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| Unit Title  “Hot, hot, hot” | Stage  2 (Year 3) |
| Term  2 | Strand  Physical World |
| Duration  10 weeks (90 minutes per lesson) | Sub-strand  Heat can be produced in many ways and can move from one object to another. (ACSSU049) |

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| **Rationale**  **This unit has been developed to meet the outcomes of both the NSW Syllabus and the Australian Curriculum which aims to ensure students have a variety of hands on experiences that are integrated across the curriculum. It focuses on inquiry so students are responsible for constructing their own learning and are able to pursue their interests and develop their own understanding of scientific concepts. This unit of work has considered the importance of incorporating the Early Years Learning Framework (DEEWR, 2009) and the pedagogy of play into the classroom.**  **The unit of work has been based on the constructivist approach to learning. Teachers will combine aspects of them in different ways to provide students with learning experiences that meet their needs and interests. “Primary students enjoy science when it is student centered, their ‘voices’ are heard, and there is a focus on investigation” (Skamp, 2012).**  **Technology (ICT) has been consisted in the unit of work and students have been able to use it appropriately to convey their investigations, experiments and predictions. It allows students to be able to effectively produce written work in a creative manner using “Edmondo” which has addressed students’ needs and interests. “Using ICT in science does have a strong motivational effect and can engage attention as well as fulfil other roles” (Ball, 2003).**  **The classroom has been setup in a manner that allows students to take on a role as a scientist. This is demonstrated through observations, exploration, predictions and investigation. This unit allows students to work independently, in groups and as a whole class.**  **Students will benefit through scaffolding throughout lessons ensuring they meet their Zone of Proximal Development (Vygotsky, 1978).**  **Students will develop an understanding that Aboriginal peoples and Torres Strait Islanders peoples have particular ways of knowing their environment. This will be demonstrated through lessons and activities based on the 8 ways of learning. Students will have opportunities to learn that Aboriginal peoples and Torres Strait Islander peoples have developed knowledge about the world through:**  **• Observation**  **• using all the senses**  **• Prediction and hypothesis**  **• testing (trial and error)**  **• making generalisations within specific contexts.** |

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| **Assessment – formative (during learning engagements)**  The unit of work will provide multiple and a variety of assessment strategies to suit the learning styles and needs of all students.  Assessment will include observations and conversations between students as well as conversations between teacher and students. Anecdotal records and collection of work samples will also be used to determine students understanding, support requirements and, if necessary, teacher may need to alter teaching style to meet the student’s needs.  Throughout the unit of work students will be documenting their own learning by recording using digital technologies (i.e. Ipads, videoing, photographs, word processing programs and personal responses) and uploading their learning to the Edmodo webpage.This will be accessible by all students, their parents and the teacher to review and assess student’s progress and understanding. This will be the student’s Science Journal for the duration of the unit.  This may also be used for a summative assessment at the conclusion of the unit. | **Assessment – summative (at the end)**  At the completion of the unit, students will have opportunities to demonstrate their new understanding of heat, the processes of heat and its use in everyday life. This will occur in lesson 10 (Evaluate lesson) where students will bring all their work together including:   * photographs * videos * written responses and stories * labelled drawings * Representations of data * reflections * design plans * creations   This will be displayed by students in the classroom for families to see all their work and be involved in their child’s learning process. |
| Worksample – to show understanding and achievement of outcomes | |

