

## Lesson 17: B8.17 – Thinking about global warming

### 1. Connection

Q1. List reasons for deforestation

Q2. What does deforestation cause?

Q3. Why is the choice over deforestation a balancing act?

### 2. Activation

**LI: Describe what Global warming is and explain its impact**

<https://www.youtube.com/watch?v=oJAbATJCugs>

Make a note of the title and the LI

1. Read pages 356-357
2. List key words – define those you don't know
3. Name greenhouse gases and bullet point why they are increasing (green section)
4. How are species affected by global warming (purple section)

### 4. Consolidation

Complete and self assess the relevant past paper question for this topic -  
From the B8 DIP file

### 5. Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

### 3. Demonstration

Attempt questions 1-5

In 10 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

- Green questions to GCSE Level 3
- Blue questions to GCSE Level 6
- Purple questions to GCSE Level 9

## Answers Lesson 17: B8.17 – Thinking about global warming

### Connection

**Q1.** space for farmland (cattle and crops)

### Q2.

- Increased atmospheric CO<sub>2</sub> (more out less in) & increased methane levels > global warming
- Loss of biodiversity

### Q3. Balance against:

- Need for land for food production V need to protect habitats and preserve biodiversity
- Use of peat as cheap fertiliser V the need to reduce CO<sub>2</sub> emissions

### Demonstration

**1** A rise in the average global temperature of the Earth.

**2** Increasing levels of carbon dioxide and methane

**3** Actions affecting global warming:

- increases the release of carbon dioxide into the atmosphere because less photosynthesis takes place and therefore less carbon dioxide absorbed.

Burning of the trees also releases carbon dioxide as does respiration of the microorganisms that decompose the remaining plant material.

- reduces biodiversity as fewer trees and less habitat and diversity of habitat to support other species
- Increases methane in the atmosphere because land is cleared and used to grow rice in swamp like fields or to raise cattle both of which produce methane

**4** Affect on diversity:

- loss of habitat due to polar ice and glaciers melting and rise in sea levels causing flooding of low-lying land
- changes in the distribution of species in areas where temperature or rainfall has changed changes to migration patterns of animals as climates get hotter or cooler
- destruction of coral reefs due to change in sea temperature.

**5** Examples

- White lemuroid possums almost extinct in Australia vulnerable to increases in environmental temperature because they cannot maintain their body temperature.
- Little terns in the UK make their colonies just above the high tide line. Their nests are vulnerable to flooding by stormy seas. Stormy weather is increasing due to global warming
- Penguins and polar bears under threat – due to loss of polar icecaps
- Coastal mangrove forests grow in equatorial regions. Increasing numbers of storms and typhoons are undermining the fine sediment that the mangroves grow in. Seedlings cannot root and essential nutrients for the mangrove ecosystems are washed away.

## Lesson 18: B8.18 – Looking at waste management

### 1. Connection

Q1. List 2x greenhouse gases

Q2. List 4x factors increasing greenhouse gases

Q3. How can global warming affect species?

### 2. Activation

**LI: Explain how human waste impacts ecosystems**

<https://www.youtube.com/watch?v=1Z405uGDZGo>

Make a note of the title and the LI

1. Read pages 358-359
2. List key words – define those you don't know
3. Make a list of the different waste substances (green section)
4. Bullet point how waste substances are affecting the environments (blue section)
5. Draw figure 8.52

<https://www.youtube.com/watch?v=1PDjVDIrFec>

5. Bullet point effects of acid rain (purple section)

### 4. Consolidation

Complete and self assess the relevant past paper question for this topic -  
From the B8 DIP file



### 5. Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

### 3. Demonstration

Attempt questions 1, 3-5

In 10 mins answer as many questions as you can.

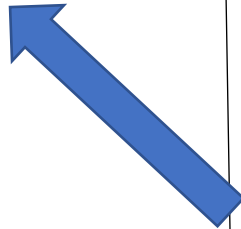
Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

Green questions to GCSE Level 3

Blue questions to GCSE Level 6

Purple questions to GCSE Level 9



## Answers Lesson 18: B8.18 – Looking at waste management

### Connection

**Q1.** carbon dioxide and methane

**Q2.**

- Burn fossil fuels for energy and transport
- Increase in rice and cattle farming
- Deforestation and destruction of peatland

**Q3.**

- Organisms have difficulty in maintaining body temperature eg lemuroid possum
- Ecosystems vulnerable to high tides and storms eg little terns and mangroves

### Demonstration

**1** As the human population grows and living standards increase, we are using more resources: the demand for agriculture, manufacturing and industry increase, producing more waste.

