

# EcoLogic

You have the power to create a sustainable future

**These teachers' notes are to be used with Project Pull-out #52, which is found in issue 105 of DMAG. Students will develop an understanding and appreciation for our world by learning about climate change and its effects on our natural environment and living things.**



## This supplement encourages students to:

- Understand that there are various forms of energy
- Understand that natural resources are limited and need to be used wisely
- Acknowledge that there are many physical phenomena which can change the environment
- Recognise that the activities of people can change the balance of nature
- Understand that the future must be considered when making choices of particular technologies
- Recognise that there is a relationship between the process of investigation and the process of design and production

## Science: Switched on

Ask the class what forms of energy they are familiar with. How do they work? Using their answers, draw a mind map on the board. Then, ask the class to complete the *Coming to Terms* and *As Good As New* exercises in their Students Worksheets and discuss what makes a renewable and non-renewable resource. Then, divide the class into six groups.

Each group is to research one of the following energy sources:

- Coal
- Fossil fuel
- Natural gas
- Solar
- Wind
- Hydro

In their research they should find out when this energy source was discovered, how it creates energy, if it's renewable or non-renewable, how environmentally friendly it is, how commonly used it is and why it's so common/uncommon. Which do they think is better; renewable or non-renewable energy?



## Extension exercise

Gifted and talented students can research further into various forms of renewable and non-renewable energy. They are to write a discussion on their differences, and evaluate each on their environmental impact.

## HSIE: Environment matters

Ask the class what they think global warming is. How are humans contributing to it? These days we're working to reduce our contribution. Has this always been the case? Students are to research how attitudes to global warming and its contributors (e.g. the burning of fossil fuels) have changed over the years and write their findings in the form of a time line.

## History: What's the weather?

Ask students to read pages 48 and 53 of DMAG's Project Pull-out and do some research into a past period of climate change, for example one of the ice ages. In their research they are to answer the following:

- What was the climate like before the change?
- What caused the change?
- What the climate was like after the change?
- What was the consequence of the change? Did any flora or fauna become extinct?

After students share their findings, discuss what could happen to our world if we don't work to reduce climate change and global warming.

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## Extension exercise

Our practices on Earth can contribute to climate change, but there are also natural occurrences that can contribute as well. Gifted and talented students can look at naturally occurring events such as volcanic eruptions, an increase in sunspot activity and the tilt of the Earth and how they can affect the Earth's climate.

## Environment matters: excursion

If you can, take the class on an excursion to a local waterway to determine its health. Ask students to write down what they observe of the environment. Are there many plants or creatures in and around the water? What kinds of creatures are they? If you can, bring a water pH test kit and test the water.

Back in class, discuss the students' findings. Is the water acidic, alkaline or neutral? What does this suggest about the water's health? What about the creatures? Were there many bugs and insects in water? Explain to the students that some water insects are sensitive to pollution – so a lack of insects could suggest an unhealthy environment. What could be possible reasons for the water's state of health? What can be done to improve it?

## Science experiment:

### The effect of acid

As a class, read page 48 of DMAG's Project Pull-out. Why are shellfish at such great risk if the water becomes too acidic? As a class, conduct this experiment.

**You'll need:** egg (can be boiled or raw), white vinegar, plastic container.



**The experiment:** place egg in container and coat with white vinegar. What is the egg's first reaction to the presence of vinegar? (Ans. bubbles will start to appear on it). Cover the container and check back on it the next day. What has happened? Has the shell dissolved? What is left? Cover it up again and check back on it the following day. How does the egg look now? What could be the reason for this? (Ans. shells, like those on eggs, contain calcium carbonate. When this comes in contact with acetic acid (found in vinegar), the acid strips the carbonate away.) Although this is an extreme case, how might this be similar for shelled marine life?

## Science: Making it easy

Besides household appliances, what other objects require energy? (E.g. torches, cars). Are their energy sources renewable or non-renewable? Are there alternate energy sources that can be used that are more sustainable? Students are to bring an object or an image of an object that uses a renewable form of energy and share it with the class, explaining

what sort of energy it uses and how. Examples might include a wind-up torch, solar powered calculator and hydrogen powered car.

## HSIE: A change for the better

Ask students to do the *My Carbon Footprint* exercise in the Student's Worksheets. Each student is to share with the class one thing they do (or can do) to reduce their carbon footprint. Using their responses, create a poster to hang in the classroom of ways students can reduce their carbon footprint.



## Extension exercise:

Students can develop either a prototype for a device or a house that is "ecological." Students are to write a one-page explanation on how their device/home is ecological and share it with the class. If students like, they may also create a model of their device/home to share with the class.

## ABOUT DMAG

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