**INTEGRATED UNIT: MATERIAL WORLD**

**QL Quality Learning Tool**  **Aboriginal Perspective ICT Integration**



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| **Year: 3** | **Year: 2010** | | | **Duration: TERM 4, 10 weeks** |
| **Aim/Rationale:** This unit provides opportunities for students to develop an understanding of the properties of materials and how they relate to use. Through investigations, students will explore how to test the properties of materials fairly and how to use this knowledge to choose materials wisely. | | | | |
| **Big Ideas**: | | **Outcomes:**  **SCIENCE & TECHNOLOGY: *BE S2.1, ES S2.6,***  ***PS S2.5*** | | |
| **Complex Question: What are the properties and uses of materials and how do they impact on our environment?** | | | | |
| **Inquiry Question/s:**   1. **What are the properties and uses of different materials?** | | | | |
| **Areas of Integration:** | | | | |
| ***English-***   * *Explanation* * *Description* * *Poetry* | | | ***Creative Arts-***  *Visual Arts - collage, sculpture* | |
| ***Mathematics-***   * *Time* * *Data* | | | ***Science & Technology/HSIE-***   * Environments * Systems & Structures * Using Technology | |
| **Understandings:**   * New materials have revolutionised modern life * Lighter, stronger, warmer fabrics have made extreme weather conditions more comfortable. * Designers are incorporating new materials in their designs to better sit our needs. * Scientists are researching materials that have desirable properties but which have less impact on the environment. | | | | |
| **Generic Skills:**  *Research Communication Solving Problems Thinking Critically Cooperation Responsibility*  *Using Technology* (Science & Technology Outcomes UTS 2.9) *Expression Task Management* | | | | |

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| **FOUNDATION STATEMENTS:**  ***ENGLISH:*** Students write well-structured literary and factual texts in terms of topic, purpose, audience and language by drafting, revising and proof-reading. Students communicate proficiently ideas and information in classroom, school and social situations for a range of purposes. They explore a range of roles when interacting in pairs and groups, using various listening strategies to gather general ideas from conversations, reports or spoken presentations.  ***HSIE:*** Students explore change in communities from different perspectives and evaluate the effects of change on individuals and groups, including Aboriginal peoples, and the environment. They understand key events related to the British colonisation of Australia and identify the changes and consequences for Aboriginal and other peoples and the continent.  Students explain how different cultures and traditions contribute to Australian and community identity. They examine a variety of local and other communities, investigating similarities and differences including ways of living, languages and belief systems.  Students identify, locate and describe natural, heritage and built features in the local area and in other parts of Australia and explain their significance and management. They locate the four compass points and other significant features on a map and develop skills to locate and evaluate information from a variety of sources.  ***CREATIVE ARTS:*** Students make artworks that represent a variety of subject matter and make choices about the forms and techniques used to best represent the qualities of the subject matter. They discuss reasons why artists make particular artworks and why different interpretations are possible, recognising similarities and differences in how subject matter is represented.  ***MATHEMATICS:*** Students gather and organise data to create and interpret tables and graphs. Students use coordinates to describe position and compass points to give and follow directions.  ***SCIENCE & TECHNOLOGY:*** Students select and safely use equipment, computer-based technology and other resources throughout the processes of investigation. |

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| **Preparing the Learning Environment:**   * Display complex & inquiry questions * Display texts/websites/stimulus posters * Prepare interactive word bank * Establish a “Did you know?” board with facts * Australian and world maps * Magazine & Newspaper articles * Display generic skills * Organise excursion * Prepare wall display |
| **Resources:**   * Bulk loan of suitable library books on natural and processed materials * Sets of guided reading texts * Teachers BLM books: Primary Connections Stage 2-*Material World*; Excel Science & Tech 3-4 - *What’s It Made Of?;* New Science & Technology Today 3 - *What’s It Made Of?* |
| **Initiating the Unit:**   * Introduce questions and resources * Introduce generic skills * Find out what the children already know and what they want to find out |