**2** types of waste

- sewage
- smoke and toxic gases
- herbicides, pesticides and fertilisers
- lead
- paper and cardboard
- plastic products.

**3** Fertilisers entering waterways, cause eutrophication. Toxic chemicals from household and industrial waste can spread into soil at landfill sites and enter waterways. Pesticides and herbicides are also washed into waterways and pollute them. Untreated sewage, chemicals and parasites can enter waterways. Microorganisms that decompose sewage use dissolved oxygen, causing aquatic organisms to die.

**4** Soot will cover the leaves and block the stomata so that gas exchange is reduced and photosynthesis is reduced. This will result in insufficient glucose for respiration in the cells, so cells die etc.

**5** Bioaccumulation

1. Small amounts of toxic substances - often from human activity - are taken up by plants.
2. These plants are eaten by primary consumers.
3. The primary consumers are eaten by secondary consumers, and the secondary consumers are eaten by higher level consumers.
4. At each stage harmless substances are excreted but the toxins remain in the tissues so the concentration of toxin becomes most concentrated in the body tissues of the animals at the top of the food chain.

## Lesson 19: B8.19 – Investigating pollution

### 1. Connection

Q1. List 3x pollutants

Q2. How do toxins affect food chains?

Q3. What is acid rain and what effect does it have?

### 2. Activation

**LI: Explain how pollution levels can be determined by indicator species**

<https://www.youtube.com/watch?v=4V0kWJkcLjo>

Make a note of the title and the LI

1. Read pages 360-361
2. List key words – define those you don't know
3. How are lichens and indicator species? (green section)
4. Copy table page 361
5. How else can pollution levels be measured (bullet points page 361)



### 4. Consolidation

Complete and self assess the relevant past paper question for this topic -  
From the B8 DIP file



### 5. Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

### 3. Demonstration

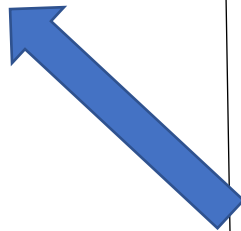
Attempt questions 1-7

In 15 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

- Green questions to GCSE Level 3
- Blue questions to GCSE Level 6
- Purple questions to GCSE Level 9



## Answers Lesson 19: B8.19 – Investigating pollution

### Connection

**Q1.** sewage, smoke/toxic gases, herbicides, pesticides, fertilisers, lead, paper & cardboard, plastic products

### Q2.

- Toxins enter the water and low levels accumulate in producers.
- These low levels are passed onto the consumers every time they feed
- Accumulate at higher concentrations at each trophic level.
- At the top of the food chain levels can be high enough to be toxic.

### Q3.

- Acidic gases produced when fossil fuels burn – dissolves in rainwater
- Acidifies water, damages plants, washes minerals out of the soil, damages fish – travels through the air as part of the water cycle

### Demonstration

**1** Changes the distribution and numbers of living organisms

**2** An organism that is used to measure environmental change e.g. lichens

**3** Yes. Stonefly larvae are sensitive to pollution and cannot survive but sludgeworms can tolerate pollution

**4** Use pH paper or use a pH probe and meter

**5** Fast running stream – A  
Stagnant pool – C  
Polluted pond – B

**6** Sample B contained the least dissolved oxygen. It contained the indicator species which are able to tolerate pollution and low dissolved oxygen levels (rat-tailed maggot, sludgeworm, bloodworm)

**7** Advantage - just need a water sample and do not need to survey the habitat  
Disadvantage – it is just a short term, spot testing

## Lesson 20: B8.20 – Maintaining biodiversity

### 1. Connection

Q1. How are lichens indicators of air pollution?

Q2. What species indicate clean water?

Q3. What species indicate polluted water?

