



SunSmart Animals
SunSmart Scientists
Learning from and about the natural world

Curriculum Level 1 Unit Plan

Introduction

SunSmart Schools Aotearoa

SunSmart Schools Aotearoa is a programme run by the Cancer Society of New Zealand.

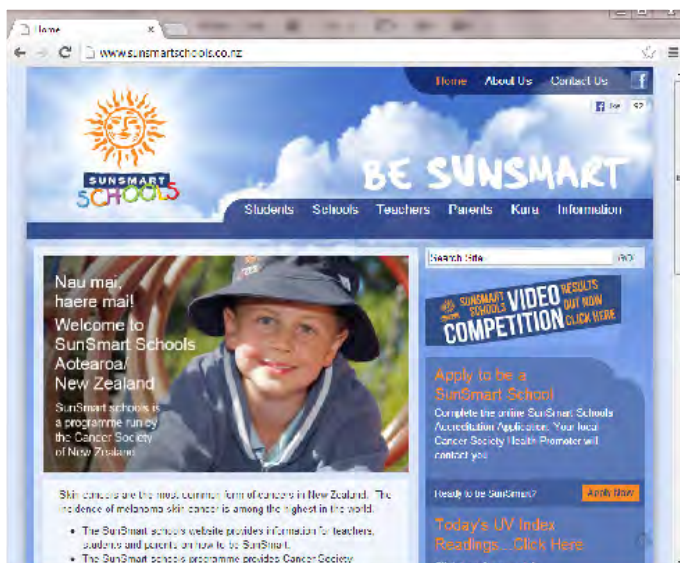
The Cancer Society supports workplaces, early childhood centres and primary intermediate and secondary schools to be SunSmart.

There are both risks and benefits from Sun exposure. In New Zealand our sunlight is very harsh as it contains high levels of UV rays. Skin cancers are the most common form of cancers in New Zealand. From an early age our children need to have the knowledge and behaviours that will protect them from the harmful rays of the Sun. The Cancer Society encourages all New Zealanders to be SunSmart and to 'slip, slop, slap and wrap'.



The SunSmart Schools Programme

The Cancer Society SunSmart programme in schools supports the findings of the [Community Preventive Services Task Force](#).¹ The Task Force [recommends](#) that primary- and middle-school interventions are put in place to prevent skin cancer, based on strong evidence of their effectiveness in increasing Sun-protective behaviours and decreasing ultraviolet exposure, sunburn incidence, and formation of new moles.



The SunSmart schools programme provides:

- * website information for teachers, students and parents on how to be SunSmart
- * Cancer Society-approved guidelines on how to make your school a safe place for students and the school community
- * highly engaging resources for students, parents, teachers and principals.

1 <https://www.thecommunityguide.org/sites/default/files/assets/Skin-Cancer-Primary-and-Middle-School.pdf>

SunSmart Teaching Resources

These four cross-curricular SunSmart teaching resources address why we need to be SunSmart, how we can be SunSmart, and how science and scientific knowledge can inform and underpin the SunSmart choices we make. The units cover the New Zealand Curriculum Levels 1–4 and aim to:

- enhance youth numeracy and literacy development and provide assessment tasks to assess the National Standards
- embed key science concepts and experiences in relation to the Sun, energy and protection
- support the principles of SunSmart and the New Zealand Curriculum
- use different examples/contexts to ensure appropriateness to different ethnic groups (particularly Māori, Pāsifika and Southeast Asian)
- use Te Reo Māori concepts and language that will be woven into the resource
- takes an inquiry-based learning approach
- utilise the SunSmart Schools Website – www.sunsmartschools.co.nz, and www.niwa.co.nz



Level 1 Unit Overview

Overview Planning Tool

The overview diagram explains how the lessons for Level 1 have been organised to scaffold the teaching and learning experiences. The overview document can also be used as a planning document for teachers.

By using the Comment tool on your Adobe Acrobat tool bar you can make notes on your students' progress or next steps. You will find an example of how the overview can be used for planning purposes over the page.

Science Explorations

These units include a number of science explorations that can be adapted/differentiated to suit learning experiences and outcomes at any other level.

Overleaf is an overview of the unit that shows the links between the curriculum, assessments, teaching and learning approaches, key concepts and ideas.

Key



A

Front loading through different sources of information



B

Front loading through hands-on experiences



C

Synthesis: Developing new understandings & knowledge through inquiry

Health



Science



Science Experience



Technology



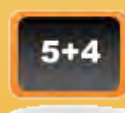
Literacy



Mathematics -
Geometry & Measurement



Mathematics -
Number & Algebra



Mathematics -
Statistics



Sun is the major source of energy

Energy makes things happen

Energy changes things

The Nature of Science

Living World Plant Earth and Beyond Physical World Material World

No Sun = no plant / animals

Lesson 1-2
Hauora

Humans are animals, too

Lesson 3-5
Living things that are in their own habitat adapt to the Sun

Lesson 6-7
Planet Earth and Beyond

Unlike other living things, humans live in many different places & need to be SunSmart

E.g. Domestic cat, dog, fish, bird need protection from Sun

E.g. Monkey, lion, hippo, rhino, zebra, koala shield from Sun

E.g. Polar bear, seal, otter, penguin make the most of Sun

What can we learn from animals living in their natural habitat? What about animals living in the zoo/out of their natural habitat? How do zoos protect animals from Sun?

Lesson 8 - We are investigating the effect that Sunlight has on - black paper - green plants

Lesson 9 - We are investigating the effect that Sunlight has on different classroom objects

Lesson 10 - We are investigating how quickly Sunlight can heat water in different coloured containers

Lesson 11 - We are investigating whether different colours affect how quickly heat from the Sun melts ice

Lesson 12 - We are investigating how the Sun makes shadows

Lesson 13 - 18
Inquiry using:
What we have learnt from animals that help protect us from the Sun.
What we have learnt from our science experiences about the energy the Sun provides.
Essential Question:
What can we do to best protect ourselves from the Sun while at school.

Design Survey

Analyse Results

Plan Action

Evaluate Outcome

Share Information / Conclusions

Links to the New Zealand Curriculum (NZC)

Purpose: To investigate how animals and humans can protect themselves from the Sun.

Curriculum Level 1

Curriculum Areas Incorporated		Achievement Objectives Relevant to the activity, including possible links	Specific Learning Outcomes Students will be able to:
Health and Physical Education	Health	Safety Management Describe and use safe practices in a range of contexts and identify people who can help.	<ul style="list-style-type: none"> Recognise the importance of protecting our bodies (and animals) from the Sun. Apply Sun protection knowledge.
		Relationships with Other People <i>Identity, sensitivity and respect</i> Demonstrate respect through sharing and co-operation in groups. <i>Interpersonal skills</i> Express their ideas, needs, wants and feelings clearly and listen to those of other people.	<ul style="list-style-type: none"> Participate and co-operate in several group projects. Appreciate and respect the differences in attitudes, beliefs and practices of others around Sun protection. Share ideas, needs, wants and feelings about Sun protection and listen to those of others.
		Community Resource Identify and discuss obvious hazards in their home, school, and local environment and adopt simple safety practices.	<ul style="list-style-type: none"> Identify and discuss the need for Sun protection at home, school and in the local environment. Identify and utilise simple SunSmart practices so as to create a Sun-safe environment at home, school and in the local environment.
		Ecology Recognise that living things are suited to their particular habitat.	<ul style="list-style-type: none"> Identify and explain how animals are protected from the cold (polar bears have black skin) and Sun (polar bears white fur). Identify and explain the ways in which we as human beings can protect ourselves from the Sun.

Science

Scientists investigate and use observation to ask questions about The Living World, Planet Earth and Beyond, Physical World and Material World.

	Understanding in Science	Investigating in Science	Communicating in Science	Participating and Contributing
Nature of Science Achievement Objectives Levels 1 & 2	Appreciate that scientists ask questions about our world that lead to investigations and that open-mindedness is important because there may be more than one explanation.	Extend their experiences and personal explanations of the natural world through exploration, play, asking questions, and discussing simple models.	Build their language and develop their understandings of the many ways the natural world can be represented.	Explore and act on issues and questions that link their science learning to their daily living.
Living World Achievement Objectives Levels 1 & 2	Life Processes Recognise that all living things have certain requirements so they can stay alive.			
Planet Earth and Beyond Achievement Objectives Levels 1 & 2	Astronomical Systems Share ideas and observations about the Sun and the Moon and their physical effects on the heat and light available to Earth.			
Physical World Achievement Objectives Levels 1 & 2	Physical Inquiry and Physics Concepts Explore everyday examples of physical phenomena, such as movement, forces, electricity and magnetism, light, sound waves, and heat.			
Material World Achievement Objectives Levels 1 & 2	Properties and Changes of Matter Observe, describe, and compare physical and chemical properties of common materials and changes that occur when materials are mixed, heated, or cooled.			

Curriculum Areas Incorporated		Achievement Objectives Relevant to the activity, including possible links	Specific Learning Outcomes Students will be able to:
English	Literacy	<p>Listening, Reading and Viewing Processes and Strategies Acquire and begin to use sources of information, processes, and strategies to identify, form, and express ideas.</p> <ul style="list-style-type: none"> selects and reads texts for enjoyment and personal fulfilment has an awareness of the connection between oral, written and visual language uses sources of information (meaning, structure, visual and graph-phonetic information) and prior knowledge to make sense of a range of texts associates sounds with letter clusters as well as with individual letters uses processing and some comprehension strategies with some confidence begins to monitor, self-evaluate and describe progress. 	<ul style="list-style-type: none"> identify animals by name. match pictures of animals with the word for each item. sort and classify pictures and words. say and write the words in the target vocabulary that they see. predict what a text is going to be about by utilising a range of comprehension strategies including identifying words that they know and visual cues. reflect on their learning and plan their next steps.
		<p>Speaking, Writing, and Presenting Acquire and begin to use sources of information, processes, and strategies to identify, form, and express ideas.</p> <ul style="list-style-type: none"> has an awareness of the connection between oral, written and visual language when creating text creates texts by using meaning, structure, visual and graph-phonetic information and prior knowledge and some processing strategies with some confidence seeks feedback and makes changes to texts is becoming reflective about production of own texts begins to monitor, self-evaluate, and describe progress. 	<ul style="list-style-type: none"> identify animals by name. match pictures of animals with the word for each item. sort and classify pictures and words. say and write the words in the target vocabulary. identify key words and use them in a presentation about Sun-safe practices. reflect on their learning about SunSmart practices and plan their next steps.

Curriculum Areas Incorporated		Achievement Objectives Relevant to the activity, including possible links	Specific Learning Outcomes Students will be able to:
Mathematics and Statistics	Number and Algebra	Number Knowledge Communicate and explain grouping.	<ul style="list-style-type: none"> group and count animals according to variety of criteria.
	Geometry and Measurement	Measurement Order and compare objects or events by temperature.	<ul style="list-style-type: none"> measure the temperature in a variety of locations and identify the highest and lowest temperature.
	Statistics	Statistical Investigation Conduct investigations using the statistical enquiry cycle: <ul style="list-style-type: none"> posing and answering questions gathering, sorting and counting, and displaying category data discussing the results. 	<ul style="list-style-type: none"> pose and answer questions, gather, sort, count, and display category data and discuss the results.
Te Aho Arataki Marau mō te Ako i Te Reo Māori	Taumata	1.1 Greet, farewell and acknowledge people and respond to greetings and acknowledgements. 1.2 Introduce themselves and others and respond to introductions. 1.3 Communicate about number. 1.6 Understand and use simple politeness conventions, for example, ways of acknowledging people, expressing regret and complimenting people. 1.7 Use and respond to simple classroom language (including asking for the word to express something in Te Reo Māori).	<ul style="list-style-type: none"> greet, farewell, acknowledge and respond to simple classroom language and politeness conventions. introduce themselves when conducting survey.

Taumata:

Level 1-4 AO and assessment activities depending on ability of individuals (pp. 56–61)
Students being able to greet, farewell, acknowledge and respond to simple classroom language and politeness conventions in Te Reo is **dependent on the teacher integrating and modelling this in their everyday practice within the classroom.**

Te Reo:

Ongoing opportunities to assess Te Reo - ko au (I, me, myself)
<http://hereoora.tki.org.nz/Unit-plans/Unit-1-Ko-au/Assessment-opportunities>
Te wa Kai: <http://hereoora.tki.org.nz/Unit-plans/Unit-5-Hauora>

Group Work:

See **Resource 18** for activities and assessment grid.

Links to Curriculum

To be encouraged, modelled and explored (NZC pp. 9–11). What aspects of the values does this activity explore, encourage or model?

Vision	Principles	Values	Key Competencies	Pedagogical Approaches
What we want for our young people <ul style="list-style-type: none"> • confident • connected • actively involved • lifelong learners. 	Beliefs about what is important <ul style="list-style-type: none"> • high expectations • treaty of Waitangi • cultural diversity • inclusion • learning to learn • community engagement • coherence • future focus. 	Expressed in thought and actions <ul style="list-style-type: none"> • excellence • innovation, inquiry and curiosity • diversity • equity • community and participation • ecological sustainability • integrity 	Which of the key competencies (NZC pp. 12–13)? <ul style="list-style-type: none"> • thinking • using language, symbols and texts • managing self • relating to others • participating and contributing 	Based on the HPS Inquiry Model (see attached); all units follow this process. Aspects of effective pedagogy (NZ pp. 34–36) are highlighted in the activity. <ul style="list-style-type: none"> • creating a supportive learning environment • encouraging reflective thought and action • enhancing the relevance of new learning • facilitating shared learning • making connections to prior learning • providing sufficient opportunities to learn • e-learning • engaging Māori and Pāsifika students and their communities.

