Biodiversity

1. Biodiversity is the **variety** of different species in an **ecosystem**
2. Biodiversity can be measured by using **sampling** techniques to count the **abundance** of different species
3. A quadrat is a piece of equipment (a frame) used to count the abundance of species

4. **Random** sampling is used to measure the abundance of a species in a particular habitat, using quadrats placed at random coordinates
5. **Systematic** sampling is used to measure the effect of a factor on the distribution of a species, using a **transect** with quadrats placed at regular intervals
6. High biodiversity makes an ecosystem **stable** because each species is not dependent on just one other

How Humans affect Biodiversity

7. Many human activities are **reducing biodiversity** on Earth
8. The global population is increasing, so more resources are needed and more **waste** is being produced
9. Pollution is caused when waste is not properly treated
10. Pollution can be very harmful to plants and animals and **reduce biodiversity**
11. Pollution does not always affect all species equally, as some may be more resistant
12. **Biodiversity** is reduced by humans using land for building, quarrying, farming and waste disposal
13. **Peat** from peat bogs is used for compost for gardens and farms, destroying habitats
14. Scientists and other citizens are using different methods to **counteract** some of the negative impacts of humans on biodiversity:
    - Protecting rare **habitats**
    - Maintaining **nature reserves**
    - **Breeding** programmes for endangered species
    - **Recycling** resources to reduce landfill waste
    - Reducing deforestation
    - Growing **hedgerows** on farms to allow more crops to grow

Global Warming

15. Levels of carbon dioxide and methane (**greenhouse gases**) in the atmosphere are increasing, contributing to global warming
16. Human activities contribute to greenhouse gas **emissions**, particularly the burning of **fossil fuels** in industry and transport
17. There are many **biological consequences** to global warming including:
    - Melting polar ice caps
    - Rising sea levels
    - Extreme weather patterns
    - Flooding
    - Loss of habitats
    -

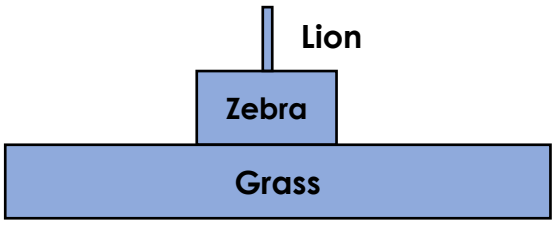
Human Waste

18. The increasing human **population** means that more resources are required and more waste is produced
19. More waste is also produced through the improved standard of living
20. If waste is not treated properly it results in pollution:
    - **Water pollution** is caused by poor sewage treatment and leaching of fertilisers
    - **Air pollution** is caused by smoke and acidic gases

- **Land pollution** is caused by landfill and toxic chemical waste

Pyramids of Biomass

21. Biomass is **lost** between **trophic levels** in a food chain
22. Producers (mostly plants and algae) transfer about 1% of the light energy they absorb for photosynthesis
23. Only approximately **10%** of biomass from each trophic level is **transferred** to the level above
24. Biomass is **lost** through waste (faeces, urine, sweat, gas) and through life processes such as **movement** and **thermoregulation**



Farming and Biotechnology

25. **Efficiency** of food production (between trophic levels) can be improved by **restricting** energy transfer from food animals to the environment
26. This includes **intensive** farming methods where movement of animals is limited and the temperature of their surroundings is controlled
27. Fish stocks in oceans are declining because of overfishing
28. Fish stocks need to remain at a high enough level for breeding to occur, to prevent the disappearance of some species
29. Fishing **quotas** are used to ensure that ocean fish stocks remain at a sufficient level and **net sizes** can be restricted to prevent juvenile fish being caught, so they can then have their own offspring
30. Modern **biotechnology** allows large quantities of **microorganisms** to be cultured for food
31. ***Fusarium*** fungus is used to produce mycoprotein (Quorn), a protein-rich food suitable for vegetarians
32. Fusarium is grown on glucose syrup in aerobic conditions before being harvested and purified
33. Genetically modified (GM) bacterium can be used to produce **insulin** to be harvested and purified to treat people with diabetes
34. **GM crops**, such as golden rice, can be used to provide increased nutritional value in areas where it is lacking

Food Security

35. Food security is having **enough food** to feed a **population**
36. Many factors can threaten food security:
    - Increasing **birth rate** means there is not enough food for the growing population
    - **Changing diets** in developed countries means that scarce food resources are being transported across the world
    - New **pests** and pathogens are affecting farming
    - Environmental changes, including **droughts**, which can lead to **famines**
    - Political instability and **conflicts** in some parts of the world threaten access to food and water
37. **Sustainable** methods must be found and used to feed Earth's population