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| **Differentiation needs**   * Lessons will be thoroughly organised to allow for positive and progressive learning achievements. * Variety of learning materials will be provided for students * Ensure free space and consider environment when carrying out scientific exploration * Students will have the opportunity to work in groups, whole class and independently in order to carry out learning tasks. * Lessons should incorporate multi modal teaching methods and encourage scientific and technological learning. | **Skills and interests**   * Ability to record and interpret observations and data using formal and informal measurements. * The use of scientific equipment in order to work scientifically. * Observing, applying, predicting, communicating and problem solving scientific investigations. * The unit provides opportunities for students to pursue their interests through making their own choices of display, design, create, represent etc.   **Prior knowledge**   * Understanding of hot and cold. * Knowledge that the sun produces heat but still investigating how and its purpose. * Understanding of solids, liquids and gases. For example, students understand evaporation and the melting process of liquids and solids. |
| Students learn about heat in everyday living  Student learn how heat is conducted   scientific terminology  What are the forms of heat?  How does heat transfer from one object to another.  Students use mathematical knowledge  Student do role play  Use a variety of ICT and technology | **Essential skills**  Students will learn a variety of scientific inquiry skills including questioning, predicting, planning, conducting, processing and analysing data and information, communicating and evaluating.   * Question and Predict   Student will be verbalising their ideas and questions they have about heat and heat transfer. Throughout every experiment and investigation students weill be provided with opportunities to form predictions and write or draw them in their Science Journal. (ACSIS064)   * Plan and Conduct   Students will be planning real experiments and investigations that they will be carrying out to answer their questions about heat (ACSIS065)  Safely use appropriate materials, tools or equipment to make and record observations, using formal measurements and digital technologies as appropriate (ACSIS066)   * Process and Analyse data   Use a range of methods including tables and simple column graphs to represent data and to identify patterns and trends (ACSIS068)   * Communicate   Represent and communicate ideas and findings in a variety of ways such as diagrams, physical representations and simple reports (ACSIS071)   * Evaluating   Reflect on the investigation, including whether a test was fair or not (ACSIS058)  Source: Australian Curriculum, Assessment and Reporting Authority (ACARA). |
| **Related text-types**  Procedures  Explanations  Expositions (written and oral) |  |

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| **5e** | **Learning Engagement** | **Resources and preparation** | **Outcomes** |
| ***Engage*** | **Lesson 1: Introduction to the unit -‘ Feeling- heat heat heat’**   * Students will be engaged in the topic of ‘feeling- heat heat heat’ using the theme of camping- human endeavour. * Students will be encouraged to visualise (seated in a yarning circle, with camping atmosphere in the classroom), the scenario of being lost in a bush, which requires them to create heat for survival purposes. * Students discuss what is meant by the term heat and how heat is used in everyday life by creating a mind map e.g. Cooking – microwave, oven etc. or sunlight to keep warm. Students further engage themselves to the topic of heat through rotational activities/stations. * **Station 1- IWB**   Students can individually participate in a variety of online games on the IWB that introduce the concept of heat, different form of heat and how heat travels form one object to another.   * **Station 2- Heat factory**   Students independently explore and manipulate with a variety of open-ended materials such as ice, torch, pencil, wood, sand paper etc. in order to discover various concepts of heat and its production through natural and man-made materials.   * **Station 3- Cooking oats**   With the supervision of the teacher/facilitator, students explore how heat is used in everyday lives such as cooking. The teacher facilitates their learning through open-ended questions that encourages curiosity while conducting the experiment.   * **Station 4- Room temperature**   Students independently use a room thermometer to find the level of heat in different parts of the room. They record their findings using Ipad and provide reasons their results. E.g. sun shining in an area causing high heat and therefore high temperature.  To conclude the lesson, student reflects and discusses their findings with the class. | * Black bed sheet – tent * Campfire- using LED light and cellophane * Black socks – rocks * IWB activity * Thermometer * Oats * Hot water * Milk * Ice * Rubber * Paper * Wood * Sand paper * Pencils * Websites:   <http://www.learninggamesforkids.com/heat-energy-games/heat-cardflip.html>  <http://www.brainpop.com/science/energy/heat/preview.weml> | ST2-1VA  ST2-6PW  MA2-9MG  MA2- 18SP  EN2-8B  EN2-10C  DRAS2.1 |

