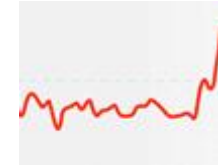
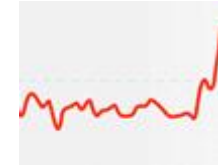


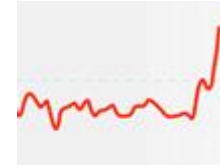
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| <p>What is the difference between weather and climate?</p> | <p>Climate is the long term average of daily weather conditions allowing for seasonal variations and viewed on a regional scale. Elements which make up climates are : temperature, rainfall, wind, pressure, humidity, cloud, sunshine, fog</p> |
| <p>What is the climate system?</p> | <p>The climate system is influenced by complex interactions between the atmosphere, oceans, land, ice, and biosphere.</p> |
| <p>What are the main influences on climate?</p> | <p>Key to this is the huge temperature gradient between the poles (-35 *C) and the equator (+ 30*C) The excess heat from the tropics is redistributed by oceans and atmosphere in currents and winds – the global circulation system. This is the engine or powerhouse behind our weather and creates a dynamic or energetic climate which is susceptible to change.</p> <p>The climate of a place is determined by</p> <ul style="list-style-type: none"> i) latitude; (ii) location, relative to continents and oceans; (iii) situation in relation to large-scale atmospheric circulation patterns; (iv) altitude; (v) local geographical features, such as topography or the nature of the built-up area. |
| <p>Is the climate changing?</p> | <p>Climate has always changed over time but the last 150 years have seen a steep warming trend. The warmest 10 years on record have been in the last 20 years</p> |
| <p>What are the natural causes?</p> | <p>The climate is variable and has always changed due to natural causes. Over the past 100 million years the climate has been cooling down since the hot, ice free cretaceous period. In the past 2.5 million years we have broadly been in a glacial period with the great northern ice sheets covering USA and Europe with ice up to 3km thick. Much of this has now gone but we still have relatively large amount of ice compared to whole of geological time – only for 10% of all time has there been more ice around than this. This matters because we have based our habitation/ land use on a world with relatively low sea levels.....the only way (for the sea levels) is up!</p> |
| <p>What are the human causes?</p> | <p>Human factors are called anthropogenic causes. Firstly and most significantly these are from burning of fossil fuels for energy production, industrial processes, transport, domestic heating, lighting and cooling. 90% of this cause comes from N America, Europe and Asia.</p> |



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| | <p>Second cause of increasing emissions is from land use changes – especially the cutting down of forests which would otherwise act as carbon sink. S America, Africa and Asia are responsible for 90% of these emissions.</p> <p>Most scientists now agree that it is human activity that is changing climates now. When researching carbon emissions take account of total and per capita figures for each country investigated.</p> |
| What will the climate be in the future? | <p>Debate continues about the amount and rate of climate change. IPCC 2100 best case scenario= temp rise of 1.4°C and sea level rise of 20cm</p> <p>Worst case scenario + 5.8°C and sea level rise of 88cm</p> |
| How do scientists predict the future climate? | <p>Scientists use computer models to predict future climate. These are called models. Modelling is a way of predicting the future taking account a range of variables. The most useful models are highly complex 3 dimensional general circulation models with sub models for ocean, atmosphere, land biosphere and ice and the interrelationships between them. The IPCC uses countless combinations of 22 different models to arrive at its predictions. There are lots of variables that are hard to predict including:</p> <ul style="list-style-type: none"> • How much of the current temperature variation is down to Co2 emissions? • What will clouds do? Will they heat us up or cool us down in the long run? • How will natural carbon sinks of the oceans and forests behave in the future? • With less snow and Ice will we be absorbing far more incoming radiated heat as our surfaces will be less reflective (the albedo effect?) • What will be the effect of population growth , industrial production and effect of UN strategies |
| What are the impacts of changing climates on different parts of the world? | <p>Impact of GW/ CC affected by physical environment, economic robustness, availability and willingness to adapt to new technologies,</p> <p>Case study areas at risk</p> <p>Low lying areas e.g. Maldives, inundation by sea water</p> <p>Desert fringes e.g. Sudan, incr unreliability of rains ,desertification, water stress</p> |



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| | <p>Lower courses of River valleys; flooding e.g. London and Manhattan Cyclone areas – increasing frequency and severity of storms e.g. SE USA and SE Asia. Alpine glacier – melt, increase runoff and flood risk e.g. Bangladesh</p> |
| <p>Are all people affected equally by climate change?</p> | <p>Those that are least able to adapt to impacts will be the most vulnerable. Global warming will exacerbate the effects of global inequalities Meaning of Adaptation and mitigation Draw parallel with risk vulnerability in case of hazards- exposure to type of risk varies across the world. Risks can be loss of life, susceptibility to epidemics, water stress, loss of permanent home, increased forced mobility/ migration through to loss of lifestyle and amenity choices e.g. more expensive skiing holidays.</p> |
| <p>What is the weather like and how have people adapted?</p> | <p>2100 is easier to get figures for IPCC report of 2001 estimates: global surface temperature rise of 1.4 - .8 degrees c global mean sea level rise between 20 – 88cm Mitigation involves taking actions to reduce greenhouse gas emissions and to enhance sinks aimed at reducing the extent of global warming. This is in distinction to adaptation to global warming which involves taking action to minimize the effects of global warming</p> |
| <p>Are different ways of life more or less sustainable?</p> | <p>Actions can be taken individually, locally, nationally and globally</p> |
| <p>What actions can be taken now to limit the impacts of global warming?</p> | <p>Some changes can be effected by ' carrot' initiatives e.g. orange bag recycling schemes, farmers markets, reduced tariffs for parking and driving low emission cars. Other initiatives need the ' stick' – e.g. congestion charges, landfill tax on local councils,</p> |



Who can effect the most change and individuals or governments?

Each of the following has a role to play in creating a solution and getting people to take responsibility for change
Science and engineering- inventing solutions. Consider carbon storage, wind power, solar power, cleaner fuels, etc. There are already 15 invented solutions which between them could maintain the level of carbon emissions globally at the 2005 levels over the next 50 years (i.e. prevent the current path of a doubling of carbon by 2050. Some solutions very expensive, many need lots of land and further research. Money needs to come from governments for these to be implemented

Business; Majority of waste and energy used by commercial and industrial sector. Tax or incentives needed to force or encourage reduction in carbon emissions. Employees do not act greenly at work yet do at home.

In newly industrialising countries great pressure to maximise profits.

Media: vital role in marketing new initiatives, providing objective and scientific journalism, creating a climate of public support and mutual responsibility rather than blame.

Politics: From local and grassroots schemes such as green blogs and Agenda 21 local council schemes e.g. free compost bins. The local authority in New Hampshire, USA started local networks of businesses to look at cooperative and low cost action to improve air quality leading to new state legislation in 1999 which was then copied by Wisconsin and California.

National level- Iceland, despite generating 99% of its electricity from geysers and HEP imports significant oil for transport and thus has one of world's highest carbon emissions per capita. Committed to go 100% hydrogen fuel by 2030 and thus reduce emission to zero.

International level-Kyoto Protocol, 2005. 186 countries signed up. For 38 industrialised nations this means binding targets to reduce their emissions by 2010- e.g. for EU countries by 8% on their 1990 level. For developing countries a fund of \$500million to help adapt to climate change. Countries with emissions targets may trade carbon emissions. USA did not sign up. (Australia delayed but then did so with new government)