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| **Unit Topic: Its Getting Hot In Here** | | | **Length of Unit: 3 weeks** | | | | **Year Level: 2/3** |
| **Overview**  In Year 3, students observe heat and its effects on solids and its effects on solids and liquids and begin to develop an understanding of energy flows through simple systems. By the conclusion of this unit, students will understand how a change of state between solid and liquid can be caused by adding or removing heat. The will explore the properties of liquids and solids and understand how to identify an object as a liquid or solid. They will understand how science affects everyday decisions and evaluate how adding and removing heat affects materials used in everyday life. The unit has been designed to have students conduct investigations, including posing questions and making predictions, assessing safety, recording and analysing results, considering fairness and communicating ideas and findings using different formats such as graphs and tables.  In Year 3 students explore digital systems in terms of their components, and peripheral devices such as digital microscopes, cameras and interactive whiteboards. They collect, manipulate and interpret data, developing an understanding of data and their representation. They design, implement and justify how their solutions meet specific needs and consider how society may use digital systems to meet needs. With teacher guidance, students will identify and list the major steps needed to complete a task or project. They will create designed solutions for each of the prescribed technologies contexts. They will create and evaluate their ideas and designed solutions based on personal preferences and evidence gathered.  The major assessment item will be the creation of a water bottle cooler which will be tested by the classroom teacher. | | | | | | | |
| **Content Descriptors** | | | | | | | |
| **Technologies:**  **Design and Technologies**   * Explore the [characteristics](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=characteristics) and properties of materials and [components](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=components) that are used to produce designed solutions [(ACTDEK004)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDEK004)   **Digital Technologies**   * Collect, access and present different types of [data](http://www.australiancurriculum.edu.au/glossary/popup?a=T&t=data) using simple software to create information and solve problems [(ACTDIP009)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACTDIP009) | | | | **Science:**   * A change of state between solid and liquid can be caused by adding or removing heat[(ACSSU046)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSSU046) | | | |
| **Assessment evidence** | | | | | | | |
| **Assessment Tasks** | | | | **Differentiation** | | | |
| **Diagnostic:**   * *Lesson 1: students to write their own definitions of solids, liquids and gases* | | | | * *multimodal resources – iPads, YouTube, interactive whiteboard* * *activities can be completed individually or in groups (differentiated cooperative groups)* * *classroom teacher to monitor group work* * *teacher aide where available* * *extra support provided to students where needed – teacher/teacher aide to read out passages to students where needed; teacher/teacher aide to scribe for certain students where required* * *extension activities provided to students who complete set tasks early* | | | |
| **Formative:**  *Throughout the course of the unit, students will be engaged in a number of formative assessment tasks.*   * *upon completion of each activity, these will be collected by the classroom teacher or uploaded to students G drive.* * *teacher to circulate room throughout each lesson, checking for understanding through questioning and discussion with individual students or groups of students.* * *check for understanding at the beginning of each lesson “what did we learn last lesson?” – consider the use of show me boards (student whiteboards) here.* | | | |
| **Summative:**   * *students to create a plan for their own water bottle cooler, with justification for their choice of materials. Students to then construct their water bottle cooler from materials provided by classroom teacher.* * *water bottle coolers will be tested* | | | | **Students with Special Needs**  *The class includes 1 English as a Second Language (ESL) student and 1 student with Autism Spectrum Disorder. Adjustments for these learners have been made in the classroom. Where available, a teacher aide is present in lessons to provide extra assistance and support to the students and teacher. For each student, the lessons are broken down into small, sequential steps, with regular monitoring. An iPad is provided to the ESL student to be able to translate difficult to understand words. A range of tactile and visual aides are situated around the classroom. Preferential seating is used for the student with ASD as attention span tends to be longer when seated near the teacher. The students are also provided with the teacher’s notes for the lesson and have been taught to colour code sections with coloured highlighters*. | | | |
| **Stage 3 – Learning plan** | | | | | | | |
| **Lesson 1** | **Length: 30 mins** | **Topic: Solids, Liquids and Gases** | | | | | |
| **ACTIVITY (S):**  **What will the students learn?** | **TEACHING STRATEGIES aligned to activities:**  **What will the teachers do?** | **General Capabilities Focus: Written in terms of what teachers will do** | | | | Resources | |
