



EARTH HOUR™

Your Future Your Say

Education Pack

USING A CLASS PARLIAMENT APPROACH

Suitable for Students Aged 12-16



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www.earthhour.org

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At 8:30pm on 26 March 2011, cities towns and municipalities across the world will turn off their lights for one hour- Earth Hour- sending a powerful global message that it's possible to take action on global warming. Earth Hour 2011 aims to send a message to world leaders that we, the citizens of the planet, demand commitment to actions that will reduce greenhouse gas emissions for the benefit of the planet and will stop harmful climate change. The first step is easy, just switch off your lights on Saturday 26 March, 8:30-9:30 for Earth Hour.

Everyone has heard about **climate change** — it is the biggest environmental issue there is. It is so important that there are international meetings of governments being held to try and solve the problem, and that aim to establish an agreement about how the countries of the world reduce their greenhouse gas emission.

- What do these meetings do?
- How is your own country involved?
- Is there some way you can make your voice heard on this issue — if you want to?

- And what about nationally and locally — are there things that can be done at these levels to address the problem?
- Is this an area where you want to be an informed and active citizen, and influence the way your society is developing?

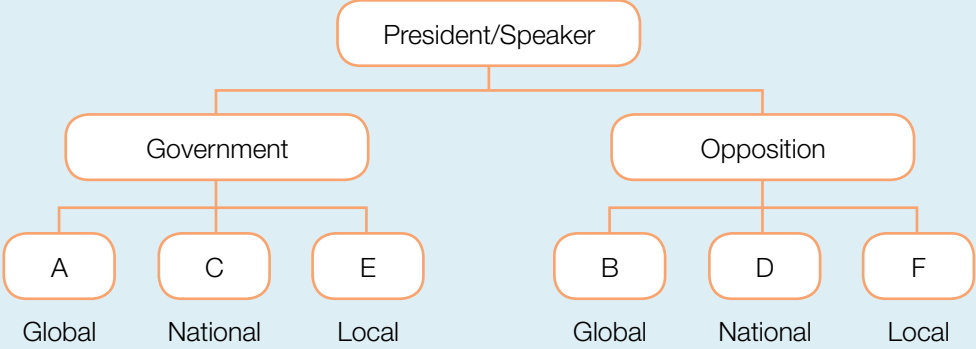
That's what this practical classroom unit is all about — helping you to contribute to your society by having an informed opinion, and then letting that opinion be heard. It can also help you to take action that will make a difference.

You do not have to get involved if you do not want to — but responsible citizenship includes understanding the issues so you can make good decisions about what actions to take.

A classroom approach

Here's one suggestion of something you can do. It is a simple but effective way of finding out about an issue, and then deciding if you want to be active or not.

STEP	ACTIVITY	RESOURCE PAGE
1 ↓	Brainstorm your knowledge and ideas and attitudes to climate change.	1
2 ↓	Divide your class into 6 teams. Let's call them A, B, C, D, E and F — but you can change these names if you want to. Each team will be a research and ideas group, with a spokesperson who will report for the group.	
3 ↓	Each team reads the general information on climate change and international conferences.	2 3 4 5 6
4 ↓	Each team will research and report on possible ways of reducing greenhouse gas emissions, in order to reduce the impacts of climate change. Teams A and D will look at this issue at a global or world level; Teams B and E will do this at the national level (it can be for your own country, or another one); Teams C and F will research and report at a local level.	7 8 9
5 ↓	Each group researches the issue further at the level they are responsible for — global, national or local. The key thing is to come up with some practical actions that the class can actually do. For example, at the global level the suggested action might be to participate in Earth Hour, the world's largest mass participation event, and send a message with the simple act of turning out the lights for one hour that the citizens of the planet demand commitment to actions that will reduce greenhouse gas emissions.; at the national level it might be to send a letter to the Minister for the Environment or equivalent position in your national government, expressing your ideas about what sort of policies you want your national representative to carry out; at the local level it might be to carry out an audit of your home or school, to identify places where energy is being wasted, and to suggest actions to reduce that waste.	

STEP	ACTIVITY	RESOURCE PAGE								
<p>6</p> <p>↓</p>	<p>The six groups now come together as a Class Parliament to present and discuss their suggested actions. Three of the teams A, C and E will be the Government, with the spokesperson being the Minister; and three (B, D and F) will be the Opposition, with the spokesperson being the Shadow Minister. The teacher will be the Speaker or President in control of the parliament, and will make the rules about the procedures — who speaks and for how long, who can ask questions, and so on.</p>  <pre> graph TD PS[President/Speaker] --> G[Government] PS --> O[Opposition] G --> A[A] G --> C[C] G --> E[E] A --- AG[Global] C --- CN[National] E --- EL[Local] O --> B[B] O --> D[D] O --> F[F] B --- BG[Global] D --- DN[National] F --- FL[Local] </pre>	<p>6</p>								
<p>7</p> <p>↓</p>	<p>The Government groups will be responsible for putting forward suggested actions for the class to take — at the global, national and local level. The Opposition will also be responsible for putting forward proposals at these levels, and have to try to come up with alternative ideas. After all proposals have been discussed and considered, the Parliament will vote on what global, national and local suggestions for action it will pass.</p>									
<p>8</p> <p>↓</p>	<p>You should now put your 'laws' into effect. This is the action dimension of informed and active citizenship.</p> <p>Then watch news reports and look for these two key things:</p> <ul style="list-style-type: none"> • What decisions are made about key policies involving the environment? • What is your country legislating to reduce its greenhouse gas emissions? 									
<p>9</p>	<p>You can now compare the way your class parliament worked with the way your country's national parliament or congress does. What are the similarities and differences, and the strengths and weaknesses of each approach? Summarise your ideas in a table like this:</p> <table border="1" data-bbox="248 1424 1270 1630"> <thead> <tr> <th>We did</th> <th>They do</th> <th>Positives</th> <th>Negatives</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p>Perhaps you might even make suggested changes to your parliamentary system and put these to your parliamentary representatives!</p>	We did	They do	Positives	Negatives					
We did	They do	Positives	Negatives							

