

ECO

**World
Savers**

GLOBAL WARMING

G4002

Activities To Build Awareness & Understanding



Malcolm Watson

GLOBAL WARMING

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GLOBAL WARMING

What Is Causing The Warming?

Teacher's Guide & Planning

The Key Issues

- The world average temperatures have increased over the past 150 years.
- The amount of Carbon Dioxide in the atmosphere has also increased over the same period.
- Carbon Dioxide has been caused by human activity. We are burning far more carbon based fuels (oil, gas and coal) than ever before and also reducing forests which are the main natural absorbers of CO₂.

Additional Activities

Language

- You are the television weather forecaster on the day which is going to be the hottest day ever recorded. Write your report and then present your weather forecast to your group.

Maths and Science

- Investigate all of the things that produce Carbon Dioxide. Don't forget animals!
- Investigate all of the things that reduce and absorb Carbon Dioxide.
- What could each of us do to help reduce the amount of Carbon Dioxide produced and increase the things that will use up and reduce Carbon Dioxide.

Art and Humanities

- Global warming is almost always in the news. Collect newspaper or internet articles relating to global warming over a few months.
- Have a large world map on the wall and link the article to the correct place(s) in the world to build up a picture of "World Global Warming Issues".

Research

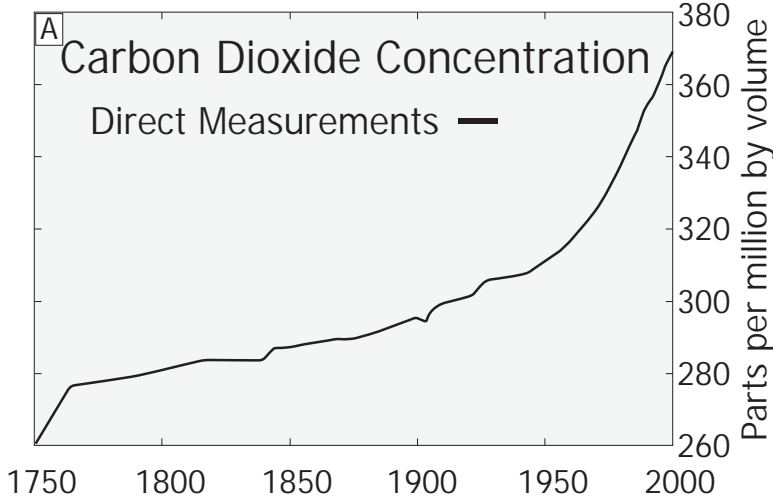
- Look deeper into what causes global warming. There are short term trends and long term trends.
Did a meteor crash cause such a cold spell that dinosaurs became extinct within a few years?
What effect did the Krakatoa volcanic eruption have on world temperatures?

More Information

Over the last 100,000 years, the earth has been both far colder and warmer than at present. This has been caused by variations in the activity of the sun and possibly events such as periods of extensive volcanic eruptions producing enough dust to screen the sun's rays. Whilst there is some discussion about the role solar activity has to play in the current warming trend, the increasing industrialisation of the world over the past 200 years, and particularly the last 75 years, has increased CO₂ levels dramatically. This is the focus of this book.

GLOBAL WARMING

What Is Causing The Warming?



Even if you do not like graphs, these are easier than they look.

Answer these 3 questions.

1. Graph A

Carbon Dioxide has gone
Up/Not Changed/Down

2. 1. Graph B

The amount of oil, gas and coal used has gone
Up/Not Changed/Down

3. 1. Graph C

World temperatures have gone
Up/Not Changed/Down

What do you notice?

