WHAT'S NEW!

Communication Objectives:	Ss will be able to: - use expressions for affirming and signposting words: arguments. - use vocabulary, phrases and idioms related to the future of the planet.
Educational Objectives:	Ss will explore current theories about possible global catastrophes.
Connected Topics:	- History of natural disasters - Population problems - Global warming - End of the Gulf Stream - Destruction of the rainforest - Super-bugs (new flu strains) - The Environmental Skeptic - Natural disasters - Overfishing and ecology - El Niño - Technology as a panacea - Religion and the end of the world - Global destruction as a film plotine
Grammar:	Verbs and prepositions Adverbial clauses
Key Vocabulary:	abrupt agent allegiance antibiotics asteroid biodiversity bioweapon blaze *n* blueprint catastrophic climatologist contaminated deliberate depletion emissions epidemic eradicate glacier global warming grade halt helping hand ice cap infectious ozone layer patch perpetrator rampaging (return) with a vengeance rogue routine sanitation shortage subsidy surge sustainable swill trawler trigger ulterior motive virulent

THE BIG question: DOES THE EARTH NEED RESCUING?

This question is related to the continuing political conflict between environmentalists and industry, and an apparently growing apathy in the general public over the extent of the problem.

VIEWPOINT

Facts: The previous mass extinctions include:

- Ordovician-Silurian extinction: 439 million years ago, caused by the decrease and increase of water level by glacier formation killing 60 per cent of marine genera
- Late Devonian extinction: 364 million years ago, unknown causes killing 57 per cent of marine genera Permian-Triassic extinction: 251 million years ago, caused by asteroid impact killing 95 per cent of all species
- End Triassic extinction: about 200 million years ago, caused by massive volcanic eruptions killing 52 per cent of marine genera
- Cretaceous-Tertiary extinction: about 65 million years ago, caused by asteroid, volcanic eruptions or global warming, killing 47 per cent of marine genera and 18 per cent of land families.

(Note: Hierarchy of organisms: kingdom, phylum, class, order, family, genus – pl. genera, specie – pl. species.)

Source:
http://biology.about.com/od/evolution

EQ: *Does this worry you at all? Is there anything that can be learned by these previous catastrophes? How are these previous catastrophes different from what might happen? Would humans survive?*

About half of the people aged 10–19 are poor. A quarter of them survive on less than $1 dollar a day. These young people also represent half of all new HIV infections. Young girls are often marrying and having children at too young an age. In 2000, a special UN summit developed the Millennium Developments Goals (MDGs), which had, among others goals, to halve poverty by 2015. These goals are already behind schedule.

Source:
www.unfpa.org/swp/swpmain.htm

EQ: *Does this information make you optimistic or pessimistic? Why? How can young people help with the problems with the Earth? Do you think most young people care about the future of the Earth? How often do you think about the environment and other problems? What effect would worrying about things all the time have on someone?*

Quotes: Richard Buckminster 'Bucky' Fuller (1895–1983) was an American designer, architect and inventor known for his geodesic domes. Later, the spherical molecules, carbon-60, were nicknamed 'bucky balls' after his geodesic designs.

EQ: *How well do you understand how the Earth works? Do you see humans as the drivers of the planet? Are we good or bad drivers?*

Photos: The photos are linked to questions to encourage students to think about overpopulation and the destruction of the environment.

1 WORD POWER

A gets students to consider the most likely threats to life on Earth and the causes for the next mass extinction. This activity can be extended by getting students to agree or disagree with other students. If they agree, they should try to use the affirming phrases from **Language Bank 8.**

B gets students to practise the affirming phrases from **Language Bank 8.** Note: Mention to students that they may need to adapt the phrases in Language Bank 8 replacing 'you' with 'pessimists' in these phrases.

1 WORD POWER A, B **Answers**

A Control over: nuclear war, overpopulation, global warming, pollution, thinning of the ozone layer, shortage of fresh water, infectious diseases, loss of biodiversity. (Sample answers) Well, most other mass extinctions have resulted from asteroid impacts, therefore, I think it would probably be the most likely. – **I have to admit, you are probably right there.** / I would guess that overpopulation will be the reason. We are able to sustain life at the moment with over 6 billion people, however, the number of humans is expected to grow to 9 billion by 2050. – **That's a good point.**

B (Sample answers) **1 I completely agree with** the pessimists who say politicians are not doing enough about / to stop pollution. **2 I have to admit** the pessimists are probably right there when they say that politicians aren't doing enough to stop nuclear war.

ARTICLES

North America, Europe May Cool in Warmer World

This article takes up a much less discussed point about the possible impact of future global warming. If the Earth heats up by a few degrees along the Equator, it will heat up many degrees more in northern regions and at the poles. Initially, the climate would be warmer in northern regions, causing the melting of the polar ice caps. This would slowly release millions of litres of fresh water into the oceans, and the rising water could flood many coastal cities.

