

# CIE Biology GCSE

## 19 - Organisms and their Environment

### Flashcards



What is the main source of energy in biological systems?



What is the main source of energy in biological systems?

The sun



# Describe the flow of energy in biological systems

## (Higher/Supplement)



# Describe the flow of energy in biological systems (Higher/Supplement)

- Light energy from the sun is trapped by photosynthetic organisms
- Energy is stored as chemical energy in organisms
- Energy is eventually lost to the environment

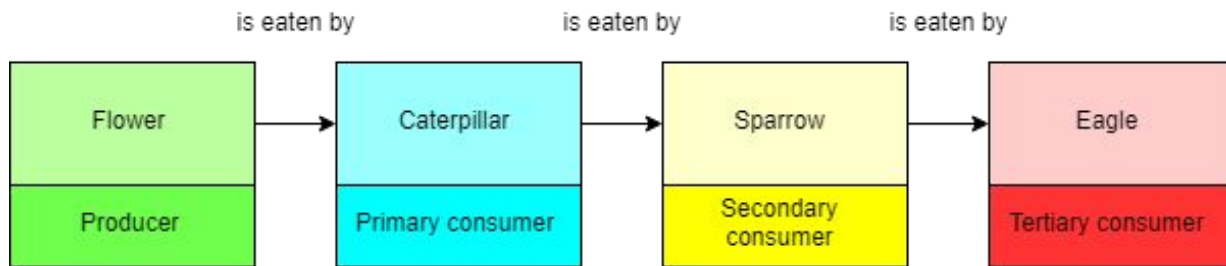


# What is a food chain?



# What is a food chain?

A way of showing the flow of energy between organisms starting with a producer



How is energy transferred between organisms in a food chain?





How is energy transferred between organisms in a food chain?

By ingestion (organisms eating other organisms)



# What is a trophic level? (Higher/Supplement)



What is a trophic level? (Higher/Supplement)

The position that an organism holds in a food chain, food web, pyramid of numbers or pyramid of biomass



Why are biomass transfers not 100%  
efficient?  
(Higher/Supplement)



# Why are biomass transfers not 100% efficient?

(Higher/Supplement)

Energy is lost through

- Egestion (removal of faeces)
- Excretion (removal of waste products e.g. urine)
- Respiration
- The production of inedible bones and shells



Why do food chains usually have fewer than 5 trophic levels?  
(Higher/Supplement)



Why do food chains usually have fewer than 5 trophic levels? (Higher/Supplement)

Biomass transfers are not 100% efficient and so there is often not enough energy to support 5 trophic levels



Why is it most efficient to supply plants  
as food for humans?  
(Higher/Supplement)





## Why is it most efficient to supply plants as food for humans? (Higher/Supplement)

- Using the plants as food for livestock wastes energy as the biomass transfers are not 100% efficient
- Eating plant transfers can maximise the amount of energy gained as there is only one transfer



# What is a food web?



# What is a food web?

## Multiple interconnected food chains



# What is a producer?



# What is a producer?

An organism that makes its own food  
(usually through photosynthesis)



# What is a consumer?



# What is a consumer?

An organism that gets its energy by eating other organisms



# What is a primary consumer?





What is a primary consumer?

An organism that feeds on producers



# What is a secondary consumer?



# What is a secondary consumer?

An organism that feeds on primary consumers



# What is a tertiary consumer?

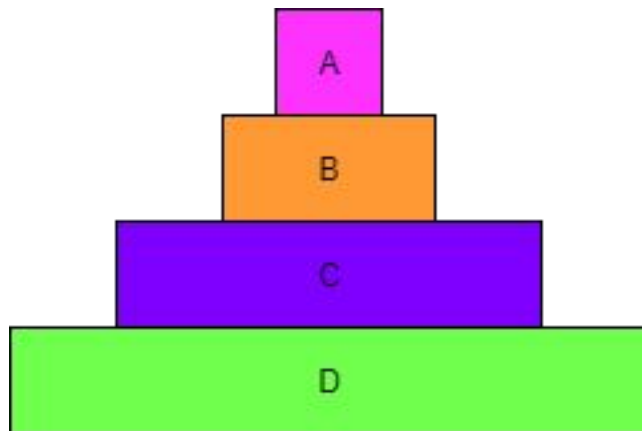


# What is a tertiary consumer?

An organism that feeds on secondary consumers



Identify the producer in this pyramid of biomass (Higher/Supplement)

