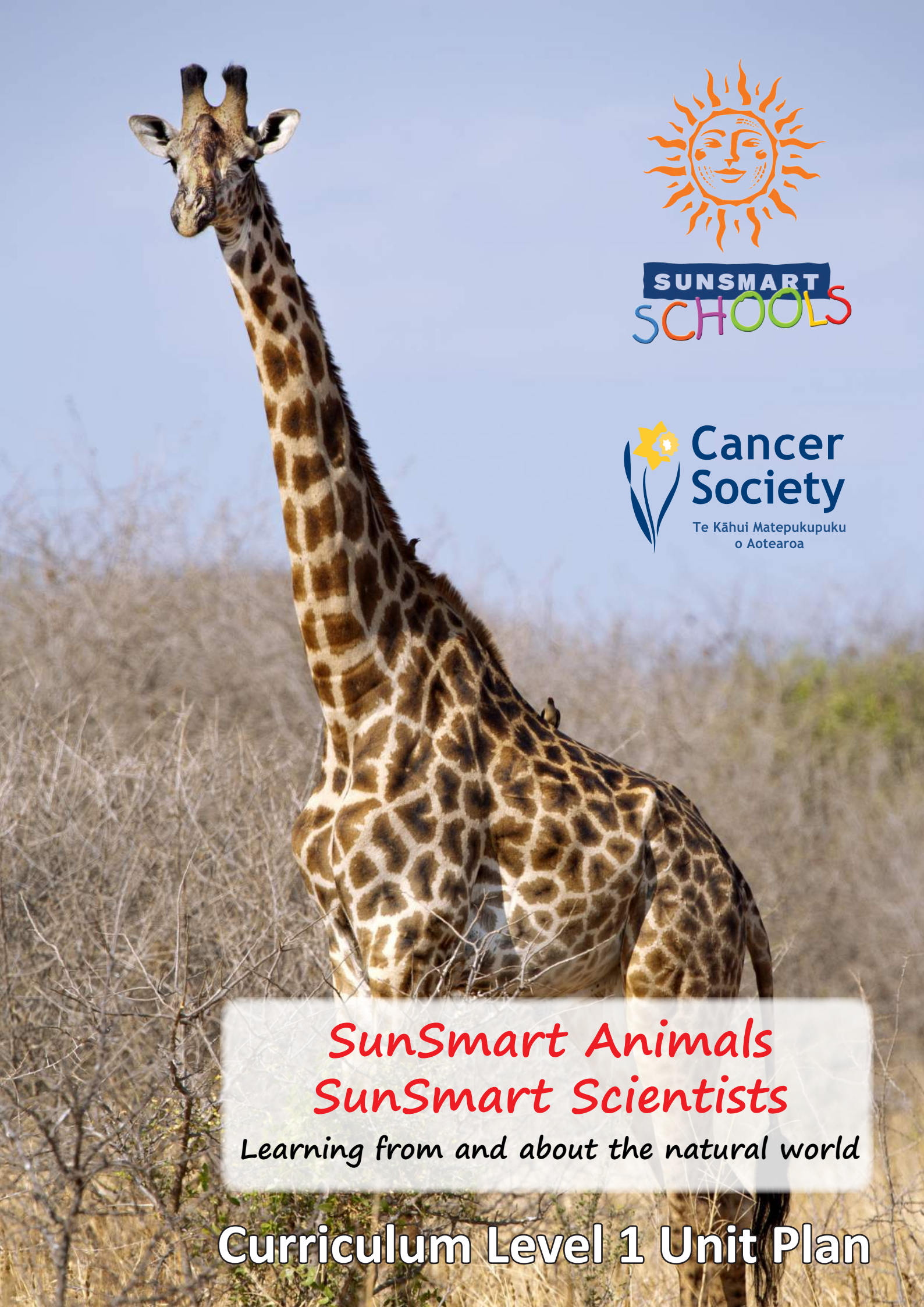


SUNSMART SCHOOLS

Cancer Society
Te Kāhui Matepukupuku o Aotearoa

SunSmart Animals SunSmart Scientists

Learning from and about the natural world

Curriculum Level 1 Unit Plan

Introduction

SunSmart Schools Aotearoa

The SunSmart Schools Accreditation Programme is run by the Cancer Society of New Zealand.

There are both risks and benefits from sun exposure. In New Zealand, the peak summer ultraviolet radiation (UV radiation) levels are 40% higher compared with corresponding latitudes in the northern hemisphere (eg. Southern Europe, mid USA). Excessive exposure to UV radiation from the sun can cause sunburn, skin damage and increase the risk of skin cancer.

Skin cancers are the most common cancers in New Zealand, and there is evidence they are increasing in incidence. From an early age, our children need to have the knowledge and behaviours that will protect them from harmful UV radiation. Students are in school when UV radiation levels are at their peak. Schools are uniquely placed to provide a sun-safe environment, educate students about sun protection behaviour and reduce the risk of skin cancer by becoming SunSmart. Energy from the sun includes heat, light and UV radiation. UV radiation cannot be seen or felt.

The Cancer Society encourages all New Zealanders to be SunSmart and "SLIP, SLOP, SLAP and WRAP".

The Cancer Society SunSmart Schools Programme accredits schools that have developed and implemented a sun protection policy for Terms 1 and 4. The policy must meet minimum criteria that ensure students and teachers are in a sun-safe environment.

The programme includes:

* 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.

Being a SunSmart school shows that your school:

* is committed to protecting students, staff and parents from the risks of UV radiation
* is raising awareness about the importance of sun protection among parents and students
* promotes the school within the community as one that is committed to the health and safety of its students
* has a sun protection policy that follows the Cancer Society minimum criteria
* promotes and supports positive sun protection behaviours such as appropriate hat wearing
* is developing and maintaining a sun-safe environment.

The SunSmart Schools Programme is supported by the findings of the Community Preventive Services Taskforce.[1] The Task Force recommends that primary and intermediate-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.

Sunsmart Schools 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:

a. enhance youth numeracy and literacy development and provide assessment tasks to assess the National Standards
b. embed key science concepts and experiences of the sun, energy and protection
c. support the principles of SunSmart and the New Zealand Curriculum (NZC)
d. use different examples/contexts to ensure appropriateness to different ethnic groups (particularly Māori, Pāsifika and Asian)
e. use Te Reo Māori concepts and language that will be woven into the resource
f. take an inquiry-based learning approach
g. use the SunSmart Schools website http://www.sunsmartschools.org.nz, the Cancer Society of New Zealand website http://www.cancernz.org.nz, the National Institute for Water and Atmospheric Research (NIWA) website http://www.niwa.co.nz and the Health Promotion Agency website http://www.hpa.org.nz/what-we-do/sun-safety

The Cancer Society of New Zealand would like to acknowledge and thank The Trusts Community Foundation and Infinity Foundation Ltd for part-funding the development of these resources.

1 http://www.thecommunityguide.org/cancer/skin/education-policy/primaryandmiddleschools.html

Further information in relation to UV Index Boards, becoming a SunSmart School and a sample SunSmart School policy are at the back of this resource.

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 on the next 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.