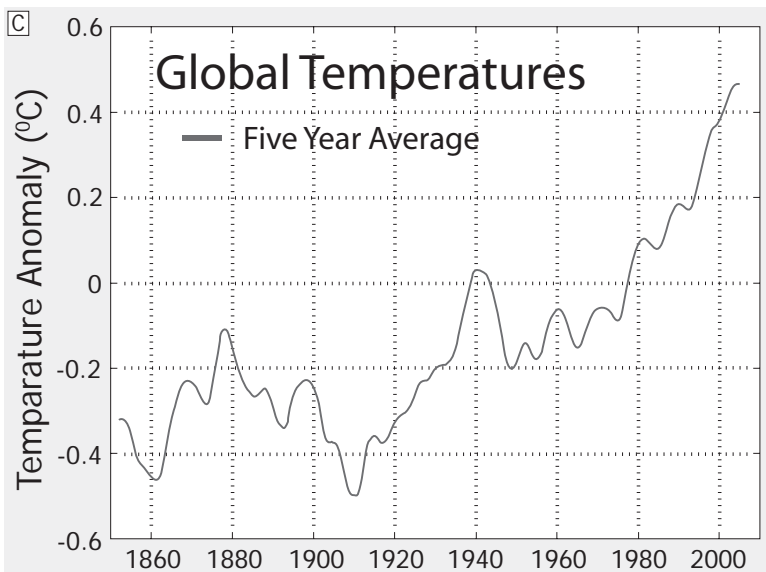
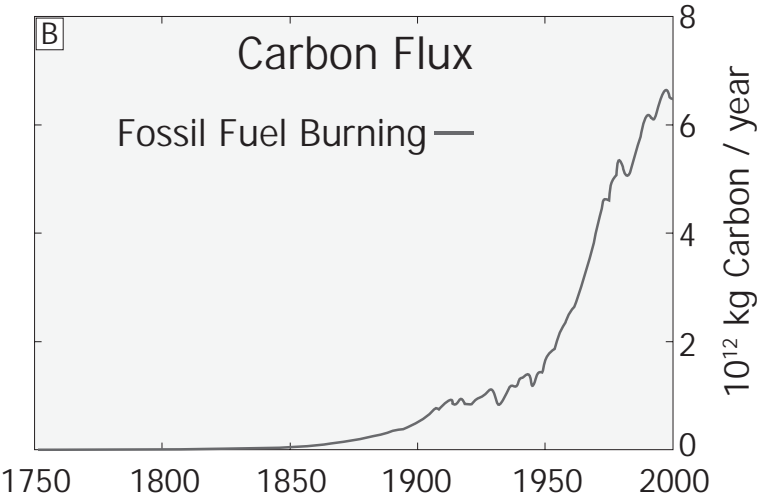
4. As we have used more oil, gas and coal, the amount of Carbon Dioxide in the air has gone

Up/Not Changed/Down

5. As the amount of Carbon Dioxide in the air has gone up, global temperatures have gone

Up/Not Changed/Down

What do you notice?



GLOBAL WARMING

The Weather Is Stormier

Teacher's Guide & Planning

The Key Issues

- Global warming gives more energy in the atmosphere.
- Rain and winds become more intense with more energy to drive them.
- Storms are destructive and affect every area of the world. The damage disrupts, kills and costs large amounts of money to put right and to try and prevent.

Additional Activities

Language and ICT

- Listen to the weather forecast. When a storm is forecast use video cameras/mobile phone cameras to make a news report. Film the storm. Film any adverse effects. Make sure that there is a reporter.

Consider sharing with schools in another country. You can also upload to YouTube or a similar site.

Use still photos to make a newspaper style article.

Science

- People often get caught in storms. What type of protective clothing is available to help them survive different types of storms?

Social Studies

- Put a world map on the classroom wall. Every time there is a major hurricane or bad weather event in the world, mark it with a label on the correct part of the map. Do this for a year.

What patterns do you notice?

Research

- Hurricanes are named alphabetically. Research how many hurricanes there were in the last 5 years in either the Atlantic or the Pacific ocean.

List their names.

- Investigate a recent major flood or storm in your own country. Was it worse than normal?

More Information

Scientists have looked at potential correlations between ocean temperatures and tropical cyclone trends worldwide over the past several decades. A 2005 study published in the journal *Nature* examined the duration and maximum wind speeds of each tropical cyclone that formed over the last 30 years and found that their destructive power has increased around 70 percent in both the Atlantic and Pacific Oceans. Another 2005 study, published in the journal *Science*, revealed that the percentage of hurricanes classified as Category 4 or 5 has increased over the same period. The findings from both studies correlate with the rise in sea surface temperatures in regions where tropical cyclones typically originate.

GLOBAL WARMING

The Weather Is Stormier

One of the stormiest weather types in the world is the Hurricane (also called a Typhoon or Cyclone). In recent years, the number of these massive storms and how strong and destructive they are has increased. This is because of both air and sea temperatures rising.

The photographs below show the city of New Orleans after being hit by Hurricane Katrina.



For each picture:

1. Describe what you can see that is clearly caused by the storm.
2. Say how the damage could be repaired or put back to normal.
3. What do you think has happened to the people in the houses and the sailors from the ships?
4. Many roads were flooded or blocked. How do you think the rescuers got to the people trapped in the floods?

GLOBAL WARMING

Deserts Are Spreading

Teacher's Guide & Planning

The Key Issues

- Global warming is making some areas drier.
- Dry weather kills off plants and makes it easy for the deserts to expand.
- As crops and farm animals die, there is famine and people move away to seek food and water.

Additional Activities

Language

- When there is a refugee crisis, caused by drought, on the news, record it and play it without the sound. Ask the children to make their own sound commentary.

Maths and Science

- Show how drought allows the soil to blow away and cover up nearby vegetation.
Plant some grass seed in a large tray of loose soil (bagged compost is best). Once the grass has sprouted put the tray on an inside window sill in the sun and do not water.
Record how long it takes for the grass to die. Once dead show how easily the soil can be blown away.
Show how grass will grow in sand, if there is water, but dies without.

