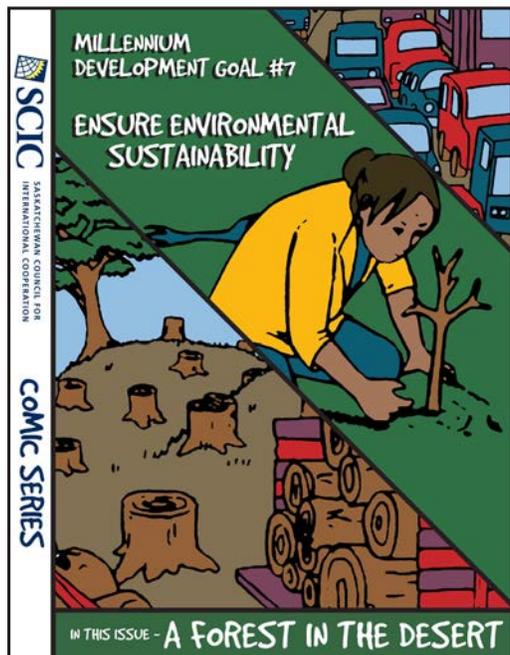


# GOAL 7: Ensure Environmental Sustainability

**CUT IN HALF THE NUMBER OF PEOPLE WHO LACK CLEAN WATER,  
IMPROVE THE LIVES OF PEOPLE WHO LIVE IN SLUMS,  
AND PROMOTE POLICIES THAT RESPECT THE ENVIRONMENT.**



**THIS COMIC TAKES  
PLACE IN CHINA**  
CONTINENT: ASIA  
CAPITAL: **BEIJING**  
LANGUAGE: **MANDARIN**  
SPORT: **MARTIAL ARTS, TENNIS,  
BADMINTON, SWIMMING**  
POPULATION (2010): **1,339,724,852**



We tend to forget about the environment having rights, but today, more than ever, The ecosystems that provide essential services are failing due to human activity. This comic takes a look at a small village in China, and the impact that deforestation and pollution have had on the survival of the forest and the surrounding natural habitat. Chen-Chi and her family work together to replant the forest, but will they be able to save the environment, or will human corruptions like pollution, unsustainable development, and waste destroy their plan? Read this comic to find out what happens!

## **GOAL 7 – RELATED LEARNING IDEAS:**

1. Measure your classroom's garbage intake for a week. Everyday, have students weigh in the amount of garbage and recycling they produce, and have them consider the impacts of this waste over a longer period of time. At the end of the week, conclude this activity by creating posters to raise awareness on waste accumulation, and garbage produced in school, in hopes of encouraging other students and classes to waste less.
2. Start a Tree Planting Campaign at your school. Involve students, teachers, staff, and parents, and make a goal to plant a certain amount of trees at your school, or around your community every year.
3. The environment is often forgotten as an important aspect of our lives. The environment has rights, just as we humans have rights. Have students write letters to their Members of Parliament, or leaders, urging these people in power to protect the environment, and take a stance against destroying our world.

Source: Wikipedia

*“We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.”*  
—Aldo Leopold, United States environmentalist.

## DID YOU KNOW?

### FORESTS

- Canada's Boreal Forest covers 53% of the country, contains the majority of Canada's plant and animal species and is the world's main source of industrial wood and wood pulp. Only 8% of Canada's Boreal Forest is officially protected from industrial activity.
- 80% of the world's old growth forest has been lost to human activity.

### WATER

- The average Canadian household generates about 1.5 million litres of waste water every year.
- The average load in an automatic dishwasher uses 35 to 45 litres of water.
- It takes 7,000 litres (1,850 gallons) of water to refine one barrel of crude oil.

### ENERGY AND GREENHOUSE GAS EMISSIONS

- Canada is the largest consumer of energy and the second-largest producer of greenhouse gas emissions on a per capita basis.
- 43% of personal greenhouse gas emissions in Saskatchewan come from cars. It takes 130 trees to absorb the carbon dioxide emitted from just one car every year.