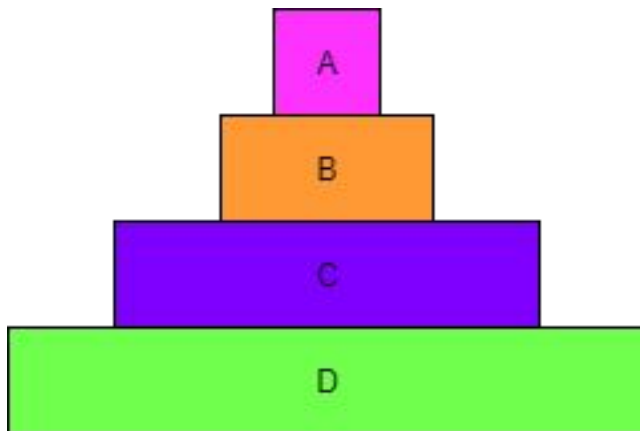


Identify the producer in this pyramid of biomass  
(Higher/Supplement)

D is the producer



Identify the secondary consumer in this pyramid of biomass (Higher/Supplement)





Identify the secondary consumer in this pyramid of biomass (Higher/Supplement)

B is the secondary consumer



# What are herbivores?



# What are herbivores?

Herbivores are animals that only eat plants



# What are carnivores?



# What are carnivores?

## Organisms that mainly eat animals



# What are decomposers?



# What are decomposers?

## Organisms that break down dead matter



# Identify the producer in the following food chain





Identify the producer in the following food chain

The grass



# Identify one consumer in this food chain

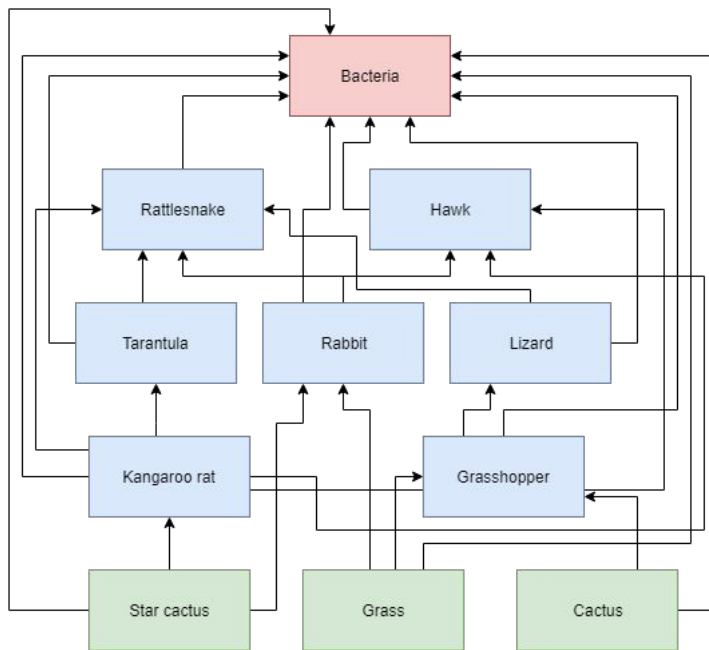


Identify one consumer in this food chain

The grasshopper, frog, snake or hawk



# Identify the 3 producers in this food web

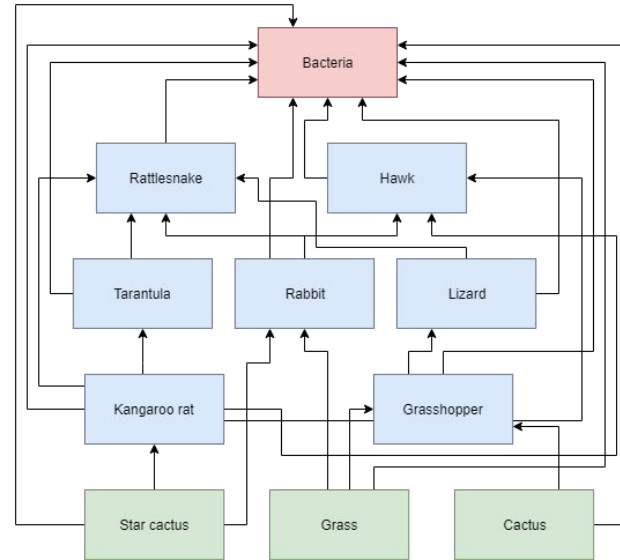


# Identify the 3 producers in this food web

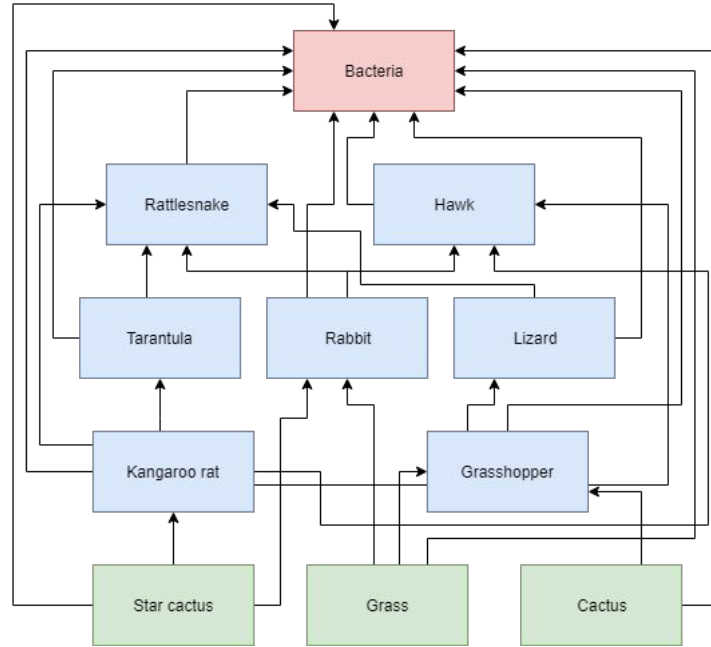
Grass

Star cactus

Cactus

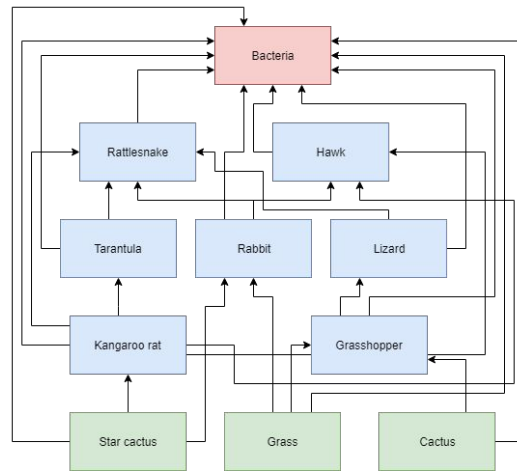