On the next page 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

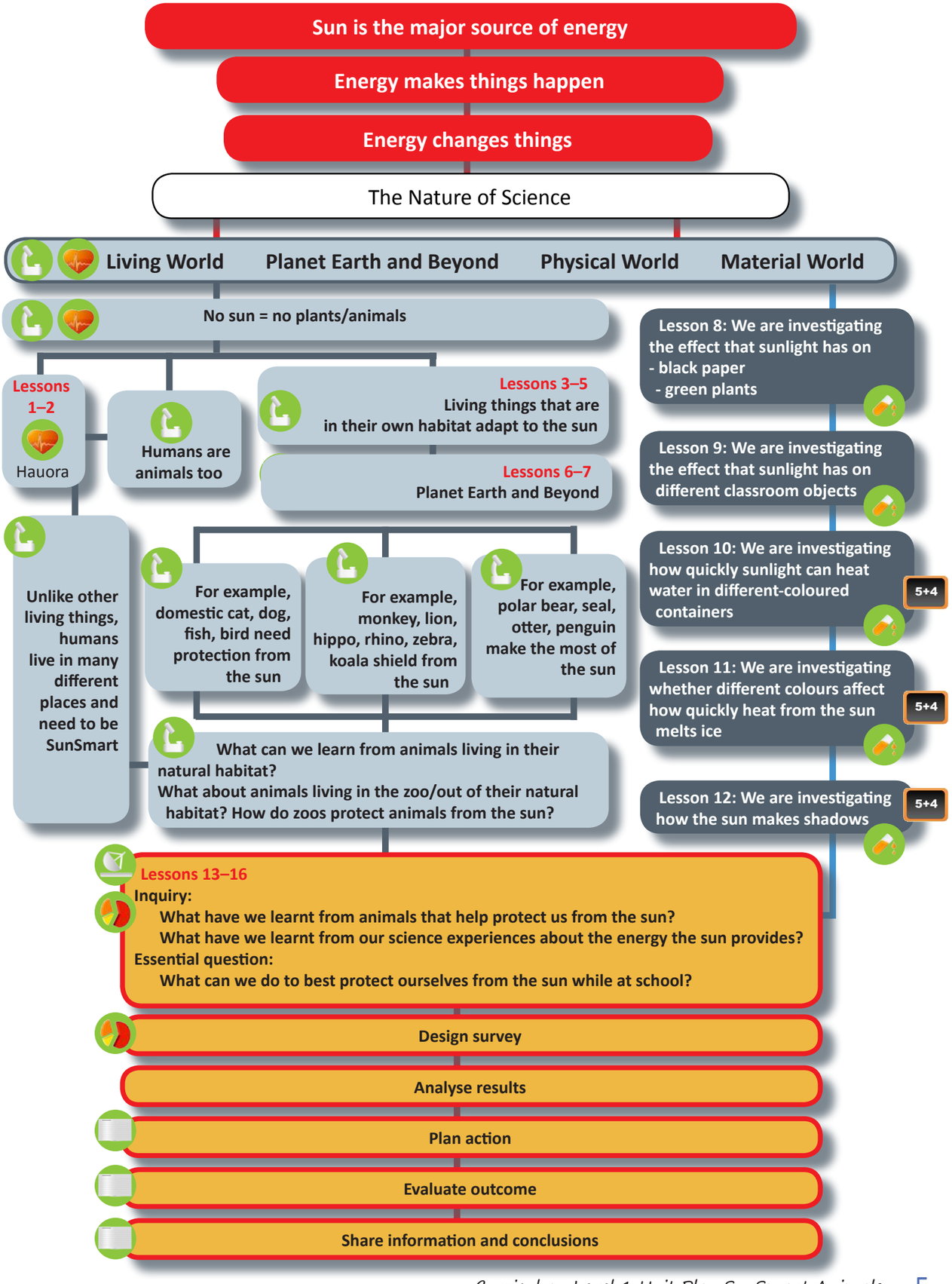
Literacy

Mathematics – Geometry & Measurement

Mathematics – Number & Algebra

Mathematics – Statistics

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



Links to the New Zealand Curriculum

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**	**Personal Health and Physical Development** *Safety management* Describe and use safe practices in a range of contexts and identify people who can help.	• recognise the importance of protecting our bodies (and animals) from the sun • apply sun-protection knowledge.
		Relationships with Other People *Identity, sensitivity and respect* Demonstrate respect through sharing and co-operation in groups. *Interpersonal skills* Express their ideas, needs, wants and feelings clearly and listen to those of other people.	• 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.
		Healthy Communities and Environments *Community resources* Identify and discuss obvious hazards in their home, school, and local environment and adopt simple safety practices.	• 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.

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.
	Ecology Recognise that living things are suited to their particular habitat.
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**	**Listening, Reading and Viewing** *Processes and strategies* Acquire and begin to use sources of information, processes, and strategies to identify, form, and express ideas. • 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-phonic 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.	• 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.
		Speaking, Writing, and Presenting Acquire and begin to use sources of information, processes, and strategies to identify, form, and express ideas. • has an awareness of the connection between oral, written and visual language when creating text • creates texts by using meaning, structure, visual and graph-phonic 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.	• 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.	• group and count animals according to variety of criteria.
	Geometry and Measurement	**Measurement** Order and compare objects or events by temperature.	• measure the temperature in a variety of locations and identify the highest and lowest temperature.
	Statistics	**Statistical Investigation** Conduct investigations using the statistical inquiry cycle: • posing and answering questions • gathering, sorting and counting, and displaying category data • discussing the results.	• pose and answer questions • gather, sort, count and display category data • 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).	• 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 (*Te Aho Arataki Marau mō te Ako i Te Reo Māori* 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
http://www.hereoora.tki.org.nz/Unit-plans/Unit-1-Ko-au/Assessment-Opportunities
http://www.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: • Confident • Connected • Actively involved • Lifelong learners.	Beliefs about what is important: • High expectations • Treaty of Waitangi • Cultural diversity • Inclusion • Learning to learn • Community engagement • Coherence • Future focus.	Expressed in thought and actions: • Excellence • Innovation, inquiry and curiosity • Diversity • Equity • Community and participation • Ecological sustainability • Integrity.	Which of the key competencies (NZC pp. 12–13)? • Thinking • Using language, symbols and texts • Managing self • Relating to others • Participating and contributing.	Aspects of effective pedagogy (NZC pp. 34–36) are highlighted in the activity: • 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.

National Standards Assessment

The New Zealand Curriculum Reading and Writing Standard for Years 1–8

The reading standard – After two years at school, students will read, respond to, and think critically about fiction and non-fiction texts at the Turquoise level of Ready to Read (the core instructional series that supports reading in the New Zealand Curriculum).

The New Zealand Curriculum Reading and Writing Standards for Years 1–8

The Writing Standard – After two years at school, students will create texts in order to meet the writing demands of the New Zealand Curriculum at Level 1. Students will use their writing to think about, record, and communicate experiences, ideas, and information to meet specific learning purposes across the curriculum.

The New Zealand Curriculum Mathematics Standard for Years 1–8

The Mathematics Standard – Statistics

In contexts that require them to solve problems or model situations, students will be able to:

- investigate questions by using the statistical enquiry cycle (with support), gathering, displaying, and/or identifying similarities and differences in category data
- describe the likelihoods of outcomes for a simple situation involving chance, using everyday language.

National Standards Assessment Tasks

Tasks to assess the **Reading Standard** – refer to Lessons 1 to 16.

Tasks to assess the **Writing Standard** – refer to Lessons 14 to 16.

Tasks to assess the **Mathematics Standard** – refer to Lessons 8 to 12.

Planned Assessments

Assessments should include both formative and summative, and any suggestions made in this unit need to be cognisant of student needs and abilities. Within the inquiry model, assessment should be ongoing reflecting understanding at key points along the way.

Spotlight On

Inquiry-based learning, e-learning

Inquiry learning – developing rubrics http://www.galileo.org/research/publications/rubric.pdf

Useful inquiry templates including assessment ideas http://centre4.interact.ac.nz/modules/folder/folder.php?space_key=368&module_key=28260&link_key=28136&group_key=0

Links and Resources

If your firewall does not allow you to open a hyperlink, go to YouTube and type in the **name** of the resource. This should provide you with access to the resource.

TKI

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

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

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 and Curriculum Levels 3–4. 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.

Science concepts

http://www.sciencelearn.org.nz/Contexts/You-Me-and-UV/NZ-Research/You-Me-and-UV

http://kidshealth.org/kid/watch/out/summer_safety.html

Digistore

http://digistore.tki.org.nz/ec/search?topic=Column+graphs

Cancer Society

http://www.sunsmartschools.org.nz

http://www.cancernz.org.nz/reducing-your-cancer-risk/sunsmart/

WHO programme http://www.who.int/uv/publications/en/primaryteach.pdf

The WHO INTERSun programme http://www.who.int/uv/intersunprogramme/activities/en/

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

Sunscreen questions and answers http://www.cancernz.org.nz/assets/files/info/SunSmart/Sunscreen%20QA%27s_14Feb2012%283%29.pdf

Songs and waiata

"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)