Links and Resources

TKI

Curriculum documents <http://nzcurriculum.tki.org.nz/>

Te Reo Māori In the curriculum guidelines, *Te Aho Arataki* there are suggestions for possible learning and assessment activities for **Curriculum Levels 1–2** <http://tereomaori.tki.org.nz/Curriculum-guidelines/Levels-1-8-Curriculum-Guidelines-for-Teaching-and-Learning-Te-Reo-Maori/Levels-1-and-2-Beginning-to-use-te-reo-Maori>. In addition, there is helpful material collected online in **Te Whakaipurangi Rauemi**. <http://tereomaori.tki.org.nz/Teacher-tools>. This collection elaborates on some of the communicative tasks outlined in **Tasks and activities**, including cloze tasks, dycomm tasks and information transfer tasks.

Wellbeing, Hauora <http://health.tki.org.nz/Teaching-in-HPE/Curriculum-statement/Underlying-concepts/Well-being-hauora>

Links to resources about the Sun and skin

The Sun, Atmosphere, Radiation explained <http://www.windows2universe.org/sun/sun.html>

Sun protection in schools (WHO) <http://www.who.int/uv/publications/en/primaryteach.pdf>

WHO Intersun programme <http://www.who.int/uv/intersunprogramme/activities/en>

SunSmart animals <http://www.foundation.sdsu.edu/sunwisestampede/meetanimals.html>

Chinese myth about the sun http://www.windows2universe.org/mythology/ten_chinese_suns.html

Science Concepts

What is UV radiation <http://www.sciencelearn.org.nz/Contexts/You-Me-and-UV/NZ-Research/You-Me-and-UV>

How to be safe in the sun http://kidshealth.org/kid/watch/out/summer_safety.html

Cancer Council West Australia has eight interesting and interactive learning activities that can be delivered as stand-alone activities or presented as a term's science work. The aim is to help students understand the science of light, with a focus on ultraviolet (UV) radiation <http://www.cancerwa.asn.au/resources/2013-04-10-uv-radiation-learning-activities-book.pdf>

New Zealand information

Sun safety information <http://www.cancernz.org.nz/reducing-your-cancer-risk/sunsmart/>

Slip, slop, slap, wrap video clip (50 seconds) <https://www.youtube.com/watch?v=ooCCM28ress>

SunSmart website - information relevant for New Zealand <https://www.sunsmart.org.nz/>

Undercover Cody - Waikato Bay of Plenty Cancer Society - has a range of online tips, games and songs that promote sun safety <http://www.undercovercody.co.nz/>

Sunscreen - including short video on key tips for use <https://waikato-bop.cancernz.org.nz/reducing-cancer-risk/what-you-can-do/sunsmart/sunscreen/>

Sunscreen Q&A's <https://waikato-bop.cancernz.org.nz/assets/Sunsmart/Sunscreen-plain-English-Q-and-A-web-ID-25450.pdf>

Video clips from NZ schools <http://sunsmartschools.co.nz/teachers/video/results.html>

Teacher Talk - Resource kit for sun safety for early childhood <https://www.teachertalk.org.nz/shop/kiwi-summer-series-sun-safety-download>

Songs and Waiata

New Zealand's Kindy Rock TV's slip, slop, slap, wrap song

<https://www.youtube.com/watch?v=GKPP8qqA7cY>

Undercover Cody's SunSmart Wrap - Waikato Bay of Plenty Cancer Society

<http://www.undercovercody.co.nz/mp3/>

“Hei Konei e te Ariki” and “He Rourou mā Koutou” (in *Hei Waiata, Hei Whakakoakoa – Waiata to Support Teaching and Learning of Te Reo Māori in English-medium Schools: Years 1–8*). “Kei Raro i te Moana” (in *Kiwi Kidsongs 1*, 1990)

Other Links

Why brimmed hats are better than caps <https://www.youtube.com/watch?v=Htfd63ccsRo>

Have fun in the sun <http://www.youtube.com/watch?v=wPCPxkIEFAk>

Play safe in the sun http://www.youtube.com/watch?v=3_V8IT67K20

Importance of sun with sing along song <http://www.youtube.com/watch?v=Zc2wE5dVx3Y>

Sun safety film (made by children) [http://www.youtube.com/watch?](http://www.youtube.com/watch?feature=endscreen&NR=1&v=QaTcqAqAwzmU)

[feature=endscreen&NR=1&v=QaTcqAqAwzmU](http://www.youtube.com/watch?feature=endscreen&NR=1&v=QaTcqAqAwzmU)

Sun days fun days - children & the ways they protect themselves during the week

http://www.youtube.com/watch?v=jc_kCw9_Nds

Online Learning Games

Undercover Cody - Waikato Bay of Plenty Cancer Society <http://www.undercovercody.co.nz/>

Animal Games

<http://kinderwebgames.com/cat.html>

<http://www.learninggamesforkids.com/mammal-games-videos/elephant-games-videos.html>

<http://www.learninggamesforkids.com/mammal-games-videos/bear-games-videos.html>

<http://www.learninggamesforkids.com/animal-games-monkeys.html>

Note: The suggested websites are not all maintained by the Cancer Society of New Zealand. We only suggest sites that we consider offer credible and reliable information, but we cannot guarantee that the information on such websites is accurate, up to date or evidence based.

Part One, Lessons 1-5

Lessons 1-2: Introduction & Hauora Concept

OVERVIEW: Today we are learning about the concept of Hauora

Assessment Opportunities	Structure	Curriculum and Resource Links
<p>We are successful when we can:</p> <ul style="list-style-type: none"> identify the things that keep us happy and healthy (physical (taha tinana), mental/emotions (taha hinengaro), social (taha Whānau) and spiritual (taha wairua)) understand that all four elements above need to be in balance for us to feel happy, healthy and safe identify and share the things that make us feel safe, grow and learn understand and use some plural pronouns understand and use some short forms of address identify our family members in Te Reo. <p>Evidence: Teach and assess social and interpersonal skills (pp. 21-32 in resource booklet). Ideas for teachers re: ongoing assessment.</p>	<p>Prepare: https://www.youtube.com/watch?v=2bwqTDuyv7Y Song: Sue goes to the beach for a nice relaxing day and ends up having to teach her friends about Sun-safety. Who's laughing now?</p> <p>Teacher draws up grid on the board Has copies of large happy and sad faces with blue tack on the back (Resource 1a)</p> <ol style="list-style-type: none"> taha tinana taha hinengaro taha whānau taha wairau <p>Or teacher could place students in groups with each group having a copy of the table and the faces so that they can place them.</p> <p>Connect:</p> <ul style="list-style-type: none"> Introduce the concept of Hauora using the diagram in the Resource 1b, Teacher's Notes. Provide context for video. It is important to look after all four elements – we need the four walls – (physical (taha tinana), mental/emotions (taha hinengaro), social (taha whānau) and spiritual (taha wairua)). In the video we see that Sue has taken care of her physical needs. What happens about her other needs – mental/emotions (taha hinengaro), social (taha whānau) and spiritual (taha wairua)? 	<p>Pedagogical links:</p> <ul style="list-style-type: none"> creating a supportive learning environment encouraging reflective thought and action enhancing the relevance of new learning facilitating shared learning making connections to prior learning providing sufficient opportunities to learn e-learning engaging Māori and Pāsifika students and their communities. <p>Key competencies:</p> <ul style="list-style-type: none"> Thinking Using language, symbols and texts Managing self Relating to others Participating and contributing. <p>Literacy:</p> <ul style="list-style-type: none"> English and Te Reo vocabulary building.

Lessons 1-2

Structure

Opportunity to discuss and learn Te Reo for family. See <http://hereoora.tki.org.nz/Unit-plans/Unit-1-Ko-au/Reomations/Taku-whanau-My-family> for animation and teaching resources, vocabulary and activities.





Activate:

- Students watch the video.

If students in groups, they can place their faces in the four quadrants to describe this part of Sue's hauora.

Demonstrate:

- Discuss what Sue uses to protect herself from the Sun. We can see that Sue is looking after her taha tinana - her physical needs – so we can put a happy face in that box.

1. taha tinana		1. taha hinengaro	
1. taha whānau		1. taha wairua	

- How do her friends treat her when they see her on the beach? How does this make her feel? Can we put a happy face next the mental/emotions (taha hinengaro)? No? So add a sad face to the board.
- Who does Sue have to play with? Is she included in her whānau's games in the water? No? So what should we add to the taha whānau section on the board? Sad face.
- How does Sue feel inside when they are all laughing at her and playing in the water without her? Happy/sad face in the taha wairua space?
- Who can tell me what happens to her friends who have been playing in the Sun?
- By the end of the song Sue's hauora has changed. What should we now have in the four boxes – happy/sad faces?
- How do the things we do (e.g. taking care of ourselves so we do not get sunburnt and sharing sunscreen with our friends) impact on what happens? How does what others do impact on what happens? Discuss personal responsibility for our own actions and the responsibility of others.
- (If students are capable of understanding the imagery) All of these things help make us feel safe and secure, help us to grow and learn. They are like the four walls of a house (draw/copy Hauora (Resource 1b) diagram for students to see and define four walls) which are necessary to keep everything inside safe. Can we put the pictures/words above/beside the four walls of the house? Some things may go under more than one heading.

Teacher may do this on the board or students to do in pairs depending upon abilities.

Consolidation:

- Refocus on the grid and faces in each of the quadrants.

Students draw the three things most important to them that help them to feel safe, grow, and learn.

Lessons 1-2, Resource 1a

Resource 1a Happy and Healthy

Key Vocabulary:

happy, healthy, wellbeing, hauora, taha tinana, taha hinengaro,
taha whānua, taha wairua

1. taha tinana

2. taha hinengaro

3. taha whānau

4. taha wairua



Lessons 1-2, Resource 1b

Hauora Concept

Information taken from Health and Physical Education online: http://www.tki.org.nz/r/health/curriculum/statement/hpe_statement.pdf

Wellbeing

The concept of wellbeing encompasses the physical, mental and emotional, social, and spiritual dimensions of health. This concept is recognised by the World Health Organisation.

Hauora

Hauora is a Māori philosophy of health unique to New Zealand. It comprises taha tinana, taha hinengaro, taha whānau, and taha wairua.

Taha Tinana – Physical Wellbeing

The physical body, its growth, development, and ability to move, and ways of caring for it.

Taha Hinengaro – Mental and Emotional Wellbeing

Coherent thinking processes, acknowledging and expressing thoughts and feelings and responding constructively.

Taha Whānau – Social Wellbeing

Family relationships, friendships, and other interpersonal relationships; feelings of belonging, compassion, and caring; and social support.

Taha Wairua – Spiritual Wellbeing

The values and beliefs that determine the way people live, the search for meaning and purpose in life, and personal identity and self-awareness. (For some individuals and communities, spiritual wellbeing is linked to a particular religion; for others, it is not.)

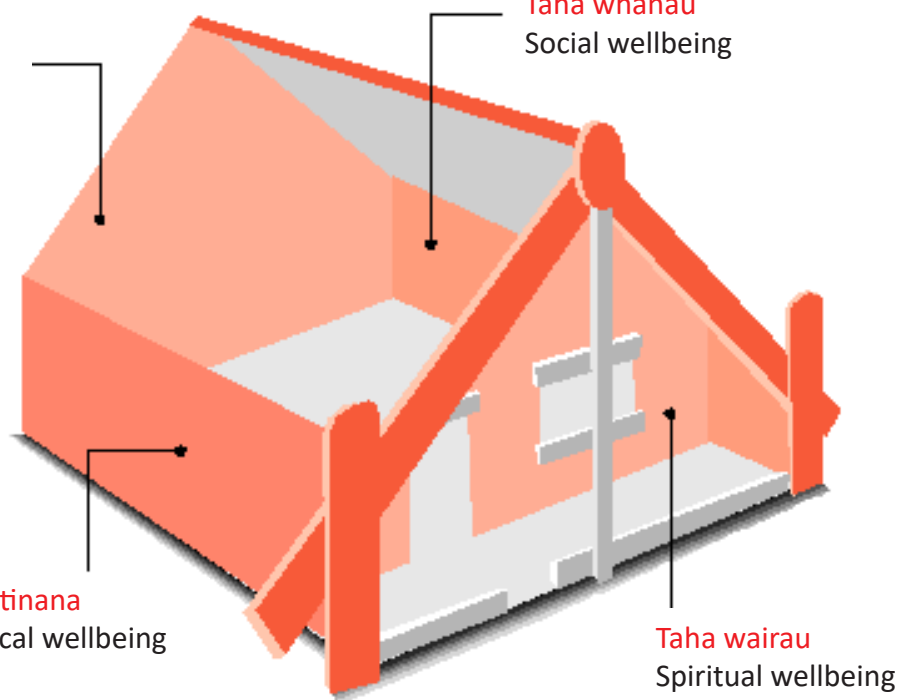
Each of these four dimensions of hauora influences and supports the others.