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| ***Engage*** | **Lesson 2: All about heat**   * Looking at the KWLH chart as a class, students will continue to transfer their knowledge of heat through a shared discussion. The KWLH chart will be presented on the interactive whiteboard. * Using coloured dye and hot/ice cold water in a clear cup, students will discuss their observation of how the dye disperses differently in hot water compared to cold water. * Students will write down questions that they would like to investigate about the experiment. Students are encouraged to consider a variety of variables that contribute to the relationships of heat and it’s products. For example, using plastic cups versus glass and adding varying amounts of liquid. Students will begin developing scientific and mathematical knowledge during this experiment as they measure and compare. * Students will re visit the concept of heat and the production of heat. For example, how is heat produced and where heat is seen in everyday life, e.g. (electrical, natural heat from the sun, motion, cooking etc.) * Students will engage in a physical activity about the properties of heat. For example, the teacher will encourage students to use their senses such as touch when rubbing their hands together to create a motion, which creates heat. Students will generate questions and build new ideas of producing heat as a class, in groups or paired. * Students in groups of 4 and in station groups will engage and explore with a variety of resources and collect information using the Ipad. Students will be encouraged to use rich scientific vocabulary and add new words to existing word wall. * Students using prior knowledge, will discuss what they think heat is and look at variety of materials they believe produce heat. They will place materials under three headings ‘heat’, ‘not heat’ and ‘unsure’. * Teacher will introduce the use of Edmodo to students and at the end of each lesson, students will share with their group what they have learnt and what they found interesting. * Groups are not selected by learning ability. The purpose of this is to assess students’ prior knowledge of content material: Heat. From this the teacher will be able to allocate groups according to learning levels and ensure that learning for all students are fair and supportive. This is a form of diagnostic assessment. | * IWB with a table for KWLH chart. Students will contribute and share ideas and understandings of heat. This will be revisited before each lesson. * Coloured dye * Plastic cups and glass * Hot water (teacher will supervise and control) * Measuring cups so students ensure the correct amount of dye and water is added. * Thermometer will be used and students will predict, test and record from experiment. * Ipad * <http://www.learninggamesforkids.com/heat-energy-games/heat-energy-song.html> * <http://scienceforkids.kidipede.com/chemistry/atoms/heat.htm> * <http://www.physics4kids.com/files/thermo_transfer.html> * <https://www.edmodo.com> * Gloves, plastic bottle, empty hot water bottle, ice cube tray, battery, candle, sticks, paper, wool, rubber, and elastic band. | ST2-6PW  MA2-18SP  EN2-7B |
| ***Explore*** | **Lesson 3:**   * Students look at ways heat is produced in everyday living. * Students are given a variety of magazines and make a collage on everyday living (ways we keep warm and cold). * Students share their ideas in small groups and discuss what is more or less effective. * Exploring how heat can be produced through natural or man-made materials. * Students will first predict what materials will produce more heat. * Students write down words that they relate to heat add any new words to the word wall. * Introducing words such as friction, rubbing, burning. * Students watch video on IWB to acknowledge cross cultural links to Indigenous Peoples). Reflecting on Aboriginal ways of living. Aboriginal’s purpose for the use of fire/heat. <https://www.youtube.com/watch?v=Jbyd0LuVoZw> * Students will bring from home and given class time to explore the environment to collect natural and man-made materials such as. Sticks, rocks, leaves, bark. Students explore these materials looking at how they create heat. * Students will explore by rubbing, holding ect   Activity 2   * Students explore how natural light from the sun produces heat. * Student will do an experiment on how soil and water heats up in the sun. * Students hypothesise and make a prediction about what they think will heat up faster and explain why? (soil or water). * Students observe and record their predictions in their science journal. * Students will place their soil and water under the sun for 15 minutes. Students will record the temperature using a thermometer of the soil and water.   Students can draw or write a short reflection on their findings in their science journal. | * Word Wall * Paper and pencils * Magazines * Science Journals * IWB * Rocks * Leaves * Sticks * Sand grass (natural materials) * Steel * Aluminum * Wood * Plastic * Coins * Rubber (man-made). * Beakers * Soil * <https://www.youtube.com/watch?v=Jbyd0LuVoZw> | ST2-6PW  ST2-4WS  EN2-7B  ENS2.6  CUS2.3  MA2-1WM |