There is another worse consequence. Scientists have come to understand that the Gulf Stream that supplies Europe and eastern North America with warmer weather could shut down, making Europe and eastern North America much colder. This would have a significant impact on agriculture (imagine no grape growing in France), trade (frozen sea ports and rivers in Northern Europe) and energy costs (energy needs for heating would increase; many houses are not insulated).

EQ: *What's the warmest and coldest weather you have experienced? How might your city be different if it were 10°C warmer or colder throughout the year? Do you think politicians in your country or others take global warming seriously?*

Open to Attack

This article discusses developments regarding infectious diseases. Besides the two cases mentioned in the article, anthrax and foot-and-mouth disease, there have been several cases of infectious disease since 2001. Severe acute respiratory syndrome (SARS) in 2003 killed 10 per cent of the 8,096 people infected in 28 countries. Avian influenza ('bird flu') in 2003 / 2004 killed 58 per cent of the 88 people infected in three countries. If this bird flu virus begins to spread through human-to-human contact, a pandemic may be possible. Already a problem in the UK and other European countries, Bovine spongiform encephalopathy (BSE, also called 'mad cow disease') was detected in 2003 in Canada and the United States. In 2005, a killer Asian influenza virus was accidentally sent in a standard lab testing kit to labs in 18 countries. It could have caused a pandemic similar to 1957 in which between 1 to 4 million people died. People born after 1968 have little or no immunity to the virus.

EQ: *Which diseases around the world worry you? (e.g. AIDS, malaria, Ebola, dengue fever, tuberculosis, leprosy) How likely is it for someone from your country to contract these diseases? What is the relationship between poverty and disease?*

2 READING

A is a reading comprehension activity that requires students to find the correct multiple choice response. Questions 1 and 2 refer to the first article, 'North America, Europe May Cool in Warmer World'. Question 3 refers to the second article, 'Open to Attack'.

B This question gets students to consider the reasons for experimenting with germs (viruses and bacteria). You may want to help them by asking leading questions.

EQ: *Should governments be experimenting with lethal viruses (e.g. Ebola, Small Pox, Avian Flu)? If so, what can be learned from these experiments? If not, why not? There are permanent nuclear and chemical weapons inspectors, but no permanent biological weapons inspectors. Why do you think this is?*

2 READING A **Answers**

A 1 b **2** a **3** a

3 SPEAK YOUR MIND

This section covers the topics of global warming, the Kyoto Protocol, rainforest depletion and epidemics.

A Global warming – **EQ:** *What effects will global climate change have on you and your country? How would the projected 50 cm to 2 m increase in sea levels by 2100 affect your country? What impact would this have on countries near sea level like the Netherlands, the Maldives or Bangladesh? Does global warming worry you? Why / Why not?*

B Kyoto Protocol – **EQ:** *Carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) are the three main 'greenhouse' gases* (six gases in total). *Where and how are they produced?* (e.g. CO_2 – cars, humans / animals, industry; CH_4 – industrial livestock (cows, pigs), rotting vegetation (hydro-electric dams); (N_2O) – cars, industry, industrial agriculture.) *Do you support cutting greenhouse gases? Even if it hurts the economy or means losing your job? Which is more important – the economy or the environment? Why? Is it possible to have a healthy economy and a healthy environment?*

C Rainforest – **EQ:** *Why are plants and trees important to the world climate? Is deforestation a problem in your country? Why / Why not? When the environment conflicts with human development, which usually wins? Which should win? Why?*

D Epidemics – The 1918–19 Spanish Influenza pandemic killed between 20 and 50 million people around the world—that is more people who died than were killed in World War I. About 10 per cent of the global adult population died.

EQ: *Will the next pandemic be natural or manmade? How would more air travel increase its spread? Are we ready to deal with a global pandemic? Global warming is expected to spread tropical diseases (malaria, yellow fever) to warmer Northern countries. What impact might this have?*

3 SPEAK YOUR MIND A **Answers**

A (Sample answer) Greenhouse gases insulate the Earth's atmosphere. This traps the heat given off by the sun. Temperatures rise around the world / globally.

4 LISTEN DVD

This audio clip deals with Bjorn Lomborg, a controversial Danish professor of statistics. After reading a book by American economist Julian Simon, Lomborg, a self-professed green, tried to debunk Simon's theories that the Earth was in fact getting better. As Lomborg wrote in his 2001 book, *The Environmental Skeptic* (note AmE spelling), he actually found Simon's arguments to be statistically sound. He contends that mortality rates, consumption rates, natural resource supplies and several other points are getting better. He has many notable critics especially for his suggestion that the money to be spent on the Kyoto Protocol (up to $350 billion) would be better spent elsewhere. Lomborg suggests in a pure cost-benefit analysis it would be better to spend that amount of money on bringing clean drinking water to developing countries.