Taha hinengaro
Mental and
emotional wellbeing

Taha whānau
Social wellbeing

Taha tinana
Physical wellbeing

Taha wairua
Spiritual wellbeing



Dr Mason Durie's whare tapawha model compares hauora to the four walls of a whare, each wall representing a different dimension: taha wairua (the spiritual side); taha hinengaro (thoughts and feelings); taha tinana (the physical side); and taha whānau (family). All four dimensions are necessary for strength and symmetry. (Adapted from Mason Durie's *Whaiora: Māori Health Development*. Auckland: Oxford University Press, 1994, page 70).

Lessons 3-5

Part One – Living World – Finding out about SunSmart Animals

As animals, humans need the Sun. Unlike other living things, we live in many different places and this means that we have to be SunSmart. Living things that are in their own habitats have adaptations that help them to shield themselves from excessive Sun or make the most of the limited Sunlight available. Camels/polar bears for example have adaptations.

Overview: Today we are learning about animals and whether they live in hot or cold countries and how they protect themselves from the Sun

Assessment Opportunities	Structure	Curriculum and Resource Links
<p>We are successful when we can:</p> <ul style="list-style-type: none"> • identify animals by sight • identify and match pictures of animals with the word that names them • Identify other animals that begin with the same sound • classify animals using a range of criteria • say and write the name of the animal displayed in the pictures • explain where the animal lives • explain if the animal lives in a hot or a cold place • explain the different ways that animals in hot places protect themselves from the Sun • explain how domestic animals protect themselves from the Sun • explain how humans protect themselves from the Sun. 	<p>Prepare: Resources following Read Teacher’s Notes</p> <p>Connect: Teacher writes the words – polar bear, seal, rhinoceros, hippopotamus, lion, camel and elephant on the board</p> <ul style="list-style-type: none"> • Tells students that the words are for the names of animals • In pairs students are asked to find the picture of the animal (Resource 2 in envelope) for each of the words on the board. (This gives the teacher a good idea about student’s prior knowledge) • As a class they match word and picture. Teacher can also assist students with how the word sounds – and the different letters and their corresponding sound • Can you tell which of these animals live in a hot country and which live in a cold country? • Teachers ask pairs to look at the other animals in the envelope (Resource 2). Which ones belong together? • What other animals can you think of that begin with the letter “c”, etc? • Group all the animals that live in cold countries together. 	<p>Pedagogical links:</p> <ul style="list-style-type: none"> • Creating a supportive learning environment • Encouraging reflective thought and action • Enhancing the relevance of new learning • Facilitating shared learning • Making connections prior to learning • Providing sufficient opportunities to learn • E-learning • Engaging Māori and Pāsifica students and their communities <p>Key competencies:</p> <ul style="list-style-type: none"> • Thinking • Using language, symbols and texts • Managing self • Relating to others • Participating and contributing <p>Literacy:</p> <ul style="list-style-type: none"> • English and Te Reo vocabulary building • Can identify animals visually, orally and in writing and is able to connect these <p>Numeracy:</p> <ul style="list-style-type: none"> • Grouping animals according to a variety of criteria

Lessons 3-5

Structure

- In groups/pairs the students match the word with the picture of the animal, using [Resource 3a](#) ([Answers 3b](#))

Activate:

- Which animals live in trees, in water, on the ground, under the ground?
- Which ones have fur/scales/feathers/wool?
- How do animals in cold places keep themselves warm?
- Why is a polar bear's coat white? (See [Resource 4](#) for teacher background info).
- Why does a polar bear have black coloured skin underneath the fur?
- How do rhinoceros, hippopotamuses, camels and elephants keep cool and protect from the Sun? (See [Resource 4](#) for teacher background info).

Demonstrate:

Teacher gives each student/groups a copy of [Resource 5](#)

- On the picture of rhinoceros, hippopotamuses, camels and elephants, draw the ways they keep cool and protect themselves from the Sun.

See [Resource 6](#) for teachers

How many of you have a cat or dog at home?

Do cats and dogs suffer from sunburn? If so, is it just the hairless ones, or are domestic animals like dogs and cats also at risk?

How do rhinoceros, hippopotamus, camels and elephants protect themselves from the Sun?

What could we do to help cats and dogs be protected from the Sun?

Explain the similarities and differences in the ways that pets and wild animals protect themselves from the Sun.

Humans are animals, too. (Young children do not have this understanding; the teacher needs to make explicit links here as to why we are animals.) Do we do the same things that rhinoceros, hippopotamuses, camels and elephants do to protect themselves from the Sun?

Consolidation:

Students talk about all the outdoor activities that humans do and what happens if they spend too much time outside in the Sun ... what happens if we are unprotected and how can we protect ourselves? What can we learn from the animals? Look at how animals in natural habitats manage intensity of heat and sunlight.

Students connect to one of the online games listed in the lesson overview to familiarise themselves with animals, how they are spelt and where they live, etc.

Students identify the animals (aloud and if capable in writing) that they saw in the online games

Students identify which animals in the games live in hot places and which live in cold places.

Students can explain why polar bears have black skin underneath their white fur.

Students can explain how rhinoceros, hippopotamuses and elephants protect their skin from the Sun.

Online animal identification games to learn new vocabulary.

Animal identification games:

<http://kinderwebgames.com/cat.html>

http://www.learninggamesforkids.com/animal_and_nature_games/mammal-games/big-cat-games/video-lion.html

<http://www.learninggamesforkids.com/mammal-games-videos/elephant-games-videos.html>

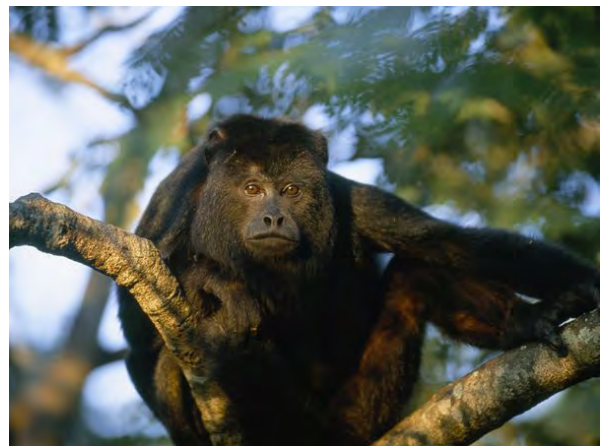
<http://www.learninggamesforkids.com/mammal-games-videos/bear-games-videos.html>

<http://www.learninggamesforkids.com/animal-games-monkeys.html>

Lessons 3-5, Resource 2

Animal Pictures

Key Vocabulary: penguin, koala, monkey, otter, zebra, hippopotamus, polar bear, seal, rhinoceros, camel, lion, elephant, koala, otter, zebra, sheep, tuatara





Lessons 3-5, Resource 3a
Mix and Match

camel

elephant

hippopotamus

koala

lion

monkey

otter

penguin

polar bear

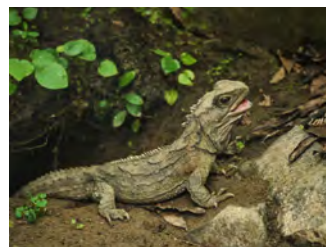
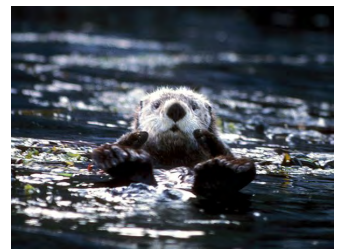
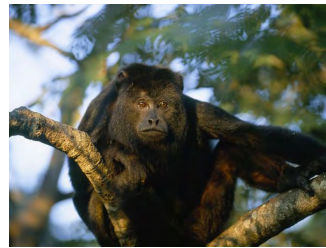
rhinoceros

seal

sheep

tuatara

zebra



Mix and match the English words from the left to the pictures on the right.

Lessons 3-5, Resource 3b
Mix and Match Answers



Camel



Elephant



Hippopotamus



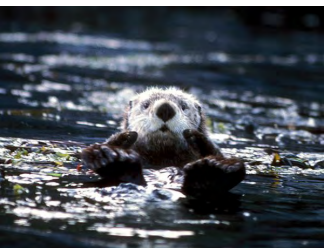
Koala



Lion



Monkey



Otter



Penguin



Polar bear



Rhinoceros



Seal



Sheep



Tuatara



Zebra

Lesson 3-5, Resource 4, Teacher's Notes

How do animals...

Key Vocabulary: coat, white, black, shade, water, protect, skin, sunblock.

How do animals in cold climates keep warm?

Polar Bears

Polar bears live in one of the planet's coldest environments and **depend on a thick coat** of insulated fur, which covers a warming layer of fat. Fur even grows on the bottom of their paws, which protects against cold surfaces and provides a good grip on ice. The bear's stark **white** coat provides camouflage in surrounding snow and ice. But under their fur, polar bears have **black skin** — the better to soak in the Sun's warming rays.

How do animals in hot climates keep cool?

Rhinoceros

White rhinos live on Africa's grassy plains, where they sometimes gather in groups of as many as a dozen individuals. Females reproduce only every two-and-a-half to five years. Their single calf does not live on its own until it is about three years old.

Under the **hot African Sun**, white rhinos **take cover by lying in the shade**. Rhinos are also wallowers. They find a suitable water hole and roll in the mud, coating their skin with a natural bug repellent and sunscreen.

Hippopotamus

Hippopotamuses love water, which is why the Greeks named them the "river horse". Hippos spend up to 16 hours a day submerged in rivers and lakes to keep their massive bodies cool under the hot African Sun. Hippos are graceful in water, good swimmers, and can hold their breath underwater for up to five minutes. However, they are often large enough to simply walk or stand on the lake floor, or lie in the shallows. Their eyes and nostrils are located high on their heads, which allows them to see and breathe while mostly submerged.

Hippos also bask on the shoreline and **secrete an oily red substance**, which gave rise to the myth that they sweat blood. **The liquid is actually a skin moisturizer and sunscreen that may also provide protection against germs.**

Camels

The hump stores up to 36 kilograms (80 pounds) of fat, which a camel can break down into water and energy when sustenance is not available. These humps give camels their legendary ability to travel up to 100 desert miles (161 kilometres) without water. Camels rarely sweat, even in desert temperatures that reach 120°F (49°C), so when they do take in fluids they can conserve them for long periods of time. In winter, even desert plants may hold enough moisture to allow a camel to live without water for several weeks.

When camels do refill, however, they soak up water like a sponge. A very thirsty animal can drink 30 gallons (135 litres) of water in only 13 minutes.

Other adaptations help camels thrive in desert conditions. Their nostrils close to keep sand at bay, and **they have bushy eyebrows and two rows of long eyelashes to protect their eyes**. Large, tough lips enable them to pick at dry and thorny desert vegetation. Big, thick footpads help them navigate the rough rocky terrain and shifting desert sands.

Lesson 3-5, Resource 4, Teacher's Notes

How do animals...

Elephants

African Elephants are the largest land animals on Earth. They are slightly larger than their Asian cousins and can be identified by their larger ears which look somewhat like the continent of Africa. (Asian Elephants have smaller, rounded ears.)

Elephants' ears radiate heat to help keep these large animals cool, but sometimes the African heat is too much. Elephants are fond of water and enjoy showering by sucking water into their trunks and spraying it all over themselves. Afterwards, they often spray their skin with a protective coating of dust.

<http://animals.nationalgeographic.com/animals/facts/>

Energy from the sun includes heat, light and UV radiation. UV radiation cannot be seen or felt as heat.

Note to teachers: Dr Richard McKenzie, Emeritus Researcher on Atmospheric Radiation from NIWA, suggests, "Fair-skinned New Zealanders receive much higher UV radiation levels than our ancestral home in the northern hemisphere (e.g. United Kingdom (UK)) due to New Zealand being much closer to the equator than the UK. Our peak summer UV radiation levels are also 40% greater than at corresponding latitudes in the northern hemisphere (e.g. Southern Europe, mid USA). Further, because of our mild temperatures, it's comfortable to stay in the sun for too long."

Lessons 3-5, Resource 5





Lessons 3-5, Resource 6

How do animals keep safe in the Sun?

The Sun's Unrelenting Rays

By C. CLAIBORNE RAY
Published: May 14, 2012

Q. Do animals suffer from sunburn? If so, is it just the hairless ones, or are domestic animals like dogs and cats also at risk?

A. “Animals can get sunburn, just as people do, from too much Sun exposure,” said Dr. Paul Calle, chief veterinarian at the Wildlife Conservation Society in the Bronx.

“Wild animals are marvellously adapted to their environment, so those in areas with lots of sunlight usually have scales, feathers or fur to protect them,” he said. “They also retreat to burrows, shady areas or water; wallow in water or mud; or spray dust or water on themselves when the Sun is at its peak.”

Wild animals that are sick, injured or in distress, like stranded whales or dolphins, can develop serious sunburn because they cannot protect themselves from excessive exposure to the Sun, Dr. Calle said.

Domestic animals, including dogs and cats, that have short hair, thin coats of hair or pale skin are at greater risk of sunburn, he said. Just like people, they can also develop complications like skin cancer, especially melanoma.

“For people and animals, avoiding excess exposure to high-intensity sunlight is the best prevention” for Sun-related ills, Dr. Calle said.

Lessons 6-12

Part Two – Physical and Material World Thinking Like SunSmart Scientists

The Sun is our biggest source of energy. Energy makes things happen. Energy changes things.