### 2. Activation

**LI: Explain why conservation is important**

<https://www.youtube.com/watch?v=bs9e6ovISbs>

Make a note of the title and the LI

1. Read pages 362-363
2. List key words – define those you don't know
3. Make a list of bullet points – how to protect ecosystems (green section)
4. Make a list of bullet points – why we need to protect ecosystems (blue section)
5. Make a list of bullet points – what else is needed (purple section)



### 4. Consolidation

Complete and self assess the relevant past paper question for this topic -  
From the B8 DIP file



### 5. Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

### 3. Demonstration

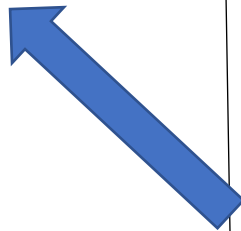
Attempt questions 1-7

In 15 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

- Green questions to GCSE Level 3
- Blue questions to GCSE Level 6
- Purple questions to GCSE Level 9



## Answers Lesson 20: B8.20 – Maintaining biodiversity

### Connection

**Q1.** Lichens are only found in clean air

**Q2.**

- Stonefly larvae, water snipe larvae, alderfly larvae, mayfly larvae

**Q3.**

- Blood worm, sludgeworm, rat-tailed maggot

### Demonstration

**1** Protected by:

- Introducing breeding programmes for endangered species.
- The protection and regeneration (restoring) of rare habitats,
- Re-introducing field margins and hedgerows on farmland
- Reducing deforestation and carbon dioxide emissions.
- replanting trees.
- Recycling resources
- Cloning endangered plant species.

**2** Hedgerows provide nesting sites for many birds, habitats for many insect species, small mammals etc.

**3** We have a moral responsibility to protect species that have become endangered because of our actions

**4** The animals are kept in a protected ecosystem, where the animals can breed and the young can be reared without danger from humans or predators.

**5** To include:

- ensuring long-term funding
- having qualified scientists who understand the issues
- animals and plants do not recognise boundaries
- many organisations and governments may be involved
- lack of 'policing' of protected areas.

**6** planting programmes are introduced and local environment agencies work to maintain healthy, litter-free sustainable forests

**7** The protection of biodiversity is important because;

- It allows a wide variation of food sources to support a species survive.
- It can provide us with potential material and economic benefits
- Plays a role in recycling of nutrients
- Morally we should encourage a culture that respects a range of habitats



## Lesson 21: B8.21 – Learning about food security (Triple)

### 1. Connection

Q1. Why are field margins useful?

Q2. Why is it important to conserve species?

Q3. What factors affect conservation projects?

### 2. Activation

**LI: Describe how different factors affect food security**

<https://www.youtube.com/watch?v=ACn3e4qnaM>

Make a note of the title and the LI

1. Read pages 364-365
2. List key words – define those you don't know
3. Make a list of bullet points – factors affecting food security (green section)

### 4. Consolidation

Complete and self assess the relevant past paper question for this topic -  
From the B8 DIP file

### 5. Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

### 3. Demonstration

Attempt questions 1-6

In 15 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

- Green questions to GCSE Level 3
- Blue questions to GCSE Level 6
- Purple questions to GCSE Level 9

## Answers Lesson 21: B8.21 – Learning about food security (Triple)

### Connection

**Q1.** provides strips of wild plants and increases biodiversity in an area that would otherwise be a monoculture of crops.

### Q2.

- Moral responsibility
- Use as medicines
- Minimise effect on food chains
- Protect food supplies

### Q3.

- Long term funding
- Qualified scientists
- Countries/  
organisations working together
- Lack of policing protected areas
- Keeping animals/  
plants in protected areas

### Demonstration

**1** when all people have access to consistent supplies of safe and nutritious food that is available, affordable and useable to meet their needs for an active healthy life.

**2** Affecting food security

- increasing birth rate
- changing diets in developed countries
- new pests and pathogens affecting farming
- environmental changes
- cost of agricultural inputs
- conflicts and war.

**3** Increasing birth rates mean that populations are growing faster and in some countries demand for food is increasing faster than the increased food production, which threatens food security.

Decreasing rainfall means that some regions of the world suffer from famine and food insecurity continually

**4** Changing diets in developed countries mean that foods are transported from countries where it is scarce, to other countries around the world. These crops are often grown at the expense of staple foods, for example, coffee.

