procedures to develop investigable questions and design investigations into simple cause-and-effect relationships. They identify variables to be changed and measured and describe potential safety risks when planning methods. They collect, organise and interpret their data, identifying where improvements to their methods or research could improve the data. Students' understanding of the factors that influence the type and rate of change will be developed through a range of

experiments using the scientific method. Students will also investigate Aboriginal peoples' knowledge of reversible processes, such as the application of adhesives.

**STEM Challenge** - Following the steps of the engineering design process, students will work in collaborative learning teams and explore if it is possible to effectively remove concentrations of salt from water and soil. They will then critically and creatively design, build, and test a range of designs to remove the salt from water and soil. Students will explore and reflect on how this challenge is relatable to 'real world' situation (desalination, soil salinity, etc) and use these when developing and improving upon designed solutions. They will reflect on their designs and further relate their thinking to irreversible and reversible changes.

Students will develop their Science Inquiry Skills through such actions as questioning, investigating, completing scientific diagrams, observing, predicting, testing ideas, collaborative group work and conducting experiments.

## **Middle Primary**

This term we will investigate and explore how properties of different materials have a range of different physical properties that can influence their use. Students group materials into either natural or processed materials, and explain how the properties of materials determine their use.

Students will use science inquiry skills to develop their understanding of the properties of materials and how they relate to the ways we use them. Through exploration and scientific investigations, students will pose questions for investigation and conduct fair tests to explore the properties of materials and how to use this knowledge to choose materials wisely.

**STEM Challenges** - Following the steps of the engineering design process, student teams will use everyday materials to creatively and critically create an alternative to synthetic plastic, and design and attempt to create a product with bioplastic material. Through this open-ended design project, they will learn about the physical properties of bio plastic and further their understanding of current sustainability practices.

Students will further develop their capability in critical and creative thinking as they learn to generate and evaluate knowledge, ideas and possibilities relating to their different challenges and other investigations and use them when developing and improving upon designed solutions.

Students will be working scientifically through such actions as questioning, investigating, observing, predicting, discussions, and planning and conducting experiments. This will be done as a whole class, individually and in groups.

Science as a Human Endeavour will be explored through developing an understanding of Aboriginal peoples' knowledge of the properties of natural and processed materials, including the production of paint and resin's for various uses. Students will also analyse the issues affecting the production and use of plastics, and the possibilities arising from the production of bioplastics.

## **Junior Primary**

This term we will be undertaking an inquiry based unit of work that explores what everyday materials are, the properties they have and how different materials can be combined for particular purposes. Students will use science inquiry skills to explore how changes to materials through heating, cooling and physical manipulation depends on the shape and type of material. They will explore and predict if these changes are reversible or irreversible. They will also develop their understanding about the reasons why materials mix and don't mix well, based on their observable properties. Through exploration and hands-on investigations, students will pose

questions for investigation and develop their understanding of fair testing by investigating how materials change as they dry out and also how changing the quantities of materials in a mixture can alter its properties and uses.

**STEM Challenges** - Following the steps of the engineering design process, students will explore and reflect upon how natural and processed materials have a range of physical properties that can influence their use. They will do this by critically and creatively designing, building, and testing a package that will protect a raw egg from breaking, when dropped from a range of heights. Through this open-ended design project, they will reflect on and practically apply their learning about the physical properties of different materials and their different uses.

Students will further develop their capability in critical and creative thinking as they learn to generate and evaluate knowledge, ideas and possibilities relating to their 'egg package challenge' and other investigations and use them when developing and improving upon designed solutions.

Students will be working scientifically through such actions as questioning, investigating, observing, predicting, discussions, and planning and conducting experiments. This will be done as a whole class, individually and in groups. Science as a Human Endeavour will involve actively exploring how we use and develop our understanding of the different properties of materials to solve natural and human influenced environmental problems.

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**Feedback and Student Voice** - Students will consistently be provided with constructive feedback and will be given opportunities to provide feedback to each other and the teacher. This will be both verbally and in written form. Students will also participate in peer, teacher and self-assessment processes.

Student voice will be evident through such areas as curriculum design, science room values and expectations development, personal feedback, reflection and STEM challenges.

**Science Room Health and Wellbeing** - Personal development through exploration and practical application of our school values, collaborative group work challenges, and Growth Mindset principles will be imbedded into our science lessons.

**Differentiation** – Approaches to teaching and learning will be differentiated to meet the needs of individual learning styles.