OVERVIEW:



Scientists investigate and use observation to ask questions about, understand, think about and explain how the Sun's energy can make things happen.



Scientists share their understanding and knowledge with other people in order to check or improve their explanations of the Sun and its effects.



We can use our understanding to protect ourselves from the harmful effects of the Sun, while still enjoying the benefits.



Part Two, Lesson 6

Assessment Opportunities	Structure
<p>Lesson 6 - Science Experiences We are successful when we can:</p> <ul style="list-style-type: none"> share our understanding with and gain understanding from others (peers and experts) use a KWL chart to record what we know, what we want to know, and what we have learnt identify the Sun and some other features of the solar system identify how the Sun is the centre of the solar system identify that the Sun is our biggest source of energy. <p>Lesson 7 We are successful when we can:</p> <ul style="list-style-type: none"> share and think about what we already know about the Sun use information from charts and videos to understand how powerful the Sun is explain that the Sun (energy) makes things happen/ changes things e.g. burns/fades/heats objects use what we know to make SunSmart Choices. 	<p>Lesson 6 Just How Powerful is our Sun? How science can help us to find out about and understand the centre of our solar system.</p> <p>Connect and Activate: Science experience- By viewing, discussing, gathering information about the Sun</p> <p>A Learning Intentions We are learning to:</p> <ul style="list-style-type: none"> find out about the Sun by sharing what I already know and by listening to experts. use a KWL chart (Resource 7) to identify what I already know about the Sun. Record 4-5 responses. Record 4 things they would like to know. <p>Connect:</p> <ul style="list-style-type: none"> Head to “Our Solar System” http://www.seasky.org/solar-system/solar-system.html. (Resource 8) Unpack how the chart shows how the Sun is the centre, how the rings show how the planets ROTATE around the Sun. Model this by acting it out. Students need explicit instruction to understand these representations. <p>Activate:</p> <ul style="list-style-type: none"> talk about how energy changes things or makes things work. How does the picture of the Sun represent this energy (looks like it is glowing etc.) Link to other things that flow when they are hot, e.g. stove elements, heaters, flames. <p>Demonstrate:</p> <ul style="list-style-type: none"> after viewing clip ask students what new things they have found out about the Sun. Any new questions they might have about the Sun, they can record these on the KWL chart in different colour View I Love Charts look at the Solar System Chart again and talk about how useful charts are to record and present information (language signs, symbols, text). <p>B Learning Intentions We learning to:</p> <ul style="list-style-type: none"> understand that the Sun is powerful think about how we must be SunSmart because of the Sun’s energy. <p>Procedure:</p> <ul style="list-style-type: none"> use video clip “Sun-safe Play Every Day” to confirm and add to students’ current knowledge. This clip uses a song about being SunSmart as well as building factual knowledge re: Sun and is tailored for use with young students point out how the title refers to every day. Alert students to whenever the Earth is facing the Sun, the Sun’s energy is acting on the earth. <p>Throughout the unit, you may like to repeat the use of this clip. “Sun-safe Play Every Day” https://www.youtube.com/watch?v=Zc2wE5dVx3Y</p> <p>Demonstrate: After viewing, allow students time to share what they have found out.</p> <p>Consolidate: Help them to record the statements or questions that they have on the two Sun ray graphics (Resources 9a and 9b).</p>

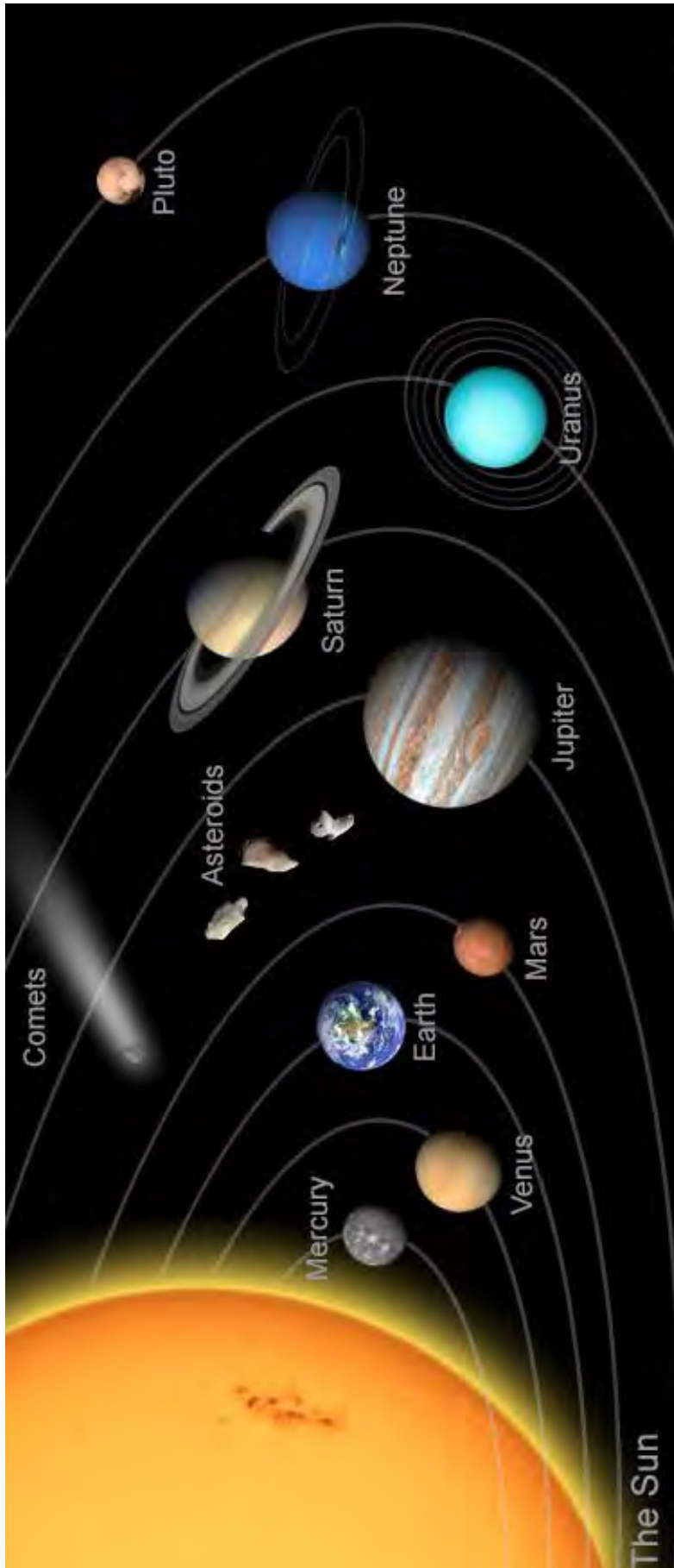
Lesson 6, Resource 7

KWL Chart

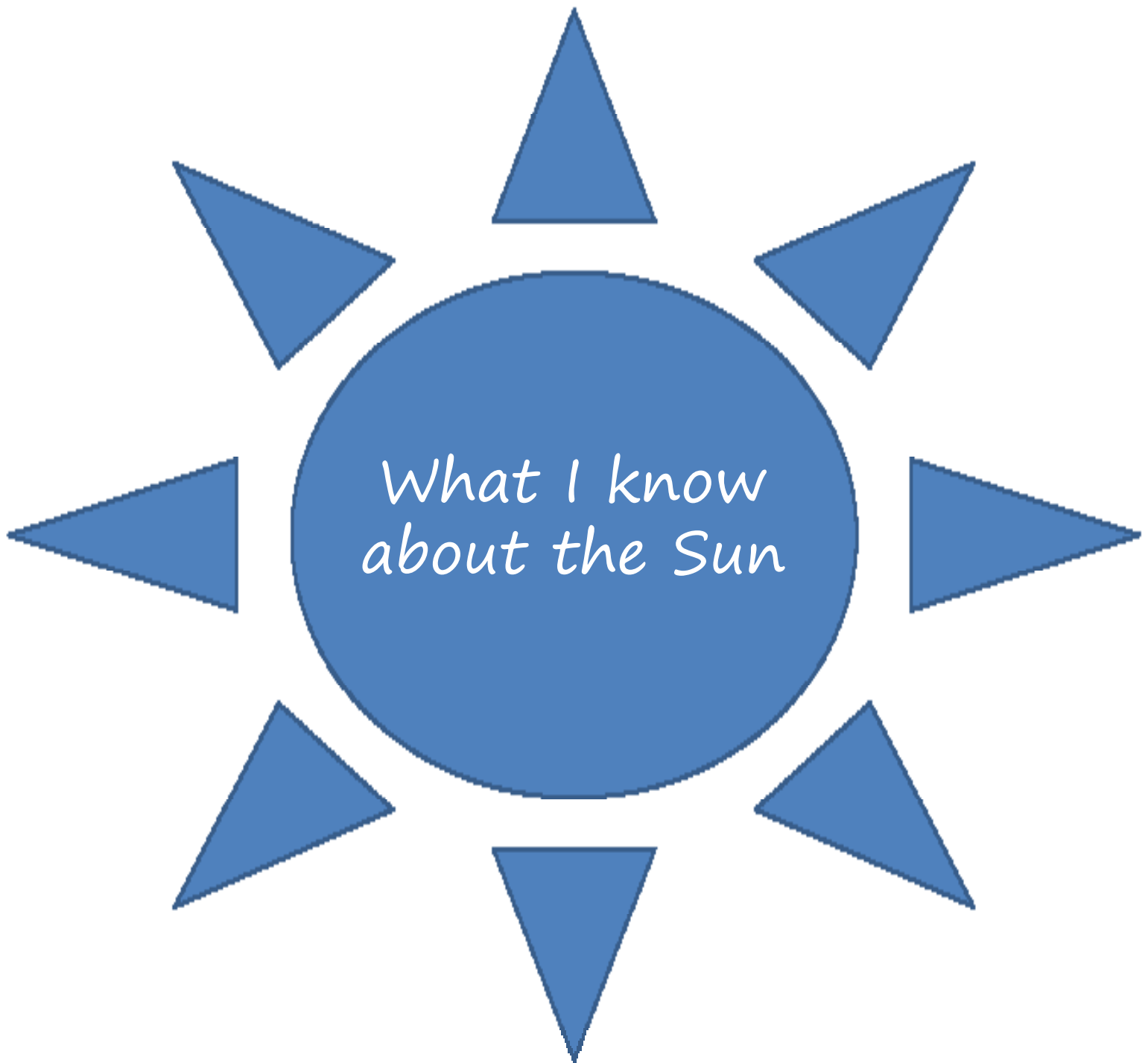
What I know, what I want to know, what I have learnt.

The Sun		
K	W	L

Lesson 6, Resource 8 Our Solar System



Lesson 6, Resource 9a
What I know about the Sun



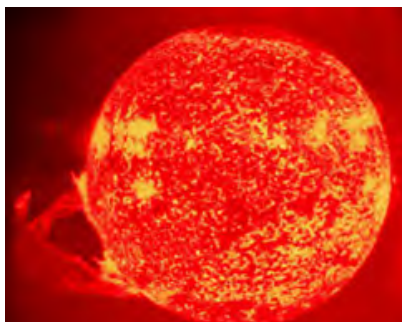
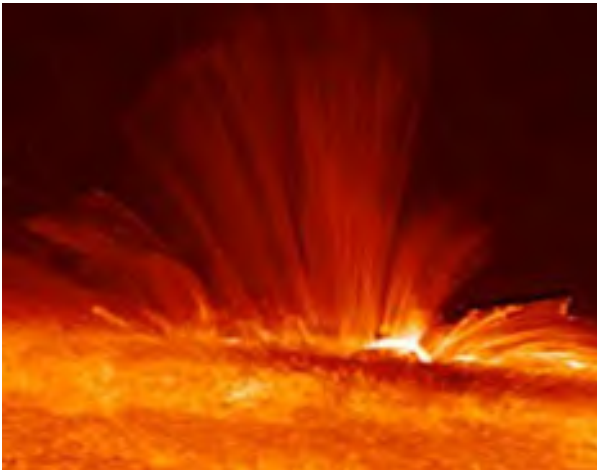
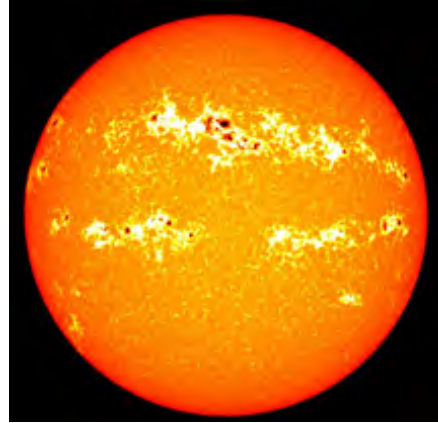
Lesson 6, Resource 9b
Our questions about the Sun