4 LISTEN B **Answers**

B **1** Greenpeace **2** American economist **3** debunked **4** Kyoto Protocol **5** $350 **6** sanitation **7** comparisons **8** ice cream

C (Sample answer) Lomborg might say that he thinks global warming is real but we only have a limited amount of money to spend so the Kyoto Protocol looks too expensive for the results we might get.

5 TEAMWORK

This activity is based on the situation in Yellowstone National Park, which stretches across three US states – Idaho, Montana and Wyoming. The last time Yellowstone Supercaldera exploded 640,000 years ago, it left a giant crater, killed everything within 1,600km, and spread volcanic ash across western North America. Today, Yellowstone is a fairly active geological region, with active geysers, hot springs and between a thousand and three thousand earthquakes every year. More recently, geologists have discovered a large bulge, about the length of seven football pitches, beneath Yellowstone Lake, which is evidence of a build-up of gas or magma. The scenario is based on what geologists believe would have happened during the last eruption, however, make sure that students know that geologists are only moderately concerned. The odds of another caldera-size eruption are less likely than winning a lottery.

Source:
www.nps.gov/yell, http://volcanoes.usgs.gov/yvo

6 CONTROVERSY

The issue of overfishing is a very serious global issue. A large part of this problem is created by governments which give large subsidies to commercial fishing fleets. The World Wildlife Fund estimates that government subsidies account for almost 20 per cent of the value of the world's annual commercial fish catch, an estimated $76–$80 billion. The countries which subsidise most are Japan, the USA, China and others from the EU. An example of what may happen can be seen in Canada's east coast cod fishery. Once the largest supply of cod in the world, this fishery closed completely in 1992 due to depleted stocks, and these stocks have still not recovered. The problem does not have any easy solution, but many national politicians want to keep subsidies because they do not want to lose votes from fishing communities if jobs are lost.

EQ: *Do you go fishing or eat fish often? How would unemployed fishermen earn a living? What problems would coastal communities face? Is fish farming the solution? What would happen if there were no fish left?*

Source:
www.fao.org, www.wwf.org

7 PORTFOLIO WRITING

See the Introduction to the Teacher's Guide.

A Sources:
The End of the Line: How Overfishing is Changing the World and What We Eat, Charles Clover

Fish, Markets and Fishermen: The Economics of Overfishing, Suzanne Ludicello
www.panda.org/stopoverfishing, http://archive.greenpeace.org/oceans/globaloverfishing/deadahead.html

B Sources:
Catastrophe: Risk and Response, Richard A. Posner
www.aoml.noaa.gov/general/lib/hurricbro.html
www.bt.cdc.gov/disasters, www.unep.org

8 METEOROLOGY *in English* [CLIL]

The El Niño Southern Oscillation (ENSO) has an enormous effect on global weather patterns. El Niño (Spanish for 'the child') was named after the Infant Jesus by early Peruvian fishermen who noticed the unusually warm water around Christmastime.
El Niño (ENSO warm episode) pushes warm water from Australia / SW Pacific Ocean to the west coast of South America. La Niña (also called the 'Little girl', 'El Viejo', anti-El Niño, or a cold episode) pushes cold water from Antarctica up towards the west coast of South America and toward Australia. These warm / cold movements have alternated regularly in past centuries with fairly even numbers of warm and cold years; since 1950, however, climatologists have noticed a trend in which El Niño occurred 31 per cent to 23 per cent for La Niña (the remaining time was normal). Since 1990 El Niño occurred five times compared to two for La Niña. Some climatologists, such as Kevin Trenberth of the US National Center for Atmospheric Research, believe that global warming is contributing to more frequent and intense warm episodes, but computer models cannot yet prove this conclusively.

The effect of more El Niños has led to dramatic changes in weather. Oceania, north and east Australia, SE Africa, NE South America, the Indian sub-continent, western North America and the southern Caribbean had extremely dry weather, causing fires and droughts. Other regions, such as the SE United States, Central Africa, NW and SE South America and Northern Europe, saw more floods and landslides.

EQ: *Do you think El Niño has affected your country? Have there been very wet or very dry years? Have you ever had floods, landslides, droughts or large fires? If so, what happened? If not, what effect would these have? How might changing weather patterns affect your country?*

Sources:
Our Affair with El Niño, S. George Philander
El Niño: The Weather Phenomenon that Changed the World, Ross Couper-Johnston
www.cpc.ncep.noaa.gov, www.pmel.noaa.gov, www.cdc.noaa.gov

9 FURTHER DISCUSSION

This section covers the topics of: Malthus' population theory, reliance on technology, religion and apocalyptic beliefs, and apocalyptic film plots.