**5** Although world population and total crop yield show an increasing trend and world population is rising at a faster rate which will cause more food insecurity in the future.

**6** Cash crops for export are grown at the expense of food crops for local people

Some areas in developing countries suffer recurring droughts and cannot grow sufficient food crops for their needs. Some regions are more prone to natural disasters e.g. volcanic eruptions, violent storms and tsunamis etc.

## Lesson 22: B8.22 – Maintaining food security (Triple)

### 1. Connection

Q1. What is food security?

Q2. What factors affect food security?

Q3. How does biodiversity affect food security?

### 2. Activation

#### LI: Evaluate modern farming techniques

<https://www.youtube.com/watch?v=nrbJl3R4YJU>

Make a note of the title and the LI

1. Read pages 366-367
2. List key words – define those you don't know
3. Make a list of bullet points – producing large yields rapidly (green section)
4. Draw and label figure 8.63
5. Bullet points to explain how intensive farming is so efficient and also to look at the ethical issues (purple section)



### 4. Consolidation

Complete and self assess the relevant past paper question for this topic -  
From the B8 DIP file



### 5. Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

### 3. Demonstration

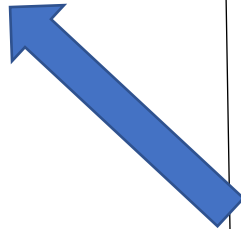
Attempt questions 1-6

In 15 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

- Green questions to GCSE Level 3
- Blue questions to GCSE Level 6
- Purple questions to GCSE Level 9



## Answers Lesson 22: B8.22 – Learning about food security (Triple)

### Connection

**Q1.** when people have access to a constant supply of affordable safe and nutritious food.

**Q2.**

- Birth rate
- Changing diets
- Pest and pathogen affecting farming
- Environmental changes
- Cost of agricultural inputs
- Conflicts and war

**Q3.**

- Reliance on too few species makes food production vulnerable. Monoculture can result in an entire food source being wiped out. Biodiversity makes sure food chains are not disrupted. Pollinators particularly bees are very important.

### Demonstration

**1** Farming using machines and chemicals to produce large yields very quickly.

**2** • using fertilisers to provide essential nutrients to increase yield • using insecticides and fungicides to kill pests, and herbicides to kill unwanted plants (weeds) • growing plants in glasshouses where environmental conditions can be controlled e.g. temperature, CO2 levels etc. • using hydroponics to grow plants • factory farming and fish grown in cages or tanks where they are protected from predators, expend little energy so more is used for growth and fed the correct diet.

**3** Advantages of hydroponics:

- Mineral supplies can be controlled and unused minerals are recycled. Production costs are lower with no pollution risk to waterways.
- It is under cover so can control conditions and diseases better

**4** Maintaining fish stocks:

- Using fishing quotas to conserve stocks at sustainable levels
- controlling net size to ensure that young fish mature and breed

**5 Advantages:** • Fish grow quickly so high yield of fish to meet demand from human population

• Obtaining fish from fish farms helps allow wild fish stocks to recover

**Disadvantages:** • Disease spreads quickly as fish in very close proximity

- Harm to local environment as chemicals and antibiotics used on fish farms can leach into local environment
- High cost of running fish farm.
- Ethics – is it moral?

**6** Factory farming - Restricted movement of animals so that energy used for movement is minimal and more can be used for growth. Controlled temperatures, to reduce the energy that an animal uses to keep cool or warm. The energy saved is used for growth.

**7** More food production in smaller spaces and more quickly through intensive farming of plants and animals but monocultures can be susceptible to new pests/diseases. Large fields with no hedgerows reduces biodiversity. Pesticides/herbicides can enter waterways and reduce biodiversity. Fertilisers can enter waterways and cause eutrophication etc. Pens/cages for animals can be cramped and injure livestock. Diseases can spread quickly in cramped conditions. Transportation can be cramped and over huge distances Slaughtering techniques can be inhumane etc.

## Lesson 23: B8.23 – Using Biotechnology (Triple)

### 1. Connection

Q1. List methods of modern farming that increase yield

Q2. How do fishing quotas help maintain food security?

Q3. What are the ethics surrounding intensive farming?

