

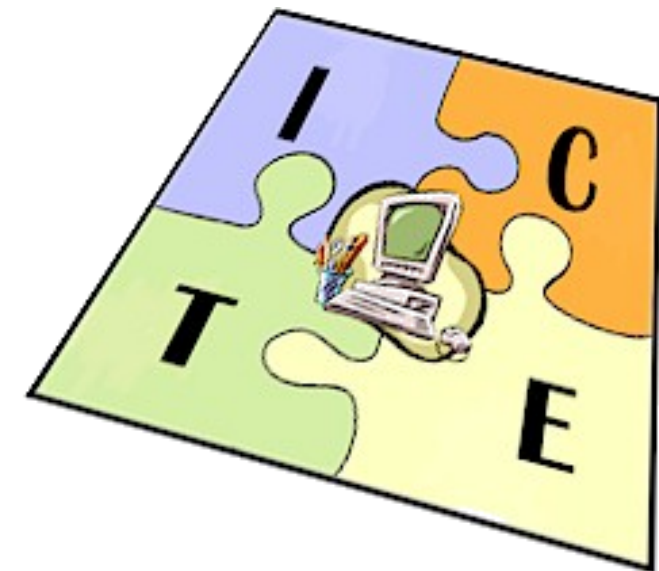
ICTE Syllabus

Workshop

Task 4:

'Engineering'

Example Unit Overview



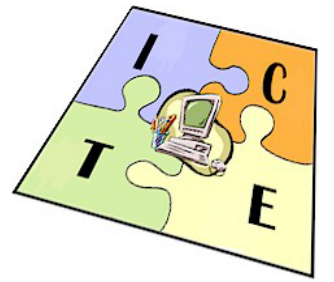
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Silver Water High School

Information and Communication Technology Education – Unit Overview – Digital Investigators!



Year Level: 8 Unit: Digital Investigators! Duration: 10 Weeks

Focus: Students will gather information from a variety of sources pertaining to the range of energy sources in use in households across Australia, and conduct a survey of the local area to ascertain the patterns of local consumption and the extent to which natural sources (wind, sun etc) are utilised. Data and information from a variety of sources will provide the core material for investigation, analysis and interpretation into electronically published media, to inform the public and encourage community change toward less burning fossil fuels to supply power.

Syllabus Outcomes:

ICTE - ACI	ICTE - DCP	ICTE - POC	Technology Links
<p>ACI 4.1 Students analyse the nature of information and discuss its relationship with data, knowledge and wisdom.</p> <p>ACI 4.2 Students access information from electronic sources, including the internet, using operational and search strategies.</p> <p>ACI 4.4 Students analyse and describe privacy and intellectual property issues related to accessing and constructing information.</p> <p>ACI 5.1 Students investigate and describe the roles of information and communication technology in the transformation of data to information.</p> <p>ACI 5.2 Students work in teams to identify and access information from electronic sources to make decisions about an issue of local concern.</p>	<p>DCP 4.3 Students analyse issues related to the use of a variety of existing media in digital communication and publishing.</p> <p>DCP 5.3 Students investigate the impact of contemporary publishing media on themselves and their immediate communities.</p>	<p>POC 4.1 Students investigate the nature and purpose of online communities and services.</p> <p>POC 5.1 Students evaluate how individuals and small groups develop a sense of community online.</p>	<p>POC 4.5 Students apply techniques for transforming and transmitting information for different audiences. (Tech I 4.2)</p> <p>POC 5.5 Students compare and select techniques for processing, managing and presenting information for specific users. (Tech I 5.2)</p>
SOSE Links			
<p>POC 4.6 Students critique information sources to show the positive and negative effects of a change or continuity on different groups. (SOSE TCC 4.4)</p> <p>PS4.3 Students participate in a field study to recommend the most effective ways to care for a place.</p> <p>PS4.5 Students explain whether personal, family and school decisions about resource use and management balance local and global considerations.</p> <p>SRP5.3 Students use a structured decision-making process to suggest participatory action regarding a significant current environmental, business, political or legal issue.</p> <p>PSD5.7 Students use appropriate technologies to take action about environmental issues of international significance.</p>			
Science Links			
<p>EC4.3 Students present alternative ways of obtaining and using energy (including energy from the sun and from fossil fuels) for particular purposes.</p> <p>EC5.3 Students discuss the consequences of different ways of obtaining and using energy (including nuclear energy).</p>			

Higher Order Thinking/Multiple Intelligences

Bloom's/ Gardner's	Intrapersonal	Interpersonal	Picture/ Spatial	Body/ Kinaesthetic	Musical/ Rhythmic	Logical/ Math
Remember						
Understand						
Apply						
Analyse						
Evaluate						
Create						