Good luck with your class parliament — you are helping to make the world a better place!

Brainstorm

Brainstorm your knowledge, opinions and attitudes to climate change. When you have finished sort them and record them in these columns. This will help you identify what you know, what you do not know, and what actions might be practical and achievable. You will be able to change and add to this summary as you research further.

WHAT IT IS	PROBABLE CAUSES

LIKELY IMPACTS (LI) & POSSIBLE ACTIONS (PA)					
Global		National		Local	
LI	PA	LI	PA	LI	PA



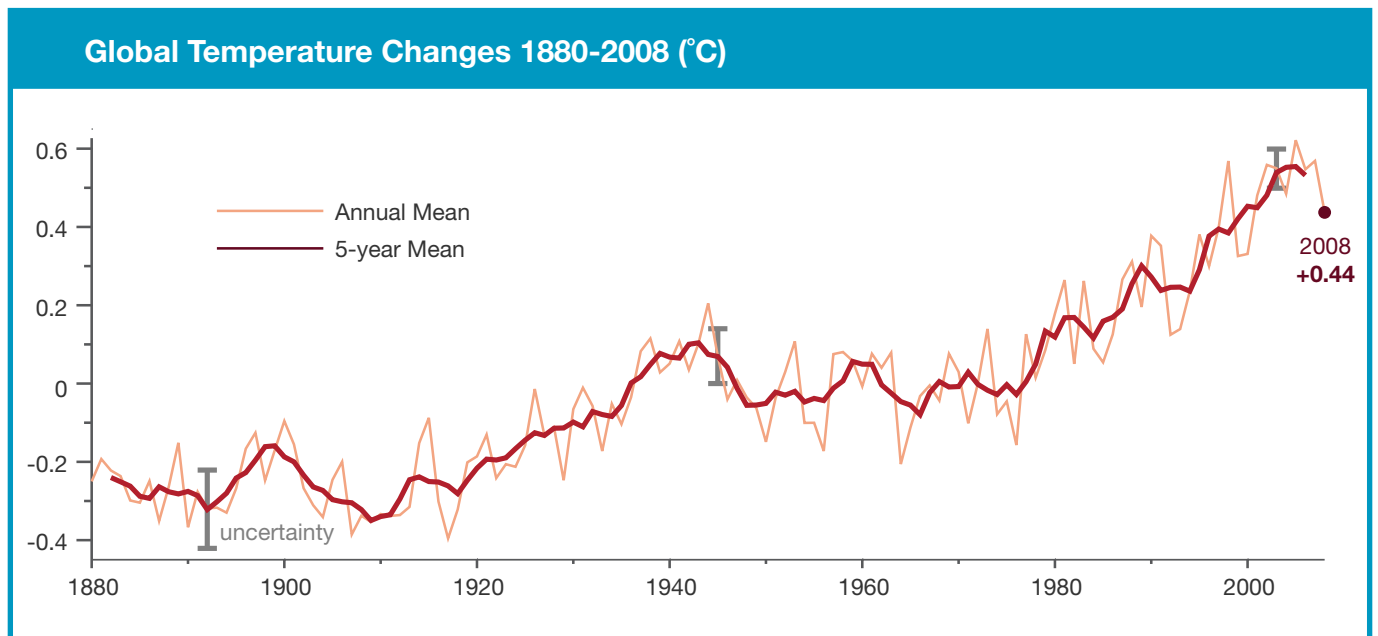
KEY ISSUES: Is the world warming?

You are investigating climate change. A widely accepted belief today is that dangerous global warming is taking place. Many believe that the frequency and severity of extreme weather events like bush fires, floods and cyclones around the globe are a product of increasing greenhouse gases in the atmosphere, especially carbon dioxide (CO₂). This harmful increase is attributed to human activity. Decreasing the amount of human-created greenhouse gases can hopefully reduce the adverse changes to our climate.

Look at some of the evidence for this belief and answer the associated questions.

FIGURE 1
Global temperature changes 1880–2008

- 1 Look at this graph and decide: Is global temperature increasing? Explain your answer.



The grey bars show the range uncertainty for the official figures used, with earlier measurements being less certain than modern ones.

