



Discovering Sustainability Teaching Notes

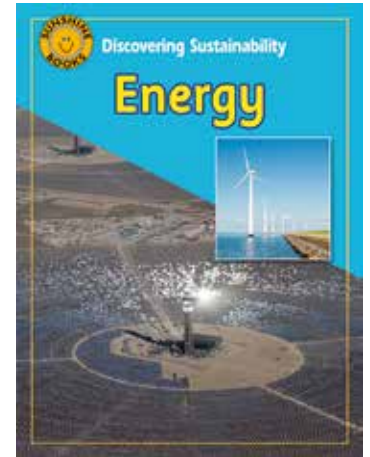
These four Discovering Sustainability books discuss the impact of sustainable and non-sustainable activities on the health of the Earth's systems. The teaching ideas can be used as a springboard for further investigation and thinking around the issues confronting the Earth today. These ideas can be used to build students' understanding and promote discussion and encourage individual and group action.

Energy

1. Have students look closely at the diagram of the hydroelectric power dam on page 16 and research and create a similar diagram for another type of sustainable energy plant.

2. Have students investigate and report on ways that energy could be saved in their home and at school.

3. Students find and explore different types of power plants using Google Earth. Have them label screenshots (as appropriate) with words like: turbines, dam, barrage, powerlines, cooling towers, mirrors, pipes to turbine, steam pipes, power station etc.



Useful search terms for Google Earth:

Solar Power:

Ivanpah Solar Electric Generating System, California

Geothermal:

Wairakei Power Station, New Zealand

Hydroelectric Power:

Dartmouth Dam, Lake Dartmouth, Victoria, Australia

Benmore, Otago, New Zealand

Tidal Power:

Rance, France

Wind Power:

Waubra wind farm, Waubra, Victoria, Australia

Cape Jervis, Australia

Biofuels:

Steven's Croft, Lockerbie, Scotland

Nuclear Power:

Hutchinson Island, Florida, St Lucie Nuclear Power Plant

4. Organise students in pairs or small groups to watch a short online video about a particular type of sustainable energy. Then have them play the video to the whole class with the volume turned off as they explain to their classmates what they are watching.

Video examples:

What is Solar Energy?

<https://www.youtube.com/watch?v=spMPnOTO078>

How Does Solar Energy Work

<https://www.youtube.com/watch?v=7OAcv7k8Qc0>

Energy 101: Solar Power

<https://www.youtube.com/watch?v=NDZzAlcCQLQ&index=8&list=PL366E88A22FD077A2>

Energy 101: Wind Turbines

<https://www.youtube.com/watch?v=tsZITSeQFR0>

How Hydro Electricity Works

<https://www.youtube.com/watch?v=rnPEtwQtmGQ>

Hydropower Animation

<https://www.youtube.com/watch?v=-6khaZNGhzo>

Energy 101: Wind Power

https://www.youtube.com/watch?v=niZ_cvu9Fts

Energy 101: Geothermal Energy

<https://www.youtube.com/watch?v=mCRDf7QxjDk>

Turn the Tides into Energy

<https://www.youtube.com/watch?v=ZPi9HeDgN58>

Ocean Energy: Wave Power Station

<https://www.youtube.com/watch?v=gcStpg3i5V8>

Tidal Wave Alternative Energy

<https://www.youtube.com/watch?v=tSBACzRE3Gw>

Ocean Energy: Tidal Current Turbine

<https://www.youtube.com/watch?v=8-sFLGMSMac>

Learn About Biofuels: Energy 101

<https://www.youtube.com/watch?v=F4bV9OmcVTk>

Useful online resources

Cool Australia

<http://www.coolaustralia.org/>

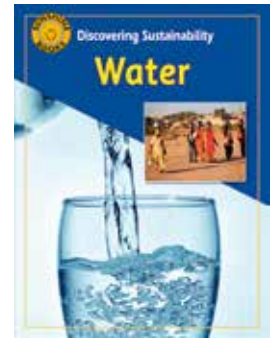
Solar Impulse

<http://info.solarimpulse.com/>

eschool Today: Renewable Energy

<http://www.eschooltoday.com/energy/renewable-energy/what-is-renewable-energy.html>

Water



1. Students use an online tool to calculate the water footprint of their favourite meal. Then compare with others in the class. See if they can generalise about the kinds of foods that have the smallest water footprint but are still nutritionally balanced.

<http://www.onedrop.org/calcul/en/>

2. Have students view the online video The Water Cycle – Untamed Science (<https://www.youtube.com/watch?v=77ENELQUIf4>) which explains how the water cycle works. Then organise them in small groups to watch and write a simple narration for one of the water cycle videos listed below. They can read their narration to the rest of the class as the video plays with the volume turned off.

NASA: The Water Cycle

https://www.youtube.com/watch?v=0_c0ZzZfC8c

The Water Cycle

<https://www.youtube.com/watch?v=StPobH5ODTw>

Water Cycle 3D Animation

<https://www.youtube.com/watch?v=xdQdP6eZTUs>

3. Do simple classroom experiments to demonstrate key features of the water cycle such as evaporation, condensation, precipitation and transpiration. Have students in small groups perform the experiments to the class and explain the results. Videos of many such simple experiments can be found online. Here is a good example:

Water Cycle _ Water Cycle in a Bag <https://www.youtube.com/watch?v=4WQBtAJxMbY>

4. Have students in small groups research, prepare and present simple water saving tips in any one of the following formats: poster, pamphlet, play, song, rap, television advertisement, radio announcement.