# Identify one consumer in this food web



# Identify one consumer in this food web

Anything in a blue rectangle (rattlesnake, hawk, tarantula, rabbit, lizard, kangaroo rat, grasshopper)



Explain the impact humans have on food chains and webs by overharvesting certain species





Explain the impact humans have on food chains and webs by overharvesting certain species

Many organisms rely on other organisms for food, overharvesting can reduce the amount of food available for other animals



Explain the impact humans have on food chains and webs by introducing other species into a habitat



Explain the impact humans have on food chains and webs by introducing other species into a habitat

Introducing new organisms increases competition and can interfere with the food chain, causing organisms who cannot compete to die



# What is a pyramid of numbers?

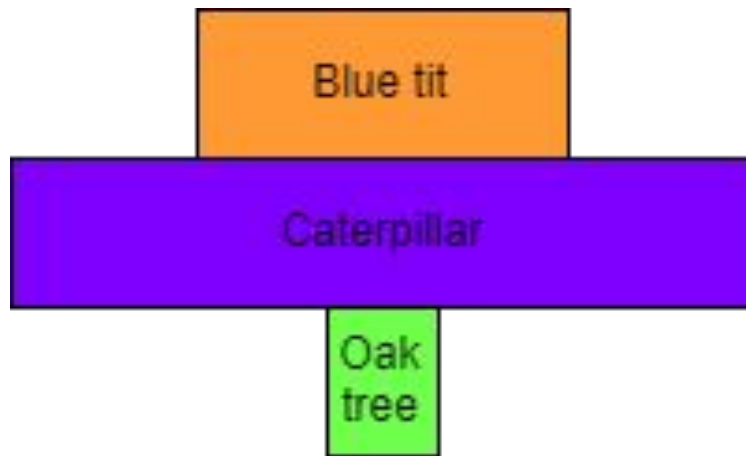


# What is a pyramid of numbers?

A pyramid of numbers shows the number of organisms at each trophic level



# Why is this pyramid of numbers not pyramid shaped?



Why is this pyramid of numbers not pyramid shaped?