## GLOSSARY

**BOTANICAL GARDENS:** gardens where plants are studied and conserved.

**CLEARCUTTING:** a controversial forestry/logging practice in which most or all trees in a harvest area are cut down.

**DESERTIFICATION:** the process of fertile land transforming into desert typically as a result of deforestation, drought or improper/inappropriate agriculture.

**ENVIRONMENT:** all living and non-living things that occur naturally on Earth.

**HORTICULTURE:** the industry and science of plant cultivation including the process of preparing soil for the planting of seeds, tubers, or cuttings.

**ILMENITE:** a mineral used as whitening for paper, plastic and paint.

**PIGMENT:** a material that changes the color of reflected or transmitted light. Pigments are used for coloring paint, ink, plastic, fabric, cosmetics, food and other materials.

**POLLUTION:** the contamination of air, water, or soil by substances that are harmful to living organisms.

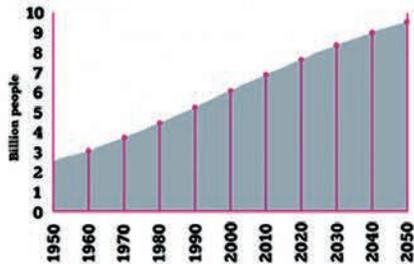
**RIO TINTO:** a large mining company.

**SUSTAINABILITY:** capable of being continued with minimal long-term effect on the environment.

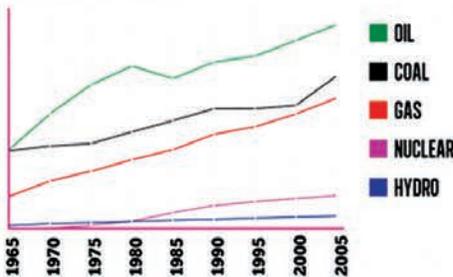
**THE HUMAN RACE IS PLUNDERING THE PLANET AT A PACE THAT OUTSTRIPS ITS CAPACITY TO SUPPORT LIFE. ALTERNATIVE WAYS TO PROVIDE FOOD AND ENERGY RESOURCES ARE ESSENTIAL AND UNDER THE SPOTLIGHT NOW MORE THAN EVER – INVESTMENT INTO SUSTAINABLE AGRICULTURE AND RENEWABLE ENERGY HAS NEVER BEEN MORE TIMELY OR CRUCIAL.**

**POPULATION GROWTH VS SHRINKING RESOURCES**

**WORLD POPULATION**



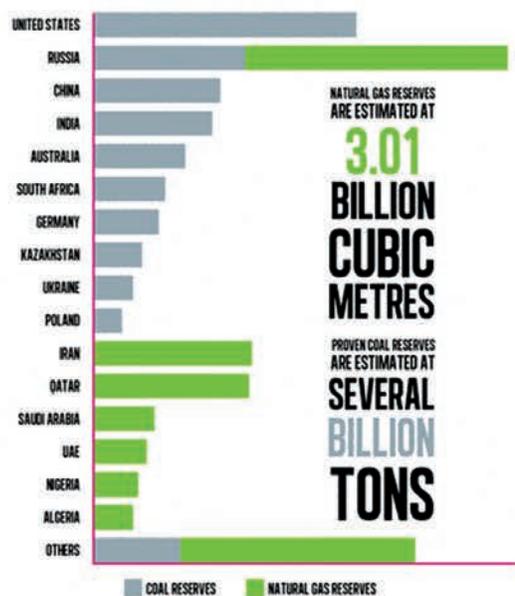
**WORLDWIDE ENERGY USAGE**



**WORLDWIDE OIL RESERVES**



**WORLDWIDE ENERGY RESERVES**



AT CURRENT PRODUCTION AND CONSUMPTION RATES, IF NO NEW RESERVES ARE FOUND, OUR NATURAL RESOURCES WILL LAST:

**OIL - 40 YEARS**

**COAL - 130 YEARS**

**NATURAL GAS - 59 YEARS**

**WORLDWIDE OIL USE PER DAY - 86,952 BARRELS**

**WORLDWIDE COAL USE PER DAY - 21,903 SHORT TONS**

**WORLDWIDE NATURAL GAS USE PER DAY - 139 MILLION CUBIC METRES**

**WHO IS INVESTING IN ALTERNATIVE ENERGY AND WHO HAS THEIR HEAD IN THE SAND?**

**UN** = 70% DECLINE IN 2010 TO \$3.3BN. MAINLY TO OFFSHORE WIND FARMS

**FRANCE** = 26% INCREASE IN 2010 TO \$1BN. MAINLY SMALL SCALE SOLAR

**CANADA** = \$5.6BN INVESTMENT IN 2010. 52% TO WIND, 24% TO SOLAR

**USA** = 51% INCREASE IN 2010 TO \$34BN. MAINLY IN ENERGY EFFICIENCY

**BRAZIL** = \$7.6BN IN 2010. 40% TO BIOFUELS, 31% TO WIND AND 28% TO OTHER SOURCES

**ARGENTINA** = \$740M IN 2010. MAINLY HYDRO AND WIND, SOME SOLAR

**GERMANY** = 100% INCREASE IN 2010 TO \$41.2BN. MAINLY SMALL SCALE SOLAR

**CHINA** = 39% INCREASE IN 2010 TO \$54.4BN (WORLD RECORD). \$45BN TO WIND (75% OF TOTAL RENEWABLE), \$4.7BN TO SOLAR

**JAPAN** = \$3.3BN IN 2010. 96% IN SOLAR ENERGY

**INDONESIA** = 55% DECLINE IN 2010 TO \$247M. MAINLY GEOTHERMAL

**AUSTRALIA** = \$10BN OVER THE NEXT 5 YEARS. RENEWABLE ENERGY

**INDIA** = 25% INCREASE IN 2010 TO \$4BN. 63% IN WIND SECTOR

**NEW REPORTS BY THE WWF CLAIM THAT IF WE CONTINUE TO CONSUME THE RESOURCES OF THE EARTH AT CURRENT RATES, BY THE YEAR 2050 WE WILL BE FORCED TO LEAVE EARTH AND COLONISE TWO MORE PLANETS!**

# Activity: Developing the Rainforest

## PURPOSE

This lesson links sustainable development and the environment with a specific focus on rainforests. Students explore an example of how economic development impacts the environment.

## SUBJECT AND GRADE

Social Studies/Biology; Grades 7-9

## TIMING

3-4 hours

## MATERIALS

Computers

Internet

Worksheet A

Worksheet B

## PROCEDURE

1. Ask students for information about rainforests. Try to include issues such as diversity of species, natural habitats, climate and global warming. Ask students to find Madagascar on the wall-map or in their atlases and mark it on a map of Africa.
2. Divide the class into 5 groups and explain that they will prepare to debate environmental issues concerning the rainforest in Madagascar.
3. Distribute "Worksheet A" and read through with students. Invite comments. Distribute "Worksheet B" and instruct groups that at the end, they will be given a position to defend. To do so, they need to read all the arguments closely.
4. Allot a role to each group. Advise students that while they may not in reality support the allotted role but that this is a good way of exploring the arguments. They will be afforded an opportunity to state their own opinions at the end. Groups should finally appoint and brief a spokesperson.
5. If there is sufficient time available they could prepare banners, posters or slogans to promote their position during the debate.
6. After the debate, encourage them to express their opinions.

# Worksheet A: Developing the Rainforest

**THE FOLLOWING ARTICLE, BY JO REVILL, APPEARED IN THE OBSERVER ON AUGUST 7, 2005:**

## **MADAGASCAR'S UNIQUE FOREST UNDER THREAT**

One of the world's biggest mining companies has been given permission to open up an enormous mine on the Indian Ocean island of Madagascar which will involve digging up some of the world's most unique forest.

Madagascar is noted for its wildlife. Many of its plant and animal species exist nowhere else in the world. Its beauty and coastline are also beginning to make it popular with tourists and its popularity has been further boosted by the film Madagascar, the animated movie which features animals escaping from a New York zoo and ending up on the island.