Online 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

Links

http://www.youtube.com/watch?v=3_V8lT67K20

http://www.youtube.com/watch?v=Zc2wE5dVx3Y

http://www.youtube.com/watch?v=KdsciC4y7Nk

http://www.youtube.com/watch?feature=endscreen&NR=1&v=QaTcqqAwzmU

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

http://www.youtube.com/watch?v=v7m0NiLzZTA

Useful links

http://www.sciencelearn.org.nz/Contexts/You-Me-and-UV/Sci-Media/Video/Why-are-UV-levels-high-in-New-Zealand-summer

http://www.sciencelearn.org/Contexts/You-Me-and-UV/Sci-Media/Video/UV-Index-time-lapse-map-for-New-Zealand

http://www.sciencelearn.org.nz/Contexts/You-Me-and-UV/Sci-Media/Video/UV-Index-time-lapse-map-for-New-Zealand

http://www.niwa.co.nz/UV-forecasts

http://www.sunsmartschools.co.nz/teachers/video/results

http://tinyurl.com/Sunbeds-Sunlamps

http://tinyurl.com/ISEyeProtection

http://tinyurl.com/HatProtection

http://tinyurl.com/IS-Sunscreen

http://tinyurl.com/BuiltShade

http://tinyurl.com/IS-ProtectiveClothing

http://www.cancernz.org.nz/reducing-your-cancer-risk/sunsmart/the-ultraviolet-index/example-of-daily-uvr-levels-over-a-summers-day/

http://www.cancernz.org.nz/reducing-your-cancer-risk/sunsmart/the-ultraviolet-index/the-ultraviolet-index/

http://tinyurl.com/VitaminDConsensus

http://tinyurl.com/SunExposureInPregnancy

http://tinyurl.com/IS-VitaminD

http://tinyurl.com/VitaminDQ-A

http://www.sunsmartschools.co.nz/schools/hats

http://www.sunsmartschools.co.nz/info/uv

http://www.sunsmart.com.au/skin-cancer/solariums

http://www.sunsmart.com.au/tools/videos/current-tv-campaigns/dark-side-of-tanning.html

http://www.youtube.com/watch?v=ASO9FM6gDLs&feature=related

Note with the last YouTube link: Skin cancer is New Zealand's most common cancer, but on the video it says second most common as it is a Canadian video. Our messaging is be SunSmart from September to April especially between 10am and 4pm. You can get sunburnt on cool and/or cloudy days.

Real stories

http://www.cancer.org.au/preventing-cancer/sun-protection/sunsmart-schools/real-stories-secondary-school-resource.html

Dear 16 year old me http://www.youtube.com/watch?v=_4jgUcxMezM

The dark side of tanning http://www.youtube.com/watch?v=58dCTnIN40w

It's a beautiful day for cancer http://www.youtube.com/watch?v=y95qkDC-z-o

Leatha face http://www.youtube.com/watch?v=UeUtBeZEDAk

Dangers of a deadly tan http://www.youtube.com/watch?v=HTHcNj4KRa8&feature=youtu.be

For shade please use

http://www.sunsmartschools.co.nz/Guidelines_Under_Cover.pdf

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

Lessons 1–2: Introduction and hauora concept

Overview: Today we are learning about the concept of hauora.

Assessment Opportunities	Structure	Curriculum and Resource Links
We are successful when we can: • identify the things that keep us happy and healthy – physical (taha tinana), mental/emotional (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. Evidence: Teach and assess social and interpersonal skills. Ideas for teachers re ongoing assessment.	**Prepare:** Resources http://www.youtube.com/watch?v=2bwqTDuyv7Y Song 3:08 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? http://www.sunsmartschools.co.nz/teachers/video/results Teacher draws up grid on the board. Has copies of large happy and sad faces with Blu Tack on the back. (Resource 1a) 1. taha tinana 2. taha hinengaro 3. taha whānau 4. taha wairua Teacher could place students in groups with each group having a copy of the table and the faces so that they can place them. **Connect:** • Introduce the concept of hauora using the diagram in 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/emotional (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/emotional (taha hinengaro), social (taha whānau) and spiritual (taha wairua)?	**Pedagogical links:** • 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. **Key competencies:** • Thinking • Using language, symbols and texts • Managing self • Relating to others • Participating and contributing. **Literacy:** • English and Te Reo vocabulary building.

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 	2. taha hinengaro
3. taha whānau	4. 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 to the mental/emotional (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) that 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.

Consolidate:

- 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.

Happy and healthy

Key vocabulary:

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

1. taha tinana	2. taha hinengaro
3. taha whānau	4. taha wairua

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.

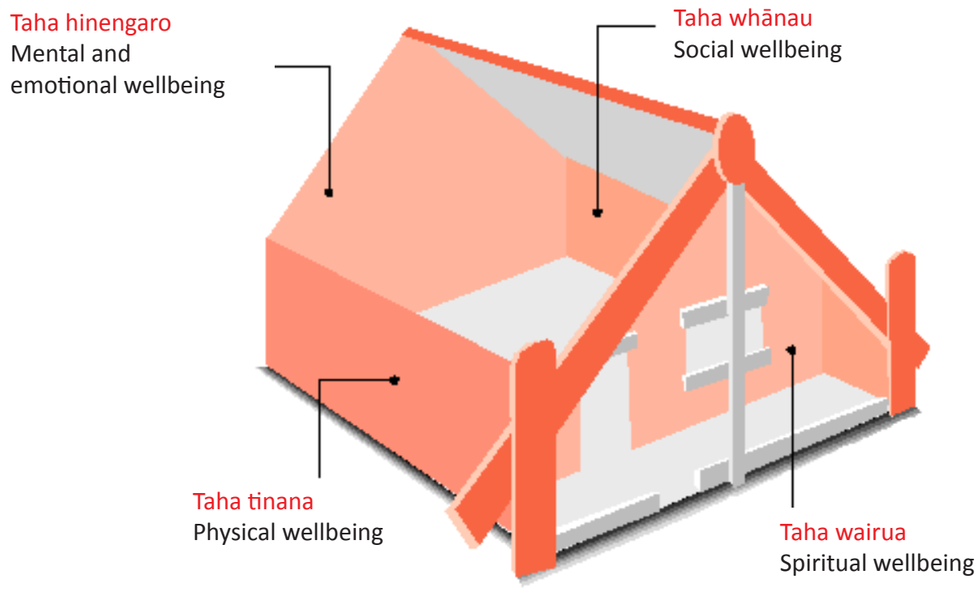
Taha whānau – social wellbeing

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.



Dr Mason Durie's Te Whare Tapa Whā model compares hauora with 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.)

Part One – Living World – Finding out about SunSmart animals

Living things that are in their own habitats have adaptations that shield them from the sun, or they may have adaptations that help them to make the most of the sun. Camels/polar bears, for example, have adaptations. 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.

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
We are successful when we can: • 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.	**Prepare:** Read Teacher's Notes. **Connect:** Teacher writes the words – polar bear, seal, rhinoceros, hippopotamus, lion, camel and elephant on the board. • Tell students that the words are for the names of animals. • In pairs, students are asked to find the picture of the animal (Resource 2) for each of the words on the board. (This gives the teacher a good idea about students' 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 (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.	**Pedagogical links:** • 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 Pāsifika students and their communities **Key competencies:** • Thinking • Using language, symbols and texts • Managing self • Relating to others • Participating and contributing **Literacy:** • English and Te Reo vocabulary building • Can identify animals visually, orally and in writing and is able to connect these **Numeracy:** • Grouping animals according to a variety of criteria

Structure

In groups/pairs, the students match the word with the picture of the animal, using Resource 3a (answers Resource 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 does a rhinoceros, hippopotamus, camel and elephant keep cool and protect themselves from the sun? (See Resource 4 for teacher background info.)

Demonstrate:

Teacher gives each student/group a copy of Resource 5.

On the pictures of the rhinoceros, hippopotamus, camel and elephant, 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 does a rhinoceros, hippopotamus, camel or elephant 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 a rhinoceros, hippopotamus, camel or elephant does 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 their names 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 a rhinoceros, hippopotamus or elephant protects their skin from the sun.

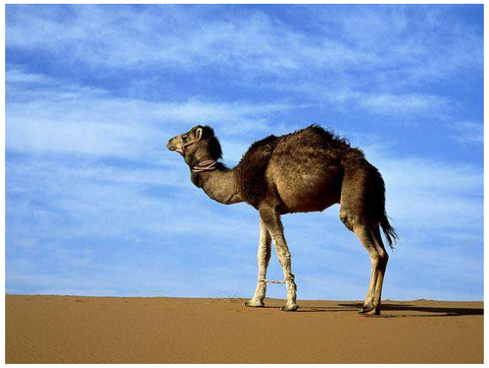
Online animal identification games to learn new vocabulary.

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

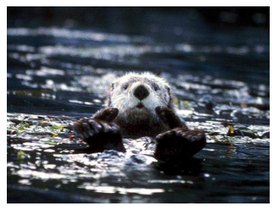
Zebra











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

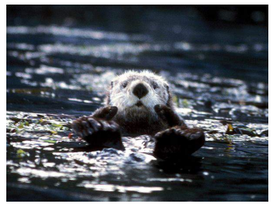
Elephant

Hippopotamus

Koala

Lion

Monkey



Otter

Penguin

Polar bear

Rhinoceros

Seal

Sheep

Tuatara

Zebra

Key vocabulary: coat, white, black, shade, water, protect, skin, sunscreen

How do animals in cold climates keep warm?