| **ICT** | | | **Differentiation** |
| Introduction to unit.  Students will be introduced to the major theme of the unit and their assessment task.  Run students through the website that will be used during each lesson.  Students to work through Lesson 1 on [**http://ahughesedp4130.weebly.com**](http://ahughesedp4130.weebly.com/)  Learn what a solid, liquid and gas is.  Watch YouTube clip “Matter Chatter”.  Complete questions on solids and liquids.  Complete sort sheet. | Teacher to introduce students to unit.  Run through task sheet briefly on interactive whiteboard – this will be covered in more depth in lesson 5. Have students use markers to underline key words.  For this first lesson, read through the bulk of the content to the class. Teacher to model to students how to navigate through website.  YouTube clip to be listened to with headphones on. Students to watch YouTube clip on individual laptops.  Run through questions that follow. Have students answer these on their Show Me boards.  Circulate room whilst students are completing sort sheet.  Collect these at the conclusion of the lesson | * identify and clarify information and ideas * organise and process information      * comprehend texts * navigate, read and view learning area texts * interpret and analyse learning area texts      * locate, generate and access data and information * generate ideas, plans and processes * generate solutions to challenges and learning area tasks | | | Multimodal resources.  Teacher to read out and have students follow along. | * Teacher laptop * interactive whiteboard * student laptops * student headphones * projector | |
| **Lesson 2** | **Length: 30 mins** | **Topic: Exploring Changes** | | | | | |
| **ACTIVITY (S):**  **What will the students learn?** | **TEACHING STRATEGIES aligned to activities:**  **What will the teachers do?** | **General Capabilities Focus: Written in terms of what teachers will do** | | | | Resources | |
| **ICT** | | | **Optional Other** |
| .Revise solids, liquids and gases through question slideshow on website.  Learn about the process of liquids becoming solids.  Copy diagram into booklets.  Perform ice cube experiment.  Each student will have 4 ice cubes which they will leave in the sun, shade, fridge and freezer.  Students need to write their predictions of what will happen to their ice cubes in their science books. Have this checked by classroom teacher before proceeding.  Students to time how long ice cubes have been in the un using stop watches.  Observations sheet has been added to resource website.  Repeat for 10 minutes and 15 minutes. | The majority of this lesson will be completed independently by students.  Teacher to circulate classroom ensuring students are on task and answering queries where needed. | * identify and clarify information and ideas * organise and process information      * comprehend texts * navigate, read and view learning area texts * interpret and analyse learning area texts      * locate, generate and access data and information * generate ideas, plans and processes * generate solutions to challenges and learning area tasks | | | Multimodal resources.  Teacher to read out and have students follow along.  Students to work in groups.  . | * Teacher laptop * interactive whiteboard * student laptops * student headphones * projector * ice cubes – 30 x 4 * petrie dishes * stopwatches * iPads | |
| **Lesson 3** | **Length: 30 mins** | **Topic: Adding heat to other solids** | | | | | |
| **ACTIVITY (S):**  **What will the students learn?** | **TEACHING STRATEGIES aligned to activities:**  **What will the teachers do?** | **General Capabilities Focus: Written in terms of what teachers will do** | | | | Resources | |
| **ICT** | | | **Differentiation** |
| Students to experiment with adding natural heat to other solids.  Choose 4 solids to perform the experiment on. They will choose a spot in the sun to leave their solids.  Using the iPads take before and after photos of each of their solids.  Place solids in the sun. While they are waiting for the experiment to complete, upload their before photos and write their prediction for each solid – they can choose to present this in a word or publisher document.  Observe the changes that have occurred to their solids. Write 2 – 3 sentences describing these changes and what might happen if their solid was left in the sun for a longer amount of time. Take their after photos and upload these to their document. Save to G Drive so teacher can access them. | The majority of this lesson will be completed independently by students.  Teacher to circulate classroom ensuring students are on task and answering queries where needed.  Upload student task sheet to G Drive for students to access next lesson | * identify and clarify information and ideas * organise and process information      * comprehend texts * navigate, read and view learning area texts * interpret and analyse learning area texts      * locate, generate and access data and information * generate ideas, plans and processes * generate solutions to challenges and learning area tasks | | | Multimodal resources.  Teacher to read out and have students follow along.  Students to work in groups.  Teacher aide available in this lesson. | * Teacher laptop * interactive whiteboard * student laptops * student headphones * projector * petrie dishes * stopwatches * iPads   Materials for experiment:   * chocolate buttons * jelly lollies * rocks * real buttons * ice cream * butter * bark | |