But the company, mining giant Rio Tinto, says environmental damage will be kept to a minimum. It says it will bring wealth to a poor region.

Coastal rainforest bordering the Indian Ocean will be dug up in a 635 million project to extract ilmenite. The operation could last for 40 years. There is enormous demand for the white pigment, which is used in paper, paint and plastics.

Madagascar has more groups of rare animals than almost anywhere else on earth. Best known of Madagascar's animals are the lemurs, monkey-like creatures with large eyes, of which there are 32 different species. Other creatures under stress are the ploughshare tortoise, the world's rarest tortoise, of which only a few hundred survive today, and the side neck turtle.

Rio Tinto assessed the likely damage. As a result, the company decided to set aside a conservation area on land it was previously going to mine, so that some of the plants and species could be protected. It also worked with experts from Kew Gardens, the famous botanical gardens in London, to preserve the seeds of threatened plants. Kew Gardens received sponsorship money from Rio Tinto as part of the deal.

Source: Irish Aid, Department of Foreign Affairs and Trade. Government of Ireland.  
[www.irishaid.gov.ie/uploads/Our World Our Future.pdf](http://www.irishaid.gov.ie/uploads/Our_World_Our_Future.pdf)

# Worksheet B: Developing the Rainforest

## FIRST ENVIRONMENTALIST (AGAINST THE PROJECT)

This is a very sad day and very bad news for the people of Madagascar.

Rio Tinto is exploiting natural resources in poorer countries and, once again, it is the local people who will pay the price.

There is terrible poverty in Madagascar, but this is not the best way to help.

Thousands of foreigners will come in to take the jobs, and there are worries about the spread of diseases such as HIV/AIDS.

I fear it's going to destroy one of the most beautiful regions in the world.

## EXPERT FROM KEW BOTANICAL GARDENS (FOR THE PROJECT)

We shouldn't criticise the company.

We wanted to see the least environmental damage possible from this project.

They are giving money to us to preserve the plant species.

Look what we have done to our country.

If we follow the same rules, shouldn't we be covering our country with oak forest and wild boars?

We have an odd view about what is right and wrong.

## COMPANY SPOKESPERSON (FOR)

We believe we have done everything we can to keep the impact on the environment as small as possible.

Ilmenite was going to be mined one way or another. If we did not do it, another company would.

Much of the forest in the south has already disappeared because local people have chopped down many of the trees for firewood.

We will actually be restoring the forest by planting seeds and trees in areas that have been stripped.

## SECOND ENVIRONMENTALIST (AGAINST)

You might have lots of plans for environmental protection, backed by lots of experts, but we are looking at a mine that will operate for 40 years.

What are we going to do if, at the end of it all, there are species that become extinct, forests that are ruined and people who are still poor?

Who's going to be held accountable for that? No one!

It's the age-old story of large companies getting exactly what they want, whatever the environmental cost.

## GOVERNMENT SPOKESPERSON FROM MADAGASCAR (FOR)

You have no right to criticise the company or the government.

Look at the type of paper and paint you want.

By demanding those goods, you are demanding that we or someone else provides ilmenite.

We are providing what you people in the developed world want.

This is among the poorest countries on Earth and you want us to protect forests at our own cost and turn up our noses at money that could provide health and education for our children.

# Activity: Finding Environmentally Friendly Alternatives

## PURPOSE

Students will split into five separate groups, which will each be responsible for understanding how one aspect of their lives contributes to climate change. Each group will share their results through a skit in the form of a commercial, demonstrating how youth can reduce their consumption and carbon emissions through a change in that particular aspect of their lives.

## SUBJECT AND GRADE

Social Studies; Grades 6-9

## TIMING

2 hours

## MATERIALS

Computers

Internet

Black/white board

## RATIONALE

Complex environmental issues can seem like problems without easy solutions. Ultimately, the solutions to these issues lie in the decisions of regular people. The average American produces 20 tonnes of carbon emissions each year. This number could easily be reduced if we all made environmentally friendly choices, which would help to slow or eliminate climate change.