Polar bear

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 – making it easier to soak in the sun's warming rays.

How do animals protect themselves from the sun?

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 2.5–5 years. Their single calf does not live on its own until it is about 3 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 5 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 moistener and sunscreen that may also provide protection against germs.

Camel

The hump stores up to 36 kilograms 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 160 kilometres without water. Camels rarely sweat, even in desert temperatures that reach 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 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.

Lessons 3–5, Resource 4, Teacher's Notes
How do animals...

Elephant

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.

Baby elephants often stand close to their mothers on the shaded side. Their mother's large body provides shade, and this helps their skin from UV radiation and helps to keep them cool.

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

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

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

How do animals keep safe in the sun?

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. Yes, all animals can get sunburnt. Even really dark or hairy ones usually have some sensitive areas like their nose or ear tips that are vulnerable.

Hairless and light-coloured animals are even more at risk.

Shade is really important for animals. Farm animals must be provided with shade, usually trees to shelter from the sun.

Pets, like cats and dogs, can come inside for shelter and should be encouraged to do so during peak sun exposure times.

There are special safe pet sunscreens you can use to help.

Vets can help treat sun-damaged skin if it happens. The earlier caught, the better the treatment.

Dr Alex Melrose
Practice Principal
Vetcare Grey Lynn
New Zealand

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.

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

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.

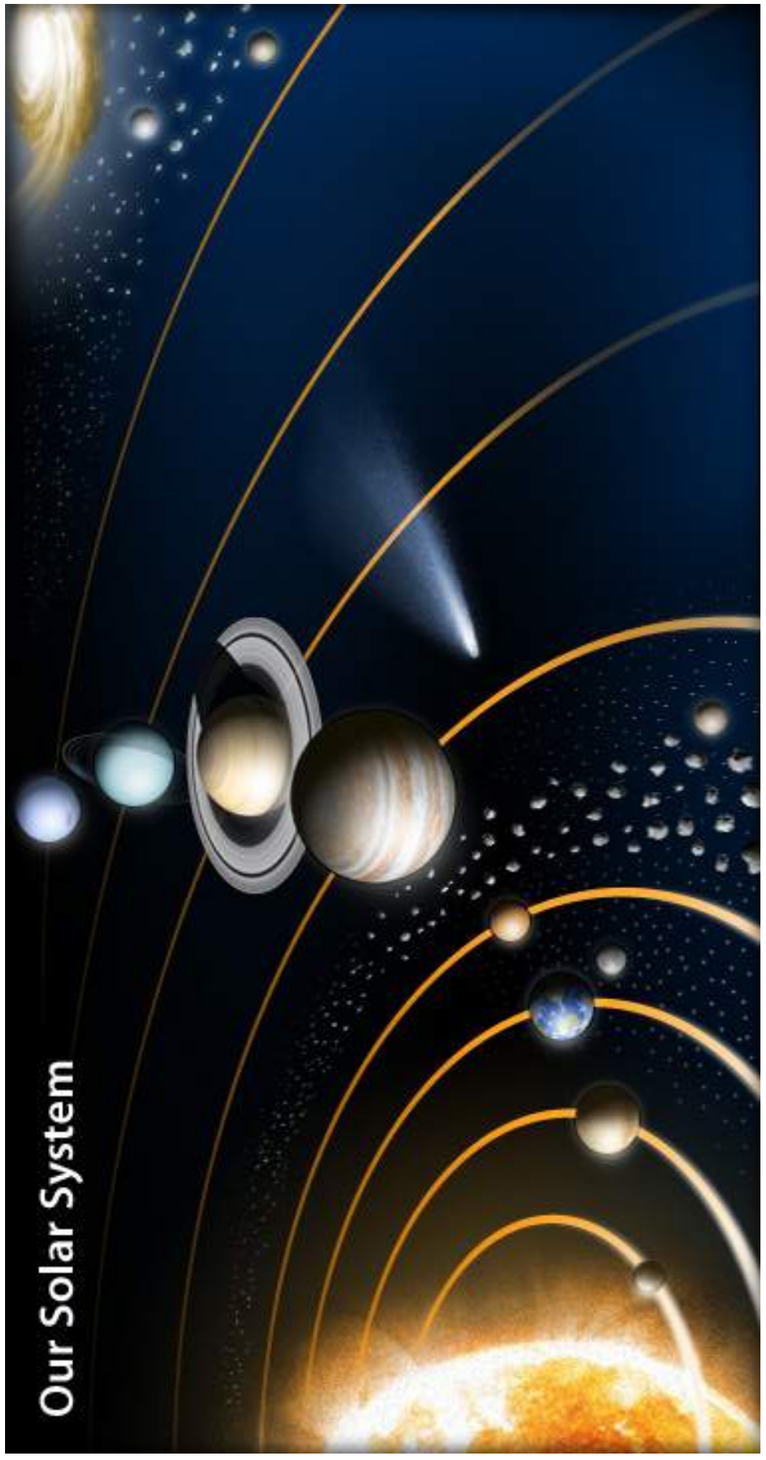
Assessment Opportunities	Structure
Lesson 6: Science experiences **We are successful when we can:** • share our understanding with and gain understanding from others (peers and experts) • use a KWL chart to record what we know, what we want to know and what we have learnt • identify the sun and some 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. Note to teachers: New Zealand SunSmart timing is especially between 10am and 4pm from September to April. This may differ on some international videos.	**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. **Connect and activate:** **Science experience:** By viewing, discussing, gathering information about the sun. **Learning intentions** **We are learning to:** • find out about the sun by sharing what I already know and by listening to experts • understand that the sun is powerful • think about how we must be SunSmart because of the sun's energy. **Connect:** • Use a KWL chart (Resource 7) to identify what we already know about the sun. • Record 4–5 responses. Record 4 things we would like to know. • Use a data projector to show the solar system chart http://solarsystem.nasa.gov/planets/ (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. **Activate:** • 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 glow when they are hot, e.g. stove elements, heaters, flames. **Demonstrate:** • Use the video clip Sun Safe Play Everyday! http://www.youtube.com/watch?v=Zc2wE5dVx3Y to confirm and add to students' current knowledge. (This clip uses a song about being SunSmart as well as building factual knowledge about the sun and is tailored for use with young students.) • Point out how the title refers to every day. Alert students that whenever the earth is facing the sun, the sun's energy is acting on the earth. • After viewing the clip, allow students time to share what they have found out and ask students what new things they have found out about the sun. Record any new questions they might have about the sun on the KWL chart in a different colour. • View I Love Charts http://www.youtube.com/watch?v=V87I10yMIb4 • Look at the solar system chart again and talk about how useful charts are to record and present information (language signs, symbols, text). **Consolidate:** • Help students record the statements or questions they have about the sun on the two sun ray graphics (Resources 9a and 9b).

