



SunSmart Fact and Fiction SunSmart Scientists

Learning from and about the natural world

Curriculum Level 2 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:

- enhance youth numeracy and literacy development and provide assessment tasks to assess the National Standards
- embed key science concepts and experiences of the sun, energy and protection
- support the principles of SunSmart and the New Zealand Curriculum (NZC)
- use different examples/contexts to ensure appropriateness to different ethnic groups (particularly Māori, Pāšifika and Asian)
- use Te Reo Māori concepts and language that will be woven into the resource
- take an inquiry-based learning approach
- 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 2 Unit Overview

Overview planning tool

The overview diagram explains how the lessons for Level 2 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.

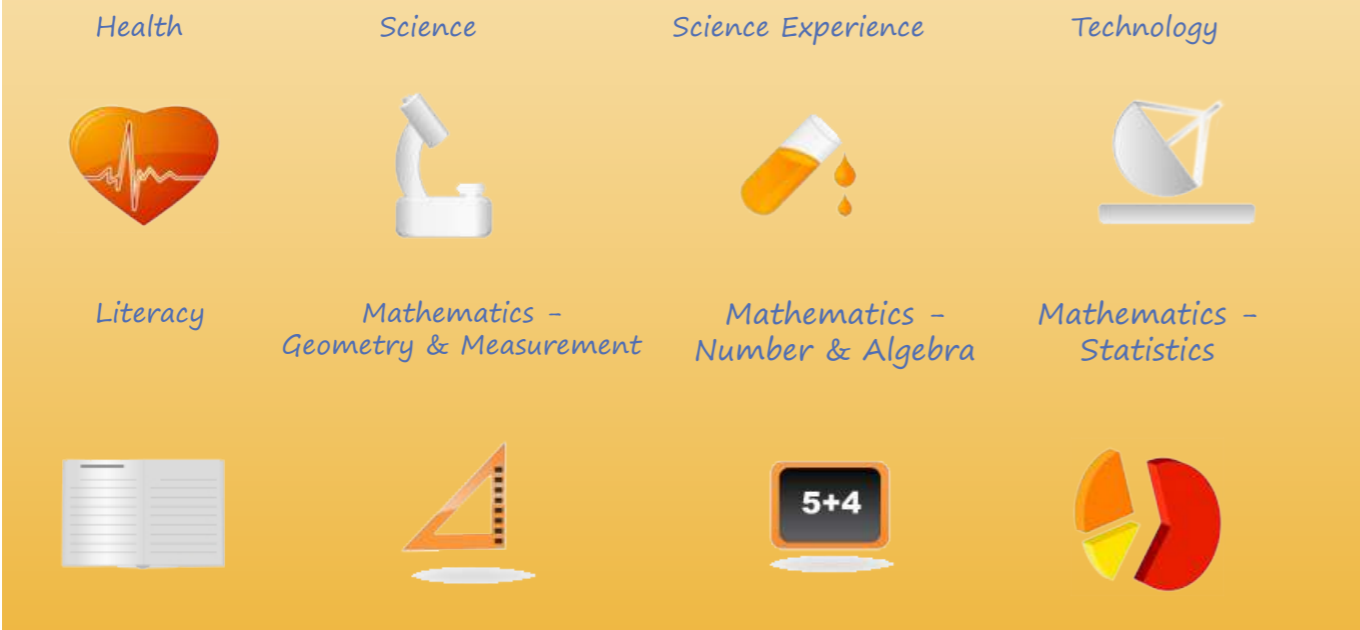
Science explorations

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

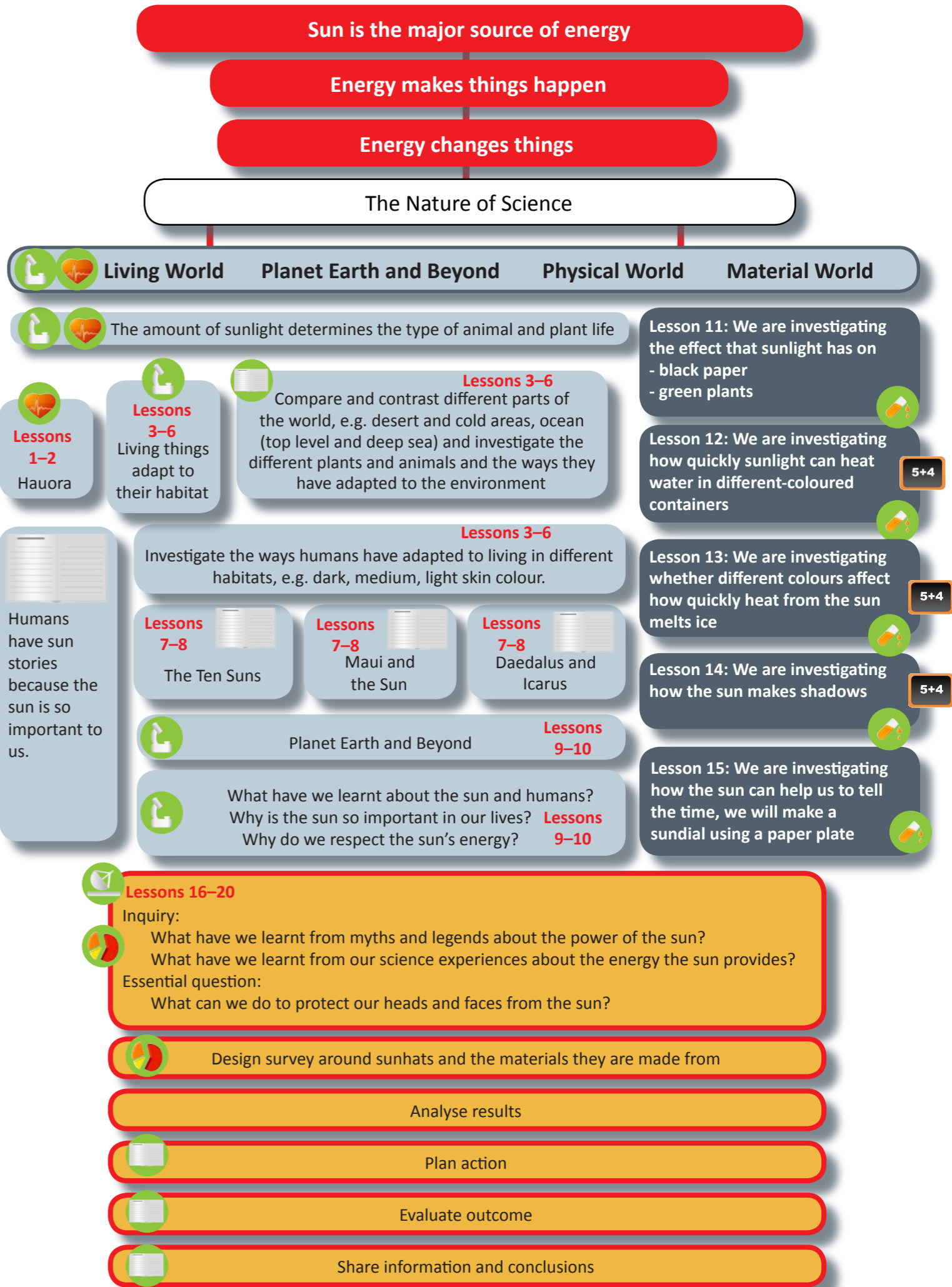
On the next page is an overview of the unit that shows the links between the curriculum, assessments, teaching and learning approaches, key concepts and ideas.

Key

- A** Front loading through different sources of information
- B** Front loading through hands-on experiences
- C** Synthesis: Developing new understandings and knowledge through inquiry



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 the facts and fictions about the sun and how humans can protect themselves from the sun.

Curriculum Level 2

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 <i>Safety management</i> Identify risks and use safe practices in a range of contexts.	<ul style="list-style-type: none">understand that skin is the largest organ in our bodyrecognise that our skin protects our internal organs from chemicals, infections, cuts, sunlight and wateridentify ways that we can limit the damage the sun can do to our skin.
		Healthy Communities and Environments <i>Societal attitudes and values</i> Explore how health care and physical activity practices are influenced by community and environmental factors.	<ul style="list-style-type: none">consider the ways in which the school community can control the sun's harmful effects on our skin.
		<i>Community resources</i> Identify and discuss obvious hazards in their home, school, and local environment and adopt simple safety practices.	<ul style="list-style-type: none">identify and discuss the need for sun protection at home, school and in the local environmentIdentify 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 <i>Processes and strategies</i> Select and use sources of information, processes, and strategies with some confidence to identify, form and express ideas. <ul style="list-style-type: none"> Selects and uses sources of information (meaning, structure, visual and grapho-phonic information) and prior knowledge with growing confidence to make sense of increasingly varied and complex texts. <i>Ideas</i> Show some understanding of ideas within, across, and beyond texts.	<ul style="list-style-type: none"> demonstrate an ability to listen, gather, read, understand and effectively use information to express ideas or draw conclusions.
		Speaking, Writing, and Presenting <i>Processes and strategies</i> Select and use sources of information, processes, and strategies with developing confidence to identify, form and express ideas. <ul style="list-style-type: none"> show some understanding of the connections between oral, written and visual language when creating texts creates texts by using meaning, structure, visual and graphophonic sources of information, and processing strategies with growing confidence seeks feedback and makes changes to texts to improve clarity and meaning is reflective about the production of texts: monitors, self-evaluates and describes progress with some confidence. 	<ul style="list-style-type: none"> form and express ideas and information with some clarity organise and sequence ideas and information with confidence use a variety of sentence structures, beginnings and lengths.

Curriculum Areas Incorporated		Achievement Objectives Relevant to the activity, including possible links	Specific Learning Outcomes Students will be able to
Mathematics and Statistics	Statistics	Statistical Investigation Conduct investigations using the statistical inquiry cycle: <ul style="list-style-type: none"> posing and answering questions gathering, sorting and displaying category and whole-number data communicating findings based on the data. 	<ul style="list-style-type: none"> gather, sort, analyse, compare and summarise data on the ways to protect our skin display data in an appropriate form.
Te Aho Arataki Marau mō te Ako i Te Reo Māori	Taumata	2.1 Communicate about relationships between people. 2.2 Communicate about possessions. 2.3 Communicate about likes and dislikes, giving reasons where appropriate. 2.5 Communicate about physical characteristics, personality and feelings.	<ul style="list-style-type: none"> discuss whānau, relationships and their impact on health and wellbeing associate words with pictures of different parts of the world interview peers and survey participants about their favourite sunhat identify words that describe feelings/opinions.

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.hereora.tki.org.nz/Unit-plans/Unit-1-Ko-au/Assessment-Opportunities>
<http://www.hereora.tki.org.nz/Unit-plans/Unit-5-Hauora>

Group work:

See **Resource 27** for activities and assessment grid.

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

Vision	Principles	Values	Key Competencies	Pedagogical Approaches
What we want for our young people: <ul style="list-style-type: none">• Confident• Connected• Actively involved• Lifelong learners.	Beliefs about what is important: <ul style="list-style-type: none">• High expectations• Treaty of Waitangi• Cultural diversity• Inclusion• Learning to learn• Community engagement• Coherence• Future focus.	Expressed in thought and actions: <ul style="list-style-type: none">• Excellence• Innovation, inquiry and curiosity• Diversity• Equity• Community and participation• Ecological sustainability• Integrity.	Which of the key competencies (NZC pp. 12–13)? <ul style="list-style-type: none">• Thinking• Using language, symbols and texts• Managing self• Relating to others• Participating and contributing.	Aspects of effective pedagogy (NZC pp. 34–36) are highlighted in the activity: <ul style="list-style-type: none">• Creating a supportive learning environment• Encouraging reflective thought and action• Enhancing the relevance of new learning• Facilitating shared learning• Making connections to prior learning• Providing sufficient opportunities to learn• E-learning• Engaging Māori and Pāsifika students and their communities.

Achievement objectives – taken from the New Zealand Curriculum.
Specific learning objectives – for this unit of work, specific learning objectives have been derived from the achievement objectives in the New Zealand Curriculum
Learning outcomes – are successfully achieved when students can demonstrate the specific learning processes, skills and knowledge detailed for each lesson in the left-hand column.
It is our expectation that teachers will adapt these specific learning objectives and learning outcomes to meet the needs of their diverse learners.

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

The Reading Standard – By the end of year 4, students will read, respond to, and think critically about texts in order to meet the reading demands of the New Zealand Curriculum at Level 2. Students will locate and evaluate information and ideas within texts appropriate to this level as they generate and answer questions to meet specific learning purposes across the curriculum.

The New Zealand Curriculum Writing Standard for Years 1–8

The Writing Standard – By the end of year 4, students will create texts in order to meet the writing demands of the New Zealand Curriculum at Level 2. 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 independently:
 - gather and display category and simple whole-number data
 - interpret displays in context
- compare and explain the likelihoods of outcomes for a simple situation involving chance, acknowledging uncertainty.

National Standards Assessment Tasks

Tasks to assess the **Reading Standard** – refer to Lesson 11.

Tasks to assess the **Writing Standard** – refer to Lesson 16.

Tasks to assess the **Mathematics Standard** – refer to Lessons 12–13.

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>

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/>
Links to resources about the sun and skin
<http://www.windows2universe.org/sun/sun.html>
<http://www.cancerwa.asn.au/resources/2013-04-10-uv-radiation-learning-activities-book.pdf>
<http://www.who.int/uv/publications/en/primaryteach.pdf>
<http://www.who.int/uv/intersunprogramme/activities/en>
<http://kidshealth.org/kid/htbw.skin.html>
<http://www.foundation.sdsu.edu/sunwisestampede/meetanimals.html>
<http://science.nationalgeographic.com/science/health-and-human-body/human-body/skin-article/>
Sun myths http://www.windows2universe.org/mythology/ten_chinese_suns.html
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 1–3
<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, information transfer tasks, multichoice, tasks, strip stories, same-different tasks, dictocomps, listen-and-draw tasks, true-false-make it right tasks and 4-3-2 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

Mind Matters resource – available online for free

<http://mindmatters.edu.au>
<http://www.mindmatters.edu.au/docs/default-source/resources-archive/enhancing-resilience-i>

Sites to assist in the development of survey questions

<http://www.stat.auckland.ac.nz/survey/>
<http://www.stats.govt.nz/methods/survey-design-data-collection/guide-to-good-survey-design-2nd-edition.aspx>

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/intersunprogramme/activities/en/>
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_V8IT67K20 Note: Sunscreen is just one of the SunSmart messages.
<http://www.youtube.com/watch?v=Zc2wE5dVx3Y>
<http://www.youtube.com/watch?v=KdsciC4y7Nk>
<http://www.youtube.com/watch?feature=endscreen&NR=1&v=QaTcqAwzmU> Note: The Cancer Society recommends use of broad-brimmed or bucket hats or caps with flaps.
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-summer-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=HTHcNj4KR8&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
<p>We are successful when we can:</p> <ul style="list-style-type: none">identify the things that keep us happy and healthy – physical (taha tinana), mental/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 safeidentify and share the things that make us feel safe, grow and learnuse some plural pronounsunderstand and use short forms of addressidentify our family members in Te Reo. <p>Evidence: Teach and assess social and interpersonal skills. Ideas for Teachers re ongoing assessment.</p>	<p>Prepare:</p> <p>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</p> <p>Teacher draws up grid on the board. Has copies of large happy and sad faces with Blu Tack on the back. (Resource 1a).</p> <div><div>1. taha tinana</div><div>2. taha hinengaro</div><div>3. taha whānau</div><div>4. taha wairua</div></div> <p>Teacher could place students in groups with each group having a copy of the table and the faces so that they can place them.</p> <p>Connect:</p> <ul style="list-style-type: none">Introduce the concept of hauora using the diagram in Resource 1b, Teacher’s Notes.Provide context for video. It is important to look after all four elements – we need the four walls – physical (taha tinana), mental/emotions (taha hinengaro), social (taha whānau) and spiritual (taha wairua).In the video, we see that Sue has taken care of her physical needs. What happens about her other needs – mental/emotional (taha hinengaro), social (taha whānau) and spiritual (taha wairua)?	<p>Pedagogical links:</p> <ul style="list-style-type: none">Creating a supportive learning environmentEncouraging reflective thought and actionEnhancing the relevance of new learningFacilitating shared learningMaking connections to prior learningProviding sufficient opportunities to learnE-learningEngaging Māori and Pāsifika students and their communities <p>Key competencies:</p> <ul style="list-style-type: none">ThinkingUsing language, symbols and textsManaging selfRelating to othersParticipating and contributing <p>Literacy:</p> <ul style="list-style-type: none">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.
- 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 most important things 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



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.