Useful online resources

Cool Australia

<http://www.coolaustralia.org/>

The Water Cycle

<https://www.youtube.com/watch?v=al-do-HGulk>

Great for language

The Water Cycle – Untamed Science

<https://www.youtube.com/watch?v=77ENELQUIf4>

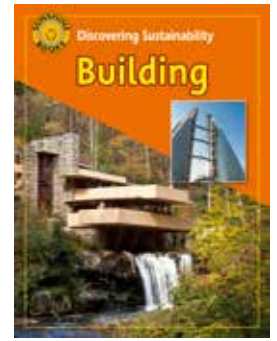
Introduction to Water

<https://www.youtube.com/watch?v=nSENoIWbyYQ>

Climate Kids: Fresh Water

<http://climatekids.nasa.gov/menu/fresh-water/>

Building



1. Have students label an image of a Korowai tree house with sustainability features.
The Korowai Tribe's incredible tree houses
<http://www.mymodernmet.com/profiles/blogs/korowai-tribe-treehouses>
2. Students take digital photographs of buildings at school or in their neighbourhoods and label them with sustainable features and unsustainable features for classroom display.
3. Have students draw a plan of their favourite room in their home and then use the Eco-Cool Remodel Tool (<http://www.gizmag.com/remodeling-tool-green-up-your-house/16735/>) to identify and record three things that could be done to that room to make it more sustainable.
4. Have students investigate and report back on the construction of houses using one of these reclaimed or re-cycled waste materials: plastic bottles; glass bottles; cardboard; aluminium cans; wood pellets; scrap metal

Useful Online Resources

Eco-Cool Remodel Tool

<http://www.gizmag.com/remodeling-tool-green-up-your-house/16735/>

Treehouse community

https://www.youtube.com/watch?v=qj_id2DC2ZE

Green spaces in cities

<http://www.mymodernmet.com/profiles/blogs/house-for-trees-vo-trong-nghia-architects?context=tag-architecture>

Treehouse in the USA

<http://www.mymodernmet.com/profiles/blogs/dave-herrle-wee-house?context=tag-architecture>

Moon shaped tent

<http://www.mymodernmet.com/profiles/blogs/roomoon-tree-house-tent?context=tag-architecture>

Recycling homes for homeless

<http://www.mymodernmet.com/profiles/blogs/gregory-kloehn-homeless-homes-project?context=tag-architecture>

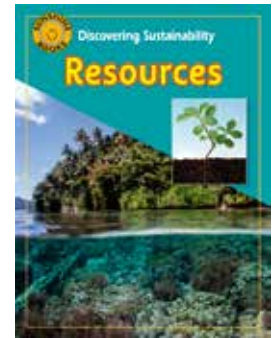
Ten most sustainable buildings

<http://www.cnbc.com/id/101906348/page/1>

City transportation

<http://www.treehugger.com/bikes/lets-bike-it-activists-campaign-show-how-much-space-one-car-occupies.html>

Resources



1. Have students view a short video on how a particular waste product is recycled. They draw a simple flow chart to illustrate the process.

How Plastic Milk Bottles are Recycled into Polyester
<https://www.youtube.com/watch?v=zyF9Mxlcltw>

2. Have students recycle waste items to create something new.

Recycling Craft Ideas For Kids
<http://101craftideas.com/kids-craft/81-recycling-projects-for-kids>

25+ Plastic Bottle Crafts for Kids
<http://www.stickybuffalo.com/plastic-bottle-craft-ideas-for-kids/>

3. Have students explore the Amazon Basin on Google Earth and ask them to find and screen shot any evidence of deforestation. Then get them to explore the Amazon Deforestation 1984-2012 time-lapse animation (<https://earthengine.google.org/#intro/Amazon>) and get them to write a paragraph about what they have learned about deforestation in the Amazon.

4. Have students research and write a description card of an animal species that is threatened by deforestation, without naming the animal. Post the profile cards on the classroom wall with an outline map showing where in the world that animal is endangered. Once complete, other students can try to work out the names of the animals.

Useful Online Resources

Species Threatened by Deforestation
<https://sites.google.com/site/globaldeforestationissues/examples-of-animals-that-have-become-extinct-due-to-deforestation>

Electric Cars
<https://www.mysolarquotes.co.nz/blog/future-of-solar-power/the-coolest-solar-power-car-charging-station-designs>

Nutrition
<http://www.feedmeright.co.nz/>

Eco Warriors
<http://www.spur.co.za/secrettribe/eco-warriors>

People Who Can and Do Influence Debate

Nicola Tesla, 19th century inventor

<http://www.tfcbooks.com/tesla/quotes.htm>

Rachel Carson, author and environmentalist

http://en.wikipedia.org/wiki/Rachel_Carson

Glen Murcutt, Australian architect

<http://www.ozetecture.org/2012/glenn-murcutt/>

Frank Lloyd Wright, American architect

<http://www.brittonmdg.com/the-britton-blog/frank-lloyd-wrights-organic-architecture-green-design-before-its-time/>

Chico Mendes

http://myhero.com/hero.asp?hero=c_mendes

Young Earth guardian and rapper

<http://www.treehugger.com/culture/meet-xiuhtezcatl-14-year-old-activist.html>

Stow it Don't Throw it

http://www.huffingtonpost.com/charles-orgbon/earth-saver-award-recogni_b_1537172.html

Jane Goodall

<http://www.biography.com/people/jane-goodall-9542363>

Wangari Maathai

<http://www.greenbeltmovement.org/wangari-maathai>

David Suzuki

<http://www.thecanadianencyclopedia.ca/en/article/david-suzuki/>

Indigenous Network for Environmentalism

<http://www.ienearth.org/>

Indigenous people protecting the environment

<http://ecommons.usask.ca/handle/10388/ETD-2012-10-795>