KWL chart

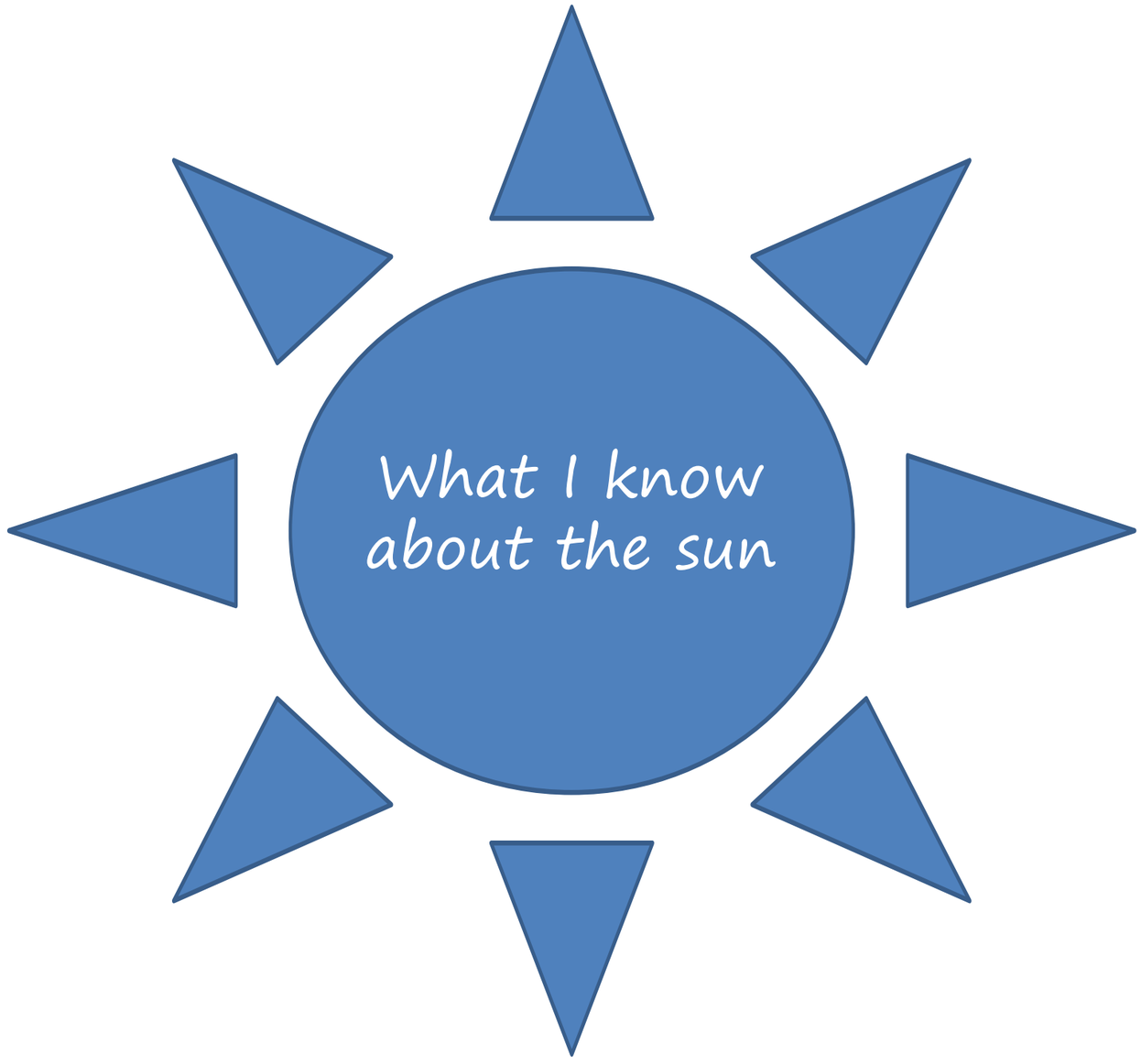
What I know, what I want to know, what I have learned

The sun		
K	W	L

Our solar system



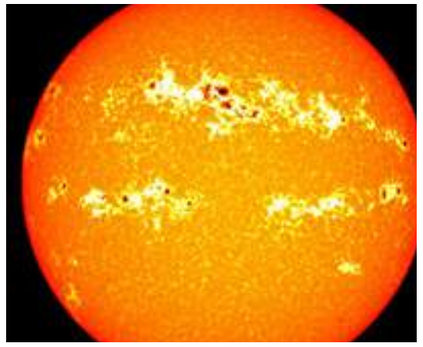
What I know about the sun

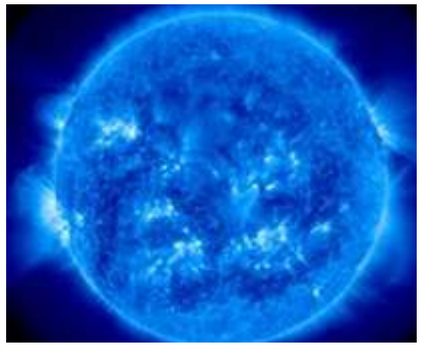


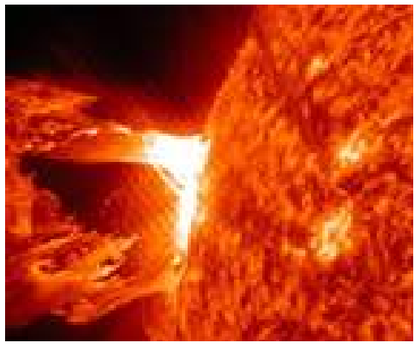
Our questions about the sun

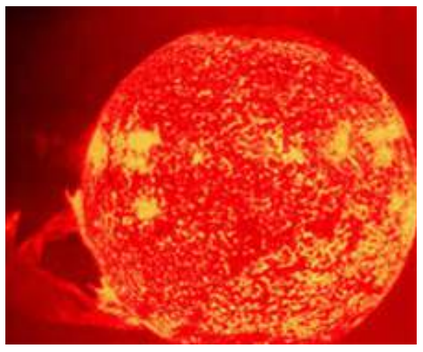
Assessment Opportunities	Structure
Lesson 7 **We are successful when we can:** • share and think about what we already know about the sun • use information from charts and videos to understand how powerful the sun is • explain that the sun (energy) makes things happen/changes things e.g. burns/fades/heats objects • use what we know to make SunSmart choices.	**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. **Learning intentions** **We are learning to:** • 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. **Prepare:** Preview this NASA clip of the sun https://www.youtube.com/watch?v=bM7bcSD4K8o&feature=youtube_gdata 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. **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 beauty. And life." **Activate:** • View Surface of the Sun As You've Never Seen It https://www.youtube.com/watch?v=bM7bcSD4K8o&feature=youtube_gdata • Ask students what they noticed and what words they would 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? **Demonstrate:** • 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.

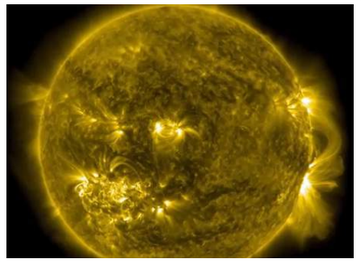
Selection of sun Images – NASA











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).

Assessment Opportunities	Overview Lessons 8–12

Lessons 8–12
We are successful when we can:
• 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.
	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 Living World.
	Lessons:
	• We are investigating the effect that sunlight has on:
	  • 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 different amounts of sunlight have on black paper

Part B

We are investigating the effect different amounts of sunlight have on 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.

Structure

Lesson 8: Part A

Prepare:

- Cut three strips of black paper 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 the 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 the classroom window ensuring the side with the 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 2 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 2 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.

Sunlight record sheet

Investigating the effect of sunlight on paper

Our predictions Start date	Our observations End date

Structure

Lesson 8, Part B

Prepare: Get three indoor plants of same type and size (e.g. lemon balm/mint)

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 the opportunity to identify plant parts. What is under the soil? (Roots, etc.) (Complete Resource 12.)
- Take a photo 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 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 2–3 days for 2 weeks and make a wall display of the picture diary. Students record progress of plant growth under photos.
- At the end of 2 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. It can damage our skin so we need to be SunSmart when we are in the sun.

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:..........

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 9

Assessment Opportunities

Lesson 9

We are successful when we can:

- 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.

Structure

Lesson 9

We are investigating the effect that sunlight has on different classroom objects.

Learning intentions

We are learning to:

- work scientifically by sharing and testing ideas
- collect data using our sense of touch
- use data to make explanations.

Prepare:

- Collect a variety of objects from the classroom that are made from different materials and are different colours, e.g. school bag, shoes, t-shirts, wooden and plastic items, books of different colours, a glass jar.
- Separate objects into two groups and take a photo of each group making sure there is space between each item. Make enough photocopies showing this so that each group has one of the photos to record their group predictions.
- Organise students into working groups.

Procedure:

- View Sid the Science Kid: Super Sun http://www.youtube.com/watch?v=0x7DKgBl1Cc

Connect:

- Ask students what forms of energy the sun sends to earth (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?
- Ask students: This video mentions the sun is so powerful you should put your sunscreen on. What else can you do to be SunSmart?

Demonstrate:

- 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 1 hour.
- Give each group a list 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 a lot, green for a little, blue for no change.

Consolidate:

- 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

Lesson 10

We are successful when we can:

- 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.

Overview

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. In the first part of the lesson, they will be building their investigation skills ready to use in the second part.

Part A

Learning intentions

We are learning to:

- 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 warm 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 group. 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 recording 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.
- Expect students to try holding thermometer in their hand etc. – it's all learning and exploration.
- Ask students if they are now confident about using the thermometer

Structure

Part B

Learning intentions

We are learning to:

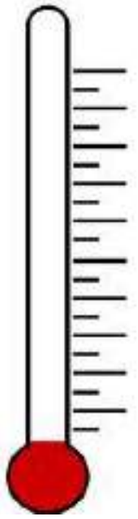
- use words and numbers to describe change
- use a watch/timer
- record results
- decide if data shows that the sunlight changes the water.