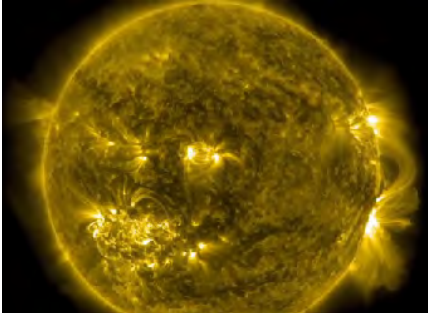
Lesson 7

Assessment Opportunities	Structure
<p>Lesson 7 We are successful when we can:</p> <ul style="list-style-type: none"> • share and think about what we already know about the Sun • use information from charts and videos to understand how powerful the Sun is • present our new learning ICT Apps • present our new understanding about the Sun by making our own pictures and sharing our ideas with our group. 	<p>Lesson 7 The Sun is very powerful and we must think about and respect this energy. Scientists study the Sun and use technology to capture still and moving images of the Sun. We can learn by watching and thinking about what these images show us.</p> <p>Learning Intentions: We are learning to:</p> <ul style="list-style-type: none"> • share what we already know about the Sun • learn from our classmates and experts about the Sun • think about how information about the Sun helps us to make sensible SunSmart Choices. <p>Prepare: Preview this clip: NASA clip of the Sun: https://www.youtube.com/watch?v=lzf51HlyEY8 This clip is important. The previous activities in Lesson 6 used graphic/cartoon representations of the Sun. There is a need to connect students with the “real” in order to build curiosity through the awe and wonder that this clip generates. The clip provides reinforcement of what has been previously explored BUT adds depth through introducing powerful, dynamic images and vocabulary. The clip could be used to help write a class description/story. The scope for science-specific words in combination with figurative language promotes learning.</p> <p>Connect: Teacher reads narration/voice-over on clip: “The Sun has shed light on our home for more than 4 billion years. It will continue to do so for another 4. It is massive almost beyond comprehension. Constant yet ever changing. Born from a swirling cloud of dust and gas, it is a giant fusion engine that drives the solar system. It seethes and boils like a living thing. Loops of plasma rise up, so large they would dwarf Earth. Explosions flash on its surface. And yet the Sun also gives us warmth. And life. And beauty”</p> <p>Activate:</p> <ul style="list-style-type: none"> • View “Surface of the Sun As You’ve Never Seen It” https://www.youtube.com/watch?v=lzf51HlyEY8 • Ask students what they noticed, what words would they use to describe the Sun after watching the clip. What wonderings do they have? • Read the voice-over script. How did the narrator describe the Sun? What was special to her? What did she notice/think? Do they agree? <p>Demonstrate:</p> <ul style="list-style-type: none"> • Talk about how the Sun is always there, every day, so we forget to even think about it. Ask how the scientists who study the Sun are able to make us think about the Sun.

Lesson 7, Resource 10
Selection of Sun Images - NASA



Lessons 7-8



Surface of the Sun as you've never seen it

Structure

- Alert students to how science can help us to know more about how the Sun's energy can work here on earth, even though the Sun is far away from us.

Consolidate:

- Use "Voicethread" <https://voicethread.com/> or "Fotobabble" <http://www.fotobabble.com/> to capture student responses to selected NASA Sun images. NASA material is free to use .
- Ask students to draw and colour their own "Sun" images after viewing clips and NASA photos. In groups, students share their images and why they have made their particular representation (teacher to model this process, [Resource 10](#)).

Lesson 8, Part A

Assessment Opportunities	Overview Lessons 8–12
<p>Lessons 8–12 We are successful when we can:</p> <ul style="list-style-type: none"> • carry out a plan of action to test our ideas • record data using words, numbers, drawings and photos • use data to make explanations • explain the relationship between exposure to the Sun and how materials can fade • explain how a green plant reacts to the presence or absence of light from the Sun • explain that the Sun can change non-living and living things. 	<p>Lessons 8–12 Investigate: The following experiences/experiments have been organised to develop understanding of the Sun and how heat and light energy work in everyday situations. Some of the experiences may seem to be repeats of the same concepts; however, students need to meet concepts in different contexts to consolidate understanding. You will be providing students with experiences that build their understanding both of the Nature of Science and contextual knowledge of the Natural World.</p> <p>Lessons:</p> <ul style="list-style-type: none"> • We are investigating the effect that sunlight has on: <ul style="list-style-type: none"> • black paper • green plants. • We are investigating the effect that sunlight has on different classroom objects. • We are investigating how quickly sunlight can heat water in different-coloured containers. • We are investigating whether different-colours affect how quickly heat from the Sun melts ice. • We are investigating how the Sun makes shadows.

Lesson 8:

This lesson has two parts. Both parts need to be set up on the same day or run as close together as possible.

Part A

We are investigating the effect that sunlight has on living and non-living things: black paper and green plants

Learning Intentions

We are learning to:

- design a scientific way of testing how sunlight changes things
- predict what will happen to paper when we put it in different amounts of Sunlight
- predict what will happen when green plants get different amounts of Sunlight
- record data using photos.

Part B

We are investigating the effect different amounts of Sunlight has on green plants.

Structure

Lesson 8: Part A

- Need black sugar paper. Cut three strips about 15 cm deep and as long as the length of the sheet (about 90 cm).
- Cut out three sets of coloured craft paper shapes. The size of the shapes need to be big enough to fit on the strips and be secured top and bottom with paper clips for easy removal.

Procedure:

Connect and Activate:

Show students three strips.

- We want to test what happens when we put this strip in the window. What shapes have I attached. Why do you think I have put these shapes on?

Lesson 8, Part A

Structure



- Secure one strip onto classroom window ensuring the side with shapes faces outside.
- If I wanted to do the opposite with this strip, where might I put it?
- So the opposite of 'in the Sun' would be 'no Sunlight' so we will put this in the cupboard (place 2nd strip in cupboard).
- Where might we put this last strip to show something in between?
- We call this being in the shade. Choose a place and secure the strip. We will leave the strips for two weeks and check.
- We have three places now to try out. We are trying to find out what happens in different amounts of sunlight (need to repeat and be explicit with young students – introducing them to experiment, design and thinking).

Demonstrate:

- Ask students to predict what they think will happen. Record on chart ([Resource 11](#)).
- At the end of two weeks, ask students to revisit their predictions, what they think might have happened (think/pair/share). Record a response.
- Look at each strip in turn. Take photos of outcomes. Make a wall display with the strips and annotate with student observations/thinking.
- Can students offer explanations? Tell students that scientists use the evidence (observations) they collect to help them explain what has happened.

Consolidate:

- Write a group explanation to display.

Lesson 8, Resource 11
Sunlight Record Sheet

Investigating the Effect of Sunlight on Paper

Our Predictions

Our Observations

Lesson 8, Part B

Structure

Lesson 8, Part B

Investigating the effect of different amounts of sunlight on green plants. Start this the same day if possible.

Prepare: Three indoor plants of same type and size (e.g. Lemon Balm)

Procedure:

Connect:

- Ask students: When we set up the three paper strips to test the effect of sunlight on paper what did we decide to do? What plan did we have? Could we use this same plan to find out about green plants?

Activate:

- Can you predict what might happen to each plant? Why?

Demonstrate:

- Divide students into three groups. Give each group time to look carefully at their specimen. Ask them to look at the leaves. What do they look like? Are they the same size? How are they joined to the stem? What colour are they? Use opportunity to identify plant parts. What is under the soil? Roots, etc. (Complete **Resource 12.**)
- Take photos of each plant. Insert photo on chart. Measure the biggest leaf and the smallest leaf on each plant. Measure the height of the plant. Record.
- Tell students that scientists use numbers to describe things accurately (measurement is a description).
- Students to describe leaf colour. Record (as shown on next page).
- Place one plant in direct Sunlight, one in indirect light and the other in a dark place where there is no Sun (e.g. in a cupboard or in a box).
- Take photos of each plant every two/three days for two weeks and make a wall display of the picture diary. Students record progress of plant growth under photos.
- At the end of two weeks, each group has time to observe their plant and to share their findings with other groups. This reporting-back time can be organised by regrouping so new groups have members from each original group. The children may need a photo prompt for their plant to support their reporting back. Or each group could nominate one or two members for a whole-class reporting-back time.

Synthesising Part A and Part B

- Relate the aim of the two investigations. How were they the same? How were they different? How did students collect data? What explanations did they have for each investigation?
- What can they now say about the effect of the Sun on their living plant and non-living material (paper).

Restate: The Sun is powerful. The Sun's energy can change things. We need to be SunSmart when we are in the Sun.

Energy from the sun includes heat, light and UV radiation. UV radiation cannot be seen or felt as heat.

Lesson 8, Part B

Record Sheet

In the Sun/no sunlight/shade
DAY __ : DATE



Insert Photo

Measurement of biggest leaf:

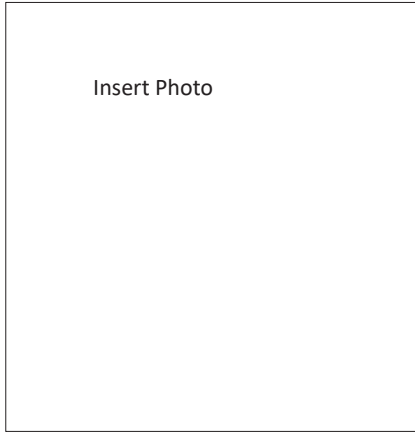
Colour of biggest leaf:

Measurement of smallest leaf:.....

Colour of smallest leaf:.....

Height of plant.....

In the Sun/no sunlight/shade
DAY __ : DATE



Insert Photo

Measurement of biggest leaf:

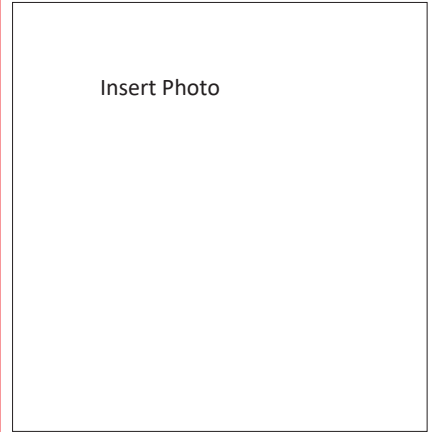
Colour of biggest leaf:

Measurement of smallest leaf:.....

Colour of smallest leaf:.....

Height of plant.....

In the Sun/no sunlight/shade
DAY __ : DATE



Insert Photo

Measurement of biggest leaf:

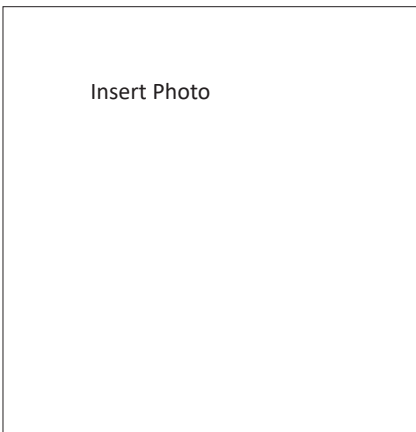
Colour of biggest leaf:

Measurement of smallest leaf:.....

Colour of smallest leaf:.....

Height of plant.....

In the Sun/no sunlight/shade
DAY __ : DATE



Insert Photo

Measurement of biggest leaf:

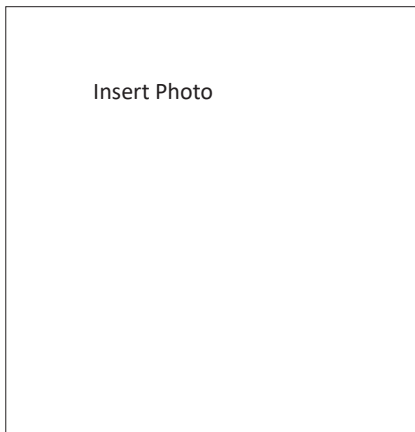
Colour of biggest leaf:

Measurement of smallest leaf:.....

Colour of smallest leaf:.....

Height of plant.....

In the Sun/no sunlight/shade
DAY __ : DATE



Insert Photo

Measurement of biggest leaf:

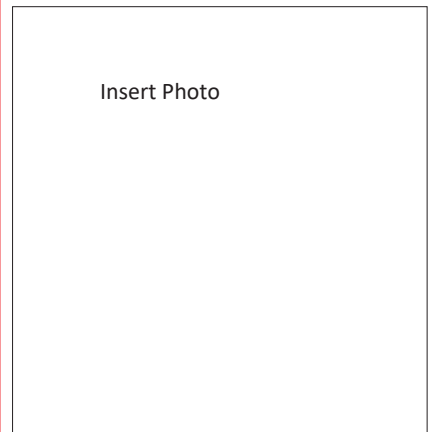
Colour of biggest leaf:

Measurement of smallest leaf:.....

Colour of smallest leaf:.....

Height of plant.....

In the Sun/no sunlight/shade
DAY __ : DATE



Insert Photo

Measurement of biggest leaf:

Colour of biggest leaf:

Measurement of smallest leaf:.....

Colour of smallest leaf:.....

Height of plant.....

Lesson 8, Part B, Resource 12

Our plant

STARTING DATE:

Scientists collect data at the beginning of their experiment. They can use words, pictures, drawings, numbers, videos and photos.

POSITION: In the Sun/no sunlight/shade



Measurement of biggest leaf:

Colour of biggest leaf:

Measurement of smallest leaf:.....

Colour of smallest leaf:.....

Height of plant:.....