Art and Humanities

- On a blank world map, have the children mark and name the major hot and temperate deserts of the world.
Californian, Atacama, Sahara, Kalahari, Gobi, Arabian, Australian.

Research

- Life is possible in deserts. Big cities such as Las Vegas, Cairo, San Diego, and Baghdad all provide food and water for the people who live in them.

Have each group of children research a different city in a desert and find out where they get their water and food from.

More Information

The southern boundary of the Sahara desert was studied between 1980 and 1990. From 1980 to 1984, the desert expanded southward, with the boundary shifting 240 kilometres (km). But from 1984 to 1985, the trend reversed and the divider moved north by 110 km in a single year. It moved northward another 30 km the next year. In 1987, the boundary shifted back southward by 55 km, and northward 100 km in 1988. In 1989 and 1990, it shifted southward 77 km. (NOTE 8 km = 5 miles)

In 10 years the southern extent of the Sahara in 1990 reached 130 km further south than in 1980. This trend has continued driving millions of people south in search of pasture for their animals and water. This has caused conflict with the people of the south and disasters such as in Sudan and Darfur.

GLOBAL WARMING

Deserts Are Spreading

Responding to drought in Ethiopia



Many people have to walk a long way to find any water

Western Ethiopia is on the edge of the Sahara desert. The Ethiopian city of Dire used to experience drought once every eight years, but in the last 8 years there have been five droughts, including one this year.

25 million people, that is the same as half the population of the UK are affected. Around 100,000 children thought to be suffering from severe acute malnutrition



These children are getting food from a refugee camp run by Oxfam.

Some farmers have seen the lack of water and grass kill their animals. One herder named Dida says 30 of his cows, 50 goats, and a camel died. Most farmers have seen over half of their cattle die.

Crop failure due to severe drought and skyrocketing food prices, have pushed millions of people to the brink of starvation and impoverishment.

1. How many people are affected by the drought?

2. Why does lack of rain cause food shortages?

3. How can charities help the people to survive?



This woman has managed to get a bag of flour from an Oxfam refugee centre

4. If there is no rain where you live for 1 year would you still have food and water to drink? Why? _____

GLOBAL WARMING

Ice Caps Are Melting

Teacher's Guide & Planning

The Key Issues

- Global warming is causing glaciers, the Arctic sea ice and Antarctic ice cap to melt.
- Melting ice is causing the sea level to rise.
- Animals such as the polar bear are in danger and rising sea level will flood low lying land.

Additional Activities

Maths and Science

- Conduct an investigation on what can be done to reduce the melting of ice.

Take 4 identical ice cubes. Put them under 4 identical lamps.

- > Leave 1 uncovered
- > Put a piece of paper in front of the lamp for number 2 - so that it shades the ice cube
- > Cover 3 with bubble wrap and then foil
- > Put dark soil on number 4

Time how long each ice cube takes to melt. Which melts fastest/slowest. Why?

In Germany the government has covered the surface of one glacier with a foam blanket in order to try and slow down its rate of melting.

Would this be effective?

Art and Humanities

- Bring in winter skiing holiday brochures. Give each group a separate resort to look at.

Have the children imagine what the area would look like without snow. Rewrite the brochure for a time when there is no snow so it offers other activities rather than skiing.

Research

- Many animals and plants will be under threat as their habitat changes. One of the most significant is the polar bear.

Research into:

- A) How much warmer the Arctic area is than 40 years ago and how much less ice there is now.
- B) Why less Arctic ice means polar bears are at risk

More Information

The Antarctic ice sheet, which contains 90 percent of the planet's ice, is losing up to 36 cubic miles of ice, or 152 cubic kilometres, annually. By comparison, that is about how much water the United States consumes in three months.

Arctic sea ice has been declining since about the 1970 coinciding with increasing temperatures around the globe. In the past decade polar bears north of Alaska and Siberia have had a very difficult time as they need the ice to hunt seals, and that will continue for the foreseeable future. Sea ice habitat will decline to 20% of what it was 20 years ago and the Arctic could be ice free in summers by 2030.

GLOBAL WARMING

Ice Caps Are Melting



Riggs Glacier 1941



Riggs Glacier 2004



Temperature may have only risen by half a degree in the last 60 years but the effect has been massive.

These 2 photos were taken from the same place.

In 1941 the Riggs glacier in Alaska was 2,000 ft (600 metres) thick.

In 2004 the ice where the photo was taken had all melted and the end of the glacier was miles back up the valley.

Look at the photos and the sketch of the area. Complete the story.

AREA A

In 1941 this was bare _____

But in 2004 was _____

AREA B

In 1941 this was covered by _____ but in 2004 was _____

AREA C

In 1941 this was _____

But in 2004 was _____

AREA D

In 1941 this was _____

But in 2004 was _____