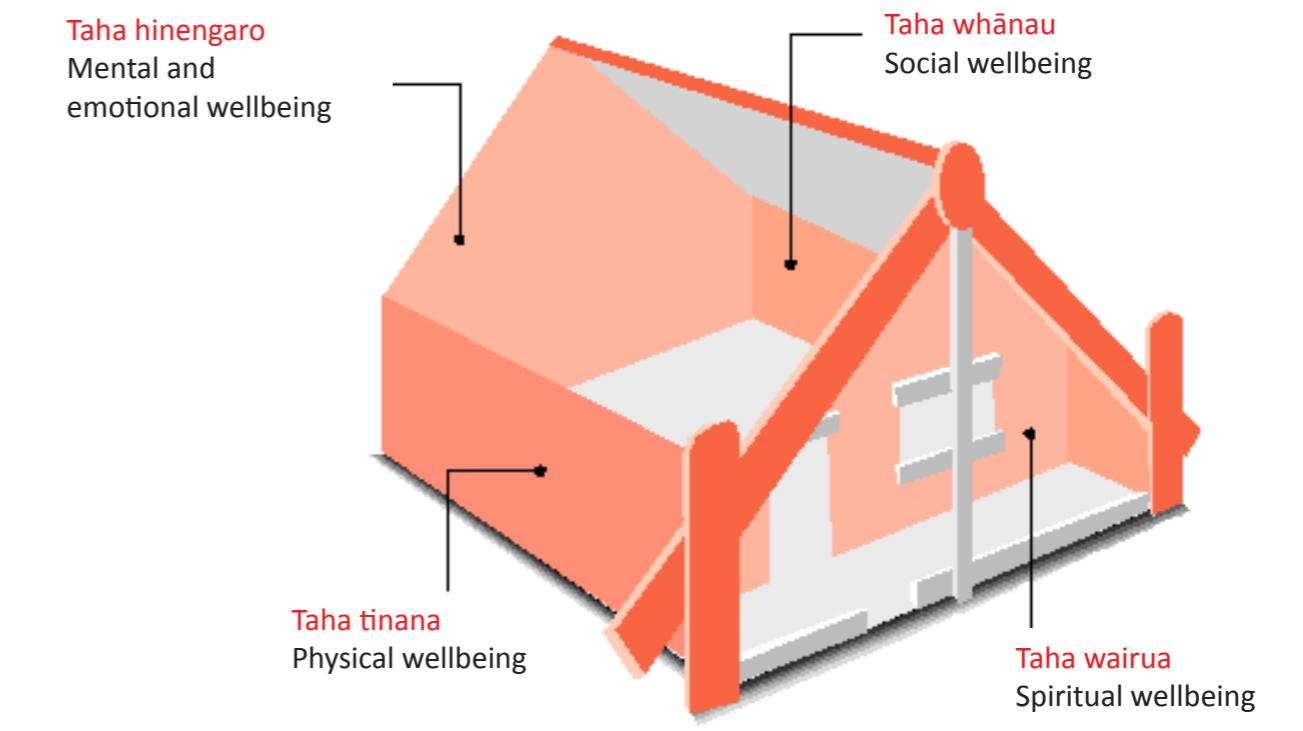
Hauora
Hauora is a Māori philosophy of health unique to New Zealand. It comprises taha tinana, taha hinengaro, taha whānau and taha wairua.

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.)

Living World – Finding out about SunSmart animals

As animals, humans need the sun. Unlike other living things, we live in many different places, and this means that we have to be SunSmart. Living things that are in their own habitats have adaptations that shield them from the sun, or they may have adaptations that help them to make the most of the sun, for example, camels and polar bears. Humans also have adaptations that help shield them from the sun.

Overview: Today we are learning about animals and whether they live in hot or cold countries and how they protect themselves from the sun. We are also investigating how humans protect themselves from the sun.

Assessment Opportunities	Structure	Curriculum and Resource Links
<p>We are successful when we can:</p> <ul style="list-style-type: none">• identify animals and places by sight• identify and match pictures of animals with the word that names them• identify other animals and plants that begin with the same sound• classify animals and plants using a range of criteria• say and write the name of the animal displayed in the picture• identify and match 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 humans protect themselves from the sun.	<p>Prepare: Read Teacher’s Notes Resource 2c. Go to http://www.foundation.sdsu.edu/sunwisestampede/meetanimals.html.</p> <p>Connect: Teacher gives students Resource 2a. Teacher tells students that the words on the left-hand side are the names of animals that are pictured on the right-hand side.</p> <ul style="list-style-type: none">• In pairs, students are asked to match the picture of the animal (Resource 2a) with each of the words on the side. (This gives the teacher a good idea about students’ prior knowledge.)• As a class, they match the word and picture. Teacher asks students how the word sounds – and the different letters and their corresponding sound. (Resource 2b has the answers.)• Can you tell which of these animals live in a hot country and which live in a cold country?• What other animals can you think of that begin with the letter c etc.?• Group all the animals that live in cold countries together and the ones that live in hot countries.	<p>Pedagogical links:</p> <ul style="list-style-type: none">• Creating a supportive learning environment• Encouraging reflective thought and action• Enhancing the relevance of new learning• Facilitating shared learning• Making connections prior to learning• Providing sufficient opportunities to learn• E-learning• Engaging Māori and Pāsifika students and their communities <p>Key competencies:</p> <ul style="list-style-type: none">• Thinking• Using language, symbols and texts• Managing self• Relating to others• Participating and contributing <p>Literacy:</p> <ul style="list-style-type: none">• English and Te Reo vocabulary building• Can identify animals visually, orally and in writing and is able to connect these <p>Numeracy:</p> <ul style="list-style-type: none">• Grouping animals according to a variety of criteria

Structure

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 do polar bears have special eyelids? (See <http://www.foundation.sdsu.edu/sunwisestampede/meetanimals.html>.)
- Why does a meerkat have black rings around their eyes?
- How does a camel protect their eyes?
- How does a rhinoceros, hippopotamus, camel and elephant keep cool and protect themselves from the sun? (See **Resource 2c** for teacher background info.)
- How does a koala, chimpanzee, gorilla and rabbit protect themselves from the sun?

Demonstrate:

Resource 3
Students work in groups. Cut out each of the animal pictures and place each of the animal pictures under the heading that describes how the animal protects itself from the sun.

Resource 4
Students work in groups. Students draw a line from each of the pictures to the type of sun protection that is being used by the people in the photographs. Some may have more than one type of sun protection.
Where do each of the animals live? Students match each of the animals in **Resource 5a** with the places that they live in **Resource 5b**.
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 koalas, meerkats, rabbits and pigs do to protect themselves from the sun?
Teacher goes to <http://science.nationalgeographic.com/science/health-and-human-body/human-body/skin-article/>. (You may be asked to join the website for free.)
Click on ‘stresses on the skin’ and then ‘sunlight’ until you are on the page as shown below.

Structure

Teacher then talks about different-coloured skins. Teacher asks students to identify what type of skin colour they have. Clicking on each of the skin types and using the exposure slide to show what happens when the skin type is exposed to the sun, teacher asks students to watch and identify which skin type goes red the quickest.

Light skin goes red fastest when it is exposed to the sun. What does this tell us about the protection needed by people who have light skin when they are in the sun? What does this tell us about people who have dark skin when they are exposed to the sun? Do people with dark skin burn in the sun? Where do people with dark skin usually live – in hot or cold countries? Where do people with light skin usually live – in hot or cold countries? Teacher goes to [Resource 6a, 6b](#) and [6c](#) to help students decide what skin type they are. Teacher to be aware that students often judge themselves to be a darker skin colour.

What does this tell us about the adaptation that humans are born with that help protect us from the sun? (Our skin can protect us from the sun, particularly if you have dark skin.)

What things can humans do to protect themselves and their skin from the sun? Teacher asks students to look again at [Resource 4](#).

Why do the people in the snow need to protect themselves from the sun?

Consolidate:

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.

Teacher explains that the sun is one form of energy and provides us with heat and light energy that we can see and feel. The sun is the main source of radiation. This makes life on earth possible but it can be dangerous for us. Luckily for us, many of the dangerous rays are blocked by the atmosphere around the earth.

There are other forms of energy that we can't see and feel. Ultraviolet radiation (UVR) is one that we can't see/feel but it makes our skin burn (refer back to National Geographic website). Teacher goes to <http://lrrpublic.cli.det.nsw.edu.au/lrrSecure/Sites/Web/sunsmart/brainiac/protect.htm> and uses the picture to show that UV radiation with the shortest course (line) is the strongest. Teacher shows on the globe how countries like Indonesia and countries in Africa get strong amounts. What about if you are standing on a mountain in Australia (show on globe)? Will this make you closer to the UV radiation rays than the people who are on flat land?

Structure

Protecting yourself

GET THE INFO

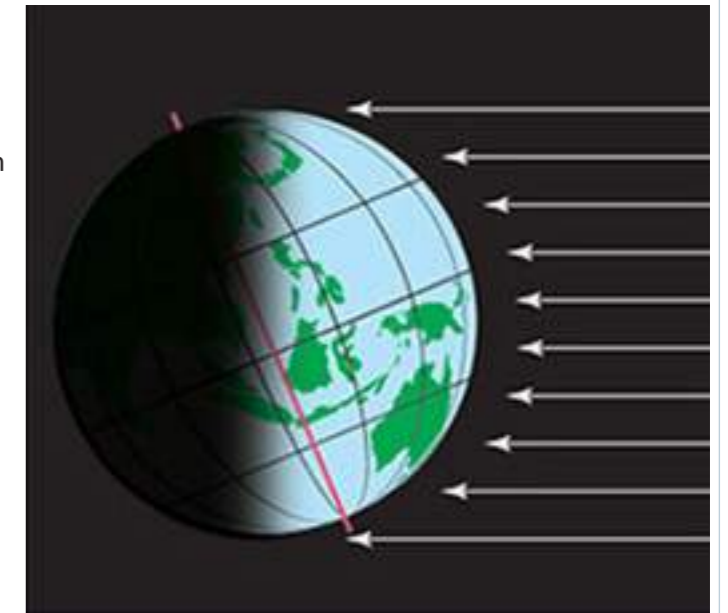
The amount of ultraviolet radiation reaching the surface is affected by the time of day and the season of the year. The higher the sun is in the sky, the shorter the path of UV radiation – this means there is more UV radiation at lunchtime than at night.

There is more in summer than in winter.

The geographic location also has an effect on the level of ultraviolet radiation. The closer you are to the Equator, the more ultraviolet radiation you will experience as you are closer to the sun.

As you go up a mountain, the amount of ultraviolet radiation increases as the atmosphere becomes thinner.

Ultraviolet is reflected by different surfaces.



Teacher could complete the survey with the class by clicking on http://lrrpublic.cli.det.nsw.edu.au/lrrSecure/Sites/Web/sunsmart/brainiac/effects_pop1.htm

For students needing additional language and word-recognition skills, they can connect to one of the online games.

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>

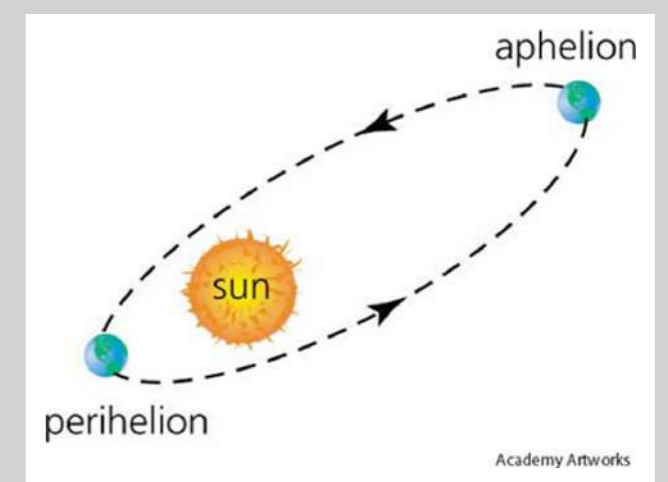
<http://www.learninggamesforkids.com/mammal-games-videos/bear-games-videos.html>

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

Note to teachers: Perihelion effect – due to the earth's axis, New Zealand (southern hemisphere) is closer to the sun in summer than the northern hemisphere is in their summer. This increases the amount of UV radiation received in a southern hemisphere summer compared to a northern hemisphere summer at similar latitude.

<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.nz/Contexts/You-Me-and-UV/Sci-Media/Video/UV-Index-time-lapse-map-for-New-Zealand>



Academy Artworks

Lessons 3-6, Resource 2a

Mix and match

Lessons 3-6, Resource 2b

Mix and match answers

- Camel
- Elephant
- Hippopotamus
- Koala
- Giraffe
- Chimpanzee
- Pig
- Polar bear
- Possum
- Rhinoceros
- Meerkat
- Gorilla
- Tuatara
- Tortoise

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



Camel



Koala



Tortoise



Rhinoceros



Tuatara



Elephant



Pig



Chimpanzee



Meerkat



Possum



Hippopotamus



Gorilla



Polar bear



Giraffe

Lessons 3–6, Resource 2c, Teacher's Notes

How do animals...

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 moisturiser 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 3–6, Resource 2c, 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 3-6, Resource 3

Ways animals protect themselves from the sun

Work in groups. Cut out each of the animal pictures. Place each of the animal pictures under the heading that describes how the animal protects itself from the sun.



1. Keep out of the hot midday sun and slip in the shade

2. Slap on dust or water

3. Slop on oil to keep their skin moist and act as a sunscreen

4. Wrap on protection for their eyes

5. Wrap on a protective shell that protects their body

Lessons 3-6, Resource 4

Slip, Slop, Slap and Wrap

Work in groups. Draw a line from each of the pictures below to the type of sun protection that is being used by the people in the photographs. Some may have more than one type of sun protection.



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



Slop on some sunscreen. Broad-spectrum sunscreen of at least SPF 30.



Slap on a broad-brimmed or bucket hat or a cap with flaps.