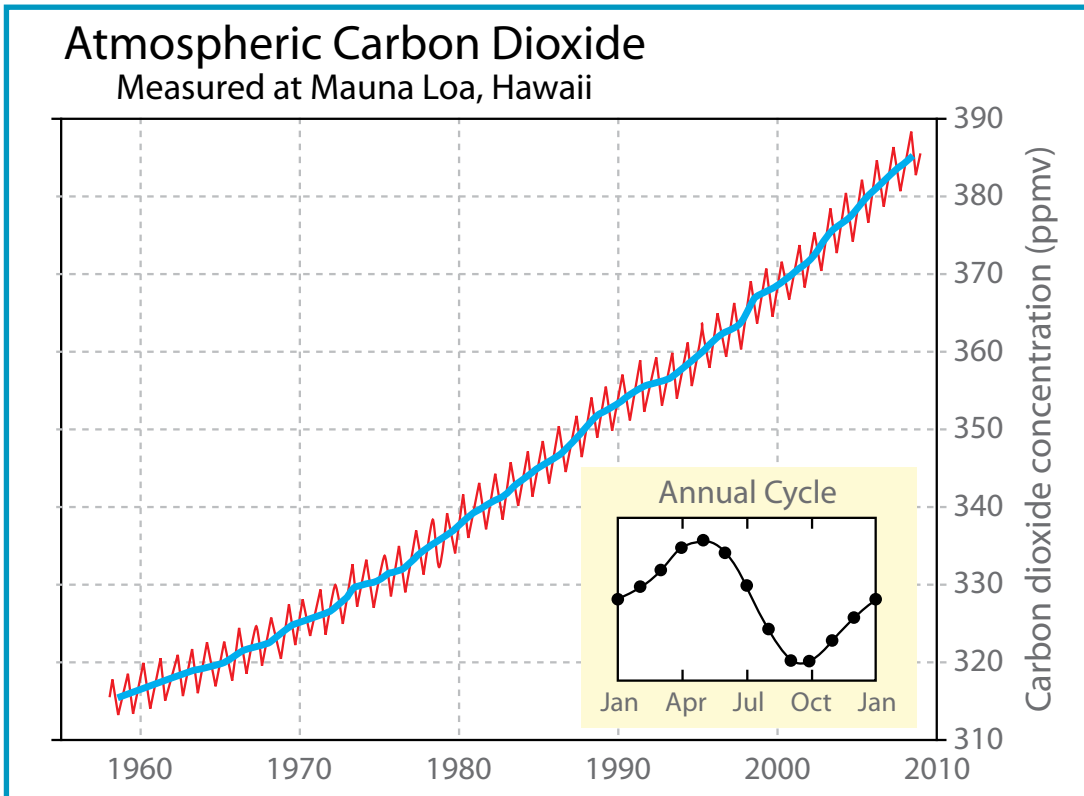
<http://data.giss.nasa.gov/gistemp/2008/fig1.gif>



KEY ISSUES: Are carbon dioxide (CO₂) emissions increasing?

FIGURE 2
Atmospheric carbon dioxide concentration

2 Look at this graph and decide: Is the concentration of CO₂ in the atmosphere increasing? Explain your answer.



www.esrl.noaa.gov/gmd/trends/co2_date_mlo.html

As of November 2007 the CO₂ concentration in the Earth's atmosphere was about 0.0384% by volume, or 384 parts per million by volume (ppmv). There is an annual fluctuation of about 3-9 ppmv which roughly follows the Northern Hemisphere's growing season. The Northern Hemisphere dominates the annual cycle of CO₂ because it has a much greater land area and plant biomass than the Southern Hemisphere. The concentrations peak at the end of winter, and reduce when spring photosynthesis is greatest.