## PROCEDURE

1. Provide a brief recap of global warming and climate change. (Note: Students may have seen the popular documentary, *An Inconvenient Truth*, created by former US vice-president Al Gore.)
2. Write these five categories as headings on the board:  
Household Activities, School Activities, Transportation, Food and Drink, Entertainment and Fashion.
3. In a large discussion, identify two to three activities or products for each of these categories that consume resources, create emissions and/or contribute to climate change.  
Provide the following examples if students are slow to provide answers:
  - HOUSEHOLD ACTIVITIES: heating, cooling, lighting
  - SCHOOL ACTIVITIES: paper use, lighting, heating (can also be specific to your school)
  - TRANSPORTATION: Idling engines in cars or buses, travelling via airplanes vs. cars vs. carpooling vs. buses vs. cycling or walking, paving and maintaining roads
  - FOOD OR DRINK: heavily processed food, food with lots of packaging, food that is shipped from far away vs. locally grown, organic foods
  - ENTERTAINMENT AND FASHION: Buying new clothes all the time vs. buying vintage or used clothes, buying clothes that are heavily processed vs. buying organic clothes
4. Split the class into five groups and assign one of the five categories to each group.
5. Provide each group with resources for research—either access to the Internet or the library. Research can also be completed as homework if necessary. Each group will choose one to two aspects of their category as a focus for their research. They will choose a specific problem—like consumption of energy through heating—and then use their research time to learn about more environmentally friendly alternatives (i.e., solar or wind power).
6. Each group will prepare a skit in the form of a commercial about their alternative, environmentally friendly practice. The purpose of the skit is to educate the rest of the class about a small change they can make in one aspect of their life to reduce their consumption.

## CLOSURE

Debrief the activity by asking each group to share the most surprising thing they learned during their research. Why did it surprise them? What will they do differently in the future based on what they have learned?

# Activity: Preferable Future

## PURPOSE

To explore the issues of global warming and sustainable development, and to allow students to think about how they would like the future to be.

## SUBJECT AND GRADE

Social Studies/Language Arts; Grades 6-8

## TIMING

1-2 hours

## MATERIALS

Newspaper articles about climate change (collected by students beforehand.)  
Access to the internet or the school library

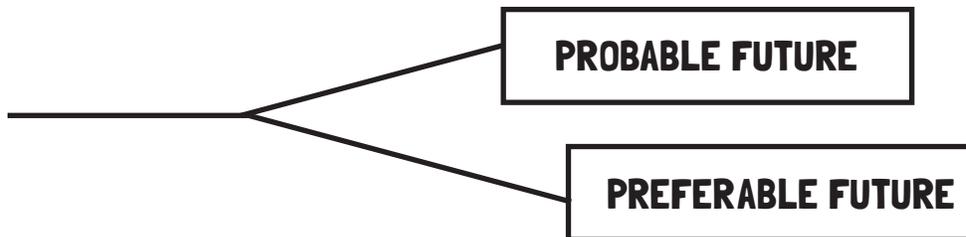
## NOTE

You will need to ask students to collect newspaper articles about climate change a few days before you do this activity. Alternatively, they could search the internet for these articles.

## PROCEDURE

1. Using the articles as a starting point, draw out the main issues in the debate about climate change. List some of the questions students have that arise from the discussion. Allocate these questions to small groups and ask them to research the answers using the internet or reference books.
2. Ask the groups to share the results of their research with the class and then begin to think about:
  - what has contributed to the present situation
  - what the probable future for the world will be in ten, twenty or thirty years' time if we do not take action.

Ask the groups what they would like the world to be like in ten, twenty or thirty years time. They can record their thoughts on 'preferable' and 'probable' timelines, as illustrated below. They could draw pictures.



Source: Change the World in Eight Steps. Oxfam UK.  
[www.oxfam.org.uk/education/resources/change\\_the\\_world\\_in\\_eight\\_steps/](http://www.oxfam.org.uk/education/resources/change_the_world_in_eight_steps/)  
Click on Goal 7: Clean up the environment—information and activities