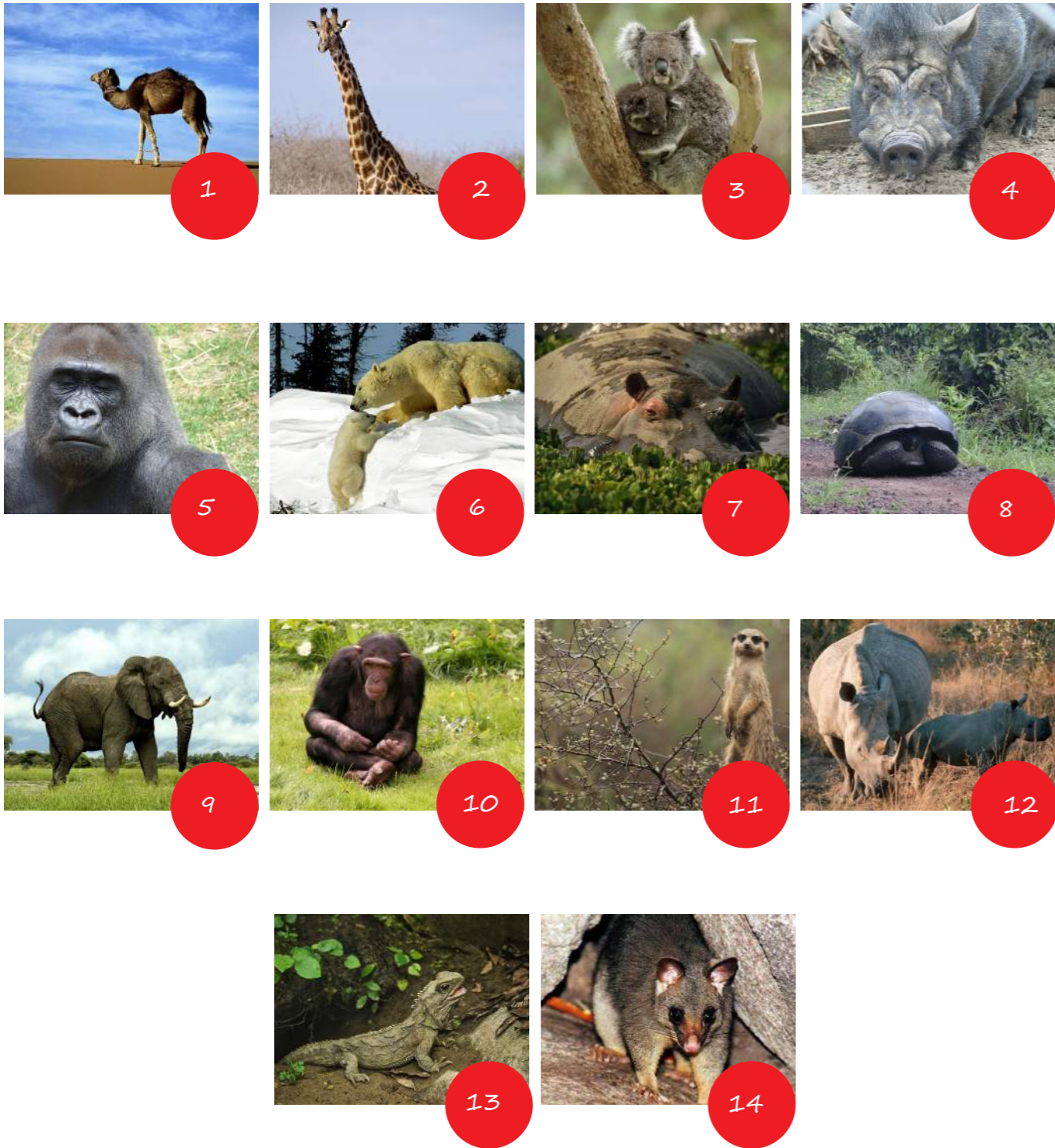


Wrap on a pair of sunglasses. Make sure they meet the Australian/New Zealand standard.



Lessons 3-6, Resource 5a

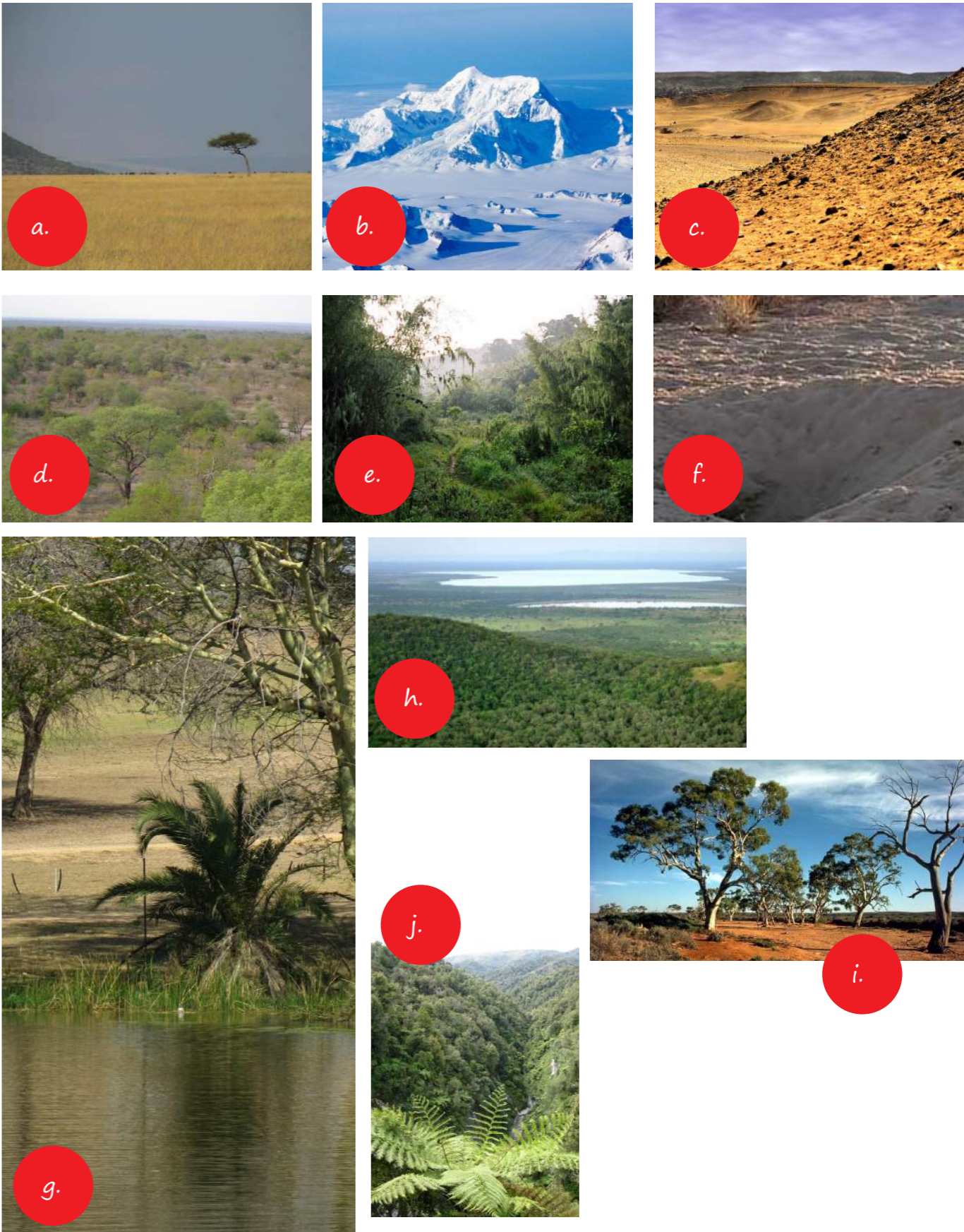
Mix and match



Match these animals to their habitats on the next page.

Lessons 3-6, Resource 5b

Mix and match





The Fitzpatrick scale is illustrative, not comprehensive in determining skin colour.

Any sign of skin colour darkening is a sign of sun damage. There is nothing healthy about a tan.

Skin types	Characteristics	Examples
Type 1	High risk of sun sensitivity, always burns, never tans.	Red hair with freckles, some New Zealanders.
Type 2	Very sun sensitive, burns easily, tans minimally.	Fair skinned, fair haired, Northern European, many New Zealanders.
Type 3	Sun-sensitive skin, sometimes burns, slowly tans to light brown.	Central European, many New Zealanders.
Type 4	Skin burns minimally, always tans to moderate brown.	Mediterranean European, some South Americans, some New Zealanders.
Type 5	Skin rarely burns, tans well, darkly pigmented skin.	Some South Americans, some Africans, some Indians, some New Zealanders.
Type 6	Darkest pigmented skin.	Some South Americans, some Africans, some Indians, some New Zealanders.

Note: Albino – extremely high risk of negative sun reaction.

It is important to distinguish between natural (constitutive) skin colour and additional acquired from UV radiation exposure (facilitative), which is associated with skin damage. There is evidence that Māori are represented in all categories. There is a growing literature on ‘people of colour’ and ‘ethnic skin’ but not much about Pacific peoples, in particular. The *British Journal of Dermatology* recently had a whole special supplement: Ethnic Skin: a New Era for Studying Human Cutaneous Diversity, October 2013, Volume 169, Issue Supplement s3, Pages iii–v, 1–97.

Determining your susceptibility to skin cancer – skin type

SKIN TYPE (Fitzpatrick)	RESPONSE TO SUN EXPOSURE	EXAMPLES	SUSCEPTIBILITY
1.	Always sunburn Don't tan	Fair-skinned and freckled Blue-eyed Celtic	Very high
2.	Always sunburn Tan minimally	Fair-skinned, blonde hair Blue-eyed Scandinavian	High
3.	Sometimes sunburn Tan moderately	Fair-skinned, brown hair Brown-eyed Unexposed skin is white	Average
4.	Seldom sunburn Tan easily	Light-brown skin, dark-brown hair, brown-eyed Unexposed skin is light brown Mediterranean, Hispanic	Low
5.	Rarely sunburn Tan profusely	Brown-skinned darker Mediterranean, South-East Asian, Eastern Indian	Very low
6.	Never sunburn Deeply pigmented	African American	Minimal

Note: Any sign of skin colour change is a sign of sun damage. There is nothing healthy about a tan.

Assessment Opportunities	Overview Lessons 7–8
<p>Lessons 7–8</p> <p>We are successful when we can:</p> <ul style="list-style-type: none">• retell a sun story using our own pictures and words• organise the sequence of events in the story into the right order• read and interpret information on the sun• use different sources of information to identify what is a fact (true) and what is fiction (false) about the sun.	<p>Prepare:</p> <p>Copy of <i>How Maui Slowed The Sun</i> by Peter Gossage (Penguin) and or a video clip of the story http://www.youtube.com/watch?v=jbM3PwcGi0g <i>The Ten Suns</i> http://www.youtube.com/watch?v=DEzgAilV0zM <i>Daedalus and Icarus</i> http://www.youtube.com/watch?v=YvrjaxNmf24 Teacher runs off enough copies of Resources 7-11 for students to work individually, in pairs or groups of three, as the teacher sees fit.</p> <p>Resource 7 Sequencing <i>How Maui Slowed The Sun</i> Teacher cuts up each set of statements and places them in an envelope. Each group gets one envelope containing a complete set of the statements and one copy of the pictures.</p> <p>Resource 8 Flow diagram. Enough for pairs/groups. <i>The Ten Suns</i>. Resource 9 Fishbone analysis. Enough for individual/pairs/groups. <i>Daedalus and Icarus</i>. Resource 10 Venn diagram. Enough for individual/pairs/groups. Resource 11 Three-level guide. Enough for each student.</p> <p>Connect:</p> <p>Teacher connects students to the previous lessons. “We have learnt that the sun is a very powerful source of energy for animals and humans. Without the sun we would not be able to survive, but too much sun is also harmful for us. There are many myths and legends about the sun that have been passed down through the ages.”</p> <p>Teacher reads: <i>How Maui Slowed The Sun</i> by Peter Gossage to students and or shows them the video clip of the story, http://www.youtube.com/watch?v=jbM3PwcGi0g (which is told in Māori with English subtitles). Also try http://www.youtube.com/watch?v=hcL3X0QXkcl</p> <p>Picture dictation: Teacher then reads/shows the video clip again. This time, students draw a series of pictures that describe what happens in the story.</p>

Structure

Activate:
How Maui Tamed The Sun – Sequencing
(See **Resource 7**.) Students can work in pairs/groups. Each pair or group matches the statements with the picture. Teacher will need to read aloud each of the statements, then ask the students to put the statements against the correct pictures.
ANSWERS
A2, B1, C3, D4, E7, F5, G6, H10, I9, J8

The Ten Suns – flow diagram
Students watch the video The Ten Suns <http://www.youtube.com/watch?v=DEzgAiIV0zM> and then complete the flow diagram in **Resource 8**.

Teachers may also like to read the story below to the students. (The story in the text below differs slightly from that in the video.)

'The suns were the 10 children of Di Jun, the god of the eastern sky. Each morning one of the suns would rise, climb into a chariot pulled by a dragon and ride across the sky, bringing light to the different parts of the world. In this way, the earth got the right amount of sunshine, at the different seasons of the year.

But the 10 suns grew bored. They wanted to work together, and one day, they woke early and rode across the sky together in their chariots.

The earth hated it. It burnt. It cracked. The rivers ran dry. Animals and people grew weak with the heat. But the 10 suns were enjoying themselves and would not listen to those who asked them to stop. They laughed and carried on riding around the sky.

Even their father, Di Jun, had no influence over them. To save the world, he sent for the Divine Archer and gave him a magic bow.

The archer flew on the wind, down to the highest mountain he could see. He had nine arrows in his quiver and, one by one, he shot an arrow at each of the suns. As each arrow struck, the sun exploded and turned into stars.


By the end of the day, only one sun remained. Next day, he rose again, and his sad tears filled the rivers and made the plants grow again. And that is the sun we see today.'

Adapted from <http://myths.e2bn.org/mythsandlegends/userstory6758-the-stories-of-the-ten-suns.html>



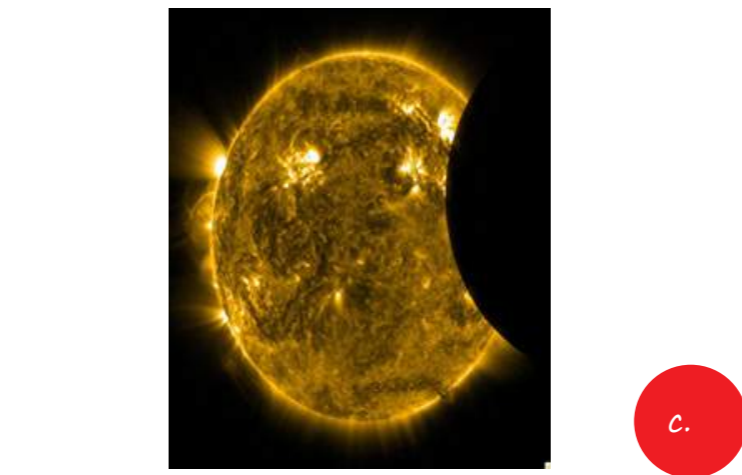
Daedalus and Icarus – fishbone analysis
Students watch the story of Daedalus and Icarus <http://www.youtube.com/watch?v=YvrjaxNmf24> and complete the fishbone analysis in **Resource 9a**. Use **Resource 9b**, Teacher's Notes to complete the fishbone analysis



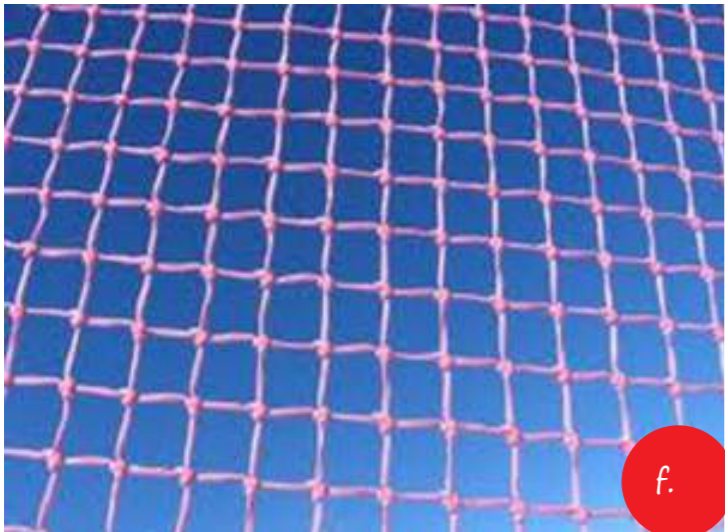
Demonstrate:
Students complete the Venn diagram in **Resource 10** (with the teacher if they need support) that shows the similarities and differences between the three stories. (Common things are that the sun is powerful, can be good and can cause harm.)