### 2. Activation

**LI: Explain how use of biotechnology ensure food security**

<https://www.youtube.com/watch?v=7TmcXYp8xu4>

Make a note of the title and the LI

1. Read pages 368-369
2. List key words – define those you don't know
3. Make a list of bullet points – GM crops can (green section)
4. Why is GM "Golden rice" so important?
5. Define mycoprotein
6. Bullet points for conditions in fermenter for making mycoprotein (purple section)

### 4. Consolidation

Complete and self assess the relevant past paper question for this topic -  
From the B8 DIP file

### 5. Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

### 3. Demonstration

Attempt questions 1-2 & 5-6

In 10 mins answer as many questions as you can.

Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:

Green questions to GCSE Level 3

Blue questions to GCSE Level 6

Purple questions to GCSE Level 9

## Answers Lesson 23: B8.23 – Using Biotechnology (Triple)

### Connection

#### Q1.

- use of fertilisers, insecticides and herbicides
- Use of greenhouses
- Use hydroponics
- Factory farming

#### Q2.

- Conserve stocks at a sustainable level
- Control of net size to allow young fish to escape so they can mature and breed
- Use fish farm fish instead

#### Q3.

- Close confinement > disease spreads and lack of movement
- Cruel pens/cages
- Poor transport/slaughtering techniques

### Demonstration

#### 1 Biotechnology:

1. produces GM crops which can:
  - be resistant to insect attack or to herbicides.
  - produce increased yields because of the characteristics chosen
2. produce mycoprotein

**2** It has been developed using a gene from carrots, which produces the  $\beta$ -carotene (which we say as 'beta-carotene') that makes vitamin A.

**3** Advantages: produces large quantities of insulin very quickly; It is less likely to cause an adverse reaction; It overcomes ethical concerns about using insulin from pigs. Disadvantages: ethical concerns about the process and inserted genes having unexpected harmful effects.

**4** Diabetes is becoming more common due to obesity rising

#### 5 Fermenting vat conditions:

- constant oxygen supplies for *Fusarium* to respire
- water jackets to remove heat produced during respiration
- pH and temperature probes to monitor conditions and
- allow adjustments to be made quickly
- stirrers to spread heat, oxygen and syrup evenly through
- the vats and keep the fungus in suspension.

**6** Large amounts of high protein foods can be produced very quickly

Foods can be modified to provide essential vitamins

There may be unknown health risks of genetically modified food.

Ethical concerns about creating new life forms, or moving genes between different species, especially if this may have side effects

## Lesson 24: B8 - Revision

### Connection

Q1. Why are GM crops important?

Q2. What is mycoprotein?

Q3. What are the conditions for producing mycoprotein?

### Activation

#### **LI: Create a topic summary sheet**

1. Fold an A3 sheet so it is divided into 8 sections
2. Look back over your lessons and group them into 8 main headings
3. Summarise the key points into each section, use keywords and diagrams and symbols rather than sentences



### Consolidation

Look through the relevant past paper questions for this topic - From the B8 DIP file – see if you can complete any additional questions

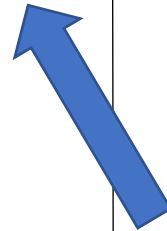


### Extension

Make a list of anything that you would like to ask your teacher to go over again

### Demonstration

Test yourself by working with the person sitting next to you by talking through each box on your summary sheet and seeing how many key facts you can remember



## Answers Lesson 24: B8 – Revision

### Connection

#### Q1.

- Produce an increased yields as they are resistant to disease, herbicides, produce pesticides or are selected for a larger fruit.
- Also modified to make super foods eg golden rice > Vit A > prevents blindness

#### Q2.

- Mycoprotein is a low fat, protein rich food. Produced by a fungus. Good for vegetarians (Quorn)

#### Q3.

- Nutrients
- Oxygen
- Warmth
- pH monitored
- Stirrers to distribute nutrients, heat and oxygen and to keep the fungus in suspension



## Humanity has wiped out 60% of animal populations since 1970, report finds

The huge loss is a tragedy in itself but also threatens the survival of civilisation, say the world's leading scientists



Cattle in the Amazon rainforest.