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| ***Explore*** | **Lesson 4:Let the heat glow**   * Divide the class into groups of two – giving each table an aboriginal land name. * Play a game of ‘who can remember’, where the table that remembers the most learning concepts from previous lessons win- allowing them to review their prior knowledge in an engaging fashion. * Students will then investigate and explore various scientific notions in relation to heat through rotational activities/stations.   **Station one**   * Students design and create their own desired clay models and investigate the most effective heating methods to dry their models e.g. sunlight, room light, hottest/coolest part of the classroom and other innovative methods. * Students revisit their understandings about using a variety of objects to obtain heat from previous lessons and may choose to use the same objects in order to dry their clay. * Students hypothesise and reason as too why their chosen method of heating is believed to be effective and post their responses and predictions on Edmodo as a part of formative assessment. * Students use mathematical knowledge when designing their models such as the length, size and shape. * Students are able to develop their own variables based on their interest and curiosity while conducting these scientific explorations. * Students observe the results   **Station two**   * Students conduct an experiment using glow sticks with teacher supervision to find out if molecules move faster in hot or cold water. * Students work scientifically as they predict and * Students use scientific tools such as thermometers to record the temperature for each different variable. * Students observe, analyse and record the results in their science journals as well as Edmodo.   To conclude the lesson students reflect through class discussion about their findings in relation to both experiments. E.g. their choice of heating method | * Wet clay * Table lamps * Sunlight- outdoors * Hairdryer * Glow sticks * Styrofoam cups * Thermometers * Ice * Hot and cold water * IWB activity * Edmodo- website | ST2-6PW  ST2-4WS  EN2-7B  MA2-1WM  MA2-13MG  VAS2.2 |
| ***Explore*** | **Lesson 5: Watch me pop!**   * Students continue to transfer what they have learnt using the KWLH chart. Students explore ways in which they can incorporate their scientific learning to demonstrate how heat is formed and transferred from object to object. * Students will be divided in groups of 4 and will be working on activities that are on rotation. * *Group 1*: Students investigate alongside with the teacher/facilitator during the experiment, testing if an inflated balloon will pop when in contact with heat. Students are encouraged to incorporate scientific inquiry skills such as predicting, observing, and testing. * Students will begin to analyse and explore scientifically and mathematically, how heat transfers from one object to another. For example, inflating different size balloons, adding varying quantity of liquid/gas, the height in which the heats radiates to the object etc. * Students investigate using a variety of variable outcomes through testing of the experiment. * *Group 2*: Students explore and consider heat transfers in the environment of the classroom and identify objects/materials in the home environment that can produce heat. Students write down their knowledge of heat products in their science journal, which will be sent to Edmodo. * Students classify scientific terminology such as conduction and convection as they start to explore a variety of materials produce heat. Students will distinguish between objects and work constructively to generate questions, ideas and problem solve how these object produce heat. * Students learn to explore heat in numerous ways concentrating on electricity, friction and burning. * *Group 3*: Whole class activity where students conduct an experiment by creating an insulator to decrease the time of melting ice. There will be a variety of materials such as a bowl, aluminum foil, Styrofoam cup, plastic cling wrap, ice cube tray etc. * Students will produce observations, time and record using a column graph on the Ipad app Evernote. The will investigate and fair test how long it will take to decrease the time of melting ice. As students undertake investigation, they will develop practical skills in making measurements accurately. Using equipment such as a stopwatch and thermometer. Students develop the understanding that particular materials help to be great insulators and helps keep energy from transferring to another object, this is through a whole class discussion. | * <http://www.learninggamesforkids.com/heat-energy-games/heat-cardflip.html> * <https://www.edmodo.com> * Packet of balloon * A cup of water * Tea light candle * Ruler * Stopwatch * Thermometer * Kettle (unplugged) * Hair dryer * Lamp * Heat packs * Small size torch and large torch * Blanket * Aluminum foil * Plastic cling wrap * Styrofoam cup * Ice cube tray * Sticky tape * Glue * Newspaper * Cut fabric such as cotton, wool, linen * Plastic containers | ST2-7PW  EN2-7B  MA2-1WM  MA2-13MG  MA2-18SP |
| **5e** | **Learning Engagement** | **Resources and preparation** | **Outcomes** |
|  | **Lesson 6: Heat travels from one object to another**   * Construct a KWLH chart as a class, in relation to all the previous lessons- revising and revisiting their prior knowledge. * Students begin conducting the first - ‘surprise balloon’ experiment by dividing themselves into groups of four, through which they investigate the cause and effect of heat on other objects. E.g. the balloon * Students experiment the concept of heat travelling from one object to another through the use of hot water, balloons, empty bottles and metal bowls. * Students work scientifically as they hypothesise and establish their predictions of what changes may occur to the balloon (placed on the neck of the bottle which is immersed in hot water) and reason their predictions in their science journals. * Students observe, analyse and record results using their science journals and a range of technological applications (apps) such as Edmodo and Evernote, allowing them to take photos, videos, create notes of new terminology or results, create posts of opinions or pose questions etc. * Students are encouraged to consider a variety of variables in relation to the experiment as they observe changes (constructing their own learning) such as, what happens if the hot water was poured inside the bottle instead of outside the bottle (in the bowl)? Does the amount of water impact * Students use mathematical concepts such as measuring the amount water in the bowl, recording the timing of reactions, recording data in graphs etc. while conducting their investigations. * Students research new terminology gathered from the experiment such as conduction, convection, radiation, friction etc. and create their own definition for these words.   To conclude student’s role play, draw or write their new understandings of the different processes of heat which can be presented to the whole class. | * Packet of balloons * Metal bowls * IPad’s – Edmodo/Evernote * Kettle – hot water * Science journals * Measuring cups * Towels – for any spills * Water resistant gloves * Paper * Black markers and pens * Websites: <http://kids.wordsmyth.net/we> * <http://kids.britannica.com> | ST2-4WS  ST2-6PW  MA2-11MG  MA2-18SP  EN2-6B  EN2-3A |