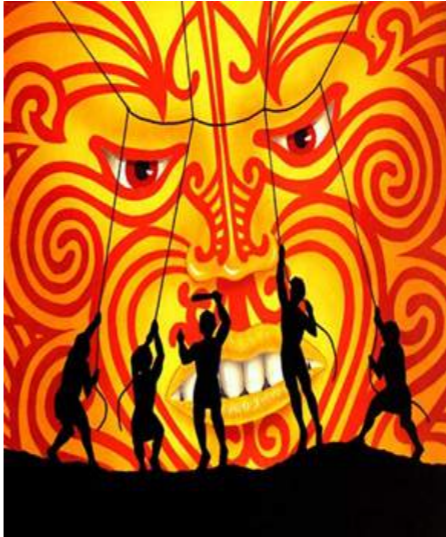

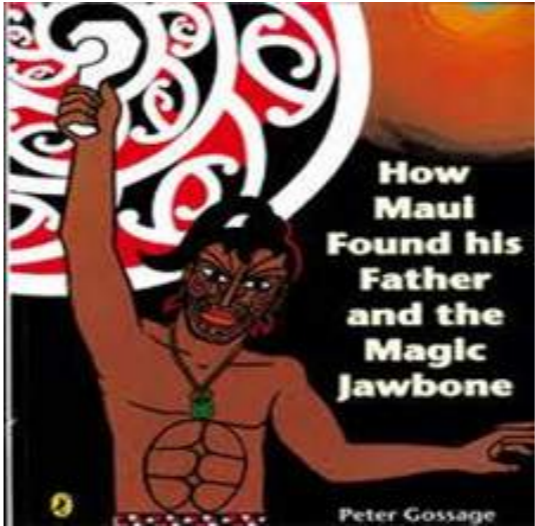
Consolidation:
Students complete **Resource 11a** (a three-level guide), which is a summary of all the knowledge and understandings they now have about the sun.
Teacher will need to read aloud the instructions and each statement for the students. (Use **Resource 11b**, Teachers's Notes for background.)
ANSWERS
1✓ 2✓ 3x 4✓ 5x 6x 7✓ 8✓ 9x 10✓ 11✓ 12x 13x 14✓ 15✓ 16x 17✓ 18✓ 19x 20✓




Maui and the Sun – sequencing
Your teacher will read out sentences that tell different parts of the story about how Maui tamed the sun. When the teacher reads out the sentence, decide which picture it is describing and place the sentence beside the picture.

Picture	Sentence that describes what is happening
	
	
	

Picture	Sentence that describes what is happening
 d.	
 e.	
 f.	



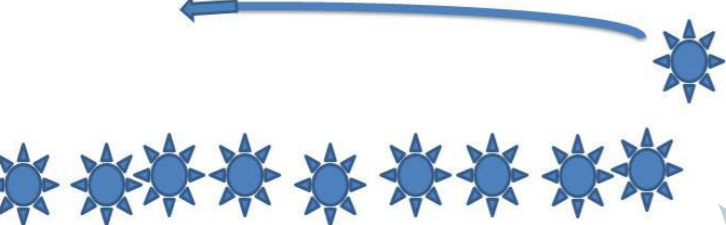

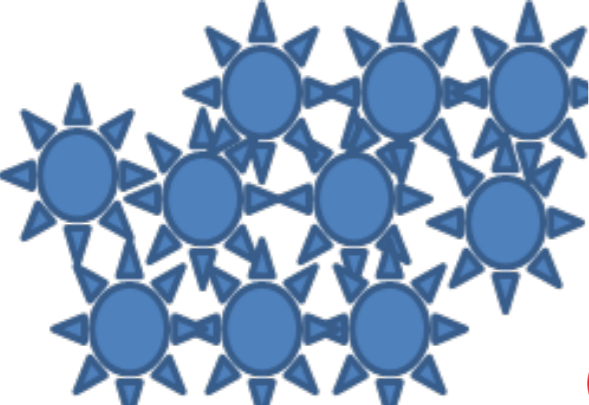

Picture	Sentence that describes what is happening
 g.	
 h.	
 i.	







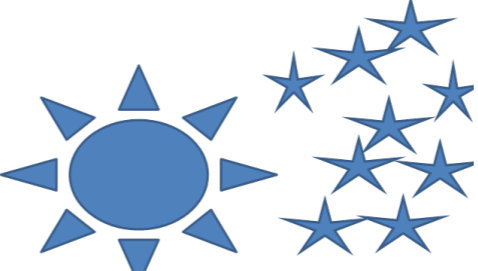

Picture	Sentence that describes what is happening
<div><div>j.</div></div>	

1. Maui had an idea	2. Maui and his whānau did not have enough daylight to do their jobs	3. Maui said that he could solve the problem by taming the sun
4. Maui asked the women in the village to make flax ropes and a net to catch the sun	5. When the sun came out of the cave in the morning, he was trapped in the net	6. Maui told his brothers to pull the ropes as hard as they could
7. Maui and his brothers found the sun in a cave	8. The sun was weak and agreed to move more slowly across the sky	9. Maui hit the sun with his magic jaw bone
	10. The sun struggled and roared	

The Ten Suns

View The Ten Suns video on <http://www.youtube.com/watch?v=DEzgAiVOzM> (or listen to your teacher as they read the story) and then complete the boxes below to explain the story. Beside each of the stages, you may like to write what is happening. Draw in the parts of the story that are missing.

Event	Your version of the story
 	
 	
 	


Event	Your version of the story
 	
 	
 	
 	

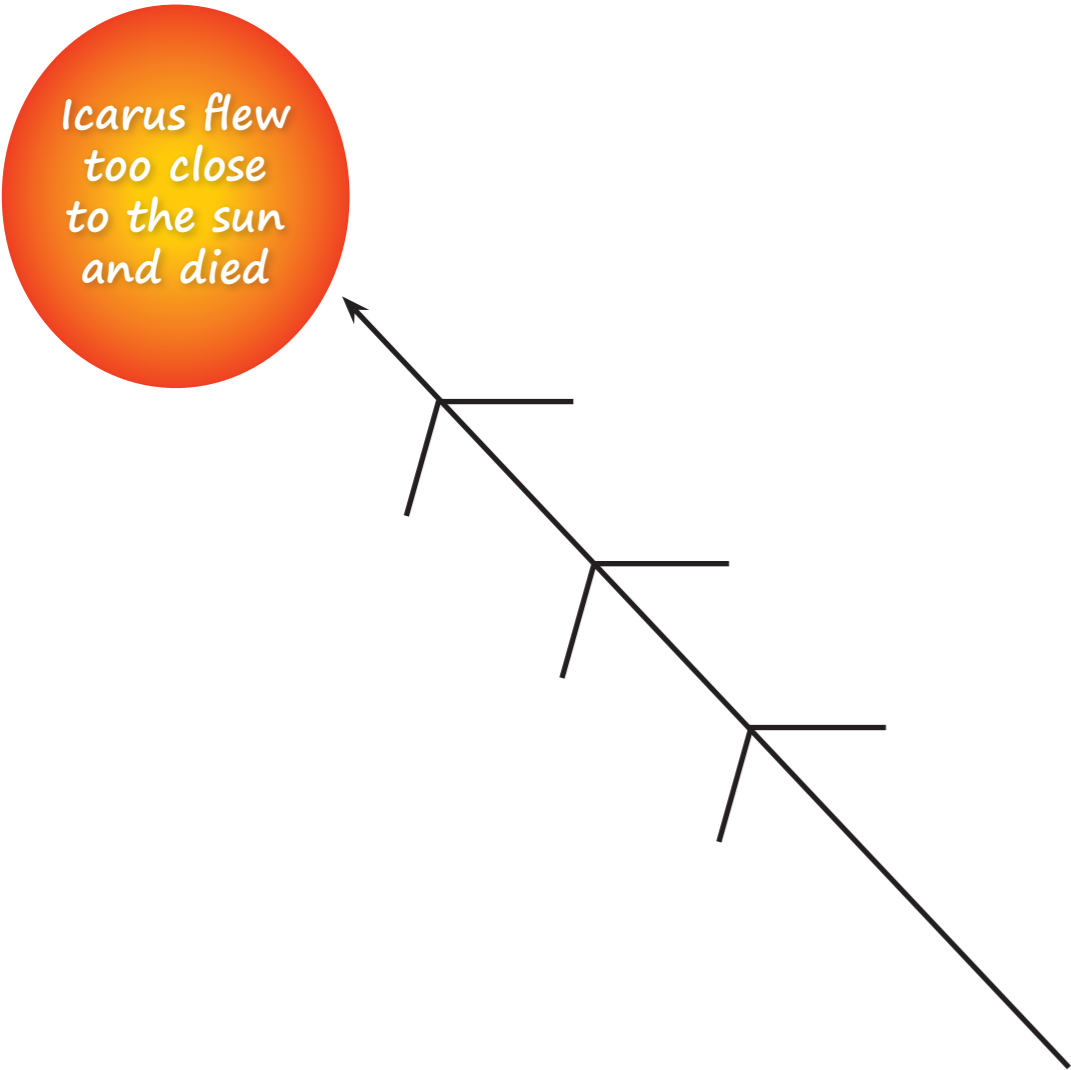
Lessons 7-8, Resource 9
Daedalus and Icarus – fishbone analysis

Structure

After watching the video <http://www.youtube.com/watch?v=YvrjaxNmf24> that tells the story about Daedalus and Icarus, complete the fishbone analysis of the story with your teacher. This will help you to remember all the details about the story.

Step 1: Write in the events that led up to Icarus flying too close to the sun on the fishbone below:

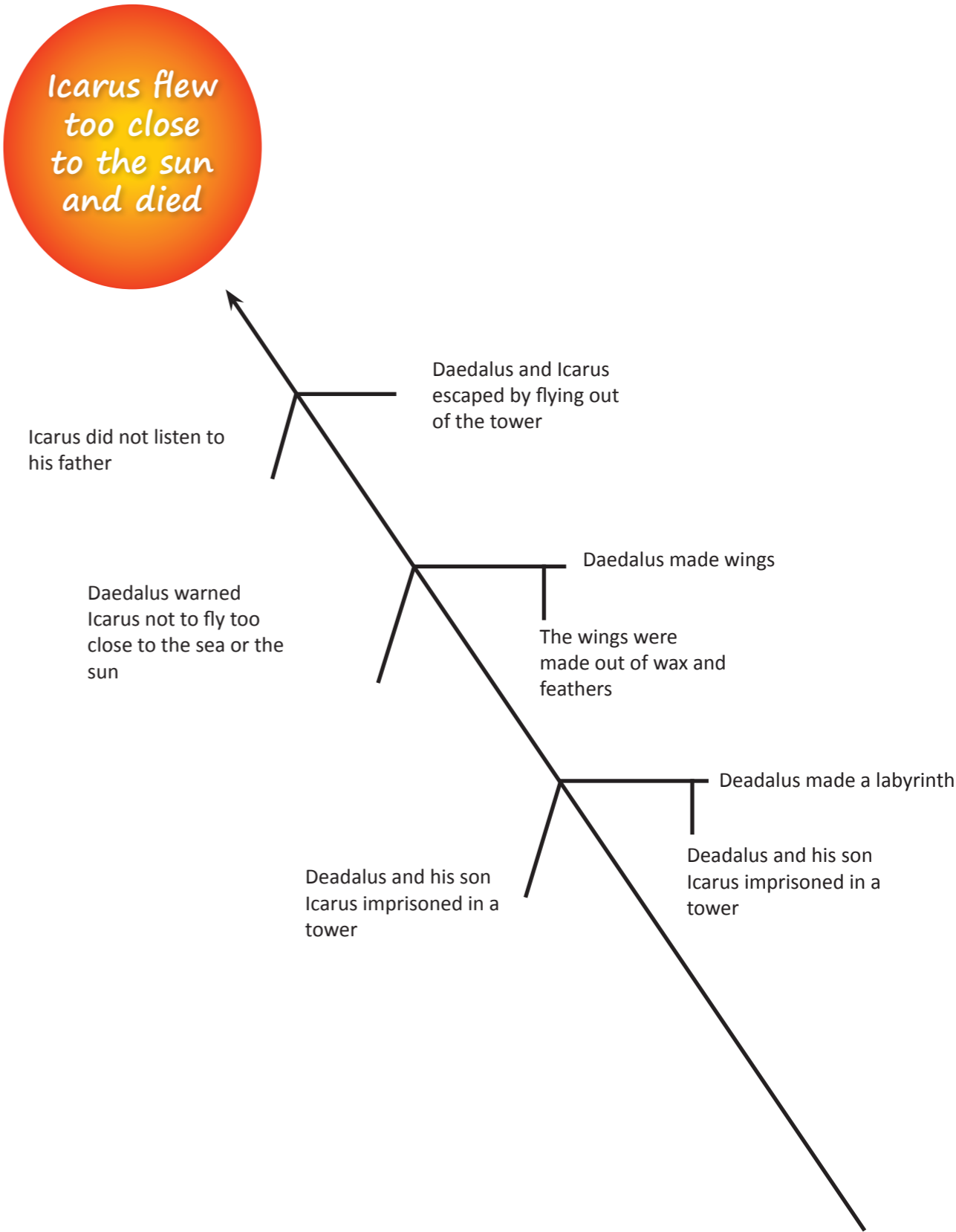




Step 2: Think about the things you know about each of these events. Brainstorm with your teacher any other factors that may affect the situation.

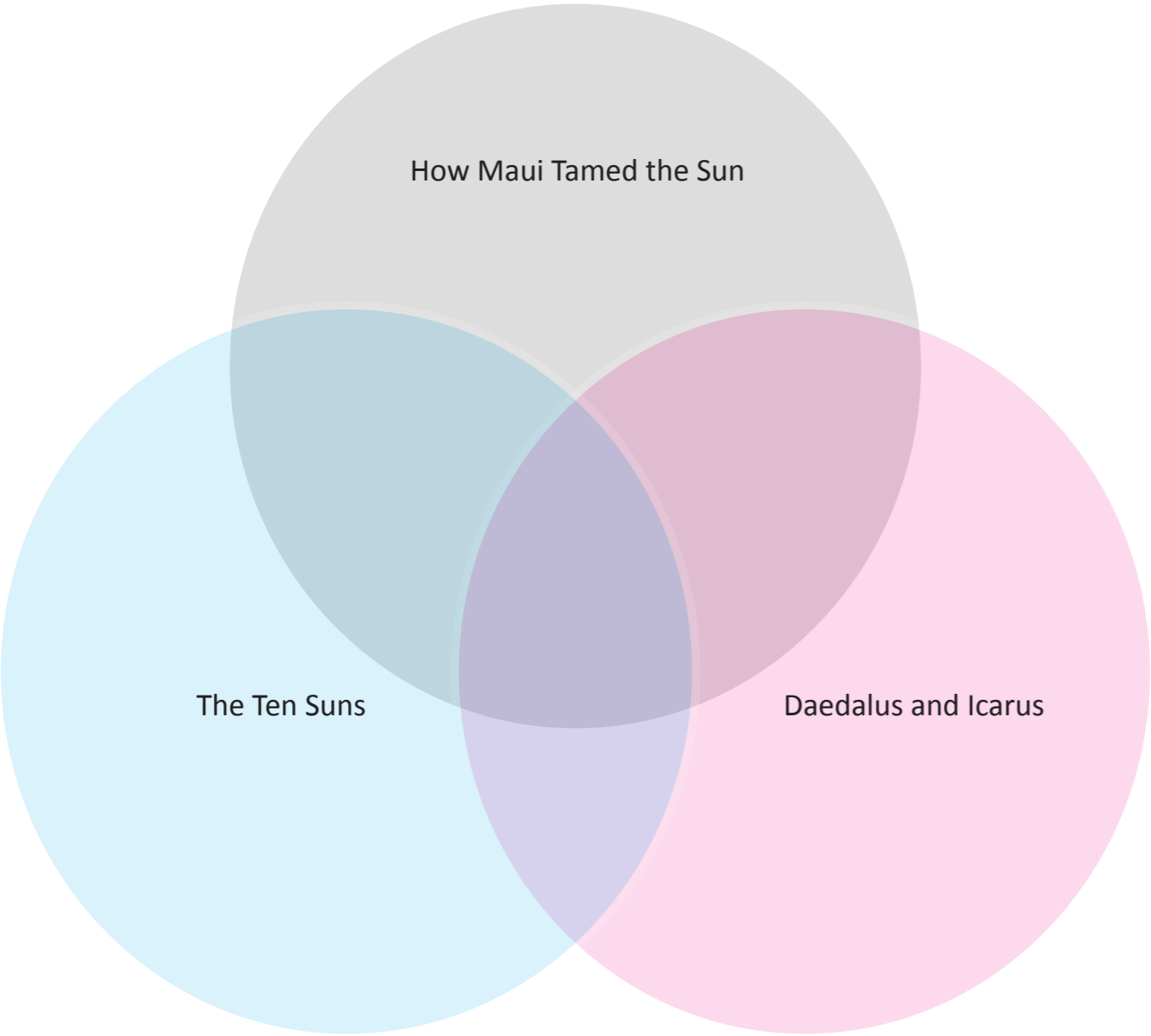
Step 3: With your teacher, put in the additional details as the extra bones.