Prepare:

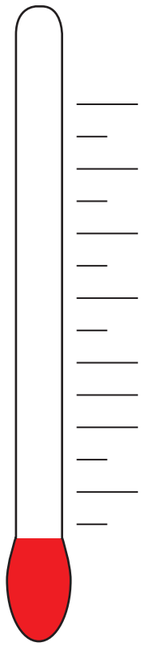
For each group: four empty aluminium cans; four rubber bands; four sheets of paper (one white, one black, plus two from a selection of colours, cut to size so can is able to be wrapped in paper and secured by rubber bands); thermometer; jug of water; towels for spills; recording sheet for each student (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 can 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 heat up the most and why.
- Record each group's suggestion.
- At the 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.

Cold water 	Describing words Cold Warm Freezing Icy Hot Chilly	Thermometer 
Hot water 	Describing words Cold Warm Freezing Icy Hot Chilly	Thermometer 

Our Can: .....



Assessment Opportunities	Structure
Lesson 11 **We are successful when we can:** • 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.	**Lesson 11** We are investigating whether different colours affect how quickly heat from the sun melts ice. 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. As students will be outside during this exploration, they need to wear their sunhats. Link this to what they have been learning. **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.** **Learning intention** **We are learning to:** • predict what will happen and give a reason. **Prepare:** For each group: • 4 ice cubes • 4 small ziplock bags • 4 coloured sheets of paper (1 black, 1 white, 2 other colours) **Procedure:** (On a sunny day) • 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 saying 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, Parts A, B, C and D

Assessment Opportunities	Overview Lesson 12, Parts A, B, C and D
Lesson 12 **We are successful when we can:** • 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.	**Lesson 12** We are investigating the link between the sun and shadows. This investigation needs to be carried out over several days. **Learning intentions** **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 • 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.

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.

Procedure:

- 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'.
- Before and after drawings: leave room next to the first drawing to place second drawing, which will be completed at the end of the investigations.

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

Lesson 12, Part B

Structure

Part B
(Beginning of a sunny 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:

- Sunhats
- Chalk – several different colours
- Camera

Procedure:

- 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 are 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, sunglasses, 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.

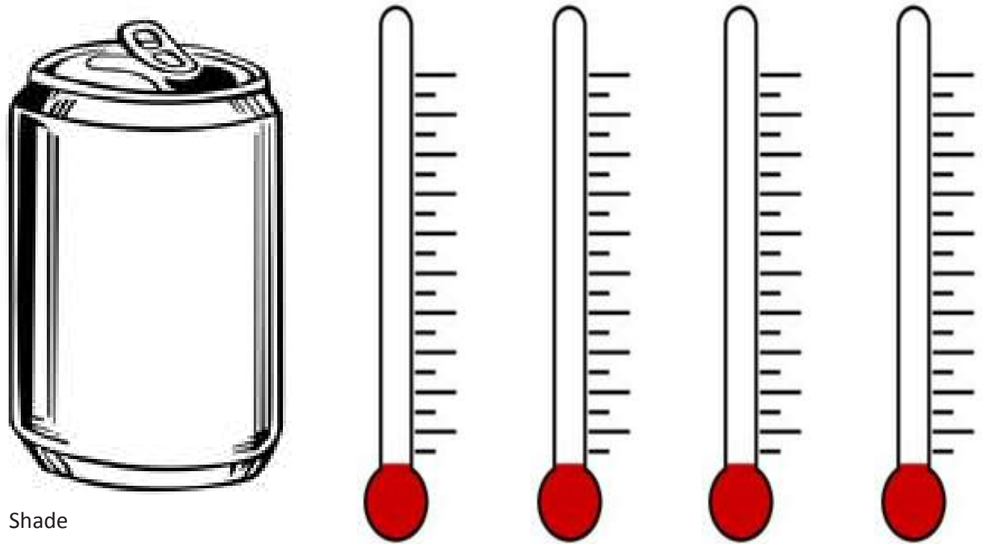
Prepare:

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

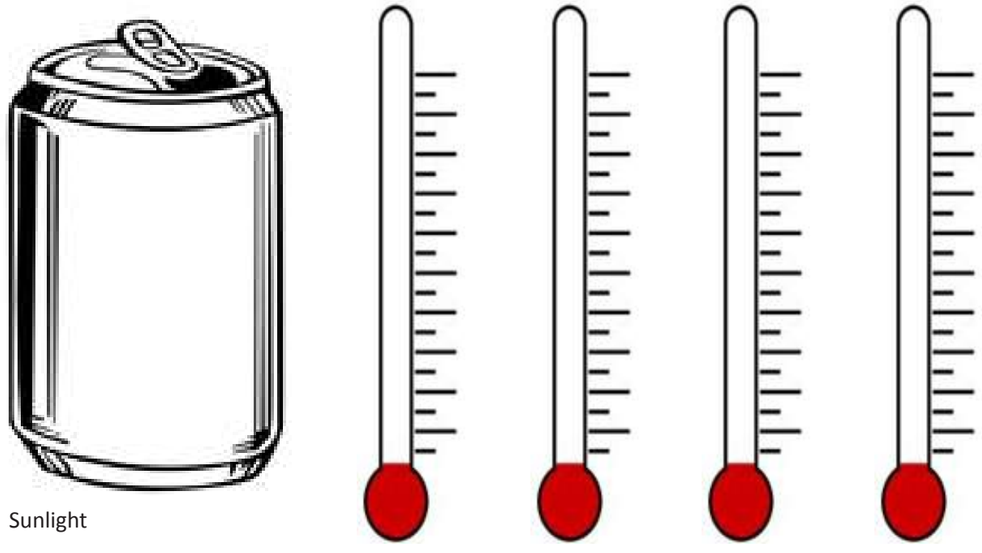
Procedure:

- To further reinforce the effect of blocking the sun, have each group place two aluminium cans that are covered in black paper and filled with the 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.

Lesson 12, Part D, Resource 15
Observation chart



Shade



Sunlight

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?

Assessment Opportunities	Structure	Curriculum and Resource Links
We are learning to: • 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.	**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. **Activate**: Show Resource 16. Survey class and count up responses and choose the most popular. **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 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.	**Pedagogical links:** • 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 **Key competencies:** • Thinking • Using language, symbols and texts • Managing self • Relating to others • Participating and contributing **Literacy:** • English and Te Reo vocabulary building • Oral and visual cues to inform thinking • Sharing ideas and preferences **Numeracy:** • Statistics

Structure
• Which option has the most ticks from students in the class? • Teacher takes a photograph of the final tally chart as a record. **Big question: What type of sun protection would ensure our whole body is protected from the sun?** **Shade is the best 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.

Slip, Slop, Slap, Wrap

Ways we can protect ourselves from the sun.

SLIP into some sun-protective clothing – a shirt with a collar and sleeves – and into some shade

SLOP on some sunscreen – broad-spectrum of at least SPF 30

SLAP on a broad-brimmed or bucket hat or a cap with flaps

WRAP on a pair of sunglasses – make sure they meet the Australian/New Zealand standard

Lesson 14

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

Assessment Opportunities	Structure	Curriculum and Resource Links
We know we are successful when we can: • 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 sun-safe school environment that can be enjoyed by all • measure how many students in our class like our sun-safe idea.	**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 for our students. Inquiry: What can we do to make our school a place where there is plenty of shade to protect us? **Activate:** Resource 17 • 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. • Students predict where the shady places are in their school by colouring them in on their map. • 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. • 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.) Show students examples from http://www.sunsmartschools.co.nz/schools/shade/structures) • Help students complete Resource 17.	**Pedagogical links:** • 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 **Key competencies:** • Thinking • Using language, symbols and texts • Managing self • Relating to others • Participating and contributing **Literacy:** • 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. **Numeracy:** • Concept of a timeline • Measurement • Statistical investigation

Slip ~ Shade in our school

1. Draw a map of your school with your teacher.
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 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?
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 it 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 meet?
16. What are possible solutions to the problems?
17. How long do you think it will take?

Consolidation Lesson 15

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

Overview: *Today we are evaluating our SunSmart actions in our school.*

Assessment Opportunities	Structure	Curriculum and Resource Links
We know we are successful when we can: • 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 sun-safe 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 sun-safe practices • identify our next steps.	**Prepare:** • Photographic display from Lesson 14. • PowerPoint of photographs from display (teacher to make). **Connect:** • Remind students about the inquiry. "What can we do to make our school a SunSmart place?" • Can we make it more sun-safe? **Activate:** • 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.	**Pedagogical links:** • 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 **Key competencies:** • Thinking • Using language, symbols • and texts • Managing self • Relating to others • Participating and contributing **Literacy:** • 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 **Numeracy:** • Concept of a timeline, statistical investigation

Lesson 15

Structure

Demonstrate:

- 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.
- Teacher draws the following on the whiteboard (SEE) as prompt for students and goes over it with them.