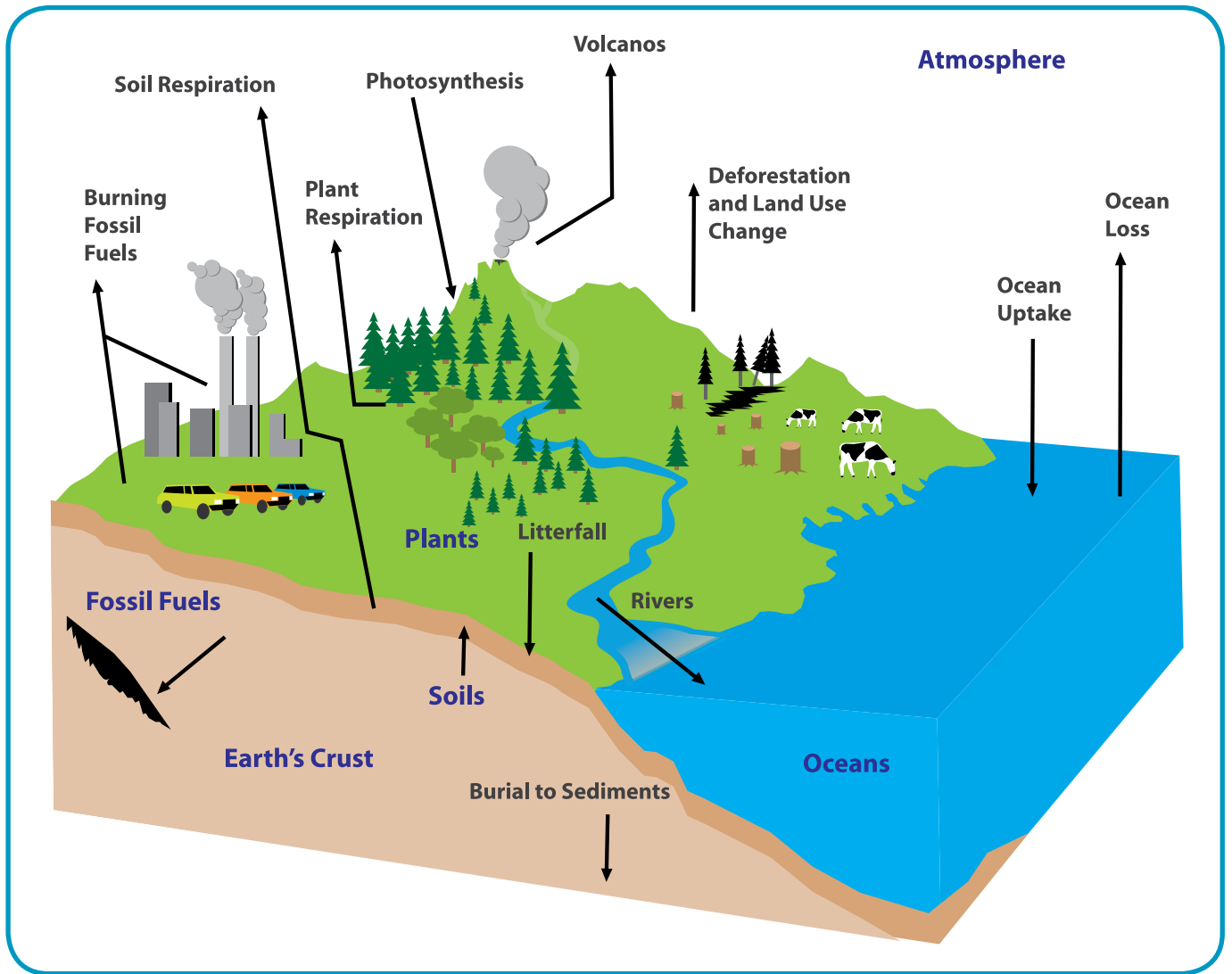
Your Conclusion: Is there a problem with climate change that is caused by human production of CO₂? Explain your answer.



KEY ISSUE: How does the carbon cycle work?

If carbon dioxide in the atmosphere is the problem, why is there more now than ever before?

To understand this you need to look at the natural carbon cycle, and the ways in which human activity might be disrupting this natural cycle.



www.globe.gov/fsl/html/templ.cgi?carboncycleDia&lang=es&nav=1

This diagram shows the global carbon cycle — where carbon is located, and how some of it is released into the atmosphere, and how some of it is released from the atmosphere.



KEY ISSUE: How does the carbon cycle work?

- 1** Locate these aspects on the the diagram on Resource Page 3A, and add the following figures in the appropriate places on it (Petagrams = 10^{15} or 10 000 000 000 000 000 grams):

Fixed sources of carbon:

- Fossil fuels 4000
- Earth's crust 100 000 000
- Soils 1500
- Plants 560
- Oceans 38 000
- Atmosphere 750

How carbon is added to the earth annually:

from the atmosphere

- Ocean uptake 92
- Photosynthesis 120

from the earth

- Litter fall 60
- Burial to sediments 0.1
- Rivers 0.8

How carbon is released from the earth to the atmosphere annually:

by natural processes

- Soil respiration 60
- Plant respiration 60
- Volcanoes 0.1
- Ocean loss 90

by human activities

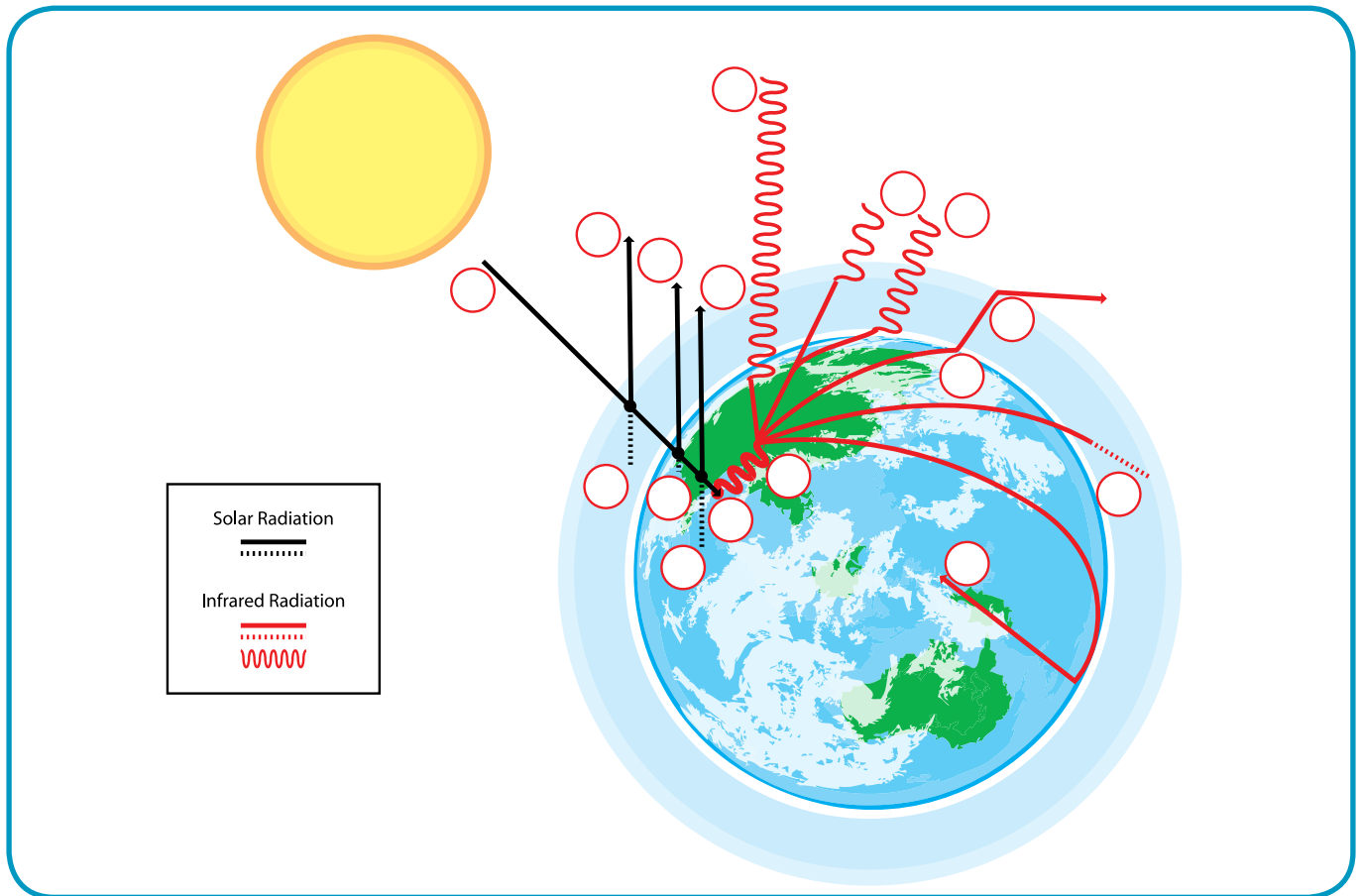
- Burning fossil fuels 6
- Deforestation and land use change 0.9

- 2** Use these figures to determine the total amount of CO_2 being added to the atmosphere annually, the total amount being lost annually, and how much of the change in balance is being caused annually by human activities.
- 3** What is the effect of human activities in the increase of CO_2 in the atmosphere? Does this matter? Look at the next page.



KEY ISSUE: How do the greenhouse effect and the enhanced greenhouse effect work?

Here is a diagram showing the Greenhouse Effect.



1 Mark these features on the diagram by placing the appropriate letter in the appropriate circle.

Solar radiation

- A** Solar radiation passes into the atmosphere towards earth
- B** Some solar radiation is reflected by the atmosphere
- C** Some solar radiation is reflected by clouds
- D** Some solar radiation is reflected from the earth's surface
- E** Some solar radiation is absorbed by clouds
- F** Some solar radiation is absorbed by the atmosphere (16%)
- G** Most solar radiation is absorbed by land and oceans
- H** This solar radiation is converted into heat and causes the emission of infrared radiation

Infrared radiation

- I** Some infrared radiation is released to space by conduction and rising air
- J** Some infrared radiation is released to space from the clouds (J1) and the atmosphere (J2)
- K** Some infrared radiation is carried to clouds (K1) and the atmosphere (K2) by latent heat in water vapour
- L** Some infrared radiation is absorbed by the atmosphere
- M** Some infrared radiation is radiated directly to space from earth
- N** Some infrared radiation is re-emitted back to earth from the greenhouse gases in the atmosphere.

2 What happens if the atmosphere traps more? Explain your answer. Is this a problem? Look at the next page and decide.



KEY ISSUE: What are the likely consequences of continued global warming?

Here is a way of showing the consequences of continued global warming.

Decide which of the three policies towards global warming reduction you would recommend, and then see the consequences of each.

POLICY 1

Current targets of 10-30% reduction of 1990 global greenhouse gas emissions by 2020 and 40-90% by 2050.



WORLD 1

- Up to 20-50% of plant and animal species is at risk of going extinct.
- Tropical diseases likely to spread around the globe with more people exposed to Dengue fever.
- Great Barrier Reef is destroyed.
- Up to 170 million people affected by coastal flooding each year.
- 1-2 billion people facing growing water shortages.
- Up to 150-550 million additional people at risk of hunger.
- Serious impact on global economies due to food and water shortages, heatwaves and losses of coastal land, potentially leading to mass migration and destabilizing conflict.

POLICY 2

Current targets of 25-40% reduction of 1990 global greenhouse gas emissions by 2020 and 80-95% by 2050.



WORLD 2

- Around 15-40% of plant and animal species is at risk of going extinct.
- Increased deaths from heatwaves, floods and droughts.
- Mass bleaching of the Great Barrier Reef.
- Up to 10 million people affected by coastal flooding each year.
- More than 1 billion people facing growing water shortages.
- Up to 150-550 million additional people at risk of hunger.
- There are still significant economic impacts on global economies from climate change.