Lessons 7-8, Resource 9b, Teacher's Notes



Lessons 7-8, Resource 10
Venn diagram

Think about the three stories that we have watched and listened to: *How Maui Tamed the Sun*, *The Ten Suns* and *Daedalus and Icarus*. With your teacher, identify all the things these stories told us about the sun. Write these things on the Venn diagram. The things that all the stories told us go in the middle.



Lessons 7-8, Resource 11a
Three-level guide

Below is a list of statements that your teacher will read to you. If you think the statement is correct, you can put a tick ✓ beside the statement. If you think the statement is wrong, you need to put a cross X.

Statement	✓ or X
1. Animals live in hot and cold places on the earth.	
2. Animals have lots of different ways to protect themselves from the sun.	
3. Tigers have special eyelids to protect their eyes from the sun.	
4. Humans are animals, too.	
5. Humans all have the same skin colour.	
6. Humans with dark-coloured skin burn the fastest in the sun.	
7. Humans can protect themselves from the sun by slipping on some protective clothing, slopping on some sunscreen, slapping on a broad-brimmed hat and wrapping on a pair of sunglasses.	
8. The sun sends down ultraviolet radiation (UVR) to the earth.	
9. We can see ultraviolet radiaton (UVR).	
10. The ultraviolet radiation (UVR) is what causes our skin to burn.	
11. There are many different stories and myths from around the world about the sun.	
12. The different stories and myths from around the world tell us that the sun is weak and humans can control it.	
13. The different stories and myths from around the world tell us that the sun is harmful and very dangerous to humans.	
14. The different stories and myths from around the world tell us that the sun is very important to humans and animals.	
15. The different stories from around the world tell us that the sun is very powerful and important to humans and animals.	
16. The sun moves across the sky to create night and day.	
17. The sun rises in the east and sets in the west in New Zealand.	
18. Unlike Icarus, we need to listen and protect ourselves from the sun.	
19. There is more UV radiation in New Zealand during the summer because we are closer to the sun compared to similar summer latitudes in the northern hemisphere.	
20. New Zealand schools should recommend all children and staff wear sunglasses when outside during terms 1 and 4.	

Lessons 7–8, Resource 11b, Teacher’s Notes

Three-level guide

- Three-level guides were developed by H Herber around 1970. They are used to help students think through oral, written or visual texts after they have been given some background knowledge of a topic. They can be used across all curriculum areas.
- A three-level guide comprises a series of statements (not questions) that prompt comprehension. The purpose of the guide must be clear and must be explained to students. The statements should be designed so that they promote a coherent understanding about some aspect/s of the topic or text (as opposed to a random set of statements about the text).

The three levels

Level one → Literal → What’s “on the lines”? → Factual level of understanding
AIM: to enable learners to accurately identify key and relevant information/ideas explicitly stated in the text.

Level two → Interpretative → What’s “beyond the lines”?
→ Interpretative level of understanding
AIM: to enable learners to reflect on and interpret the information, to pick up the inferences in the text and to draw conclusions from the text.

Level three → Applied → What’s “between the lines”?
→ Applied level of understanding
AIM: to enable learners to apply the content of the text to broader situations or generalisations beyond the text but related to or generated from the text.

What are the benefits of three-level guides?

Three-level guides:

- show students what information they need to focus on
- encourage students to become close and critical readers and thinkers
- require students to clarify, support, justify and evaluate their thinking
- support less-successful learners by offering models of how to think through the content as they are reading
- provide opportunities for language development through focused small-group discussion.

How do I write a three-level guide?

1. Choose an important content area.
Three-level guides can take time to construct, so it is important to base them on something that is significant and important for students to process in depth.
2. Work out what main ideas or understandings you want the students to get out of the text.
3. Write the level three (applied) statements first.
This leads you to work out the main ideas and concepts you want learners to think about. Level three statements should promote discussion and not be able to be answered with a simple “yes” or “no” response. Students should be able to justify their conclusions or responses by referring to the text but should be thinking beyond the text.
4. Write the level one (literal) statements.
Identify the key and relevant information that will lead learners towards the understandings at the applied level. Mix these statements with some information that is not explicitly stated/found in the text.

Lessons 7–8, Resource 11b, Teacher’s Notes

Three-level guide

5. Write the level two (interpretative) statements last.
What can the learners infer from the text by thinking about what the text implies or suggests but doesn’t say directly? These statements need to be a mixture of what can and cannot be inferred from the text. Students need to justify their choices by referring to the text.




How do I use the three-level guide?

- Make sure students understand the purpose of the task, i.e. to reach an understanding of the text at three levels.
- Stress that this is not a simple ‘true or false’ activity and that level three in particular will not have right or wrong answers.
- Model the process with a practice guide or with a first question at each level.
- Allow plenty of time to complete all stages of the task.
- You may wish to follow this process for students in the classroom:
 - Stage one: students work individually
 - Stage two: students work in groups – preferably multi-level/mixed ability
 - Stage three: present or record and discuss similarities and differences between group responses, especially at applied level.

The Nature of Science, Planet Earth and Beyond,
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.

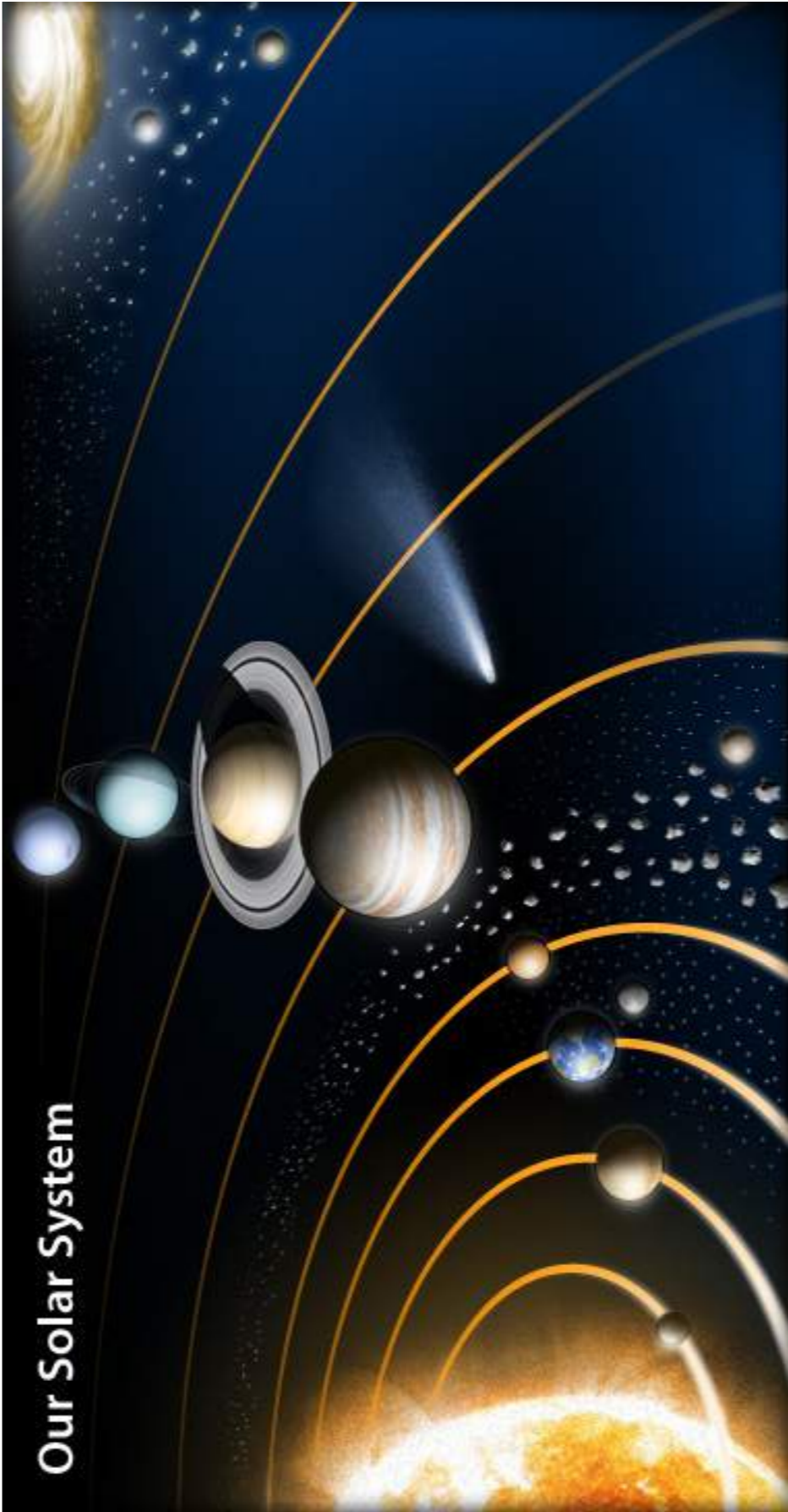


Assessment Opportunities	Structure
<p>Lesson 9 We are successful when we can:</p> <ul style="list-style-type: none">share our understanding with and gain understanding from others (peers and experts)use a KWL chart to record what we know, what we want to know, what we have learntidentify the sun and some other features of the solar systemidentify how the sun is the centre of the solar systemidentify that the sun is our biggest source of energy.	<p>Lesson 9 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:</p> <ul style="list-style-type: none">find out about the sun by sharing what I already know and by listening to expertsunderstand that the sun is powerfulthink about how we must be SunSmart because of the sun’s energy. <p>Connect:</p> <ul style="list-style-type: none">Use a KWL chart (Resource 12) 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 13). Unpack how the chart shows how the sun is the centre, how the rings show how the planets rotate around the sun. Model this by acting it out. Students need explicit instruction to understand these representations. <p>Activate:</p> <ul style="list-style-type: none">Talk about how energy changes things or makes things work. How does the picture of the sun represent this energy? (Looks like it is glowing etc.) Link to other things that glow when they are hot, e.g. stove elements, heaters, flames. <p>Demonstrate:</p> <ul style="list-style-type: none">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=V87I10yMIb4Look at the solar system chart again and talk about how useful charts are to record and present information (language signs, symbols, text). <p>Consolidate:</p> <ul style="list-style-type: none">Help students record the statements or questions they have about the sun on the two sun ray graphics (Resources 14a and 14b).

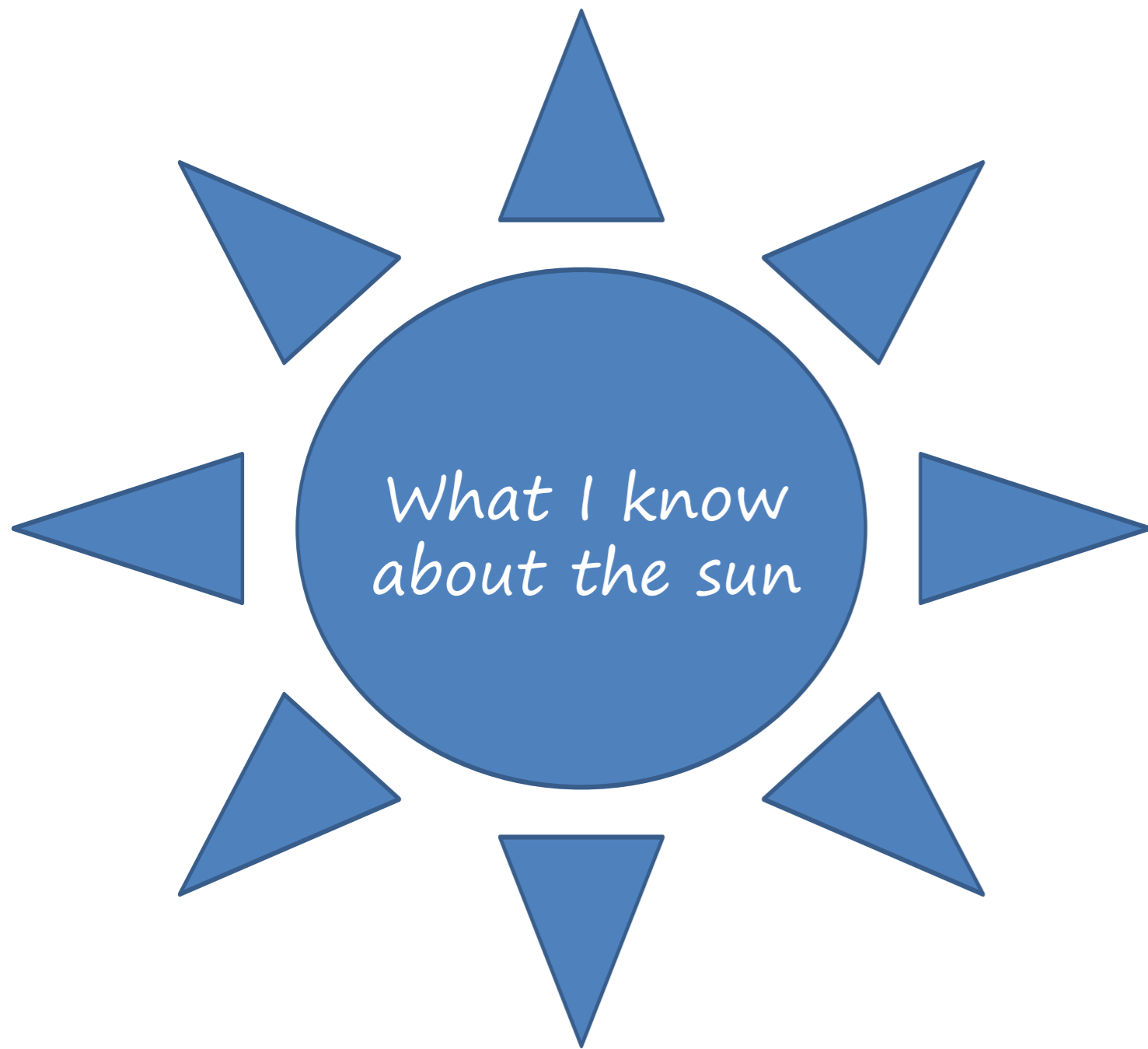
Note to teachers:
New Zealand SunSmart timing is especially between 10am and 4pm from September to April. This may differ on some international videos.