Photograph: Michael Nichols/National Geographic/Getty Images

Humanity has wiped out 60% of mammals, birds, fish and reptiles since 1970, leading the world's foremost experts to warn that the annihilation of wildlife is now an emergency that threatens civilisation.

The new estimate of the massacre of wildlife is made in a major report produced by WWF and involving 59 scientists from across the globe. It finds that the vast and growing consumption of food and resources by the global population is destroying the web of life, billions of years in the making, upon which human society ultimately depends for clean air, water and everything else.

"We are sleepwalking towards the edge of a cliff" said Mike Barrett, executive director of science and conservation at WWF. "If there was a 60% decline in the human population, that would be equivalent to emptying North America, South America, Africa, Europe, China and Oceania. That is the scale of what we have done."

"This is far more than just being about losing the wonders of nature, desperately sad though that is," he said. "This is actually now jeopardising the future of people. Nature is not a 'nice to have' – it is our life-support system."

"We are rapidly running out of time," said Prof Johan Rockström, a global sustainability expert at the Potsdam Institute for Climate Impact Research in Germany. "Only by addressing both ecosystems and climate do we stand a chance of safeguarding a stable planet for humanity's future on Earth."

Many scientists believe the world has begun a sixth mass extinction, the first to be caused by a species – *Homo sapiens*. Other recent analyses have revealed that humankind has destroyed 83% of all mammals and half of plants since the dawn of civilisation and that, even if the destruction were to end now, it would take 5-7 million years for the natural world to recover.

The Living Planet Index, produced for WWF by the Zoological Society of London, uses data on 16,704 populations of mammals, birds, fish, reptiles and amphibians, representing more than 4,000 species, to track the decline of wildlife. Between 1970 and 2014, the latest data available, populations fell by an average of 60%. Four years ago, the decline was 52%. The "shocking truth", said Barrett, is that the wildlife crash is continuing unabated.

Wildlife and the ecosystems are vital to human life, said Prof Bob Watson, one of the world's most eminent environmental scientists and currently chair of an intergovernmental panel on biodiversity that said in March that the destruction of nature is as dangerous as climate change.

"Nature contributes to human wellbeing culturally and spiritually, as well as through the critical production of food, clean water, and energy, and through regulating the Earth's climate, pollution, pollination and floods," he said. "The Living Planet report clearly demonstrates that human activities are destroying nature at an unacceptable rate, threatening the wellbeing of current and future generations."

The biggest cause of wildlife losses is the destruction of natural habitats, much of it to create farmland. Three-quarters of all land on Earth is now significantly affected by human activities. Killing for food is the next biggest cause – 300 mammal species are being eaten into extinction – while the oceans are massively overfished, with more than half now being industrially fished.

**African elephants:** With 55 being poached for ivory every day, more are being poached than are being born, meaning populations are plunging

**Orangutans:** More than 100,000 were lost in Borneo alone between 1999 and 2015, largely due to forest destruction for timber and palm oil, leaving the great apes critically endangered

**Whale sharks:** Numbers of the largest fish have collapsed by two thirds in the last 75 years in the Indian and Pacific Oceans, due to overfishing and ship collisions.

**Wandering albatross:** Populations are declining rapidly, driven largely by accidental catches in long line fisheries. One monitored population on South Georgia fell by half between 1972 and 2010

**Jaguar:** The burning of forests in South America is driving the decline of this big cat, which prefers to live in dense jungle

**Gharials:** There are now just 200 breeding adults of the fish-eating crocodile in the wild in India and Nepal, the result of rampant fishing, poaching and drops in river flow.

**Chinese giant salamander:** This creature is one of 545 critically endangered amphibians, decimated by hunting for food, destruction of rivers and lakes and pollution.

**Hedgehog:** This animal is among the fifth of UK mammals at high risk of extinction, with populations having fallen hugely in both urban and rural locations.

Chemical pollution is also significant: half the world's killer whale populations are now doomed to die from PCB contamination. Global trade introduces invasive species and disease, with amphibians decimated by a fungal disease thought to be spread by the pet trade.

The worst affected region is South and Central America, which has seen an 89% drop in vertebrate populations, largely driven by the felling of vast areas of wildlife-rich forest. In the tropical savannah called **cerrado**, an area the size of Greater London is cleared every two months, said Barrett.