Lesson 9

Assessment Opportunities	Structure
<p>Lesson 9 We are successful when we can:</p> <ul style="list-style-type: none"> • carry out a plan of action to test our ideas • understand that our senses help us collect data • use the data we collect to make explanations • use data to explain which objects are most likely to warm up in sunlight. 	<p>Lesson 9 We are investigating the effect that sunlight has on different classroom objects.</p> <p>Learning Intentions: We are learning to:</p> <ul style="list-style-type: none"> • work scientifically by sharing and testing ideas • collect data using our sense of touch • use data to make explanations. <p>Prepare:</p> <ul style="list-style-type: none"> • Collect a variety of objects from the classroom that are made from different materials and are different colours, e.g. school bag, shoes, shirts, wooden and plastic items, books of different colours, glass jar. Separate objects into two groups and take a photo of each group making sure there is space between each item. Make enough photo copies showing this so that each group has one of the photos to record their group predictions • Organise students into working groups <p>Connect:</p> <ul style="list-style-type: none"> • Ask students what forms of energy the Sun sends to earth (also link to previous clips: heat and light). • Students to share with a partner when they have noticed things getting hot in the Sun. Share with class. • Ask whether they have noticed that some things seem to get hotter more easily than others. What kind of things? <p>Demonstrate:</p> <ul style="list-style-type: none"> • Show students the objects you have selected and tell them what you are going to do with them; I will separate these objects into two sets and each set will be put outside in the Sun for one hour. • Give each group a copy of one set of items. Each group is to predict which objects will warm up a lot, a little or stay the same. • When they have decided, direct students to circle hot with a red marker/crayon, a little with a green marker/crayon and no change with a blue marker/crayon. • Explain that they are using colour coding to organise and record their thinking so they can check their predictions. • Each group chooses a member to take their set of objects outside and spread them out in a flat sunny spot on the grass (not concrete or asphalt as the stored heat will affect outcome). The objects will need to be left in full sunlight for an hour. • After the hour, each group checks their objects and uses colour-coded ticks to record their observations. Red tick for warmed up alot, green for a little, blue for no change. <p>Consolidate:</p> <ul style="list-style-type: none"> • On return to class, the groups can share their findings. What have they noticed? Were their predictions correct? Which materials warmed up the most? Which colours? • Can they answer their investigation question?

Lesson 10

Assessment Opportunities	Overview Lesson 10
<p>Lesson 10 We are successful when we can:</p> <ul style="list-style-type: none"> • explain how we can use words and numbers to explain how hot or cold a place is • understand when a thermometer is hot or cold • read the numbers on a thermometer • compare temperature readings • explain why it is important to time how long the investigation lasts • explain the relationship between exposure to the Sun and temperature. 	<p>Lesson 10 We are investigating how quickly sunlight can heat water in different-coloured containers. Students will be using different ways to collect and record their observations. The first part of the lesson they will be building our investigation skills ready to use in the second part.</p> <p>Part A Learning Intentions We are learning to:</p> <ul style="list-style-type: none"> • use our sense of touch and sight to identify the difference between two cups of water • use a thermometer to measure temperature • use words and numbers to describe the change • record results.

Structure

Prepare:

For each group of four students:

Cup of very cold water, cup of warm water, thermometer, recording sheet, towels for spills (saves worrying about mess).

- Organise groups of four

Connect:

- Refer to previous experience and outcome of Lesson 9. What did you notice about how the different objects felt? What caused the change?

Activate:

- In the first part of the lesson, we are going to practise using our sense of touch to describe the temperature of hot and cold water.
- First we are going to use our fingers and words. Then we are going to use a thermometer and numbers.
- Distribute one cup of very cold water to each group. Ask students to take turns testing the temperature using their finger. Ask them to share their describing words with members of their group.
- Discuss how when we use a finger we can only use words (warm, hot, cold, etc.). List words on teacher chart.
- Have students circle correct words on their recording sheet (**Resource 13**).
- Distribute a thermometer to each student. Have group members, in turn, examine the thermometer. What can they see? (Line of alcohol, numbers.)
- Explain that this line will let them know what the temperature is by looking at where the line begins and noticing the number where the line stops.
- Show the students the thermometer diagram on their recording sheet. Model record of starting temperature on teacher chart. Direct students to record the starting temperature on their recording sheet.

Demonstrate:

- Each group to place their thermometer in their cup of cold water. Allow time for temperature to register and get students to record on their sheet (model this on teacher chart).
- Distribute cup of hot water (not too hot) and repeat process.

Consolidate:

- Once the recordings have been made, encourage all the students to have turns using the thermometer.
- During this experience expect students to try holding thermometer in their hand etc. – it's all learning and exploration.

Lesson 10

Structure

- Ask students if they are now confident about using the thermometer.

Part B

We are investigating how quickly sunlight can heat water in different-coloured containers.

Learning Intentions

We are learning to:

- use words and numbers to describe change
- use a watch/timer
- record results
- decide if data shows that the Sunlight changes the water.

Prepare:





Each group needs:

Four empty soft-drink cans; four rubber bands; four sheets of paper (one white, one black, plus two from a selection of colours, cut to size so that can is able to be wrapped in paper and secured by rubber bands); thermometer; jug of water; towels for spills; recording sheet for each student ([Resource 14](#)).

Procedure:

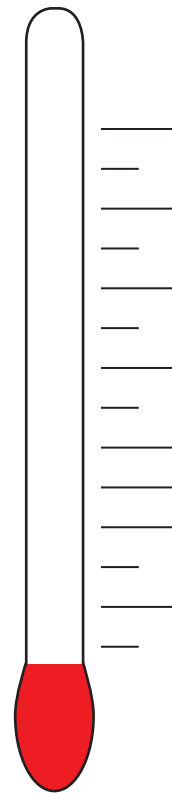
- Remind students: We are learning how energy from the Sun can change things.
- Today we are going to do an investigation to test how quickly water heats up in different-coloured containers.
- To keep this fair we are going to keep the size of container, the amount of water and the starting temperature of the water the same. Remember from the last lesson that different materials heat at different rates. We will put them outside in the same place. Only the colour of the can will be different.
- Demonstrate the following: Wrap can with black paper. Secure with rubber bands.
- Instruct students to wrap their cans. They will need to help each other with this. Point out that scientists often need to help each other as well.
- Distribute student recording chart. Students to colour in their can.
- Distribute jugs of water to groups. Take starting temperature.
- Students record on their chart by drawing line on thermometer graphic.
- Point out how everybody will have the same starting temperature.
- Each child to fill their own can to the top. Be prepared for spills. Be patient. Don't do this part for them. Science is TACTILE!
- Let students carry their group's cans outside to place in sunlight.
- Set timer and leave outside for 1½ hours.
- Once cans are set up and you have returned to class, ask students in their groups to discuss which colour can they think will be most effective and why.
- Record each group's suggestion.
- At end of 1½ hours check the temperatures in the cans.
- What has happened? Allow students time to share their results in their group.
- Collate findings of all groups. What do these results show?
- Explicitly connect outcomes to the investigation aim. Does colour make a difference?
- Link to Lesson 9.

Lesson 10, Part A, Resource 13

<p>Cold Water</p> 	<p><i>Describing Words</i></p> <p>Cold</p> <p>Warm</p> <p>Freezing</p> <p>Icy</p> <p>Hot</p> <p>Chilly</p>	<p>Thermometer</p> 
<p>Hot Water</p> 	<p><i>Describing Words</i></p> <p>Cold</p> <p>Warm</p> <p>Freezing</p> <p>Icy</p> <p>Hot</p> <p>Chilly</p>	<p>Thermometer</p> 

Lesson 10, Part B, Resource 14

MY CAN:



Lesson 11

Assessment Opportunities	Structure
<p>Lesson 11 We are successful when we can:</p> <ul style="list-style-type: none"> • prepare equipment to use in an investigation • use our data to think about what is happening and why • make a statement about the Sun, water and the colour of the paper. 	<p>Lesson 11 We are investigating whether different colours affect how quickly heat from the Sun melts ice.</p> <p>This investigation will reinforce that the Sun can change things as well as how different colours absorb more or less energy. There is a need to link these discoveries to help students understand that the more energy that is absorbed, the faster change can happen. In these explorations students can experience how darker colours can absorb more energy.</p> <p>As students will be outside during this exploration, they need to wear their sunhats and sunscreen. Link this to what they have been learning.</p> <p>We have been noticing how the Sun has energy that changes things, so that is why we wear our hats: to protect us from too much of the Sun’s energy.</p> <p><i>Learning Intention</i> We are learning to:</p> <ul style="list-style-type: none"> • predict what will happen and give a reason. <p>Prepare: For each group:</p> <ul style="list-style-type: none"> • 4 ice cubes • 4 small Ziploc bags • 4 coloured sheets of paper (1 black, 1 white, 2 other colours) <p>Procedure: (on a sunny day)</p> <ul style="list-style-type: none"> • Discuss previous experiment findings. Get students to refer back to the data they gathered. • What conclusion do they come to about the role of the Sun? Are they articulating that the Sun’s energy (heat and light) is able to change things? • After review and discussion, each group sets out their coloured paper on a grassy surface. Avoid placement on concrete or asphalt as the stored heat in these surfaces will affect the outcome. • Allow students to observe and sketch what happens. • Take photos. • Return to classroom. • Discuss whether their findings confirm what they have observed in previous explorations.

Lesson 12, Part A, B, C, D

Assessment Opportunities	Overview Lesson 12, Part A, B, C and D
<p>Lesson 12 We are successful when we can:</p> <ul style="list-style-type: none"> • share and use what our group knows about shadows • record data using drawings and photos • use the results from our shadow investigation to identify patterns made over time • make links to previous learning about the Sun and its energy. 	<p>Lesson 12 We are investigating the link between the Sun and shadows. This investigation needs to be carried out over several days. (Parts A, B, C and D)</p> <p>We are learning to:</p> <ul style="list-style-type: none"> • share our thinking about shadows using drawings and discussion • think about how investigating shadows can change or add to what we know about how the Sun works • use photos to gather and think about evidence • use our evidence to predict what will happen next • identify that changes need time to take place • identify that some changes form a pattern • think about how gathering data helps us to be better observers • check whether there is a link between shadows and temperature • use our observations to make links between how humans and other living things behave in the Sun. <p>Prepare: (on a sunny day)</p> <ul style="list-style-type: none"> • Sunhats and sunscreen • Chalk – several different colours • Camera <p>Part A. We are learning to:</p> <ul style="list-style-type: none"> • share our thinking about shadows using drawings and discussion • think about how investigating shadows can change or add to what we know about how the Sun works.

Structure
<p>Overview:</p> <ul style="list-style-type: none"> • Start with students drawing a picture of themselves and their shadow. • Bring students together to share their drawings. • Ask students to think about what they know about shadows, when and where have they seen them, whether they know how shadows are made. • Direct them to use their thinking and their drawings to talk to their partner. Tell them to listen carefully to each other to check if their partner has the same or different ideas and experiences. • Reinforce that in science sharing and collaborating is very important and that real collaboration starts with being able to listen to what somebody else has to say. • Select a few students to share. Ask if anybody else can ADD to what has already been said. • The role of the Sun will probably be identified. • Ask the students to look at their drawings and to draw where they think the Sun would be in the sky when the shadow was made. • Collect drawings and display on wall as ‘What I Know Now’. • Leave room next to the drawing for drawings completed at the end of the investigation. It is important with young students to be explicit about the link between current understanding and how INVESTIGATING in science adds to this.

Lesson 12, Part B

Structure

Part A.

We are learning to:

- share our thinking about shadows using drawings and discussion
- think about how investigating shadows can change or add to what we know about how the Sun works.

Part B

(Beginning of the school day)

We are learning to:

- use photos to gather and think about evidence
- use our evidence to predict what will happen next
- identify that changes need time to take place
- identify that some changes form a pattern.

Prepare:

- Organise students into investigation teams of four. Nominate one student from each group as the 'shadow child'. Demonstrate in class what you want them to do when outside.
- Tell students that they will be wearing their sunhats. However, the hat will not protect their eyes from directly looking at the Sun. Tell students that looking directly at the Sun will hurt their eyes. Remind them about how over time the Sun damaged the black paper.
- Take students to a Sunny position on concrete/ asphalt. Locate position of the Sun (do not direct students to do this as they may stare at the Sun). Direct 'shadow child' to stand with their back to the Sun – to discourage looking at the Sun.
- The rest of the group trace the outline on the concrete using one chalk colour. Make sure that the position of the 'shadow child's' feet are drawn as this will be the position they stand in for each drawing.
- Repeat this procedure before interval and before lunch. There will now be three outlines.
- Ask the group to predict where they think the shadow will lie when they return before the end of school. They can draw this in a fourth colour.
- Do not mention the length of the shadows as this is something for them to notice. Take photos at each stage for each group for follow-up discussion the next day.



Lesson 12, Parts C and D

Structure

Part C

(Next day)

We are learning to:

- think about how gathering data helps us to be better observers
- use our observations to make links between how humans and other living things behave in the Sun.

Procedure:

- Allow students time to share in their groups what they have noticed and what factors influence the making of shadows.
- Bring them together and ask for an explanation about how shadows are made. You may need to help this along.
- Reinforce that the work of science is to collaboratively form explanations. Students need to arrive at the understanding that shadows are caused when objects block the sunlight and as the Sun moves, the position and size of a shadow changes. Also that a shadow is two dimensional and that detail and colour is not discernible.
- Ask students if they noticed other shadows; for example, trees, buildings, seats. What do we say when we are sitting in the shadow of a large object? – the shade.
- Make a link to how animals and some plants ‘block’ the effect of being always in direct sunlight by utilising shadows.
- As we move around, humans need to think about transportable shade or blocking – sunhats, sun glasses, clothing and sunscreen. Be explicit with this age group.
- Revisit how animals, including humans, need shade.