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

The sun		
K	W	L



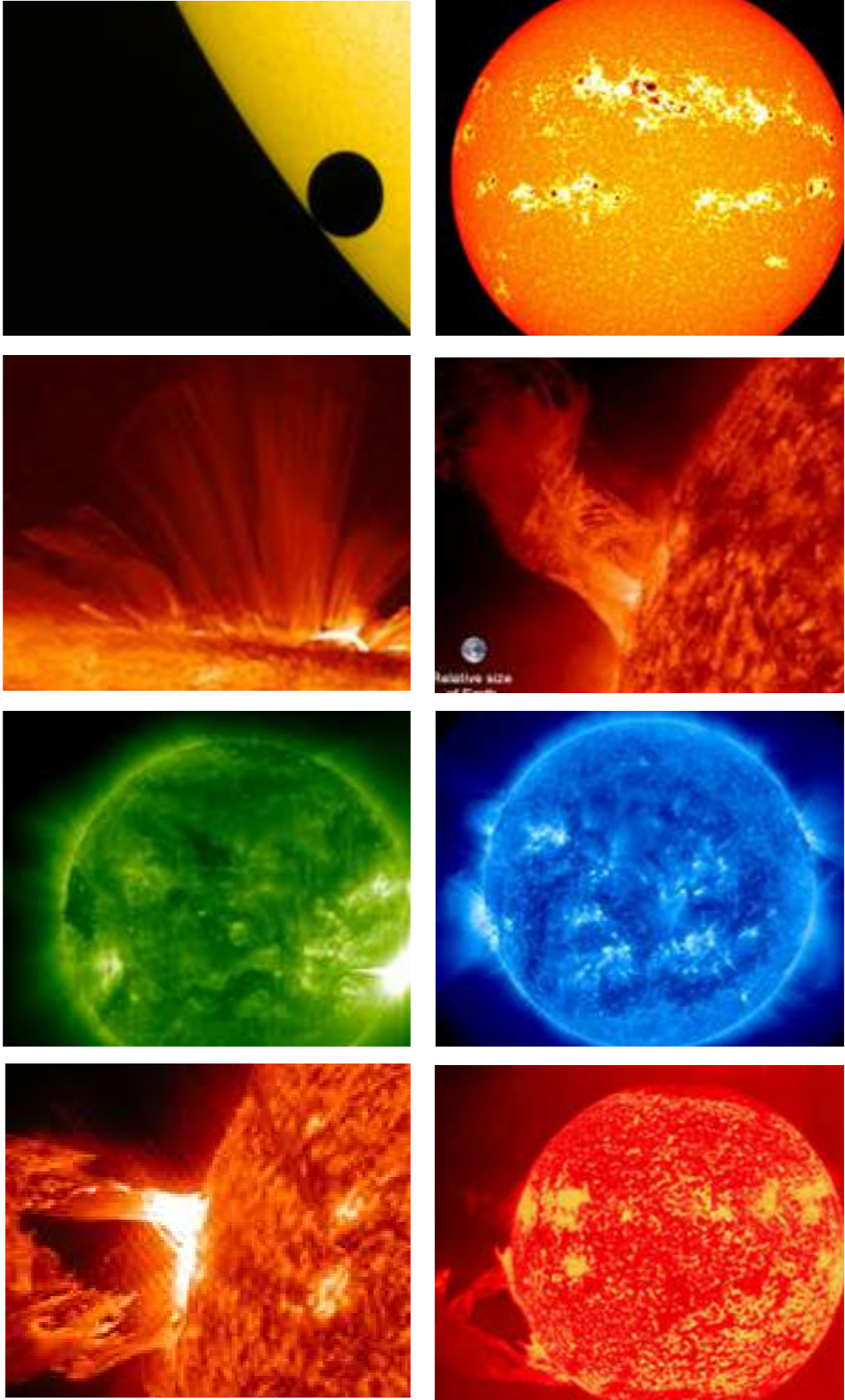
Lesson 9, Resource 14a
What I know about the sun



Lesson 9, Resource 14b
Our questions about the sun



Assessment Opportunities	Structure
<p>Lesson 10</p> <p>We are successful when we can:</p> <ul style="list-style-type: none">• share and think about what we already know about the sun• use information from charts and videos to understand how powerful the sun is• explain that the sun (energy) makes things happen/changes things e.g. burns/fades/heats objects• use what we know to make SunSmart choices.	<p>Lesson 10</p> <p>The sun is very powerful, and we must think about and respect this energy. Scientists study the sun and use technology to capture still and moving images of the sun. We can learn by watching and thinking about what these images show us.</p> <p>Learning intentions</p> <p>We are learning to:</p> <ul style="list-style-type: none">• share what we already know about the sun• learn from our classmates and experts about the sun• think about how information about the sun helps us to make sensible SunSmart choices. <p>Prepare:</p> <p>Preview this NASA clip of the sun https://www.youtube.com/watch?v=bM7bcSD4K8o&feature=youtube_gdata</p> <p>This clip is important. The previous activities in Lesson 9 used graphic/cartoon representations of the sun. There is a need to connect students with the real in order to build curiosity through the awe and wonder that this clip generates. The clip provides reinforcement of what has been previously explored but adds depth through introducing powerful, dynamic images and vocabulary. The clip could be used to help write a class description/story. The scope for science-specific words in combination with figurative language promotes learning.</p> <p>Connect:</p> <p>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.”</p> <p>Activate:</p> <ul style="list-style-type: none">• View Surface of the Sun As You’ve Never Seen It https://www.youtube.com/watch?v=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? <p>Demonstrate:</p> <ul style="list-style-type: none">• Talk about how the sun is always there, every day, so we forget to even think about it. Ask how the scientists who study the sun are able to make us think about the sun.





The surface of the sun as you've never seen it

Structure

- Draw students' attention 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. The different colours shown in the images are as a result of the different filters used to get sharper images. In groups, students share their images and why they have made their particular representation (teacher to model this process – [Resource 15](#)).

Assessment Opportunities

Lessons 11–16

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.

Overview

Lessons 11–16

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 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.
- We are investigating how to make and use a sundial.

Lesson 11

This lesson has two parts. Both parts to be set up on the same day or 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 11: 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?

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 16).
- 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.

Investigating the effect of sunlight on paper	
Our predictions Start date	Our observations End date

Structure

Lesson 11, Part B

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

Procedure:

Connect:

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

Activate:

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

Demonstrate:

- Divide students into three groups. Give each group time to look carefully at their specimen. Ask them to look at the leaves. What do they look like? Are they the same size? How are they joined to the stem? What colour are they? Use the opportunity to identify plant parts. What is under the soil? (Roots, etc.) (Complete Resource 17).
- 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 to describe leaf colour. Record (as shown on next page).
- Place one plant in direct sunlight, one in indirect light and the other in a dark place where there is no sun (e.g. in a cupboard or in a box).
- Take photos of each plant every 2–3 days for 2 weeks and make a wall display of the picture diary. Record student plant progressions 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 or a whole-class reporting-back time.

Synthesising Part A and Part B

- Reiterate 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.....

Lesson 11, Part B

Record sheet

<div>In the sun/no sunlight/shade</div> <div>DAY __ : DATE</div> <div><div>Insert Photo</div></div> <div>Measurement of biggest leaf:</div> <div>Colour of biggest leaf:</div> <div>Measurement of smallest leaf:.....</div> <div>Colour of smallest leaf:.....</div> <div>Height of plant.....</div>	<div>In the sun/no sunlight/shade</div> <div>DAY __ : DATE</div> <div><div>Insert Photo</div></div> <div>Measurement of biggest leaf:</div> <div>Colour of biggest leaf:</div> <div>Measurement of smallest leaf:.....</div> <div>Colour of smallest leaf:.....</div> <div>Height of plant.....</div>	<div>In the sun/no sunlight/shade</div> <div>DAY __ : DATE</div> <div><div>Insert Photo</div></div> <div>Measurement of biggest leaf:</div> <div>Colour of biggest leaf:</div> <div>Measurement of smallest leaf:.....</div> <div>Colour of smallest leaf:.....</div> <div>Height of plant.....</div>
<div>In the sun/no sunlight/shade</div> <div>DAY __ : DATE</div> <div><div>Insert Photo</div></div> <div>Measurement of biggest leaf:</div> <div>Colour of biggest leaf:</div> <div>Measurement of smallest leaf:.....</div> <div>Colour of smallest leaf:.....</div> <div>Height of plant.....</div>	<div>In the sun/no sunlight/shade</div> <div>DAY __ : DATE</div> <div><div>Insert Photo</div></div> <div>Measurement of biggest leaf:</div> <div>Colour of biggest leaf:</div> <div>Measurement of smallest leaf:.....</div> <div>Colour of smallest leaf:.....</div> <div>Height of plant.....</div>	<div>In the sun/no sunlight/shade</div> <div>DAY __ : DATE</div> <div><div>Insert Photo</div></div> <div>Measurement of biggest leaf:</div> <div>Colour of biggest leaf:</div> <div>Measurement of smallest leaf:.....</div> <div>Colour of smallest leaf:.....</div> <div>Height of plant.....</div>

Lesson 12

Assessment Opportunities	Overview
<p>Lesson 12</p> <p>We are successful when we can:</p> <ul style="list-style-type: none">• explain how we can use words and numbers to measure how hot or cold a place is• understand when a thermometer is hot or cold• read the numbers on a thermometer• compare temperature readings• explain why it is important to time how long the investigation lasts• explain the relationship between exposure to the sun and temperature.	<p>Lesson 12</p> <p>We are investigating how quickly sunlight can heat water in different-coloured containers.</p> <p>Students will be using different ways to collect and record their observations. The first part of the lesson they will be building their investigation skills ready to use in the second part.</p> <p>Part A</p> <p>Learning intentions</p> <p>We are learning to:</p> <ul style="list-style-type: none">• use our sense of touch and sight to identify the difference between two cups of water• use a thermometer to measure temperature• use words and numbers to describe the change• record results.
<p>Structure</p> <p>Prepare:</p> <p>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).</p> <ul style="list-style-type: none">• Organise groups of four. <p>Connect:</p> <ul style="list-style-type: none">• Refer to previous experience and outcome of Lesson 11. What did you notice about how the sun affects plants? What caused the changes? <p>Activate:</p> <ul style="list-style-type: none">• In the first part of the lesson, we are going to practise using our sense of touch to describe the temperature of hot and cold water.• First, we are going to use our fingers and words. Then we are going to use a thermometer and numbers.• Distribute one cup of very cold water to each group. Ask students to take turns testing the temperature using their finger. Ask them to share their describing words with members of their group.• Discuss how, when we use a finger, we can only use words (warm, hot, cold, etc.). List words on teacher chart.• Have students circle correct words on their recording sheet (Resource 18).• 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 starts 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. <p>Demonstrate:</p> <ul style="list-style-type: none">• 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. <p>Consolidate:</p> <ul style="list-style-type: none">• 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:


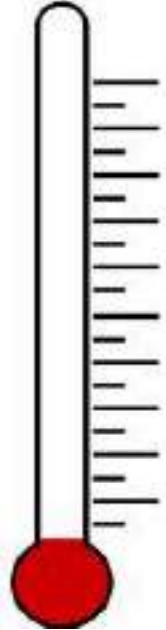

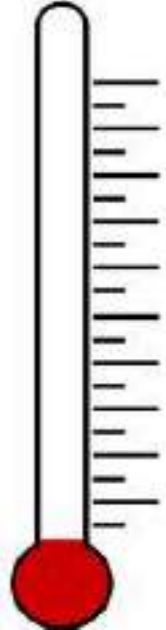
- use words and numbers to describe change
- use a watch/timer
- record results
- decide if data shows that the sunlight changes the water.

Prepare:

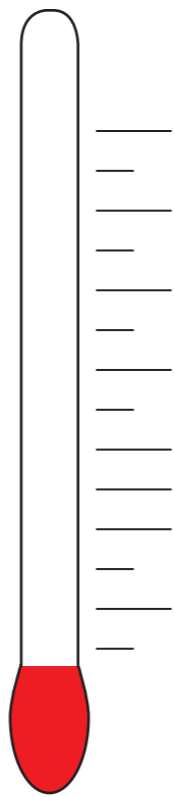
Each group needs: four empty aluminium cans; four rubber bands; four sheets of paper (one white, one black plus two from a selection of colours, cut to size so that can is able to be wrapped in paper and secured by rubber band); thermometer; jug of water; towels for spills; recording sheet for each student (Resource 19).

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. 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 the 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 temperature 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 11.

<div>Cold water</div> <div></div>	<div>Describing words</div> <div>Cold</div> <div>Warm</div> <div>Freezing</div> <div>Icy</div> <div>Hot</div> <div>Chilly</div>	<div>Thermometer</div> <div></div>
<div>Hot water</div> <div></div>	<div>Describing words</div> <div>Cold</div> <div>Warm</div> <div>Freezing</div> <div>Icy</div> <div>Hot</div> <div>Chilly</div>	<div>Thermometer</div> <div></div>

Our Can:



Assessment Opportunities

Lesson 13

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.

Structure

Lesson 13

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 how the more energy that is absorbed, the faster change can happen. In these explorations, students can experience how darker colours can absorb more energy. It is good to wear dark clothing as it absorbs more of the sun's UV rays.

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 articulating that the sun's energy (heat and light) is able to change things?
- After review and discussion, each group sets out their coloured paper on a grassy surface. Avoid placement on concrete or asphalt as their stored heat 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 14, Parts A, B, C and D
Science Experiences

Assessment Opportunities	Overview Lesson 14, Parts A, B, C and D
Lesson 14 We are successful when we can: <ul style="list-style-type: none">share and use what our group knows about shadowsrecord data using drawing and photosuse the results from our shadow investigation to identify patterns made over timemake links to previous learning about the sun and its energy.	Lesson 14 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: <ul style="list-style-type: none">share our thinking about shadows using drawings and discussionthink about how investigating shadows can change or add to what we know about how the sun worksuse photos to gather and think about evidenceuse our evidence to predict what will happen nextidentify that changes need time to take placeidentify that some changes form a patternthink about how gathering data helps us to be better observerscheck whether there is a link between shadows and temperatureuse our observations to make links between how humans and other living things behave in the sun.

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

Lesson 14, Part B

Structure
Part B (Beginning of a sunny school day) We are learning to: <ul style="list-style-type: none">use photos to gather and think about evidenceuse our evidence to predict what will happen nextidentify that changes need time to take placeidentify that some changes form a pattern. Prepare: <ul style="list-style-type: none">SunhatsChalk – several different coloursCamera Procedure: <ul style="list-style-type: none">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 14, Parts C and D
Science Experiences

Lesson 14, Part D, Resource 20
Observation chart

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.

Part D
We are learning to:

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

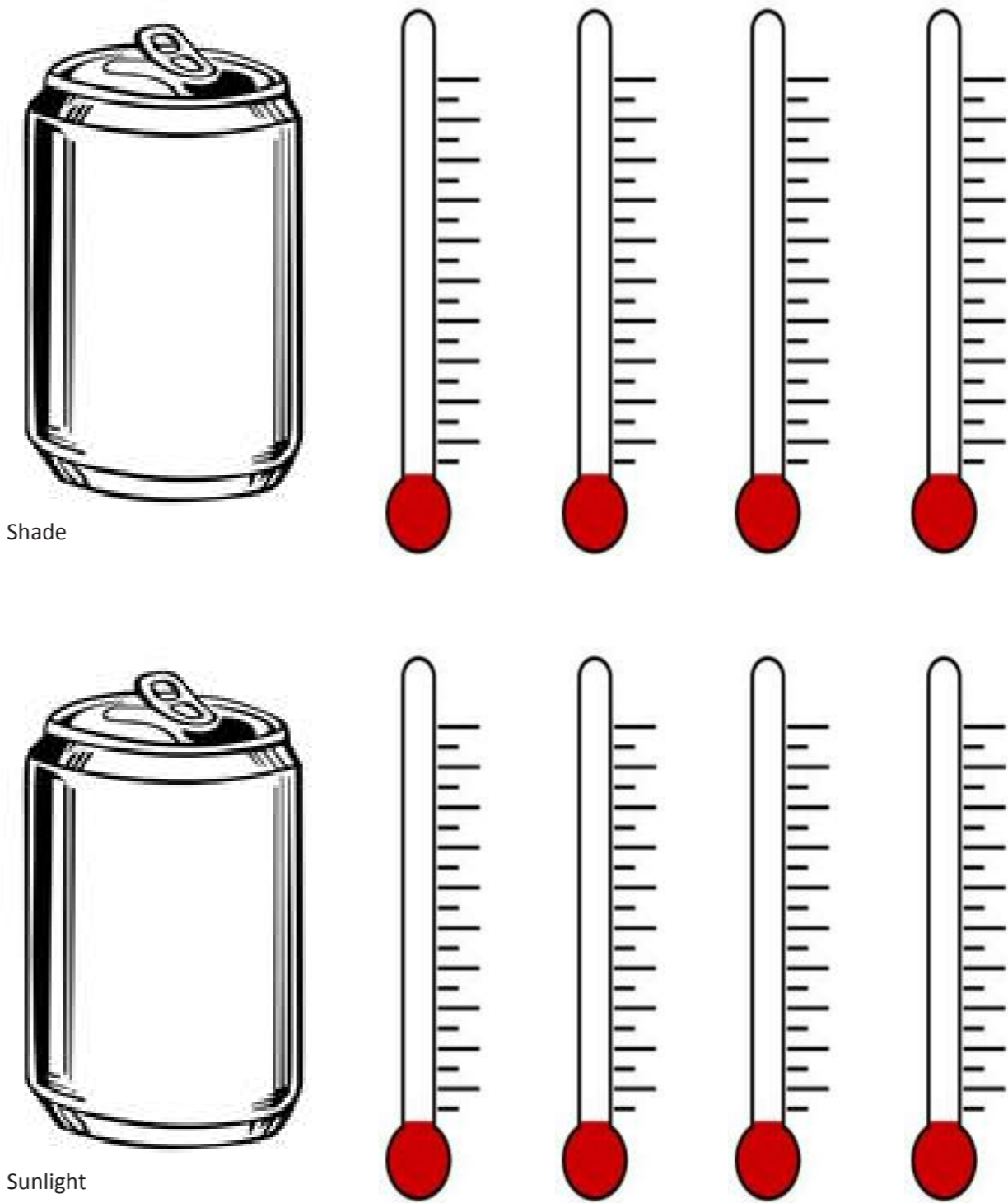
Prepare:

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

Procedure:

- To further reinforce the effect of blocking the sun, have each group place two soft-drink cans that are covered in black paper and filled with 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 20) to record data.
- Let students share the outcomes in their working groups.
- Write a class explanation.