KEY ISSUE: What are the likely consequences of continued global warming?

POLICY 3

Current targets of more than 40% reduction of 1990 global greenhouse gas emissions by 2020 and more than 95% by 2050.



WORLD 3

- The worst impacts of climate change outlined in Worlds 1 and 2 are avoided.
- Significantly fewer plants and animals will face extinction in comparison to Worlds 1 and 2.
- Great Barrier Reef is largely preserved, but experiences some coral bleaching.
- Significantly fewer people facing food and water shortages in comparison to Worlds 1 and 2.
- Significantly fewer people are displaced by rising sea levels in comparison to Worlds 1 and 2.
- Economic impacts of climate change are reduced significantly.

In a poll conducted this year in Australia by World Vision and Australian Youth Climate Coalition on these possible futures, 34,267 (91.5%) voted for World 3, 2,225 (5.9%) voted for World 2 940 (2.5%) voted for World 1.

How would you vote?

How can you bring about your preferred world? To see how you can have a say look at the next Resource Page.



KEY ISSUE: Creating a class parliament for COP15

You are about to be part of a **Class Parliament**.

The idea of a Class Parliament is for you to become informed about an issue, and to suggest practical actions that you can take either to let decision-makers (at the global, national and local levels) know your attitudes, or to carry out in your local community, or both.

What are International Climate Change Conferences?

The overall goal is to establish an international agreement by participating countries on commitments to reduce their greenhouse gas emissions so as to combat climate change. These policies should take effect from 2012, when the current Kyoto Agreement polices expire.

The Kyoto Protocol established legally binding commitments for the reduction of four greenhouse gases (carbon dioxide, methane, nitrous oxide, sulphur hexafluoride), and two groups of gases (hydrofluorocarbons and perfluorocarbons) produced by industrialised nations, as well as general commitments for all member countries.

As of January 2009, 183 parties had ratified the protocol, which was initially adopted for use on 11 December 1997 in Kyoto, Japan and which entered into force on 16 February 2005.

Under the Kyoto Protocol, industrialized countries agreed to reduce their collective green house gas (GHG) emissions by 5.2% from the level in 1990. National limitations range from the reduction of 8% for the European Union and others to 7% for the United States, 6% for Japan, and 0% for Russia. The treaty permitted the emission increases of 8% for Australia and 10% for Iceland. Some countries are within their targets, others are not. Overall greenhouse gas emissions have risen by 38% worldwide between 1992 and 2004, with the major increase coming from non-Kyoto members China and the United States, and India, which is a member but did not have any targets applied to it.

Who is responsible for lowering the emissions?

There are strong arguments put by developing nations (such as China, India, Vietnam and Brazil) for following the principle of *common but differentiated responsibility*. India and others maintain that the major responsibility of curbing emission rests with the developed countries, which have accumulated emissions over a long period of time. However, the U.S. and other Western nations assert that India and China will account for most of the emissions in the coming decades owing to their rapid industrialization and economic growth. Therefore India and China must also be prepared to set large targets for emissions cuts.

Policy priorities to be decided at an International Climate Change Conference:

- Setting a target percentage of reduction of greenhouse gas emissions for 2017
- If predictions are correct there will need to be at least 20-30% reduction in total annual greenhouse gas emissions by 2020 to avoid climate change, and 80% by 2050 to keep the increase to 2°C maximum
- Setting clear actions for cutting the amount of greenhouse gases individual countries release into the atmosphere
- Supporting poorer countries in preparing for the effects of climate change
- Encouraging the development and sharing of technology to tackle the causes and consequences of climate change
- Protecting forests, since deforestation is a major contributor to the levels of greenhouse gases in our atmosphere.

A deal will also need to set out how to pay for these actions, and how international bodies can best ensure that they are carried out effectively.

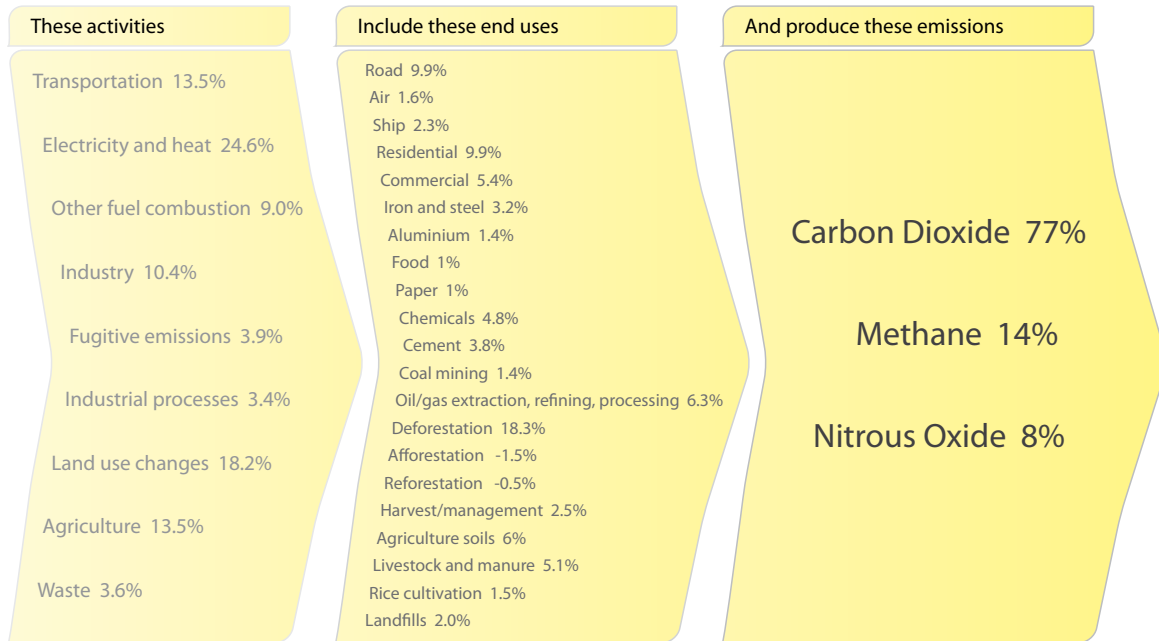
So, your task in your Class Parliament is to research the issue of climate change, decide what your own attitude is to the issue, and then consider what 'laws' you would pass. Then decide what you can do in your own local community to help achieve your goals.