| **Lesson 4** | **Length: 30 mins** | **Topic: Materials Investigation** | | | | | |
| **ACTIVITY (S):**  **What will the students learn?** | **TEACHING STRATEGIES aligned to activities:**  **What will the teachers do?** | **General Capabilities Focus: Written in terms of what teachers will do** | | | | Resources | |
| **ICT** | | | **Differentiation** |
| In this lesson students will perform an investigation into which materials are able to keep ice cubes intact for the longest amount of time when left in the sun.  Students will revisit what they learnt in the previous lesson about insulators,  Students need to form groups of 4 (teacher to consider forming these groups themselves). Each member of the group to choose one (1) material from those provided by teacher. Make prediction about what will happen to their ice cube when it has been wrapped in their chosen material. Students will leave their ice cube in a sunny area for 10 minutes, to be timed by each group with a stop watch.  Use iPads to photograph the before and after shots of experiment  Whilst students are waiting for their experiment to complete, they need to create an excel document in which to present their findings. They need to choose how to present their findings – in a table, graph or pie graph.  Rank each of the materials 1 – 4.  Present findings to the class.  From observations made about effective materials that have been able to keep their ice cube the coldest for the longest, students are to design a water bottle cooler to be made in the next lesson.  Students need to draw their design and label fully using a drawing program on their computers. They will need to upload them to their G Drive. Students are able to choose materials used during their experiment, other materials used by other groups, or something from home. | Introduce experiment to students.  Show them where they can find the materials – to be provided by school.  Have ice cubes ready for students.  Use questioning to prompt students predictions of which materials are going to be the most effective in keeping their ice cube cold.  Consider grouping students into ability based groups/have them complete the experiment in their seating groups to save time.  Display the definitions for insulation on the board to prompt student memory.  Circulate the room whilst students are preparing their experiment.  Provide students with a stop watch to be able to time their experiment.  Talk to them about the importance of not handling the ice cubes with their hands for extended periods of time so as not to compromise the experiment – consider introducing this as a limitation and question students as to what some other might be.  Monitor student progress throughout the course of the lesson.  Use effective questioning methods to encourage discussion about results:  “Which materials worked best/worst?”  “Why do you think certain materials worked better/worse?” | * identify and clarify information and ideas * organise and process information      * comprehend texts * navigate, read and view learning area texts * interpret and analyse learning area texts      * locate, generate and access data and information * generate ideas, plans and processes * generate solutions to challenges and learning area tasks | | | Multimodal resources.  Teacher to read out and have students follow along.  Students to work in groups.  Teacher aide available in this lesson. | * Teacher laptop * interactive whiteboard * student laptops * student headphones * projector * ice cubes – 30 * stopwatches * iPads   Materials to use in experiment:   * glad wrap * aluminium foil * cotton wool balls * sticky tape * towel * wet suit material * newspaper * foam place mats – purchased from the Reject Shop * tarp * bubble wrap * egg cartons | |
| **Lesson 5** | **Length:** | **Topic: Keep It Cold** | | | | | |
| **ACTIVITY (S):**  **What will the students learn?** | **TEACHING STRATEGIES aligned to activities:**  **What will the teachers do?** | **General Capabilities Focus: Written in terms of what teachers will do** | | | | Resources | |
| **ICT** | | | **Differentiation** |
| Students to complete their assessment in this lesson.  Students will require their designs which should be completed in their G Drive. Once this has been checked by the teacher, this can be printed and used for student’s reference.  Allow extra time for completion if required. | The majority of this lesson will be completed independently by students.  Teacher to circulate classroom ensuring students are on task and answering queries where needed. | * identify and clarify information and ideas * organise and process information      * comprehend texts * navigate, read and view learning area texts * interpret and analyse learning area texts      * locate, generate and access data and information * generate ideas, plans and processes * generate solutions to challenges and learning area tasks | | | Multimodal resources.  Teacher to read out and have students follow along.  Students to work in groups.  Teacher aide available in this lesson | * Teacher laptop * interactive whiteboard * student laptops * student headphones * projector * iPads   Materials to use in assessment   * glad wrap * aluminium foil * cotton wool balls * sticky tape * towel * wet suit material * newspaper * foam place mats – purchased from the Reject Shop * tarp * bubble wrap   egg cartons | |