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| ***Elaborate*** | **Lesson 7:**  Student Investigation:  Launch a Solar Hot Air Balloon: Group Activity  The balloon will visually demonstrate the power of solar energy.  **1.** Students will be provided with the materials to create a hot air balloon  **2.** Fill the balloon with air. Tie the balloon.  **3.** Students add a long cord and marked every ten-centimeter interval so that elevation can be measured.  **4.** As the black balloon is allowed to sit in the sun, it will heat up and begin to rise.  **5.** Start timing as soon as the balloon begins to rise. Record the elevation every minute.  Record the results in Science Journal. Each student creates a table and a written explanation of what happened in this investigation.  **Why did the balloon begin to rise? Did it rise at a constant rate?**  Paired activity: Problem solving  Pose a problem to students: How could we use solar power to melt butter?   * Provide students with materials and allow them to create their own idea of how solar power could produce heat. Students need to consider what materials would be the best to insulate the box and conduct heat. * Students design and create a solar panel/box using a labeled drawing explaining how the heat will be transferred to the butter to melt it. Students make and write down their predictions. * The solar panel is then created * Students test how fast their solar panel melts butter by placing the butter inside the box using a timer and the sun. * Students record results and compare to others by teacher doing a whole class graph and comparing materials and those that are less effective.   Reflect on:  **How is the heat being transferred?** | Activity 1:   * Balloons-black and white * String * Ruler * Pen * Timer   Activity 2:   * Cardboard shoe box * Aluminum foil * Coloured paper * Plastic sheet (e.g. overhead transparency) * Glue and sticky tape * Scissors * Pen * Butter (or marshmallows) * Styrofoam cups * Timer | ST2-6PW  ST2-4WS  ST2-5WT  MA2-18SP |
| ***Elaborate*** | **Lesson 8:** Design your own experiment  In groups of four students will:  Design and create a product that will conduct heat, insulate heat or create heat (friction) etc. (Students choose idea)   1. Students discuss and plan a design on paper in a variety of forms i.e. a labeled drawing and a written response or list of their justification for using certain materials or a certain design. 2. Students construct item-using materials provided. (Film and photograph process using Ipad). 3. Students document the process of designing and creating their item using an Ipad to photograph and document. (Add to science journal) 4. Each group will present their item to the class and give an oral justification (reasoning) behind their choice of: 5. Structure 6. Materials 7. Purpose of the item (optional) 8. Test the product out using a thermometer and create a graph of results. Work out the difference in temperature between the results to rank the highest to lowest heat production. 9. Reflect on what may need to be changed, what didn’t work, what did work and why that may have occurred.   Record results and reflection in science journal. | * Ipads * Thermometer * Shoe boxes * Plastic and Styrofoam cups * Hot cup lids * Aluminum foil * Construction paper * Scissors * Tape * Cardboard, black and coloured paper * Styrofoam peanuts or pieces for insulation * Plastic bubble wrap * Different sized jars with lids * Newspaper Paper towels Plastic containers with lids with holes in them * Wax paper * Any additional items the students may want or that you have handy (e.g. Wool, scrap fabric, batting, etc.) * Graph paper * Edmodo |  |