Good luck!



KEY ISSUE: Who contributes globally?

World Greenhouse Gas Emissions Flow by source



Based on World Resources Institute figures for 2000

The top 10 are:

- China (21.5% of the total figure for 2006 emissions)
- USA (20.2%)
- Russia (5.5%)
- India (5.3%)
- Japan (4.6%)
- Germany (2.8%)
- United Kingdom (2.0%)
- Canada (1.9%)
- South Korea (1.7%)
- Italy (1.7%)

To see what your own country's CO₂ contributions are go to <http://unfccc.int/di/DetailedByParty.do>

Look at the sectors that are producing the greatest greenhouse gas emissions. Brainstorm to suggest ways that the emissions they can create can be reduced. For example, you might say 'use less'; or 'use alternative methods that produce fewer emissions'; and so on.

Your Task for the Class Parliament is to suggest what your class can do to let the government decision-makers know what your perspectives are.

To do this you will need to know:

- Who your nation's decision-makers are
- How you can contact these decision makers

You need to draft your ideas in the form of a 'law' that you will put to the Class Parliament. Both Government and Opposition will present and argue for your suggested laws. The Class Parliament will then vote on which 'laws' they want to accept. Your suggestions need to be reasonable, practical and 'do-able'.

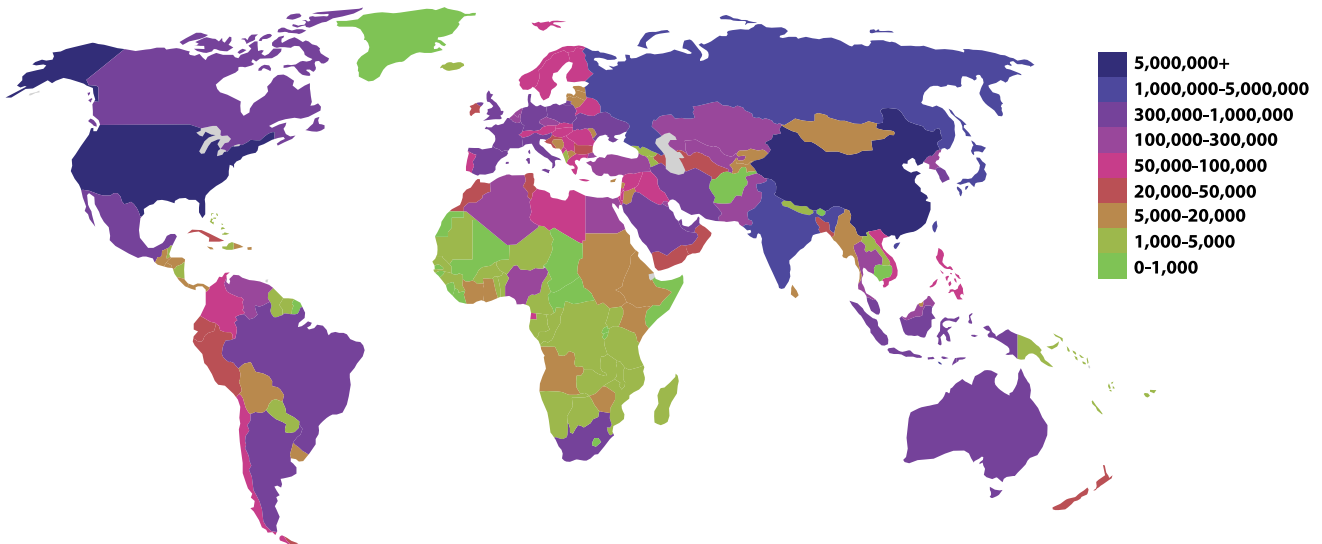
Good luck with your laws — they are important!



KEY ISSUE: Who contributes nationally?

Every country contributes, but some contribute more than others.

World CO₂ Emissions From Fuel Combustion (in thousands of metric tons)



Map constructed from figures in International Energy Agency *CO₂ Emissions for Fuel Combustion Highlights* (2009)

Your Task for the Class Parliament is to suggest what your class can do to let the decision-makers at COP 15 know what your attitudes are.