Productive Pedagogies

Intellectual Quality					
Higher Order Thinking	Deep Knowledge	Deep Understanding	Substantive Conversation	Knowledge as Problematic	Metalanguage
Connectedness					
Knowledge Integration	Background Knowledge	Connectedness to the World	Problem-Based		
Supportive Classroom Environment					
Student Direction	Social Support	Academic Engagement	Explicit Quality Criteria	Self-Regulation	
Recognition of Difference					
Cultural Knowledges	Inclusivity	Narrative	Group Identity	Active Citizenship	

Sequence:

<p>Week 1. ACI 4.1 ACI 5.1 Introduction to topic – outcomes, assessment, aims of the unit.</p> <ul style="list-style-type: none"> Discussion of possibilities for investigations, publishing media for presentation. Preparations for engaged learning based on student needs. Investigate difference between data, information knowledge and wisdom. Investigate web sources of data and information services, and online communities that share information. Email partnerships commenced with other classes doing similar activities. Discussion and plans – a basic web site for showcasing the class project. 	<p>Week 2/3: Searching skills in context – investigation of power sources and related information services, opinion and scientific evidence about energy use/fossil fuels.</p> <ul style="list-style-type: none"> Students in pairs/grouping with different tasks as agreed upon. Class discussions/presentations on energy consumption concerns locally, globally Copyright, privacy issues discussed and correct referencing of sources, tracking of saved files and details of media types. Periodic discussions-progress, groups report and coordinate to keep cohesive Concept mapping (with software) of small tasks to big picture – outcomes. Students compile individual reports to demonstrate understandings.
<p>Week 4/5/6: Commencement of local investigations and gathering data from partner classes – surveys in local homes of energy usage/types of energy (solar power?)</p> <ul style="list-style-type: none"> Usage patterns and public opinions on conservation, global warming etc Short videos and digital camera still photos compiled Data added to spreadsheets, databases Class web page(s) updated with progress reports – privacy issues raised Students compile individual computer-presented materials to demonstrate the progress made in the project, own understandings of core content, issues and computer skills. Class discussions for evaluation of issues and source materials at key times 	<p>Week 7: Completion of information gathering and compilation. Detailed analysis</p> <ul style="list-style-type: none"> Sources of information, media and influence on target groups Data vs information vs knowledge vs wisdom in these contexts Partnership with other school(s) – reflection and comment on community building – continued exchange of findings, files as attachments. What information to present, what formats – a look at media Plans for publications to inform and persuade community Privacy and copyright issues revisited
<p>Week 8/9: Publication and presentation</p> <ul style="list-style-type: none"> Posters, brochures, web pages constructed from samples/documents created and extracts of files compiled thus far. Evaluation of progress by teams, individuals Sharing continued with partner class/shared web pages? Student self/group/unit evaluation 	<p>Week 10: Culmination activities – celebration of learning</p> <ul style="list-style-type: none"> Presentation to community – school open day. Presentation to other year levels. Brochures distributed through local shops Presentation to local council and government bodies – invitation to school.

Teacher Strategies:

<p>KWL – Energy sources, searching skills Group matching D/I/K/W Media evaluation Concept Map Partner classes ready</p>
<p>Suitable web sites, search engines, CD ROM materials ready. Student 'team leaders' elected Special shared saving directory on network Minor assessment tasks/observation checklists</p>
<p>File management, email, spreadsheet, database support with key concepts and skills. Teams report back to whole group on progress/findings Task assessment of individuals and groups</p>
<p>Higher order thinking activities – Reflection Group Tasks: Prioritising/what's cool/what's important/what audience would like/should know/copyright and privacy 'balancing act'</p>
<p>Computers skills assessment Team work with a common goal Reflection task sheets</p>
<p>Plan for publicity Make community/council contacts Invite visitors/ parents to the school Organise displays</p>