| ***Elaborate*** | **Lesson 9: Melting: Using a variety of convectors and conductors that help keep heat through insulation.**   * Students will be testing out a variety of products that produce heat. Students will investigate and apply knowledge that will extend their understanding of heat, insulation and matter (solids, liquids and gas). * Students will review the KWLH chart by discussing what they have learnt so far and adding new learning from prior lessons. * Students will base their prior knowledge of **what is heat? What are the forms of heat? And how does heat transfer from one object to another.** From this, students will draw a column graph using the app Evernote and uploading it to Edmodo once done. Students will undertake several experiences in groups of 4 at alternating workstations. * *Group 1*: Students will investigate, fair test, observe, apply, analyse, describe and record the way materials (dark/white chocolate and sugar.) change when they are heated using varying electrical products (microwave and oven). Students will be making connections with everyday life as well, be introduced to scientific equipment such as a tripod that will be readily available in replacement of the oven in the case that the lab is unavailable. * Students learn a range of scientific and mathematical skills as they compare and conduct fair testing on each product and material. Students will be encouraged to explain what they suspect would happen and draw on knowledge and understanding of heat. The teacher is the facilitator as students are actively constructing their own learning and experiments using the materials and products. The teacher will guide and ensure safety is maintained when in contact with electrical products. * *Group 2*: Students will create a short learning book using the app Storybook. Students will be required to take photos, make videos and add information about heat. Students will ensure they use elaborative scientific terminology that they have learnt from prior lessons. * *Group 3*: Students will design an experiment to see which product more affects the rate of heating. Students will be able to describe the heating process of each product and material, using electrical, motion or natural sun as a form of heat properties. * Students demonstrate an understanding of merging prior knowledge and learning of heat to this experiment, as they test using varying variable products (using the lamp to radiate heat onto the jelly – **what will happen? Will the lamp increase the heat transfer than a torch?** * Students begin to construct their own idea and learning through physical and hands on learning activities. Students are also encouraged to work in groups and share roles of recording and testing materials. Students then upload video and short description of each variable outcome to Edmodo. This is a form of formative and peer and group assessment. | * <http://www.sciencekids.co.nz/experiments/chocolate.html> * <https://evernote.com/> * <https://www.edmodo.com> * <http://www.sciencekids.co.nz/experiments/lightcolorheat.html> * Microwave * Oven * White and Dark chocolate * Metal bowls * Plastic microwavable bowls * Wooden spoon * Metal spoon * Water * Sugar * Jelly (dissolved and made) * Bread * Lamp * Small torch and large torch * Fabric – cotton and thick wool * Ipad * Plastic zip lock bags * Paper black and white coloured * Outdoor sunlight | EN2-10C  EN2-8B  ST2-7PW  ST2-6PW  MA2-18SP  MA2-13MG  MA2-1WM  DRAS2.4 |
| **5e** | **Learning Engagement** | **Resources and preparation** | **Outcomes** |
| ***Evaluate*** | **Lesson 10:**   * Students plan and write up a story related to the process of the production of heat (its purpose in everyday life). * In small groups students will act it out in the way they choose. * Students will record it and either present it or act in out in front of the class. * Students play and interactive game which asks them a variety of questions regards to heat:   <http://www.learninggamesforkids.com/heat-energy-games/heat-energy-word-o-rama.html>   * Students reflect on what they have learnt throughout the unit. (Students reflect on several questions and post it up in Edmodo).   This is used as part of a summative assessment for the unit.   * What ideas did you have about heat at the start of the unit? * What did we want to find out about? * What have you learned about heat? Why do you think that now? * What experiment did you like best? Why? * What activity did you find the most challenging? Why? | * IWB * Camera * IPad * Props * <http://www.learninggamesforkids.com/heat-energy-games/heat-energy-word-o-rama.html> * <https://www.edmodo.com> | ST2-6PW  EN2-10C |