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| **Inquiry Question:**   1. **What are the properties and uses of different materials?** | **Duration: 3 weeks** | | | | | | **Wks:**  **1 - 3** |
| **TEACHING & LEARNING EXPERIENCES:** | | **Planned Observation** | **Product Analysis** | **Teacher Conference** | **Assessment Product** | **Outcomes/**  **Generic**  **Skills** | |
| **Tuning In**   * Read a book about clothing in different parts of the world – *Around the World Clothes –* and discuss the properties of the clothes shown and their suitability for the climate and purpose. * Ask questions such as: *When would you wear gumboots> Why?* and, *Would you wear a coat in the desert? Why?* * Define the terms: object, materials and properties. Demonstrate their meaning using an item of clothing found in the classroom. * Record responses to the questions in the student’s Integrated Unit books.   e.g; The object is a \_\_\_\_\_\_\_\_\_  The \_\_\_\_\_\_\_\_\_\_ is made of \_\_\_\_\_\_\_\_\_.  \_\_\_\_\_\_\_\_\_was used because \_\_\_\_\_\_\_\_\_.   * Create a “materials snapshot” using stick-it notes. Students write statements about various materials, their properties and their uses e.g. *Rubber is bendy and can be used in shoes; Plastic is waterproof and can be used in raincoats; Paper is flat and tears easily and it is good for writing on.* * Show the students the Powerpoint on *Gloves.* Discuss the different types of gloves shown and discuss their properties and uses. Show the students a variety of gloves (teacher to bring in a selection of gloves) and allow them to examine each one and in small groups discuss their properties and possible uses. Ask the students why the materials used would have been chosen for each glove. Ask questions such as: *What might this glove be used for? What is it made of? Why is it made of that material? What else could it be used for?* * Provide the students with a copy of the ‘glove guide’ (Resource sheet 1). Model on an enlarged copy an annotated drawing of a glove including materials used, properties of the materials & uses for the glove. * Students complete a Science Journal entry in their books using the following sentence starters:   *Things I think I know about the properties and uses of materials are.........*  Things I am interested in finding out are......  Provide students with the “Bags at Home Project” to be completed as Homework. | | **√**  **√**  **√** | **√**  **√**  **√** |  | Student written and oral responses  Materials Snapshot Display  Completed Resource sheet 1  Journal entry  Homework project | *Communication*  *Communication*  *Expression*  *Communication*  *Research*  *Cooperation*  *Task Management*  *Expression*  *Communication* | |
| **Finding Out**   * Fair testing. Conduct a Clothes Relay activity (see pp16-17 Primary Connections) in order to demonstrate the concept of fair testing. Discuss the variables which may have affected the outcomes of the test (relay) e.g. number of clothes, length f run, number of team members, speed of runners. * Discuss ways of ensuring the variables in any scientific test Do NOT affect the outcomes of the test i.e. that conditions, materials and environment are the same. * Conduct the test *Rot or Remain* (see Primary Connections pp 18-21) making sure it is a ‘fair test’. Students record their predictions and observations in their books as a Journal entry. * Conduct the test, *Leak, Soak or Repel?* (see Primary Connections pp 22-27) ensuring it is a fair test. Students record their predictions and observations on Resource sheet 4. * Conduct the test, *Snap, Tear or Stretch* (see Primary Connections pp 30-34) ensuring it is a fair test. Students record their predictions and observations on Resource sheet 5. | | **√**  **√**  **√**  **√** | **√**  **√**  **√** |  | Student reponses  Science Journal entry  Completed worksheet.  Completed worksheet. | *Research*  *Cooperation*  *Task Management*  *Expression*  *Communication* | |
| **Sorting Out**   * Discuss how different properties make materials suitable or unsuitable for certain objects. * Ask questions such as:   *What properties do the materials for a sponge need?*  *What properties would you want a winter coat to have?*  *Would you make a shopping bag out of bricks? Why? Why not?*  *Would you make a belt out of marshmallow? Why? Why not?*   * Ask students to recall what they discovered about bags from their *“Bags at Home Project”.* * Ask students to tell of their experiences carrying objects in bags and refer to the properties of the materials used to make the bag. * Show the students the 5 numbered and labelled bags to be used for *“The Carrying Dilemma”* (Resource Sheet 6). Students are to match a bag with an item to be carried. Each bag can only be used once. Divide students into learning groups. Each group to report back to the class on their findings. * Return to the *“Rot or Remain”* test begun in an earlier session. Students retrieve their samples and record their observations under the heading *“Rotten Results”.* * Discuss the results with the whole class. *What types of materials rotted? Which types did not rot? What may have caused some things to rot and not others?* * Discuss biodegradable materials by asking questions (see PC Unit p43). Read and then paste *Puzzling over Plastic* (Resource sheet 7) into books. | | **√**  **√**  **√**  **√**  **√**  **√**  **√** | **√** |  | Student Responses  Student Responses  Student Responses  Completed Worksheet  Student responses  Student responses  Student responses | *Thinking Critically*  *Research*  *Cooperation*  *Communication*  *Task Management*  *Thinking Critically*  *Expression*  *Solving Problems* | |
| **Making Connections**   * Ask students to suggest materials that might be good at keeping things warm. (Look back over earlier work on properties of materials used in clothing). * Explain that we are going to investigate the question *Which material keeps things the warmest?* * Explain the investigation as outlined on p50, Primary Connections. Discuss the variables that might affect the temperature of the water and the rate at which the temperature drops. * Introduce the large copy of *“Keeping It Warm”* (Resource sheet 8).Discuss and model how to complete this planner. * Model how to set up and perform the investigation (p50) * Students conduct investigations and record their findings in their Science Journal. * Model how to construct a graph to visually represent the information recorded in the investigation. (p51 & Resource sheet 8) * Students use the *Explaining Results* (Resource Sheet 8) | | **√** |  |  | Student responses.  Student participation.  Completed planner.  Student responses.  Graph.  Student responses. | *Solving Problems*  *Thinking Critically*  *Task Managament*  *Communication*  *Task Management*  *Communication* | |
| **Going Further**   * Review prior learning. * Explain the task: to create a class book in the form of a catalogue to display suitable materials to be used for clothing in given situations. * Provide students with scenarios that they are to design clothes for. * Give students a copy of *Material Matters* (Resource Sheet 9). Explain that they will create a drawing of clothing which suits the scenario given. Students are to annotate the materials chosen for their outfit and to give reasons for their choice. * Compile the sheets into a class catalogue. | | **√** | **√**  **√** | **√** | Annotated design. | *Research*  *Communication*  *Thinking Critically* | |
| **Reflecting and Acting**   * Students review their journals and worksheets and reflect on their learning during the unit. * Provide questions to guide student reflections:   *What new things did I learn during this unit?*  *What activity did I enjoy most and why?*  *What activity was the most challenging>? Why?*  *What am I still wondering about?*  *What skills did I improve when working in teams?*   * Students share one of their reflections with the whole group. | |  | **√**  **√** | **√** | Student responses. | *Thinking Critically*  *Expression*  *Communication* | |