Objectives and Outcomes: (Teacher and School Curriculum Plan related...)	Students are to know:	Students are to do:	Products and Assessment:
<p>1. Information Literacy:</p> <ul style="list-style-type: none"> sources of information; variety of media and forms of presentation for particular applications and audiences; gathering, organising and presenting information in different ways; observance of copyright, referencing; concept mapping. 	<p>ACI 4.1 The relationship between of data, knowledge information and wisdom. ACI 5.1 The role of information technology – connecting people, provision of data etc...</p>	<p>Participate in related class activities. Provide examples of each. Describe how data may be transformed with the aid of information technology by presenting an example.</p>	<p>Activity sheet and group activity contributions</p>
<p>2. Computer Skills:</p> <ul style="list-style-type: none"> internet search, email, spreadsheet, database and simple publishing/web page skills; creating and using a variety of media; 	<p>ACI 4.2 How to use search facilities of CD ROMs, online databases and the Internet. ACI 5.2 The importance of individuals and teamwork in decision making and meeting goals.</p>	<p>Gather materials (a range of file types, data and media), which demonstrate their skills. Contribute to a group effort in gathering suitable information with an agreed focus.</p>	<p>Teacher checklist observation items Compiled resources presented by team to class indicate an effective approach</p>
<p>3. Public Speaking/Self Confidence</p> <ul style="list-style-type: none"> present ideas, findings and viewpoints verbally to peers about identified issues. present to peers/school community a finished product with the use of a data projector; 	<p>ACI 4.4 Issues related to copyright, intellectual property and privacy in relation to electronic sources of information.</p>	<p>Participate in class discussions and investigations Present a checklist on key points. Observe conditions in gathering & presenting information.</p>	<p>Checklist preparation Evidence of consideration in work produced</p>
<p>4. Group Interaction/Team Building</p> <ul style="list-style-type: none"> work in small groups/pairs toward a common purpose, sharing responsibilities and tasks. 	<p>DCP 4.3 A variety of media and their effective purposes for particular audiences, applications to influence people. DCP 5.3 What media is of influence to them and why, which of the resources they have been gathering influenced them most. POC 4.5 A range of techniques for basic presentation of information in easily developed and accessed media. (Tech I 4.2) POC 5.5 Which techniques are most suited to the transforming and presentation of their information to the chosen audience(s) (Tech I 5.2) SRP5.3 Understand a range of ways of promotion of an issue to the public and target audiences. PSD5.7 Which tools and techniques are easily employed for promoting their issue of significance locally and globally.</p>	<p>Participate in class discussions, concept mapping activities Write a brief evaluation of media types they have experienced and what it is that influences them. Decide which media are best suited to their public education campaign. Choose the tools and techniques and forms of media, which are easily employed as an effective publication tool within a given time and are most likely to appeal. Decide on a strategy for public promotion utilising their produced resources.</p>	<p>Concept Map Evaluation of media types. Choice of media for their own publications, promotions. Tools and techniques listing Group action plan with aims, roles, tasks</p>
<p>5. Higher Order Thinking</p> <ul style="list-style-type: none"> opportunities for this in individual and in group activities 	<p>POC 4.1 The nature and role of some online services and the communities they service (through their investigations). POC 5.1 The benefits of participation in an online community through their exchanges with other classes for a common purpose. POC 4.6 How different information sources and services may affect particular audiences (SOSE TCC 4.4)</p>	<p>Describe what services they have seen online in their investigation of energy issues and list what communities of people serviced. Brief critique of information sources and their impact on communities. Describe the benefits of online communications to their learning and motivation in responding to challenges</p>	<p>Listing of services, reflection sheet/retrieval chart Brief reviews of information sources – critique (influence/effects on audience) Emails sent and received, class discussion concept map.</p>
	<p>PS4.3. How energy is used in the local community – what we rely most on and what people’s feelings/understandings are about energy use. PS4.5 Which concerns of a local nature (related to the task) are also reflected in other communities in Australia and other nations. EC4.3 Know a range of energy sources and which are most suited for taking care of the environment. EC5.3 Understand the consequences of the use of different types of energy.</p>	<p>Gather energy use information from local area/own homes to generate patterns of usage/degree of solar etc Compare the local data with sources of energy/patterns of energy use in other locations in Australia and other countries. Present in their published information, alternative energy sources and preferred options for the future Students discuss today’s concerns and predict possible futures in the over-use of particular energy sources.</p>	<p>Gathered data from local area, email and information source searching (inc. graphing and summary.) Published information for public promotion (simple brochure, web pages, posters, small booklets etc.) Possible discussion paper compiled from class and partner class(es) research activities.</p>
	<p>Note: This is an example unit only – not a prescription! It is deliberately complex and heavy with outcomes and activities. The intention is to show how the ICTE learning experiences may be given extra meaning and real world context and meaning through integration with other KLA’s with an upper primary school approach interpreted into junior secondary. To cover this in 10 weeks, we are thinking out of the box – SOSE and Science not taught individually for their own sakes, nor is ICTE. (Note how SOSE, Science, Technology and ICTE outcomes can be targeted with the one unit and focus project which has meaning and connectedness – why miss the chance or engage in repetition which isn’t a good use of teacher time?) In this case we are not having ICTE lessons on ‘using a search engine’ etc. for their own sake with ‘contrived’ text book example exercises. It may seem much to cover in 10 weeks, but think of what may be achieved by reinvention of junior secondary timetabling. There are also 4-5 range in outcomes to cater for assessing differing abilities.</p> <p>We also have to consider that computer resources are already at a premium in most schools, and non-computer subject teachers for instance have trouble getting suitable amounts of time in a computer lab to achieve great things – the answer is to integrate. Many schools may not be able to even consider adding ICTE to their subject offerings, considering the already stretched computing resources. Furthermore, we are expecting that all teachers are to use computers well – that means more equitable access and team teaching so in this case SOSE, Science teachers become better with computers and computer teachers become better with SOSE and Science so their work has more context.</p> <p>There are also indicators which are to remind us that we should be considering the thinking skills and pedagogies we employ. Having students in front of computers doesn’t necessarily improve learning outcomes unless the classroom practice is effective and the learning meaningful.</p> <p>Sel Kerans – Education Adviser, ICT/Curriculum Murrumba District Office Ph 07 2881 9623 Email: sel.kerans@ged.qld.gov.au</p>		