Resources

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| Text |
| On-line/ Audio/visual/IWB   * <http://www.learninggamesforkids.com/heat-energy-games/heat-energy-song.html> * <http://scienceforkids.kidipede.com/chemistry/atoms/heat.htm> * <http://www.physics4kids.com/files/thermo_transfer.html> * <http://www.learninggamesforkids.com/heat-energy-games/heat-cardflip.html> * <http://www.sciencekids.co.nz/experiments/chocolate.html> * <https://evernote.com/> * <https://www.edmodo.com> * <http://www.sciencekids.co.nz/experiments/lightcolorheat.html> * <https://www.edmodo.com/> * <http://kids.wordsmyth.net/we/> * <http://kids.britannica.com/> |
| Human  Teacher |
| Place  Outside |
| Materials/Real life items (realia)  • Microwave  • Oven  • White and Dark chocolate  • Metal bowls  • Plastic microwavable bowls  • Wooden spoon  • Metal spoon  • Water  • Sugar  • Jelly (dissolved and made)  • Bread  • Lamp  • Small torch and large torch  • Fabric – cotton and thick wool  • Ipad  • Plastic zip lock bags  • Paper black and white coloured  • Outdoor sunlight  Ipads  • Thermometer  • Shoe boxes  • Plastic and Styrofoam cups  • Hot cup lids  • Aluminum foil  • Construction paper  • Scissors  • Tape  • Cardboard, black and coloured paper  • Styrofoam peanuts or pieces for insulation  • Plastic bubble wrap  • Different sized jars with lids  • Newspaper Paper towels Plastic containers with lids with holes in them  • Wax paper  • Any additional items the students may want or that you have handy (e.g. Wool, scrap fabric, batting, etc.)  • Graph paper  • Edmodo  • Word Wall  • Paper and pencils  • Magazines  • Science Journals  • IWB  • Rocks  • Leaves  • Sticks  • Sand grass (natural materials)  • Steel  • Aluminum  • Wood  • Plastic  • Coins  • Rubber (man-made).  • Beakers  • Soil |