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



Lesson 15
Making a sundial

We are investigating making and using a sundial.

Assessment Opportunities	Structure
<p>We are successful when we can:</p> <ul style="list-style-type: none">make and use a sundial to observe how the shadows produced can indicate the passage of timeuse photos to capture the stages as we make our sundialuse photos to capture the different stages of how our sundial worksrecord our data and thinking on a table/chartuse our observations to predict and justify the next position and the length of a shadow on our sundialshare data with our group/class and discuss how sundials can be used as timekeepersrecognise the connection between the length of a shadow and the position of the sun.	<p>Lesson 15</p> <p>Prepare: Enough paper plates and straws so that there is one for each student.</p> <p>Connect:</p> <ul style="list-style-type: none">Explain to students that they will make sundials and collect data based on their observations.Teacher to model steps for making the sundial.Distribute materials.Students to locate centre of the paper plate and mark (provide templates for the group to use).Students divide the circumference of the circle into quarters, making a mark at each of the four points.Make one mark longer than the others. These marks will help the students reposition their sundials when collecting data throughout the day.Students make 4.20 mm cuts in one end of the straw.Splay the cuts of the straw and tape to the centre of the plate. The straw should be perpendicular to the surface of the plate.Cut the straw to 60 mm length. <p>Activate:</p> <p>Day One: work in groups</p> <p>The tracing of the straw shadow will need to be done at regular intervals, e.g. every 2 hours, starting as soon as possible to 9am.</p> <p>Use Resource 21 to record your findings.</p> <ol style="list-style-type: none">Place sundials in a sunny spot on the asphalt/concrete in the playground.Make strong chalk marks on the asphalt/concrete at the four quarter points of the sundial edge (demonstrate).Ensure one of the chalk marks is longer so that the sundials can be correctly repositioned.Draw around the straw's shadow with a pencil. Darken the shadow and record the time at the top of the shadow.Record on data table/chart where the sun is in the sky. Warn students NOT to look directly at the sun.Measure the shadow length and add to data sheet.Repeat the process at times decided e.g. every 2 hours on the hour.In groups, students to predict and justify where they think shadows will fall in the afternoon, e.g. 2pm (looking for and identifying patterns).Using a different-coloured pencil, have students outline the predicted shadow on their sundials. <p>Day Two:</p> <ol style="list-style-type: none">At 2pm, place the sundials in their original locations, aligning the marking points.Students to check if their predictions are correct.Students to trace the actual shadow.Record question prompts (Resource 22). In their groups students discuss their group findings. Students use their worksheet during this discussion.

Lesson 15, Resource 21

Sundial data _____
Group members _____



TIME	SHADOW LENGTH (Remember to measure from zero!)	POSITION OF SUN (Remember – do not look directly at the sun)
1.		
2.		
3.		
4.		
5.		

Time of longest shadow? _____ Time of shortest shadow? _____

Sundial investigation

What we observed

Our thinking

Group members:

What did the shadows do?

When was the shadow the longest? Where was the sun?

When was the shadow the shortest? Where was the sun?

Why do you think the shadows change length? How can you explain what you are observing?

How could you use a shadow to tell the time of day?

How accurate were your predictions?

Our observations make us think:



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

What can we learn from myths and legends about the power of the sun? What have we learnt from our science experiences about the energy of the sun?

Assessment Opportunities	Structure	Curriculum and Resource Links
<p>We are learning to:</p> <ul style="list-style-type: none">ask questions and find answers from othersgather, sort and count answers from othersshow the results in a tablediscuss the resultsuse the results as a basis to decide a course of action.	<p>Connect:</p> <p>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. Rabbits and possums go outside during the evening to feed in order to avoid the hot midday sun. We have found out that the sun can melt things. We have found out how to use the sun to help us to tell the time. And, we have also found out that plants, like humans, also change colour when they have less or more sunlight. Let's find out how you like to protect yourself from the sun. (Teacher may like to show students Resource 23 to identify the ways they protect themselves.)</p> <p>Activate:</p> <p>Show Resource 23. Survey class and count up responses and choose the most popular.</p> <p>Demonstrate:</p> <ul style="list-style-type: none">Teacher draws a tally chart on the board. Students look at Resource 23 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.Which option has the most ticks from students in the class?Teacher takes a photograph of the final tally chart as a record. Teacher works with students to draw a simple graph of the results. <p>Consolidation:</p> <p>Big question: What type of sun protection would ensure our head and face is protected from the sun?</p> <p>Wearing a hat is the best way to protect our whole body.</p> <p>How much shade protection do we have at our school?</p>	<p>Pedagogical links:</p> <ul style="list-style-type: none">Creating a supportive learning environmentEncouraging reflective thought and actionEnhancing the relevance of new learningFacilitating shared learningMaking connections to prior learningProviding sufficient opportunities to learnE-learningEngaging Māori and Pāsifika students and their communities <p>Key competencies:</p> <ul style="list-style-type: none">ThinkingUsing language, symbols and textsManaging selfRelating to othersParticipating and contributing <p>Literacy:</p> <ul style="list-style-type: none">English and Te Reo vocabulary buildingOral and visual cues to inform thinkingSharing ideas and preferences <p>Numeracy:</p> <ul style="list-style-type: none">Statistics

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

Structure

Prepare: Resources 24a, 24b, 25 and 26 and information at <http://www.sunsmartschools.co.nz/schools/hats>

Connect:

We have identified that hats in dark colours are a great way to protect our head and face from the sun. We have also found that, if a hat is to provide the best protection, it must cover our **face, neck and ears**.

Inquiry: What can we do at this school to protect our head, face and eyes? How can we encourage members of our school community to wear a hat that will protect their face, neck, ears and head?

Activate:

Resources 24a and 24b, 25 and 26

Dictagloss

1. Dictation. Students are given Resource 24a. The teacher reads the text (Resource 24b) at a speed a little bit slower than native speaker speed. Students are encouraged to listen and write down any word/a picture that describes what the information is about. The purpose is to get the main ideas.
2. The teacher then reads the text for a second time at native speaker speed. On this second reading, students individually make very brief notes (words) or draw pictures about the main ideas. Remember that the purpose is to get the main ideas, not every word exactly as it appears in the text, so do not read too slowly.
3. Reconstruction. The students work in pairs and then fours to compare notes and pictures. They write or draw a shared version of the text, adding in words and or pictures to ensure they have included the main ideas.
4. The teacher reads the text for a final time. Students can add to their shared version. Students then Blu Tack their shared version to the wall. The students view the shared versions (in silence) as if they are in an art gallery.
5. Students then compare their reconstructions with other groups and with the original. Teacher leads discussion of the differences.

Demonstrate:

The Cancer Society recommends that staff and students wear hats that provide good shade to the face, back of the neck and ears.

The teacher then tries on a cap. Will this protect my face, back of the neck and ears? No?

The teacher tries on a broad-brimmed hat. Will this protect my face, back of the neck and ears? Yes?

This is called a broad-brimmed hat. If we have to wear a broad-brimmed hat, what kind of designs are broad-brimmed? Which ones do you like or would you wear? (See Resource 25.) How could you make the broad-brimmed hat look funky or cool for students to wear? How could you make the broad-brimmed hat look funky or cool for teachers to wear?

Students are given three large A4-sized copies of their chosen hat (see Resource 26). They have three copies so that they can experiment and do draft copies. They then make adaptations including colours and designs on the hat to make them more attractive for students and teachers to wear.

Think, pair, share

In pairs, students share their designs. They make suggestions to each other about improvements.

- What is good about the design?
- What and how could the design be improved?
- Who do you think will wear it? (Students, teachers, males, females, etc.?)

Using the feedback from peers, students make the adaptations.

In groups of four, students share their design and get feedback from the others.

Gallery

Students then place their designs in a gallery (as they did for the dictagloss exercise). Students view each other's work. Teacher leads discussion about what they liked/didn't like.

Dictagloss

1. Dictation

Your teacher will read aloud a piece of information to you three times. The first time the teacher reads aloud the information, you need to listen carefully, and if you want to, you can write down any words or draw quick pictures about the main ideas in the box below.

The second time the teacher reads aloud the information, you can write down more words or draw more pictures about the main ideas. Remember that the purpose is to get the main ideas, not every word exactly as it appears in the text.

The last time the teacher reads aloud the text, you will be able to make final changes.

MAIN IDEAS IN THE TEXT:

2. Reconstruction

Working in pairs, and then fours, compare your notes and pictures. Write or draw a shared version of the text, adding in words and or pictures to ensure you have included the main ideas.

3. Analysis and correction

Your teacher will read aloud the text one more time so that you can make any final adjustments. Your group will then put your shared version on the wall with Blu Tack.

4. Gallery

Imagine that you are in an art gallery. No-one is to talk. All you have to do is move around the room and look at the shared reconstructions of the text.

5. Compare your reconstructions with the others. Discuss the differences.

Dictation text:

The Cancer Society of New Zealand recommends that all students and staff should wear broad-brimmed or bucket hats or a cap with flaps. Hats need to provide good shade to the face, back of the neck and ears when outdoors.

This is because the most common areas for skin damage and skin cancer are the neck, ears, lips, face and nose. These areas of our bodies are constantly exposed to the sun. They receive more ultraviolet radiation than other parts of the body.

A hat can also provide some UV radiation protection to the eyes.

Wearing a hat is one of four SunSmart behaviours recommended by the Cancer Society to protect our body. The other SunSmart things to do are:

Slip on a collared long-sleeved shirt and into the shade

Slop on sunscreen

Slap on a hat and

Wrap on sunglasses

Ultraviolet radiation levels are the most dangerous between 10am and 4pm in terms 1 and 4 of the school year. Staff and students need to wear their hats whenever outside at school during these times.

Which type of hat do you like?



Legionnaire hat



Bucket hat



Broad-brimmed hat



Broad-brimmed hats should have a brim at least 7.5 cm wide. A broad-brimmed hat that provides good shade can considerably reduce UV radiation exposure to the face.



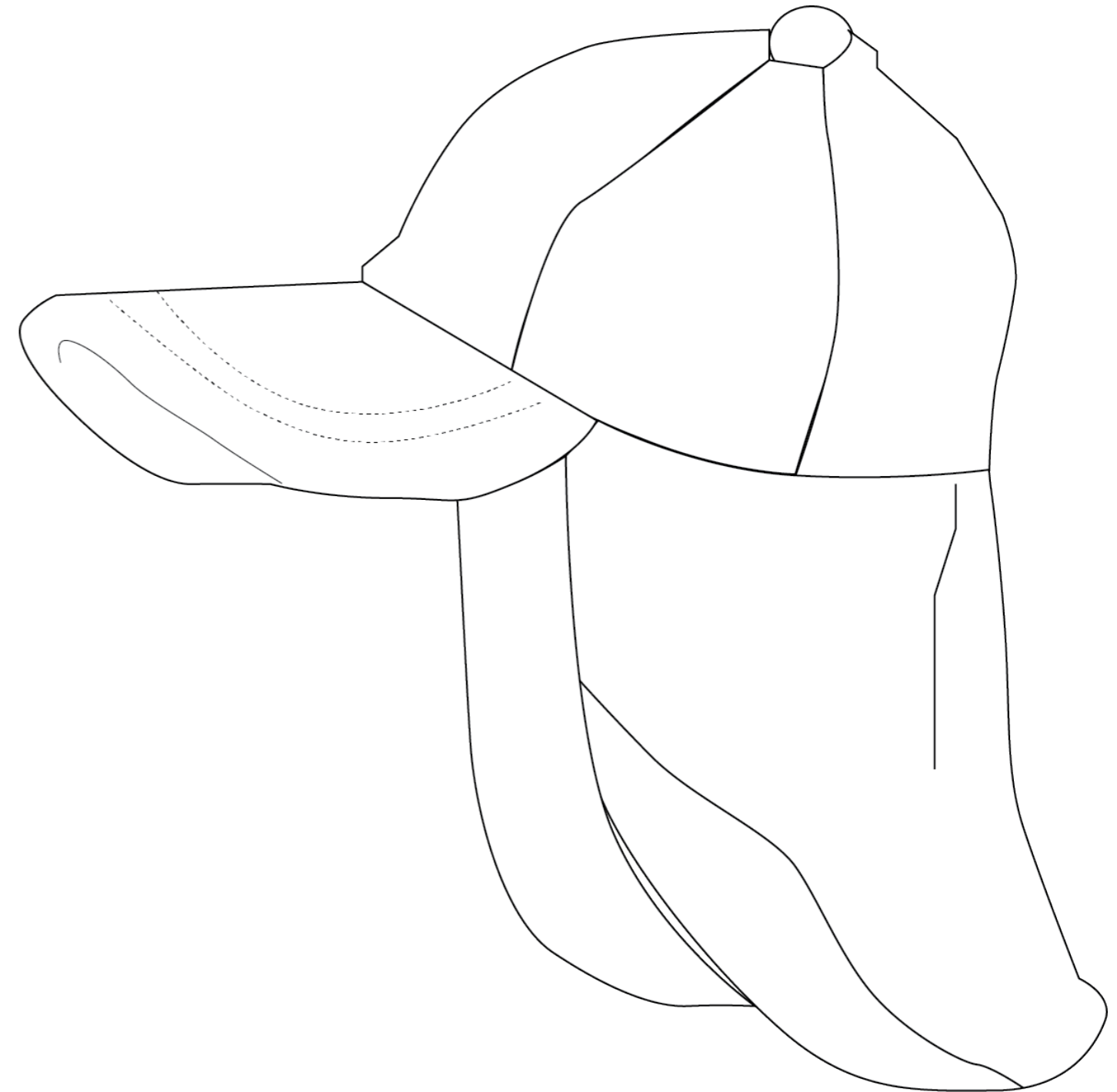
Bucket or surfie-style hats must have a deep crown and sit low on the head. The angled brim should be at least 6 cm to provide the face, neck and ears with plenty of protection from the sun. Please note that brims need to be measured from the rim on the inside of the hat.