A Try to get students to consider the current 6 billion population and the projected 9 billion by 2050 and the resources available on the Earth.

EQ: *What effects does human overpopulation have? How large is your country's population? Is it increasing or decreasing? What social, economic and political effects might this have? Genetically modified (GM) foods may provide a solution to world hunger. Do you agree with GM food production?*

B This question looks at the belief that technology can solve most of humanity's problems.

EQ: *Give some examples where technology has solved world problems. Give examples where technology has created world problems. Given that most technology is developed for business purposes, is there a market for saving the environment?*

C Some conservative US politicians openly advocate anti-environmental policies on religious grounds. See also www.apocalypsesoon.org and www.raptureready.com.

EQ: *What do different religions believe about the end of the world? The environmental movement is a 20th century phenomenon. Most religions are many centuries old. How can you reconcile ancient beliefs with the modern world?*

D Some apocalypse movies: *Armageddon, The Core, Deep Impact, Independence Day, Godzilla, Outbreak, Hellboy, 28 Days Later, The Day after Tomorrow, Terminator 1, 2 and 3, Constantine, Dr. Strangelove, Planet of the Apes, Mad Max.*

EQ: *Why do you think the media is so interested in doomsday scenarios? Are films about the end of the world just light entertainment or just in bad taste?*

10 *Your answer:* DOES THE EARTH NEED RESCUING?

This question tries to get students to address the main theme of the unit: Are they optimistic or pessimistic about the future of the Earth? Optimists can discuss what will lead to these improvements (e.g. technology, human activity) and whether the Earth's looming environmental catastrophe has been overstated (e.g. the environmental sceptic, Malthus and GM foods). Pessimists can discuss what can be done locally and globally to help (e.g. grassroots action, changing government policy, ending subsidies).

WORKBOOK

1 WORD POWER

This activity will give students the chance to practise signposting words for arguments from **Language Bank 8.**

1 WORD POWER **Answers**

1 Although / Whereas **2** As a result
3 Similarly **4** However / But
5 In the same way / Similarly / As a result.

2 USE OF LANGUAGE: Verbs and prepositions

This activity gives information about the problems relating to geomagnetic reversal, the process in which the Earth's magnetic poles are reversing. The magnetic field around the Earth protects all life from lethal cosmic radiation. During these reversals, the field weakens and cosmic radiation can shower the Earth killing everything. The activity is based on an activity type for the CAE and CPE exams.

2 USE OF LANGUAGE **Answers**

2 **1** to **2** of **3** by **4** in **5** during **6** up
7 off **8** with **9** from **10** up **11** about, by

3 WRITING

A Sources:

OECD, Energy to 2050: Scenario for a Sustainable Future
Global 2050: A Basis for Speculation, John Cole
www.futurist.com, www.census.gov/ipc/www/worldpop.html
www.wfs.org

B Sources:

Terraforming: Engineering Planetary Environments, Martyn J. Fogg
A Traveller's Guide to Mars, William K. Hartmann
www.redcolony.com
www.bio2.com

4 IDIOMS

4 IDIOMS **Answers**

1 e **2** a **3** d **4** c **5** f **6** b

1 the tip of the iceberg = only a small part of the whole (often used for a problem) **2** to turn over a new leaf = to change one's ways / what you do **3** a recipe for disaster = very likely to lead to a very negative result **4** to go against the grain = to go against your or other people's wishes **5** a small world = for unexpected connections between people or things that seemed unknown to each other / unconnected **6** a ray of hope = some hope

Ask students to use the idioms when answering these questions orally. This can be done as pair work or as a class.

- *How worried are people in your country about environmental problems?*
  – I think they've *turned over a new leaf* since the 1960s. Many people are concerned about the environment today.
  – It's such *a small world*. I wouldn't have thought that something like El Niño so far away could affect the weather here.
  – I think you are *going against the grain* if you are not worried about the environment.

- *Does it bother you that so many species are dying out?*
  - I think there is still *a ray of hope* that things will improve. I mean at least everyone is discussing it it now.
  - I've heard that the loss of species today is just *the tip of the iceberg* compared to the future. Millions of species could die because of global warming.
  - Yes, I think it would *a recipe for disaster* if today's species died out.
- *Do you think there will be a global pandemic in your lifetime?*
  - I think you would *go against the grain* not to say 'yes' when so many scientists are predicting it.
  - I think there is still *a ray of hope* that a pandemic could be contained, as SARS was in 2003.