Risk Assessment

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| **Risk** | **Lesson/s applicable** | **Prevention** |
| Hot water causing injury or burn | Lesson 1, Lesson 2, Lesson 4, Lesson 5, Lesson 6, Lesson 9 | Establish clear and explicit to students about the significance of taking caution near hot water.  Encourage the use of water resistant gloves to protect hands.  Ensure that teacher is present at all times that involves activity with hot water.  Ensure to remove all the water from the kettle and turn off the appliance completely and pack away. |
| Food allergies | Lesson 1, Lesson 9, Lesson 7 | Ensure that all food items used are not allergic to students or staff.  Ensure prior to commencement to check for children with allergies and from that the teacher can plan and provide appropriate ingredients for all students. |
| Injury using sticks, rocks and other materials | Lesson 1, Lesson 3 | Establish clear rules in terms of being inappropriate with any materials.  Ensure the size of materials and risk free such as the size of sticks and are not too long |
| Candle flame causing burn | Lesson 5. Lesson 9 | Ensure that materials are safe, the teacher is the controller of flammable materials. |
| Use of electrical appliances such as oven, microwave, lamps and torches | Lesson 9, Lesson 4 | Establish clear and explicit rules to students about the importance of safety when dealing with electrical appliances.  Ensure all the appliances are turned off before and after use.  Ensure there are no wet surfaces near PowerPoints  Make sure the materials are appropriate for the electrical appliances for e.g. microwavable plastic containers, foil not to be placed on the stove and not in the microwave. |

References:

American Association for the Advancement of Science. (n.d.). *Hot and Cold Colors - Science NetLinks*. Retrieved July 12, 2014, from http://sciencenetlinks.com/lessons/hot-and-cold-colors/

Australian Curriculum Assessment and Reporting Authority (ACARA). (2012). *The Australian Curriculum v6.0 Science Foundation to Year 10 Curriculum*. Retrieved from http://www.australiancurriculum.edu.au/science/Curriculum/F-10

Australian Science Teachers Association. (n.d.). *Year 3-4 Unit 1 Overview | ScienceWeb - ASTA*. Retrieved July 8, 2014, from <http://scienceweb.asta.edu.au/years-3-4/unit1/overview/yr34-unit1-overview.html>

BBC Worldwide. (2008). Aboriginal fire starting - Ray Mears Extreme Survival - BBC [Video file]. Retrieved from https://www.youtube.com/watch?v=Jbyd0LuVoZw

Board of Studies. (2012). *NSW English Syllabus*. Retrieved from <http://syllabus.bos.nsw.edu.au/english/>

Board of Studies. (2012). *History K–10 Syllabus*. Retrieved from http://syllabus.bos.nsw.edu.au/hsie/history-k10/

Board of Studies. (2012). *NSW Science K–10. Science K–10 (incorporating Science and Technology K–6)*. Retrieved from <http://syllabus.bos.nsw.edu.au/science/science-k10/>

Board of Studies. (2012). *NSW Mathematics Syllabus*. Retrieved from <http://syllabus.bos.nsw.edu.au/mathematics/>

*BOAST: Hands-on Science Lessons: Testing Heat and Temperature*. (n.d.). Retrieved July 2014, from <http://www.life.illinois.edu/boast1/sciencelessons/glowstick.htm>

Bursill, L. (n.d.). *Aboriginal Words-The Archaeology of The Dharawal People of NSW*. Retrieved July 9, 2014, from <http://users.tpg.com.au/sshists/aboriginalwords.htm#Food>

Australian Government Department of Education, Employment and Workplace Relations (2009). *Belonging, being and becoming - The early years learning framework for Australia*. Canberra, Australia: Retrieved March, 2014 from: <http://education.gov.au/early-years-learning-framework>

*Fizzics Education "Water balloon over a candle experiment"*. (n.d.). Retrieved July 12, 2014, from <http://www.fizzicseducation.com.au/experiments/Force%20and%20Movement/water%20balloon%20and%20candle.html>

Lunar and Planetary Institute. (n.d.). *Ice Investigations Activity - The Great Backwards Ice Cube Melting Race*. Retrieved July 12, 2014, from <http://www.lpi.usra.edu/education/explore/ice/activities/investigations/melting_race/>

Skamp, K., & In Skamp, K. (2012). *Teaching primary science constructively*. South Melbourne, Victoria: Cengage Learning.

Villis, J. (2011). *The heat is on*. Retrieved July 12, 2014, from <http://the-heat-is-on.wikispaces.com/>

Zechman, M. (2013). *Easy Science Projects for Studying Friction - Education Possible*. Retrieved July 12, 2014, from <http://educationpossible.com/easy-science-projects-for-studying-friction/>