

Lesson 1

Introduction Lesson

Student-Centred Problem Based Learning

Content Descriptor:
Processes and production skills:
Explain how students' solutions and existing information systems are sustainable and meet current and future local community needs (ACTDIP021).
Relevant elaborations:
Use sustainability criteria to explain how students' solutions meet requirements

Learning intention:

By the end of this lesson students will be able to:

- Conduct research in environmental monitoring systems
- Develop brainstormed solutions
- Explain how these solutions are sustainable and meet the current and future needs of the Townsville community.

Formative assessment suggestion:

- Individual graphic organisers
- Group work presentation
- Individual student self-appraisal.

Equipment list:

- Projection screen
- Electronic copy of example graphics organiser
- Butcher's paper and markers for each group
- Access to class set of computers/laptops
- Access to Google Classroom
- Class set of self-appraisal worksheets.

Lesson Outline (60min lesson)

Introduction 10 min	Focus Question: "To plan for climate change what sort of data should local environmental scientists be collecting? How can they collect this data?" • "Environmental scientists are asking our class to develop sustainable information systems to help with environmental monitoring." • "Local environmental scientists are hoping to monitor the effects of climate change and average temperature increase to prepare for the future. The scientists have told me their main concerns are with continued rising temperatures, wildlife habitats, our local natural environment and city planning." Read the focus question again and ask students to think about what the question might mean. • "Can anyone tell me what they think this question means?" • "What is climate change?" • "What is data? How can you collect data?" • "What technologies can be used to collect data?" • "What is the job of an environmental scientist?" • "What words should we identify as key terms for this question?" • "What should we identify as important parts of the question?"	Display the focus question on the white board. Introduce students to the idea that local environmental scientists from TCC and JCU have recruited your class to help with a very important project. Help students to analyse and clarify the problem • Data is information – usually numerical, that is collected through observation, sensors, and monitoring techniques. • technology can include sensors – e.g. temperature and humidity • An environmental scientist: studies the environment and develops solutions for environmental problems • key terms include plan, climate change, data, local, how can they collect
Body 30 min	Students attempt to solve the problem with existing knowledge • Students in groups of 5-7 • Students are to work collaboratively in their groups to develop a 'mind map' using the butcher's paper and markers.	The 'mind map' should include any ideas about environmental monitoring, climate change, technologies, sensors, creating a data network and the types of data they need to collect

	Collaborative Research - Students use the google classroom resources to research environmental monitoring techniques, technology information systems and sensors. Developing their final solution - Students use their graphic organisers and research to develop a concept idea for a piece of technology equipment or information system that will assist local environmental scientists to collect data to effectively prepare for climate change.	Students work as a team to determine what they would need to research/learn more about to solve the problem. Display example graphic organiser on the whiteboard Students to work as a group to draw, write about, use mind maps, tables or dot points to describe their concept idea.
Conclusion 20 min	Submitting their solution - One at a time, each group spends two minutes explaining their solution, and how their solution will assist local environmental scientists in their current and future research. “What type of data does your solution collect?” “How does your solution collect this data?” “How will this data help the environmental scientists?” “How will your solution meet the current and future needs of the environmental scientists and our community?” Self-appraisal - Self-appraisal worksheet/resource - Group undertakes a self-appraisal activity to reflect personally, one another and the group.	Ask each group prompt questions to ensure they meet the curriculum descriptor and effectively justify their solutions and the decisions they made. - which solution did they choose to study in google classroom documents? - what issues does this sensor monitor? How often are we experiencing these issues? Is this relevant to the local community and why? How does this issue relate to climate change? How can this information help scientists?