S State what your main question is. How we can make our school a healthy place?
What is the action the class chose?

E Explain the steps, challenges and how you overcame them
(arrow to the timeline on the board to remind them).

E Examples of what you have learnt as a result:

1.

2.

3.

- What you will do next and how you could encourage them to wear your hat. (3–5 mins.)
- In pairs, prepare presentation of report as detailed above. Those capable can write their ideas next to the SEE prompts.
- 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. When ready, teacher should video the individual students presenting their report as it can be used as evidence for National Standards.
- Teacher may suggest that some deliver their report in pairs, sharing the delivery.

Consolidation:

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? School newsletter, PowerPoint of photos and commentary for board of trustees, parents, peers, assembly, local paper etc. or play/song/cartoon.

Lesson 16

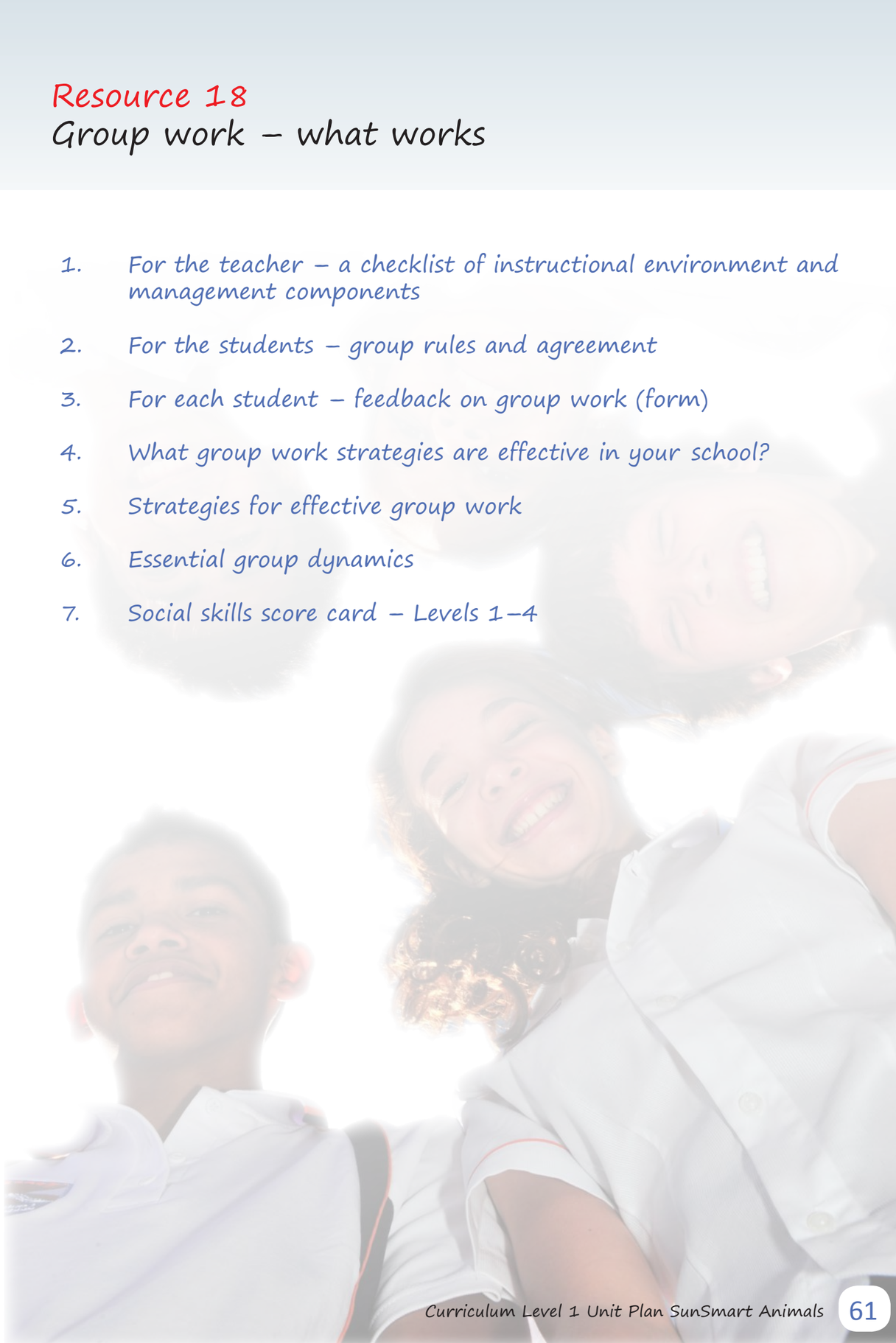
Lesson 16
Sharing our information/conclusions

Overview: Today we are sharing our findings with our community.

Assessment Opportunities	Structure	Curriculum and Resource Links
We know we are successful when we can: • 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 sun-safe practices • evaluate the impact that our presentation has had on others.	**Connect:** • Before the presentation, ensure the students have had adequate time to practise. Reassure them that the timeline and prompts will be on display and visible to help them if they forget. • Go over the PowerPoint, time-line and prompts with them. **Activate:** • Allow students the opportunity to practise in the venue where they will be delivering their presentation. **Demonstrate:** • Teacher introduces and students present individually or in pairs to: the board of trustees, staff, senior management, whole school at assembly, parents at parent teacher interviews/conferencing etc. **Consolidation:** • Reflect on what went well for us, what we could improve, what we have learnt as a result. • Again, teacher should video performances as evidence for National Standards.	**Pedagogical Links:** • 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 **Key competencies:** • Thinking • Using language, symbols and texts • Managing self • Relating to others • Participating and contributing **Literacy:** • 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

1. 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 their 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.

2. 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 you 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 their 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

3. Feedback on group work

Beside 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 'sank'		We worked together to ensure that we 'swam' rather than 'sank'	
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	

4. 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 outcast; 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

5. Strategies for effective group work

1. **Group size**
   Maximum 5 (3 or 4 ideal).

2. **State objectives and set goals**
   For example, give each group 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 6. Essential group dynamics).

4. **Resources**
   Ensure you have enough resources for each group.

5. **Identify roles**
   Design some role-play cards that 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.

6. Essential group dynamics

Below is a list of essential elements important to establishing a co-operative group. These will be important when working together in groups or as a class.

1. ### Good leaders and followers
These people can make decisions, keep things moving and 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

7. 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								

Social skills score card
Level 3

Student's name:
Date:

	Interviewing	Coaching	Teaching	Negotiating	Brainstorming	Resolving conflict	Building on others' ideas	Being trustworthy
Student								
Peer								
Teacher								

Social skills score card
Level 4

Student's name:
Date:

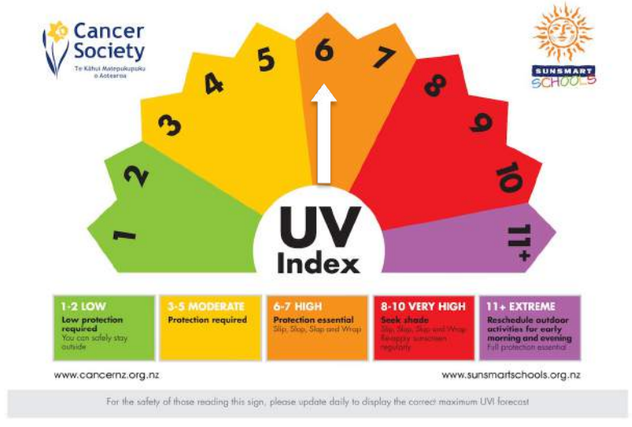
	Creative group problem-solving	Planning and organising	Decision-making	Negotiating curriculum	Research	Resolving conflict	Accepting others' differences	Being trustworthy
Student								
Peer								
Teacher								

How to monitor the UV Index Board

The UV Index (UVI) Board is a great tool students can use to monitor UV radiation levels for your area.