"It is a classic example of where the disappearance is the result of our own consumption, because the deforestation is being driven by ever expanding agriculture producing soy, which is being exported to countries including the UK to feed pigs and chickens," he said. The UK itself has lost much of its wildlife, ranking 189th for biodiversity loss out of 218 nations in 2018.

The habitats suffering the greatest damage are rivers and lakes, where wildlife populations have fallen 83%, due to the enormous thirst of agriculture and the large number of dams. "**Again** there is this direct link between the food system and the depletion of wildlife," said Barrett. Eating less meat is an essential part of reversing losses, he said.

### Humans make up just 0.01% of all life but have destroyed 83% of wild mammals

The Living Planet Index has been **criticised** as being too broad a measure of wildlife losses and smoothing over crucial details. But all indicators, from extinction rates to intactness of ecosystems, show colossal losses. "They all tell you the same story," said Barrett.

Conservation efforts can work, with tiger numbers having risen 20% in India in six years as habitat is protected. Giant pandas in China and otters in the UK have also been doing well.

But Marco **Lambertini**, director general of WWF International, said the fundamental issue was consumption: "We can no longer ignore the impact of current unsustainable production models and wasteful lifestyles."

The world's nations are working towards a crunch meeting of the UN's Convention on Biological Diversity in 2020, when new commitments for the protection of nature will be made. "We need a new global deal for nature and **people** and we have this narrow window of less than two years to get it," said Barrett. "This really is the last chance. We have to get it right this time."

Tanya Steele, chief executive at WWF, said: "We are the first generation to know we are destroying our planet and the last one that can do anything about it."

[Damian Carrington](#) The Guardian Environment editor

Tue 30 Oct 2018 00.01 GMT Last modified on Tue 21 May 2019 11.19 BST

### Questions from text:

1. What percentage of mammals, birds, **fish** and reptiles have become extinct because of man's activities?
2. What are scientists calling this event?
3. What do scientists think man is doing to create this?
  
4. What other activities is man doing to harm wildlife?
5. What crop is being grown on land from burned down forests?
6. What area of forest is being destroyed in South and Central America every two months?
  
7. What trade has spread a fungal disease in the world's amphibians?
8. What fundamental issue is driving this decline in wildlife?
9. How long do we have to secure a new global deal to protect nature?  
Suggest what actions we need to take in this global deal.

## Answers: B8 DART - Biodiversity

1. 80%
2. The sixth mass extinction
3. Destruction of natural habitat and killing for food.
  
4. Hunting/poaching, overfishing, pollution.
5. Growing soya beans / soy for animal feed.
6. An area the size of Greater London
  
7. The pet trade
8. Consumption (producing and eating/wasting food) by humans
9. Less than two years.  
Any of:
  - Prevent destruction of forest
  - Stop overfishing the seas
  - Prevent poaching of animals for trophies/food
  - Limit the construction of dams
  - Stop polluting rivers
  - Use less water for agriculture
  - Waste less food
  - Stop growing soy to feed animals (cattle, pigs, chickens) for meat



Attainment Band :		B8 Ecology in action (AQA) Knowledge and Understanding
<b>Yellow Plus/ Yellow</b>	<p>Explain how a gradual change in an abiotic factor can affect the distribution of species.</p> <p>Explain why the cycles of predator and prey populations are out of phase with each other.</p> <p>Explain how to perform accurate sampling.</p> <p>Interpret a diagram of the carbon cycle.</p> <p>Explain the impact of environmental change.</p>	
<b>Blue</b>	<p>Explain the impact of introducing a new species or pathogen.</p> <p>Explain how the size of a predator population will affect the numbers of prey and vice versa.</p> <p>Describe how to use a transect line.</p> <p>Explain how carbon is recycled.</p> <p>Describe the impact of environmental change.</p>	
<b>Green</b>	<p>Identify abiotic and biotic factors that affect ecosystems.</p> <p>Describe how changes in the population of one organism can affect other organisms.</p> <p>Construct food chains.</p> <p>Describe how to use some sampling techniques.</p> <p>Recall that plants take in carbon as carbon dioxide.</p> <p>Recall causes of environmental change.</p>	
<b>White</b>	<p>Some elements of the above have been achieved</p>	