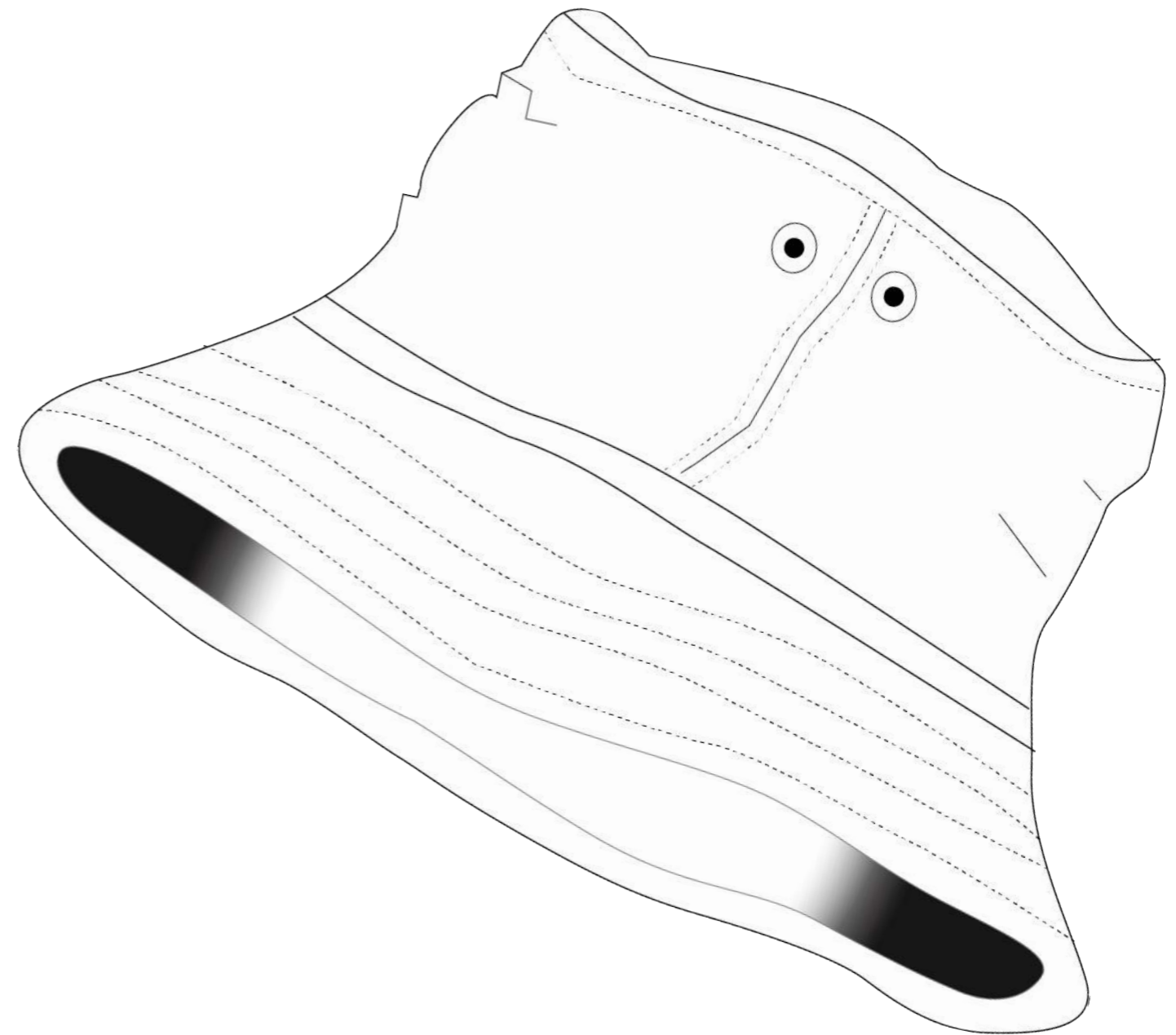
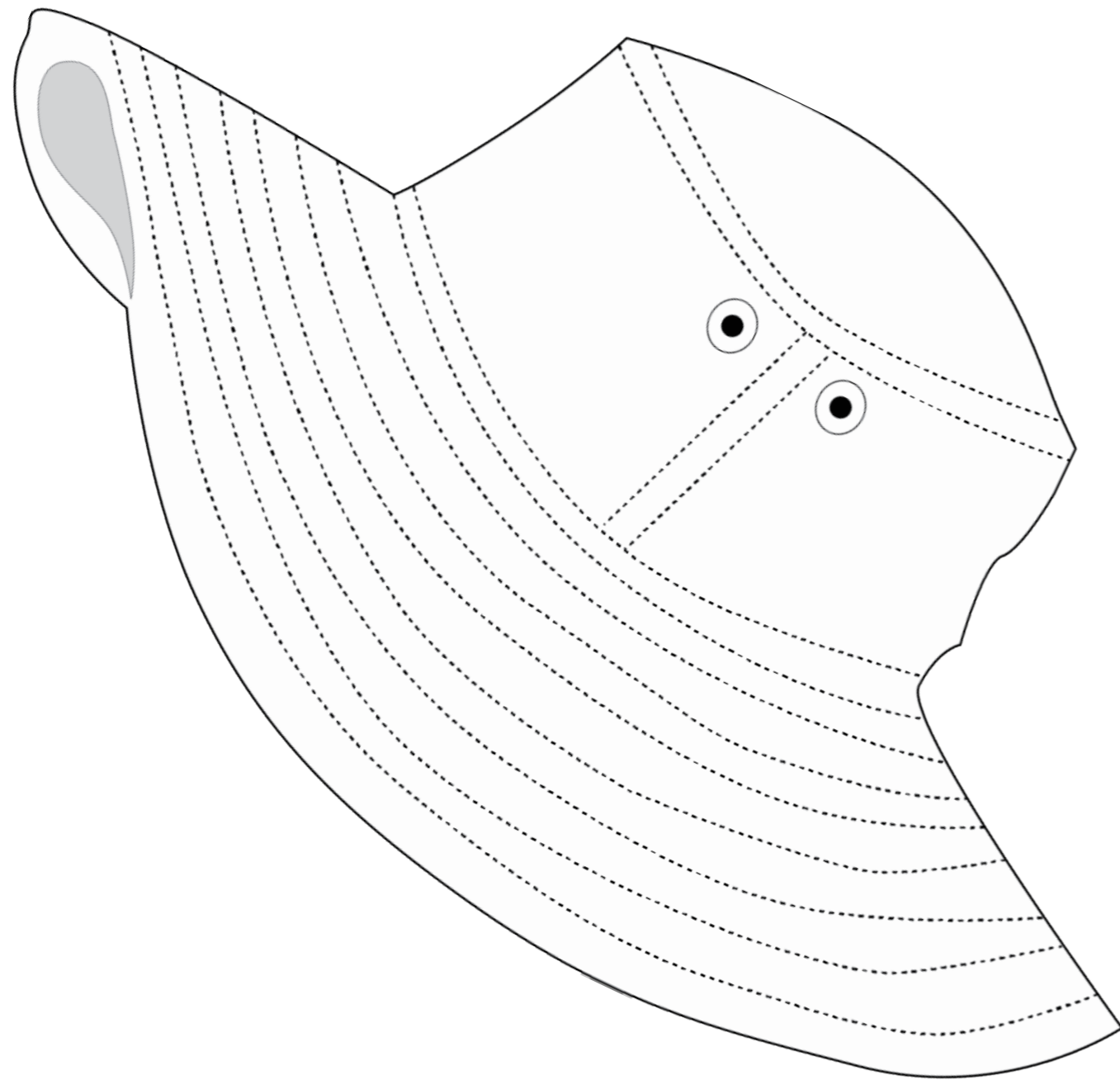


Legionnaire-style hats should have a flap that covers the neck and meets the sides of the front peak to provide protection to the side of the face.

Baseball caps and sun visors are NOT recommended as they leave the ears and back of the neck exposed.

How could you make your hat look more funky/fun to wear?





Lesson 18
Evaluation

Consolidation Lesson 18

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

Overview: Today we are evaluating our actions to improve our use of sun protection for our heads and faces in our school.

Assessment Opportunities	Structure	Curriculum and Resource Links
<p>We know we are successful when we can:</p> <ul style="list-style-type: none">clearly explain our inquiry, what we did and the resultsidentify and carry out actions that encourage people to make the school a healthy placeidentify key words and use them in our presentation about sun-safe approachesgive and receive constructive feedbackmake changes to our presentation based on the feedbackexplain events in terms of a timelinereflect on our learning about sun-safe practicesidentify our next steps.	<p>Prepare:</p> <ul style="list-style-type: none">Display of hat designs from lesson 17PowerPoint of hat designs from display (teacher to make). <p>Connect:</p> <ul style="list-style-type: none">Remind students about the inquiry “What type of sun protection would ensure our head and face is protected?” <p>Activate:</p> <ul style="list-style-type: none">Look at the photographic display of students’ hat designs.Watch the PowerPoint of the designs in the display.Write down/draw the challenges and how we overcame them.Write down/draw the successes and how we overcame them.Write down/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, successes and hard-to-achieve events above drawn in on the timeline (teacher may have to lead) and a big star for the thing that was hardest to achieve.How could we find out which hat design people in our school would like to wear?Brainstorm how we could share our designs with others. <p>Display student hat designs for the board of trustees, staff, senior management, whole school at assembly, during parent-teacher interviews/conferencing etc. and in the library or hall. School community given chance to vote by placing sticker next to the hat design they like.</p>	<p>Pedagogical links:</p> <ul style="list-style-type: none">Creating a supportive learning environmentEncouraging reflective thought and actionEnhancing the relevance of new learningFacilitating shared learningMaking connections to prior learningProviding sufficient opportunities to learnE-learningEngaging Māori and Pāsifika students and their communities <p>Key competencies:</p> <ul style="list-style-type: none">ThinkingUsing language, symbols and textsManaging selfRelating to othersParticipating and contributing <p>Literacy:</p> <ul style="list-style-type: none">English and Te Reo vocabulary buildingLanguage development and developing an understanding about interpersonal communication skill development through focused small group discussionOral communication and public speaking skillsSeeks feedback and makes changes based on recommendationsGathering, reading and interpreting information to form conclusions about the survey

Lesson 19
Presentation

Structure	Curriculum and Resource Links
<p>Demonstrate:</p> <ul style="list-style-type: none">Teacher discusses with students and models what makes an effective speaker when delivering a report to a group, i.e. speak clearly, in a loud voice, stand up straight and still and look at our audience when we talk.How to introduce themselves in Te Reo Māori.Teacher draws following on whiteboard (SEE) as prompt for students and goes over it with them. <p>S State what your main question is. What type of sun protection would ensure our head and face is protected from the sun? What is the action the class chose?</p> <p>E Explain the steps, challenges, and how you overcame them (arrow to the timeline on the board to remind them).</p> <p>E Examples of what you have learnt as a result:</p> <ol style="list-style-type: none"> <ul style="list-style-type: none">Example of the hat you have designed.What others thought about your hat design.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 SEE prompt.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. <p>Consolidation: We want to tell our community that we have designed sun-safe hats. In the previous lesson, we have decided on the best way to do this, and we will put it into action. This includes a presentation, school newsletter, PowerPoint of photos and commentary for board of trustees, parents, peers, assembly, local paper etc. or play/song/cartoon.</p>	<p>Numeracy:</p> <ul style="list-style-type: none">Concept of a timeline, statistical investigation

Lesson 20
Presentation

Lesson 20
Sharing our information/conclusions

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

Assessment Opportunities	Structure	Curriculum and Resource Links
<p>We know we are successful when we can:</p> <ul style="list-style-type: none">• speak clearly, in a loud voice, stand straight and still and look at our audience when we talk• use key words in our presentation• reflect on our learning about sun-safe practices• evaluate the impact that our presentation has had on others.	<p>Connect:</p> <ul style="list-style-type: none">• 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. <p>Activate:</p> <ul style="list-style-type: none">• Allow students the opportunity to practise in the venue where they will be delivering their presentation. <p>Demonstrate:</p> <ul style="list-style-type: none">• Teacher introduce 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. <p>Consolidation:</p> <ul style="list-style-type: none">• Reflect on what went well for us, what we could improve, what we have learnt as a result.• Again, teacher should video performances as evidence for National Standards.	<p>Pedagogical Links:</p> <ul style="list-style-type: none">• Creating a supportive learning environment• Encouraging reflective thought and action• Enhancing the relevance of new learning• Facilitating shared learning• Making connections to prior learning• Providing sufficient opportunities to learn• E-learning• Engaging Māori and Pāsifika students and their communities <p>Key competencies:</p> <ul style="list-style-type: none">• Thinking• Using language, symbols and texts• Managing self• Relating to others• Participating and contributing <p>Literacy:</p> <ul style="list-style-type: none">• Language development and developing an understanding about interpersonal communication skill development through focused small-group discussion• Oral communication and public speaking skills• Seeks feedback and makes changes based on recommendations• Gathering, reading and interpreting information to form conclusions.

Resource 27
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 27

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 27

Group work – what works

9. Stress the importance of attendance

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

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

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

11. Reward often

Use both extrinsic and intrinsic rewards.

12. Provide frequent specific feedback on the task

13. Monitor the progress of the groups

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

14. Everyone has a role to play

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

15. Be patient

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

Resource 27

Group work – what works

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 27

Group work – what works

3. Feedback on group work

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

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

Individual	Grade 1–5	Group	Grade 1–5
1. I had a positive attitude when working with the group		The group had a positive attitude	
2. I was generous with praise for others in my group		My group was generous with praise for each other	
3. I listened while others talked		My group listened while others talked	
4. I took my turn to contribute and talk		We took turns to contribute and talk	
5. I looked at people when I talked to them		We looked at people when we talked to them	
6. I joined my group quickly		We joined our group quickly	
7. I took responsibility for my own behaviour		We took responsibility for our own behaviour	
8. I took responsibility for the behaviour of my group members		We took responsibility for the behaviour of our group members	
9. I worked together with the others to ensure that we swam rather than 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	

Resource 27

Group Work – What Works

4. What group work strategies are effective in your group?

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, self-evaluation (student and teacher)

Resource 27

Group Work – What Works

5. Strategies for effective group work

- 1. Group size
Maximum 5 – 3 or 4 is 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.

Resource 27

Group work – what works

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 27

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								

Resource 27

Group work – what Wworks

How to monitor the UV Index Board



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:

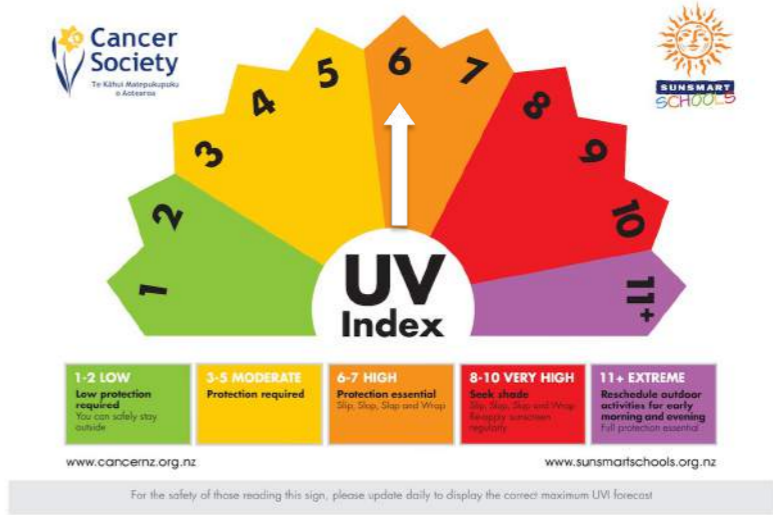
	Creative group problem-solving	Planning and organising	Decision-making	Negotiating curriculum	Research	Resolving conflict	Accepting others' differences	Being trustworthy
Student								
Peer								
Teacher								

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:

- Go to <http://www.niwa.co.nz/UV-forecasts>
- Click on the nearest town/city to your school
- 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
- 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.
- 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/>

Steps to becoming a SunSmart school



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 school’s 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/gymnasias 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 school’s 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 _____