Part D

We are learning to:

- check whether there is a link between shadows and temperature.

Prepare:

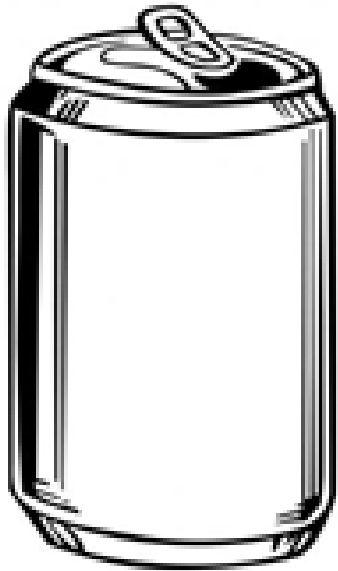
- timer
- For each group of four: thermometer, two empty soft-drink cans (same size) covered in black paper, water, chart/table of results

Procedure:

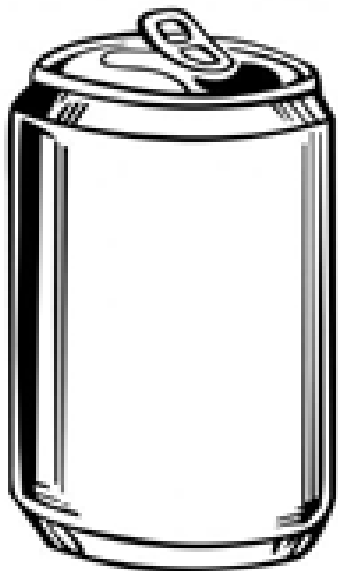
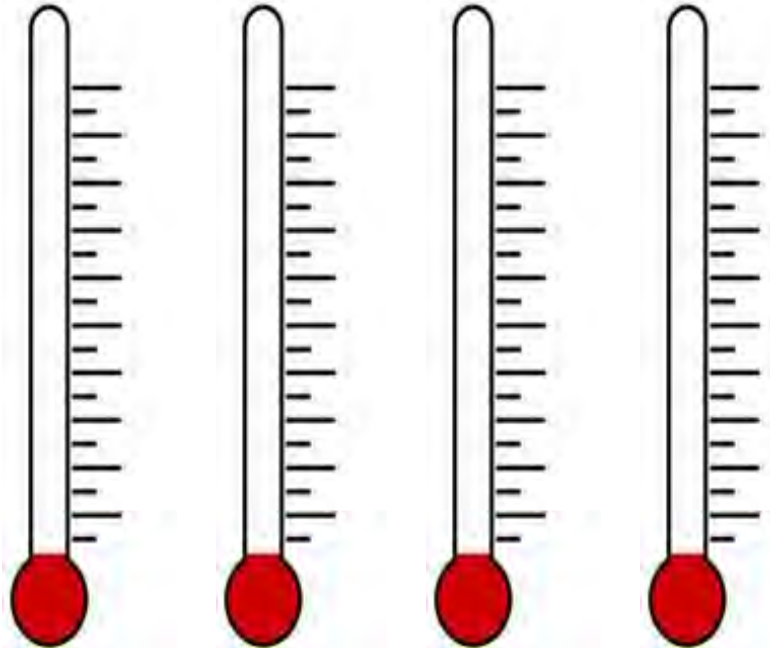
- To further reinforce the effect of blocking the Sun, have each group place two soft-drink cans that are covered in black paper and filled with same temperature water outside for 1½ hours (one in the shade and one in full sunlight).
- At half-hourly intervals (use a timer) record the temperatures with a thermometer.
- Use a table ([Resource 15](#)) to record data.
- Let students share the outcomes in their working groups.
- Write a class explanation.

Note: The shorter your shadow, the higher the UV levels.

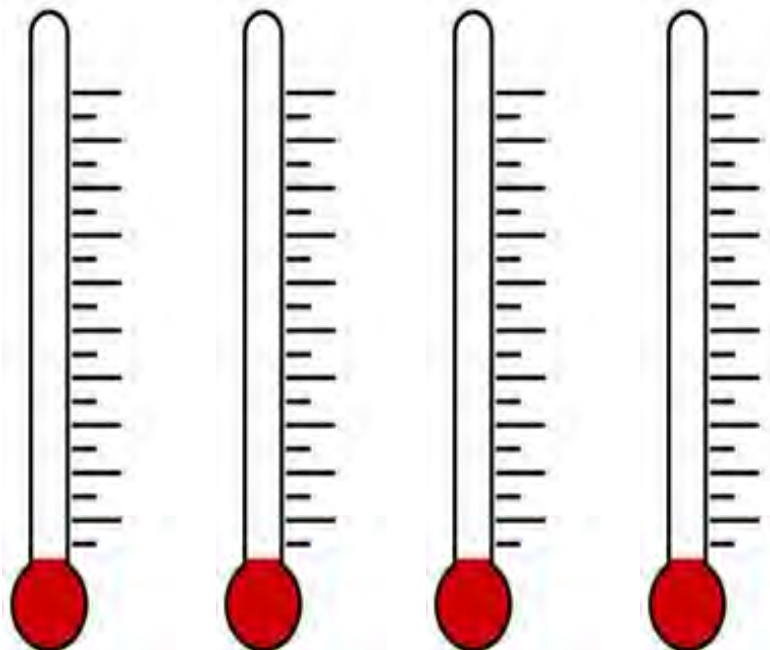
Lesson 12, Part D, Resource 15
Observation Chart



Shade



Sunlight



Lesson 13

Lesson 13

Inquiry – Data Gathering – Photographic evidence dated and displayed in classroom to map progress

What can we learn from animals that will help protect us from the Sun?
(Photographic evidence dated and displayed in classroom to map progress of action taken.)

Assessment Opportunities	Structure	Curriculum and Resource Links
<p>We are learning to:</p> <ul style="list-style-type: none"> ask questions and find answers from others gather, sort and count answers from others show the results in a table discuss the results use the results as a basis to decide a course of action 	<p>Prepare: Resources 15 and 16</p> <p>Connect: We have found that animals protect themselves from the Sun by sitting in the shade, wearing dust or dirt as a sunscreen, protecting their face and protecting their eyes. We have also found out that the Sun can heat, fade and burn things and that black surfaces get hotter than white surfaces. Let's find out how you like to protect yourself from the Sun. (Teacher may like to show students Resource 16 to identify the ways they protect themselves.)</p> <p>Activate: Survey class and count up responses and choose the most popular.</p> <p>SLIP into the shade</p> <p>SLIP into sun protective clothing</p> <p>SLOP on sunscreen</p> <p>SLAP on a hat with a brim</p> <p>WRAP on some sunglasses</p> <p>Demonstrate: Teacher draws a tally chart on the board. Students look at Resource 16 to decide which one they do most often. Teacher records each student's response by recording their response with a tick. Once all the class members have given their response, teacher ask pairs to add up the columns and find out which form of Sun protection is most used by the students.</p>	<p>Pedagogical links:</p> <ul style="list-style-type: none"> Creating a supportive learning environment Encouraging reflective thought and action Enhancing the relevance of new learning Facilitating shared learning Making connections to prior learning Providing sufficient opportunities to learn E-learning Engaging Māori and Pāsifika students and their communities <p>Key competencies:</p> <ul style="list-style-type: none"> Thinking Using language, symbols and texts Managing self Relating to others Participating and contributing <p>Literacy:</p> <ul style="list-style-type: none"> English and Te Reo vocabulary building Oral and visual cues to inform thinking Sharing ideas and preferences <p>Numeracy:</p> <ul style="list-style-type: none"> Statistics

Lesson 13, Resource 16

Slip, Slop, Slap, Wrap

Ways we can protect ourselves from the Sun.



SLIP into the shade



SLIP into sun protective clothing eg long sleeves, collars etc



SLOP on Sunscreen
broad-spectrum SPF30+



SLAP on hat with a brim



WRAP on sunglasses

Structure

Teacher then tallies up.

Which option has the most ticks from students in the class?

Teacher takes a photograph of the final tally chart as a record.

Big Questions: What type of Sun protection would ensure our whole body is protected from the Sun?

Shade is a great way to protect our whole body. How much shade protection do we have at our school?

Consolidation:

Students discuss the big question and predict where the shade protection is at the school.

Lesson 14

Lesson 14

Overview: *Photographic evidence dated and displayed in classroom to map progress*

Assessment Opportunities	Structure	Curriculum and Resource Links
<p>We know we are successful when we can:</p> <ul style="list-style-type: none"> participate and co-operate in the group project show respect towards others share ideas, needs, wants and feelings and listen to those of others take individual and collective action to create a SunSmart school environment that can be enjoyed by all measure how many students in our class like our SunSmart idea. 	<p>Prepare Resource 17</p> <p>Connect: We have identified that shade is a great way of protecting our whole body from the Sun. We have predicted where we think the school has shade protection of our students. Inquiry: What can we do to make our school a place where there is plenty of shade to protect us?</p> <p>Resource 17</p> <ol style="list-style-type: none"> Teacher draws a map of the school on the board with students' contributions (teaching opportunity for map conventions and symbols). Students draw their own map or teacher provides On their map, students draw in the places where children like to sit and play during morning tea and lunchtime At morning tea and lunchtime on sunny days. Where are the shady places in our school? Students predict where the shady places are in their school by colouring them in on their map. <ul style="list-style-type: none"> Teacher takes students around the school on a sunny day. They look at all the places that students like to sit at morning tea and lunchtime, and where the shade is at morning tea and lunchtime. They draw chalk around the shade areas in the morning (one colour) and then at lunch time (in a different colour). Is there a difference? Why is there a difference? Teacher takes photographs of the places that students like to sit and play at morning tea and lunchtime and displays them on the wall in the classroom. See Resource 16 for students. Are there enough places in our school for all the children to sit or play in the shade when it is sunny? What could we do to create more shady places at our school? (Encourage them to be creative). See Resource 16. 	<p>Pedagogical links:</p> <ul style="list-style-type: none"> Creating a supportive learning environment Encouraging reflective thought and action Enhancing the relevance of new learning Facilitating shared learning Making connections to prior learning Providing sufficient opportunities to learn E-learning Engaging Māori and Pāsifica students and their communities <p>Key competencies:</p> <ul style="list-style-type: none"> Thinking Using language, symbols and texts Managing self Relating to others Participating and contributing <p>Literacy:</p> <ul style="list-style-type: none"> English and Te Reo vocabulary building Language development and developing an understanding about interpersonal communication skill development Focused small-group discussion Oral communication and public speaking skills Seeks feedback and makes changes based on recommendations Gathering, reading and interpreting information to form conclusions about the survey. <p>Numeracy:</p> <ul style="list-style-type: none"> Concept of a timeline Measurement Statistical investigation

Lesson 14, Resource 17

Slip ~ Shade in Our School

1. Draw a map of your school with your teacher. (Teaching opportunity for map conventions and symbols.)
2. On your map, draw in the places where children like to sit and play during morning tea and lunchtime.
3. At morning tea and lunchtime on sunny days, where are the shady places in your school?
4. Draw in the shady places in on your map.

Your teacher will take photographs of these places for you and have them displayed on the wall in the classroom.

5. Are there enough places in your school for all the children to sit or play in the shade when it is Sunny?
6. What could we do to create more shady places at our school? (Encourage them to be creative. Show students examples from <http://sunsmartschools.co.nz/schools/shade/structures.html>)
7. Draw on your map where you think we could have more shade.
8. In a group of three or four students - choose one of the places that needs more shade.
9. Discuss with your group how you could make the place you have chosen a cool and funky shady place to sit or play with your friends.
10. Draw a picture that shows what you would do and what it would look like.
11. Make a model of your shade idea out of newspaper and cardboard.

Your teacher will take a photo of your model and place on the wall by the photo of the location in the school.

12. What materials will you need if you are going to make your shade idea in real life?
13. How could you find out if it will work (stay in place, withstand the weather and be safe) or not?
14. Who would you need to ask for help?
15. What possible problems might you face
16. Possible solutions to the problems
17. How long do you think it will take?