To do this you will need to know:

- What your country's contribution is to global greenhouse gas emissions. To see what your own country's CO₂ contributions are go to <http://unfccc.int/di/DetailedByParty.do>
- Where these contributions come from. For example, Australia's contributions by different sectors are shown in the table.
- How that amount might be reduced
- Who are your countries main representatives at international meetings
- How to contact that representative
- How to contact other key environmental decision-makers

SECTOR	1990	2006	2007
Agriculture, forestry, fishing	220.4	158.6	150.1
Mining	32.1	52.0	56.9
Manufacturing	65.1	69.8	71.5
Electricity, gas, water	136.3	204.4	205.9
Commerce and building	21.8	18.6	19.2
Transport	27.2	38.3	39.2
Residential (non-transport)	7.8	9.7	10.0
Residential (transport)	35.7	44.9	44.3

You need to draft your ideas in the form of a 'law' that you will put to the Class Parliament. Both Government and Opposition will present and argue for your suggested laws. The Class Parliament will then vote on which 'laws' they want to accept. Your suggestions need to be reasonable, practical and 'do-able'.

Good luck with your laws — they are important!



KEY ISSUE: Who contributes locally?

What can you do at a local level to influence greenhouse gas emissions? The diagrams opposite show the typical energy use and greenhouse emissions patterns of a family living in a major city in a developed country. Look at the uses and suggest some practical ways that energy use and therefore greenhouse gas emissions could be reduced. Does it need to be this high?

Your Task for the Class

Parliament is to suggest what your class can do to let the decision-makers know what your perspectives are.

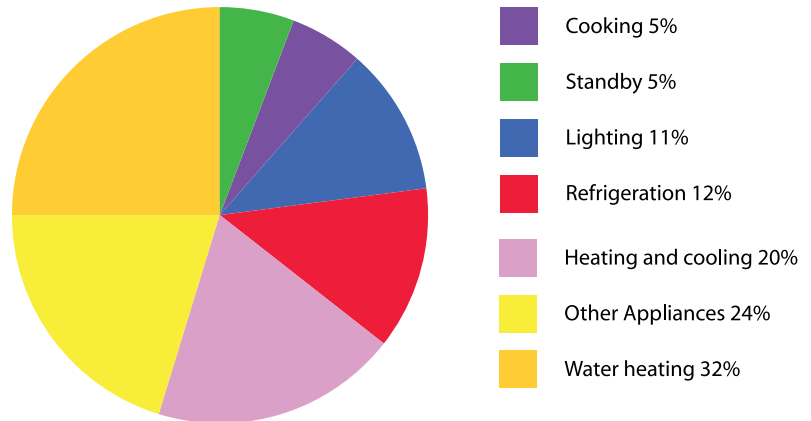
You will be better able to do this if you know what happens in your house or school, and if you are trying to make a change.

DID YOU KNOW...

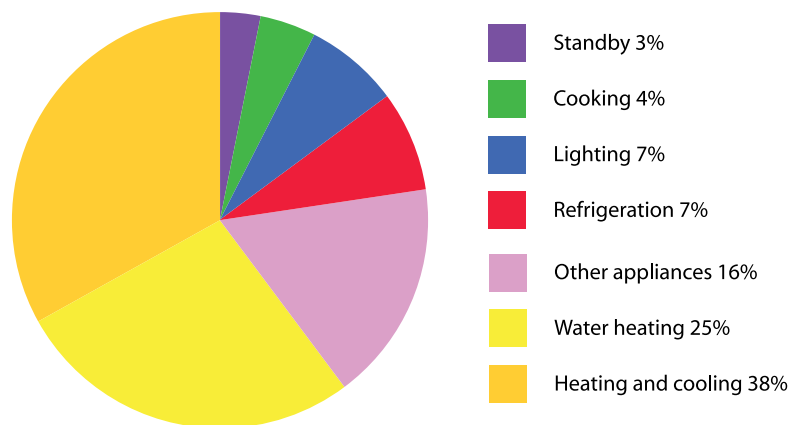


- Two dripping taps is like having an additional person in the house taking a shower every day
- Hot water can account for about a quarter of your energy use and solar hot water can save about half to three-quarters of your hot water energy use
- A cold water wash reduces your washing machine greenhouse emissions by up to 80 per cent
- Shade trees can reduce your cooling energy costs by up to 30 per cent

Typical household energy use – major city in a developed country



Typical household greenhouse gas emissions – major city in a developed country



Research to find out – there are many personal carbon footprint calculators available on the net, and you can find a practical school audit approach at http://www.panda.org/how_you_can_help/greenliving/footprint_calculator/.

You will also find many practical suggestions for reducing your household energy costs, reducing your greenhouse gas emissions, and saving your family money — without costing you a cent!

You need to draft your ideas in the form of a 'law' that you will put to the Class Parliament. Both Government and Opposition will present and argue for your suggested laws. The Class Parliament will then vote on which 'laws' they want to accept. Your suggestions need to be reasonable, practical and 'do-able'.

Good luck with your laws — they are important!

Your future, your say
earthhour.org

