

Investigating

Communicating

Knowledge and understanding

Meeting Current and Future Energy Needs

Learning outcomes in focus

Students should be able to:

ES6 research different energy sources; **formulate** and **communicate** an informed view of ways that current and future energy needs on Earth can be met

NS6 conduct research relevant to a scientific issue, **evaluate different sources of information** including secondary data, understanding that a source may lack detail or show bias

Learning intentions

We are learning to:

- conduct independent research
- synthesise information from a variety of sources
- present findings in manner appropriate for the chosen audience
- evaluate different energy sources in terms of suitability, sustainability and reliability
- understand that a reliance on non-renewable resources is unsustainable into the future

Teaching and Learning Context

This task was undertaken by two mixed-ability classes of First Year students. Prior to the task, students had been introduced to energy types and energy conversion. They had also worked collaboratively in small groups to complete and present for peer review a STEM activity called Moja Island.

<http://practicalaction.org/moja-island-1>

Students all have Ipad and were given a single class and the weekend to complete the task.

Task

Project title - *How to meet current and future energy needs.*

Students were given the following instructions:

1. Research the topic using your Ipad and/or other sources. Present your findings either as a poster, pamphlet, keynote/powerpoint/Prezi, video, drama, song or any other means.
2. Discuss your choice(s) of energy source and explain how it meets the project title: *How to meet current and future energy needs.*

Success criteria:

I can:

- **SC1:** search for and find relevant information about the topic
- **SC2:** arrange and report my findings
- **SC3:** use data in an informed manner to argue my position
- **SC4:** acknowledge sources

SC3:
Information about three energy sources, albeit with some factual errors.

Hydrogen Power

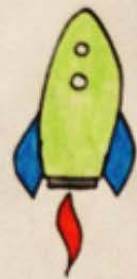
Hydrogen is the most common element on earth, but is usually combined with other elements. Water contains $\frac{2}{3}$ of hydrogen.

Hydrogen has three times more energy than fuel and it doesn't pollute the air. It can be made on demand and it's completely renewable.

To turn hydrogen into energy they use fuel cells.

The fuel cell turns the chemical energy in hydrogen and oxygen into direct energy.

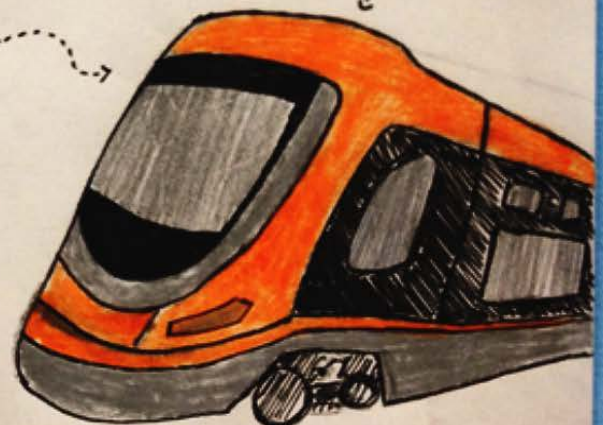
It can power ships, vehicles, homes, industries and rockets.



Example:

- China has made a hydrogen powered tram to reduce air pollution.
- Hydrogen powered cars release steam instead of exhaust.

Hydrogen Powered
Tram in China



SC2:
Clearly arranged
descriptions of findings.

SC3:
Offers an informed position
based on location.

SC4:
No sources
acknowledged

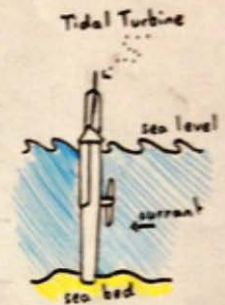
Other Sources of Energy

Tidal Energy :

Tidal energy uses the force of the tides to make kinetic energy.

It can produce large amounts of energy even in low speed tides.

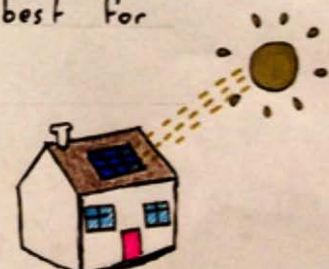
Only for coastal areas.



Solar Energy :

Solar power turns sunlight into electricity using solar panels.

It is a free energy source, but it's best for countries that get lots of sun.



Overall judgement: In line with expectations