How to use:

1. Go to http://www.niwa.co.nz/UV-forecasts
2. Click on the nearest town/city to your school
3. Once you have clicked on the town, information will be displayed that will show:
   - the date today
   - the maximum (clearsky) UVI forecast for the day
   - the location
4. Measure across from the top of the bell-shaped curve to the UVI number on the left side of the graph. This number is the maximum UVI for the day.
5. Move the arrow on your board to display the maximum UVI for the day



For more information on sun protection in schools, visit the SunSmart Schools website http://www.sunsmartschools.co.nz/

Tips and Ideas

Update the UV Index Board every morning to display the correct daily maximum UV forecast.	**Include the daily UV Index in other school activities**, e.g. at school, assembly, on school radio, on PC's, in school newsletters, etc.
Think about the best place to display the sign. As many students as possible need to see the sign. It's also useful to place it somewhere that parents and visitors can see it. This will help reinforce what is being taught at school.	**Students could think up other visual ways of displaying the UV Index level.** Each level could have a different brightness of sun, or pictures of trees, hats, etc. could be put up on a board to show what type of protection is needed when the day has a higher level of UV radiation.
Mapping the UV Index for the year according to month is a great idea to get the students to monitor and to see the pattern that the UV Index can take. This could be used for further discussion.	**Seeing the UV Index each day**, even when it is cloudy, helps students to understand why they need to protect themselves not just from bright sun but also from UV radiation between September and April.
Update the board every day throughout the school year, not just in the summer months. This will help students to understand the reasons why wearing hats and other SunSmart behaviours are required during Terms 1 and 4 (as New Zealand has a very high UV Index during these terms).	

For more information on sun protection in schools, visit the SunSmart Schools website http://www.sunsmartschools.co.nz/

First, have a commitment to improving sun safety in your school community.

Complete the online SunSmart Schools Accreditation Application to see how well your school is doing at meeting the Cancer Society's minimum criteria for accreditation. You will need your school's MoE number:
http://database.sunsmartschools.co.nz
Review your school sun protection policy. A sample policy is provided here: http://www.sunsmartschools.co.nz/schools/accreditation/become-a-sunsmart-school
Submit your sun protection policy online
OR
download the printable application form http://www.sunsmartschools.co.nz/schools/accreditation/become-a-sunsmart-school
Attach your current sun protection policy.
Send the application form and your policy to your local division of the Cancer Society by email or post.

After you have applied for accreditation your local Cancer Society health promoter will contact you. They will advise you if there are areas to be included/amended in your policy to meet the minimum criteria for accreditation. Once you have made any necessary changes, your policy can be resubmitted online.
Once you have become accredited, you will receive a SunSmart Schools Accreditation Certificate, a sign for your school building or gate and a media release for your local newspaper.

Minimum criteria for SunSmart schools accreditation

The sun protection policy is implemented during Terms 1 and 4, when ultraviolet radiation levels are most intense.
All staff, students and parents/caregivers are to be informed of the sun protection policy and its intended practices.
All students wear broad-brimmed (minimum 7.5cm brim), legionnaire or bucket hats (minimum 6cm brim, deep crown) when outside.
See: http://www.sunsmartschools.co.nz/schools/hats.
Students not wearing a hat are required to play in allocated shade areas.
The use of broad-spectrum sunscreen of at least SPF 30 is encouraged.
The use of sun-protective clothing is encouraged (e.g. shirt with sleeves and a collar).
Staff are encouraged to act as role models by practising SunSmart behaviours.
SunSmart education programmes are included in the curriculum at all levels every year.
The sun protection policy is reflected in the planning of all outdoor events (e.g. camps, excursions, sporting events).
Outdoor activities are rescheduled, whenever possible, to minimise time outdoors between 10am and 4pm.
The school has sufficient shade or is working towards increasing the number of trees and permanent shade structures to provide adequate shade in the school grounds.
You can find some helpful tips and documents here: http://www.sunsmartschools.co.nz/schools/shade

The board of trustees and principal review the sun protection policy regularly, including making suggestions or improvements at least once every 3 years.

Steps to becoming a SunSmart school

SunSmart policy

A comprehensive sun protection policy for schools covers the following four areas:

- Behaviour – reducing exposure to ultraviolet radiation e.g. through use of sunhats, clothing, broad-spectrum sunscreen of at least SPF 30.
- Environment – promoting the provision and use of shade and rescheduling activities.
- Curriculum – educating about sun protection and skin cancer prevention.
- Policy review – undertaking review at least 3 yearly.

A SunSmart policy needs to:

- be developed in consultation with the whole school community of board of trustees, staff, students, parents and caregivers
- outline the way in which the school will protect students and staff from the harmful effects of ultraviolet radiation
- meet the minimum criteria for SunSmart Schools accreditation with regard to behaviour, curriculum, environment and policy review.

To help you develop a comprehensive sun protection policy, a sample policy is available for download here:
http://www.sunsmartschools.co.nz/schools/accreditation/become-a-sunsmart-school

Evaluation of your sun protection policy

The Cancer Society's role is to encourage and assist schools to become sun safe, not to judge or compare progress with other schools.
Your school's application form and sun protection policy will help the Cancer Society assess your school's existing sun protection strategies to assist schools to become accredited.
Not every strategy in the application form needs to be included in your policy. The assessment will be based on the minimum criteria for SunSmart Schools accreditation.

Working towards meeting the criteria for SunSmart Schools accreditation

Some schools' existing sun protection policy will already meet the criteria for SunSmart accreditation.
Other schools may need to review their existing sun protection policy to meet the minimum criteria (or develop a new policy if they do not already have one). It is important that the whole school community is involved in the development of the policy so there is a commitment to it. For some schools, it may take a period of time to develop a policy that covers all areas of the essential criteria. There is no time limit by which a school has to become accredited.

Contact your local Cancer Society centre to help you with your application and to develop a policy that meets the minimum criteria for SunSmart Schools accreditation.

Sample SunSmart Schools Accreditation Policy for Primary and Intermediate Schools

Why we need this policy

New Zealand has among the highest melanoma rates in the world. Excessive exposure to ultraviolet radiation (UVR) from the sun causes sunburn, skin damage and increases the risk of skin cancer. Getting sunburnt in childhood and adolescence will increase the risk of melanoma and other skin cancers in later life.

This sun protection policy will apply during Terms 1 and 4, (especially between 10am and 4pm). However, from the beginning of September UVR levels are increasing. Therefore, sun protection should be used in September when children are outdoors for extended periods (e.g. sports days). During the winter months sun protection is not usually needed except at high altitudes in highly reflective environments, for example, in snow, or skiing.

This policy is adopted from (DATE) so that children attending (SCHOOL NAME) are protected from excessive exposure to UVR from the sun.

Being SunSmart

- Require children to wear broad-brimmed (minimum 7.5cm), legionnaire or bucket hats (minimum 6cm brim and a deep crown) when they are outside (for example, during interval, lunch, sports, excursions and activities).
- Provide hats for children to borrow.
- Encourage students to wear clothing that protects their skin from the sun even when out of uniform (for example with sleeves and collars, and rash tops when swimming outside).
- Implement a "No Hat, Play in the Shade" policy. Require children without hats or with bare shoulders to play in the shade or indoors.
- Work with the school community to promote students□ use of SPF 30+ broad-spectrum sunscreen.[1]
- Make sunscreen available to students at school outdoor activities, particularly at sports days and similar events.
- Encourage all staff to role model SunSmart behaviour, for example use appropriate hats within the school grounds and during outdoor school activities.
- Regularly publicise and reinforce the SunSmart Policy (for example through newsletters, school website, parent meetings, and student and teacher activities).
- Talk to parents about the school□s SunSmart Policy at enrolment and encourage parents to practise SunSmart behaviour, i.e in school newsletters and enrolment packs.

A Curriculum that includes SunSmart education

- Include SunSmart education and activities as part of the schools curriculum at all levels each year. For curriculum resources visit the SunSmart Schools website www.sunsmartschools.co.nz

Building a SunSmart environment

- Work towards developing and improving existing shade in areas where students gather. Shade can be both built (shade verandas) and natural (trees).
- Include a sun exposure assessment in the Risk Analysis and Management system for any Education Outside The Classroom (EOTC) plan for outdoor activity.
- Hold outdoor activities in areas with plenty of shade whenever possible.[2]
- Consider the possibility of rescheduling suitable outdoor events/activities to early morning / late afternoon.
- Allow children access to indoor shade such as indoor sports and recreational facilities/gymnasia during lunch breaks.

Supporting and evaluating SunSmart behaviour

- Ensure on-going assessment of SunSmart behaviour, shade and curriculum emphasis.
- The Board of Trustees and Principal will review the schools SunSmart policy at least every three years.

1. Sunscreen should not be the only or primary form of sun protection.
2. The highest clear-sky UVR levels occur around the middle of the day. The Cancer Society recommends planning trips to venues with adequate shade or providing your own shade (umbrellas or tents).

Policy prepared by: _____ (Name or title e.g. BoT) on

Policy approved by: _____ (Name or title e.g. BoT) on

Policy will be reviewed on_____

SUNSMART SCHOOLS

Cancer Society
Te Kāhui Matepukupuku o Aotearoa