Lesson 15

Consolidation Lesson 15

Preparing to report at end of project (Over two or three lessons)

OVERVIEW: Today we are evaluating our actions to improve our use of the resources in our school

Assessment Opportunities	Structure	Curriculum and Resource Links
<p>We know we are successful when we can:</p> <ul style="list-style-type: none"> clearly explain our inquiry, what we did and the results identify and carry out actions that encourage people to make the school a healthy place identify key words and use them in our presentation about SunSmart approaches identify ways to encourage others to take actions that will make our school a healthy place give and receive constructive feedback make changes to our presentation based on the feedback explain events in terms of a timeline reflect on our learning about SunSmart practices identify our next steps. 	<p>Prepare: See lesson overview for resources</p> <p>Connect:</p> <ul style="list-style-type: none"> Remind students about the inquiry. “What we can do to make our school a healthy place?” <p>Activate:</p> <ul style="list-style-type: none"> Look at the photographic display Watch the PowerPoint of the photographs in the display Write down or draw the challenges and how we overcame them Write down or draw the successes and how we overcame them Write down or draw the thing that was hardest to achieve? What did we learn from this experience? What is our next step? Draw a timeline with the milestone actions listed, and the challenges and successes noted below. Above the timeline, also add in the hard-to-achieve events with a big star by the thing that was hardest to achieve. (The teacher may have to help with this.) Brainstorm how we could share this information with others, e.g. board of trustees, whole school assembly, parents at parent/teacher interviews etc. 	<p>Pedagogical links:</p> <ul style="list-style-type: none"> Creating a supportive learning environment Encouraging reflective thought and action Enhancing the relevance of new learning Facilitating shared learning Making connections to prior learning Providing sufficient opportunities to learn E-learning Engaging Māori and Pāsifica students and their communities <p>Key competencies:</p> <ul style="list-style-type: none"> Thinking Using language, symbols and texts Managing self Relating to others Participating and contributing <p>Literacy:</p> <ul style="list-style-type: none"> English and Te Reo vocabulary building Language development and developing an understanding about interpersonal communication skill development through focused small group discussion Oral communication and public speaking skills Seeks feedback and makes changes based on recommendations Gathering, reading and interpreting information to form conclusions about the survey

Lesson 15

Structure	Curriculum and Resource Links
<p>Demonstrate:</p> <ul style="list-style-type: none">• Teacher discusses with students and models what makes an effective speaker when delivering a report to a group, i.e. speak clearly, in a loud voice, stand up straight and still and look at our audience when we talk.• How to introduce themselves in Te Reo Māori.• In pairs prepare presentation of report as detailed below. Those capable can write their ideas next to the SEE prompt. <p>(Teacher draws the following on the white board (SEE) as prompt for students and goes over it with them.)</p> <p>S State what your main question is. How we can make our school a healthy place? What is the action the class chose?</p> <p>E Explain the steps, challenges, and how you overcame them (arrow to the timeline on the board to remind them).</p> <p>E Examples of what you have learnt as a result:</p> <ol style="list-style-type: none">1.2.3. <ul style="list-style-type: none">• What you will do next and how others could help to make the school a SunSmart place. (3–5 mins)• Students practise their presentation in pairs, beginning with introducing themselves in Te Reo Māori. Receive feedback and make adjustments. Teacher may like to accompany with PowerPoint photos of the main steps.• Teacher should also listen and provide feedback. For some children teacher may need to provide prompts.• Teacher may suggest that some deliver their report in pairs, sharing the delivery. <p>Consolidation:</p> <p>We want to tell our community how we have made our school a Sun-safe place. What would be the best way for us to tell our community about our Sun-safe strategies?</p> <p>School newsletter, PowerPoint of photos and commentary for board of trustees, parents, peers, assembly, local paper etc. or play/song/cartoon.</p>	<p>Numeracy:</p> <ul style="list-style-type: none">• Concept of a timeline, statistical investigation

Final Lesson

Final Lesson

Sharing our information/conclusions

OVERVIEW: *Today we are sharing our findings with our community*

Assessment Opportunities	Structure	Curriculum and Resource Links
<p>We know we are successful when we can:</p> <ul style="list-style-type: none"> • speak clearly, in a loud voice, stand straight and still, and look at our audience when we talk • use key words in our presentation • reflect on our learning about Sunsafe practices • evaluate the impact that our presentation has had on others. 	<p>Prepare:</p> <p>Connect:</p> <ul style="list-style-type: none"> • before the presentation ensure the students have had adequate time to practice. Reassure them that the timeline and prompts will be on display and visible to help them if they forget. • go over the PowerPoint, timeline and prompts with them. <p>Activate:</p> <ul style="list-style-type: none"> • Allow students the opportunity to practice in the venue where they will be delivering their presentation. <p>Demonstrate:</p> <p>Teacher introduces and students present individually or in pairs to:</p> <ul style="list-style-type: none"> • the board of trustees, staff, senior management, whole school at assembly, parents at parent teacher interviews/ conferencing etc. <p>Consolidation:</p> <ul style="list-style-type: none"> • Reflect on what went well for us, what we could improve, what we have learnt as a result. • Teacher may want to video performances. 	<p>Pedagogical Links:</p> <ul style="list-style-type: none"> • Creating a supportive learning environment • Encouraging reflective thought and action • Enhancing the relevance of new learning • Facilitating shared learning • Making connections to prior learning • Providing sufficient opportunities to learn • E-learning • Engaging Māori and Pāsifika students and their communities <p>Key competencies:</p> <ul style="list-style-type: none"> • Thinking • Using language, symbols and texts • Managing self • Relating to others • Participating and contributing <p>Literacy:</p> <ul style="list-style-type: none"> • Language development and developing an understanding about interpersonal communication skill development through focused small group discussion • Oral communication and public speaking skills • Seeks feedback and makes changes based on recommendations • Gathering, reading and interpreting information to form conclusions

Resource 18

Group Work – What Works

1. For the Teacher – a checklist of instructional environment and management components
2. For the Students – Group rules and agreement
3. For each Student – Feedback on group work (form)
4. What group work strategies are effective in your school?
5. Strategies for effective group work
6. Essential group dynamics
7. Social skills score card – Levels 1–4

Resource 18

Group Work – What Works

Instructional Environment and Management Components

Teachers:

1. *A Positive Attitude*

Believe that students are capable of learning. Have high expectations and make students accountable for meeting these expectations.

2. *Ensure your instructions and criteria for success are clear*

3. *Teach and assess the social and interpersonal skills*

These include:

- **Level 1**

Building trust, listening, taking turns, looking at people when they talk, forming groups quickly and efficiently, taking responsibility for their own and the group's behaviour, accepting and valuing differences, resolving conflict constructively.

- **Level 2**

Active listening, asking questions, clarifying, constructive criticism, helping and accepting others, paraphrasing, summarising.

- **Level 3**

Interviewing, coaching, teaching, negotiating, brainstorming, building on each other's ideas.

- **Level 4**

Creative group problem solving, conflict resolution, planning and organising, decision-making, individually negotiating curriculum and research.

4. *Use a variety of team formations*

Teacher-selected groups can be the primary groupings, but you can vary this by using randomly selected and student-selected groups. Students who do not work in student-selected groups may lose this privilege and be placed in teacher-selected groups or work individually on projects.

5. *Ensure students understand their positive interdependence within the group (outcome and means interdependence)*

Students realise that they "sink or swim together".

6. *Encourage considerable promotive (face-to-face) interaction between students*

7. *Individual accountability and personal responsibility are paramount*

Each student is held responsible by group members for contributing his or her fair share to the group's success. The teacher is no longer the fountain of all knowledge, but is a resource guide.

8. *Ensure there is group processing at the end of every session.*

Groups reflect on how well they are functioning by:

- describing what actions were helpful and unhelpful
- making decisions about what actions to continue or change

Group processing also promotes a sense of self-efficacy.

Resource 18

Group Work – What Works

9. *Stress the importance of attendance*

Each student needs to feel that there is ownership and a responsibility to turn up. They will be answerable to their group when their absence negatively impacts on the group's ability to complete a task.

10. *Consistency – arrange your room so that group work can take place frequently*

Use co-operative learning regularly as “you have to sweat in practice before you can perform in concert”. The skill needs to be practised until it becomes an automatic habit pattern.

11. *Reward often*

Use both extrinsic and intrinsic rewards.

12. *Provide frequent specific feedback on the task*

13. *Monitor the progress of the groups*

Keep a book that details the points and bonus points students have gained for effort and social skills as well as the task-specific skills

14. *Everyone has a role to play*

Groups need a chairperson, recorder, timekeeper, clarifier and summariser.

15. *Be patient*

New skills take a while to master. Students need a lot of practice before it becomes automatic.

Resource 18

Group Work – What Works

Group Rules and Agreement

You will need to discuss and then write up a list of agreed rules that will govern your group. Each member of your group will need to sign the agreement below.

Points to consider:

1. *A positive attitude*
2. *Be generous with praise for each other*
3. *Listen while others talk, take turns, look at people when they talk, form the group quickly, take responsibility for your own and the group's behaviour, resolve conflict constructively*
4. *Remember you 'sink or swim' together*
5. *Each group member is responsible to the group for contributing her fair share*
6. *Each group member is responsible for the outcome – they need to show up to class*
7. *Be patient with those who find it difficult to understand the first time*

Group members:

List of rules for our group:

My role in this group is: _____

Signed: _____

Date: _____

Resource 18

Group Work – What Works

Feedback on Group Work

Besides each of the statements write the number that best describes your judgement.

1 = always, 2 = often, 3 = usually, 4 = sometimes, 5 = never

Individual	Grade 1–5	Group	Grade 1–5
1. I had a positive attitude when working with the group		The group had a positive attitude	
2. I was generous with praise for others in my group		My group was generous with praise for each other	
3. I listened while others talked		My group listened while others talked	
4. I took my turn to contribute and talk		We took turns to contribute and talk	
5. I looked at people when I talked to them		We looked at people when we talked to them	
6. I joined my group quickly		We joined our group quickly	
7. I took responsibility for my own behaviour		We took responsibility for our own behaviour	
8. I took responsibility for the behaviour of my group members		We took responsibility for the behaviour of our group members	
9. I worked together with the others to ensure that we “swam” rather than “sunk”		We worked together to ensure that we “swam” rather than “sunk”	
10. I contributed my fair share to the group		We all contributed our fair share to the group	
11. I showed up regularly to class		We showed up regularly to class	
12. I was patient with those who found it difficult to understand the first time		We were patient with those who found it difficult to understand the first time	

Resource 18

Group Work – What Works

What Group Work Strategies are Effective In Your School?

SUMMARY:

- Goals* Expectation clearly expressed (verbally and on OHT/board)
- Rules* Individual roles within team
- Objectives* Clear time allocation
- Understanding* Student behaviour – (the shy; the outcasts; the saboteur)
- Planning* Where in the unit will this fit?
- When?* Time of day/week/term?
- Organisation* Environment/resources – well before the lesson
- Resources* An obvious one
- Knowledge* Development of group-work skills
- Evaluate* Student feedback/strategies for group work reflection – i.e. score cards, discussion and self-evaluation (student and teacher)

Resource 18

Group Work – What Works

Strategies for Effective Group Work

1. **Group size**
Maximum 5, with 3 or 4 ideal.
2. **State objectives and set goals**
E.g. give each group (4) an egg, 4 straws, 6 sheets of paper and Sellotape. Design a contraption using these materials to stop an egg breaking when it is dropped from a height of 5 metres.
3. **Identify strategies for working together (Group dynamics)**
This may be done at the start of the year or lesson to set the scene for appropriate group work (see attached ESSENTIAL GROUP DYNAMICS).
4. **Resources**
Ensure you have enough resources for each group.
5. **Identify roles**
Design some role-play cards, which clearly describe the job of each member of the group; e.g. Initiator – must get the group started in discussion.

Assign roles to each member of the group.

Roles can include:
 - Initiator:** must get the group started in discussion
 - Reader:** reads problems to the group and comes up with the first idea
 - Reporter:** writes down group ideas
 - Evaluator:** writes down how well the group worked together
 - Improver:** writes down things the group could do to improve and works closely with the evaluator.
6. **Evaluation**
After participating in a group activity, evaluate how well the group worked together. Teacher can share their observations.

Resource 18

Group Work – What Works

Essential Group Dynamics

Below is a list of essential elements important to establishing a co-operative group. These will be important this year when working together in groups or as a class. Head up “Essential Group Dynamics” and copy the following.

1. *Good leaders and followers*
These people can make decisions, keep things moving, and can work with others in the group to achieve goals. They should never totally dominate but look to include others’ opinions because these can be valuable. Good followers should offer opinions and support the leader’s approach to completing a task. It should not be up to the leader alone to complete tasks.
2. *Give everyone a chance*
Statements like “What do you think ...?” can help include others in group discussions. Always look for those who aren’t involved and help them feel accepted into your group, especially if they are people you do not generally talk to in class.
3. *Be involved yourself*
What you think is often what you never say because you feel others will “shame you out”. If we support other’s opinions and challenge opinions carefully people don’t get hurt.
4. *Good groups and individuals co-operate*
Identify your challenges and set goals either in debate or discussion and sort out a plan of attack. A group’s decision may not always be what you agree with. Good team members are people who can accept team decisions. (Think of some of the rules your parents set you – you may not agree with these). Distribute the tasks so time is maximised and everyone feels involved.

Some groups argue, some debate and others discuss. Arguing can slow things and harm others. Debating and discussion provides many opinions and solutions to challenges.

The most important component of all these is **CO-OPERATION**.

Resource 18

Group Work – What Works

Social Skills Score Card

Level 1

Student's Name:

Date:

	Listening	Taking turns	Eye contact	On task	Responsible behaviour	Resolving conflict	Accepting others' differences	Being trustworthy
Student								
Peer								
Teacher								

Social Skills Score Card

Level 2

Student's Name:

Date:

	Active Listening	Asking questions	Clarifying	Constructive criticism	Helping others	Paraphrasing	Accepting others	Summarising
Student								
Peer								
Teacher								

Resource 18

Group Work – What Works

Social Skills Score Card

Level 3

Student's Name:

Date:

	Interviewing	Coaching	Teaching	Negotiating	Brain storming	Resolving conflict	Building on others ideas	Being trustworthy
Student								
Peer								
Teacher								

Social Skills Score Card

Level 4

Student's Name:

Date:

	Creative group problem-solving	Planning and organising	Decision-making	Negotiating curriculum	Research	Resolving conflict	Accepting others differences	Being trustworthy
Student								
Peer								
Teacher								



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