Pyramids of numbers don't take size and mass of organisms into account



# What is a biomass pyramid? (Higher/Supplement)



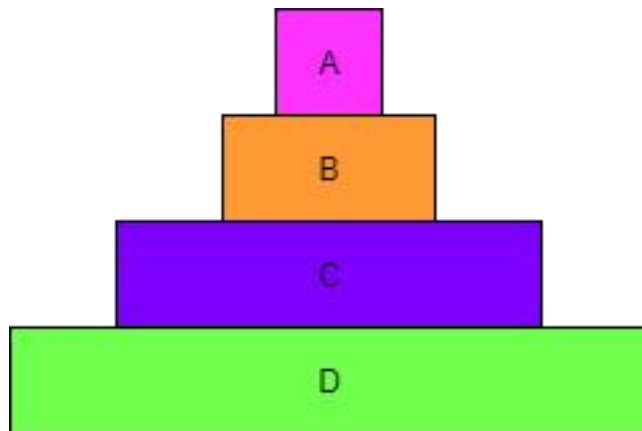


What is a biomass pyramid? (Higher/Supplement)

A pyramid that shows the total dry mass of organisms at each trophic level



Identify the producer in this pyramid of biomass (Higher/Supplement)



Identify the producer in this pyramid of biomass  
(Higher/Supplement)

D is the producer



Why is a pyramid of biomass a better way of representing a food chain than a pyramid of numbers?  
(Higher/Supplement)



Why is a pyramid of biomass a better way of representing a food chain than a pyramid of numbers? (Higher/Supplement)

Pyramids of biomass take into account the size of the organisms and are less easily misinterpreted



# Describe the carbon cycle



# Describe the carbon cycle

- Plants fix carbon dioxide into organic molecules during photosynthesis
- The organic carbon-containing molecules are passed onto organisms that eat the plants
- Carbon dioxide is released back into the atmosphere by respiration from animals and plants
- Burning fossil fuels also releases carbon dioxide into the atmosphere



State the effect of burning fossil fuels on carbon dioxide concentration in the environment





State the effect of burning fossil fuels on carbon dioxide concentration in the environment

Burning fossil fuels releases more carbon dioxide into the atmosphere, increasing the concentration of  $\text{CO}_2$



State the effect of deforestation on carbon dioxide concentration in the environment



## State the effect of deforestation on carbon dioxide concentration in the environment

- Trees take in carbon dioxide during photosynthesis (decreasing the atmospheric carbon dioxide concentration)
- Cutting down trees prevents this and so the atmospheric carbon dioxide concentration does not decrease



# Describe the water cycle



# Describe the water cycle

- Water from lakes and oceans evaporates
- The evaporated water condenses into clouds and returns to earth as precipitation
- The water from precipitation is useful for life on land
- The water then returns to rivers and oceans through surface runoff



# Why is the water cycle important?



# Why is the water cycle important?

Living organisms require water. The water cycle provides organisms on land with a continuous supply of water



Briefly describe how nitrogen is cycled  
through an ecosystem  
(Higher/Supplement)





## Briefly describe how nitrogen is cycled through an ecosystem (Higher/Supplement)

- Nitrogen is fixed by lightning and bacteria
- Decomposers break dead matter down into ammonium ions
- Nitrifying bacteria convert ammonia into nitrites and nitrates
- Plants absorb nitrate ions
- Denitrifying bacteria release nitrogen back to the atmosphere

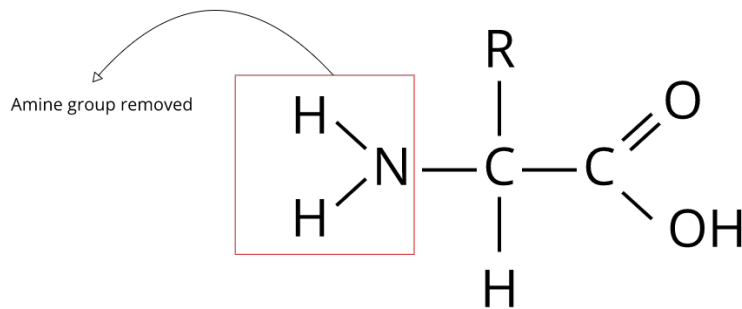


# What is deamination? (Higher/Supplement)



# What is deamination? (Higher/Supplement)

The removal of the amine group in an amino acid



State 4 roles of bacteria in the nitrogen cycle (Higher/Supplement)



## State 4 roles of bacteria in the nitrogen cycle (Higher/Supplement)

- Decomposition
- Nitrification
- Denitrification
- Nitrogen fixation



# Define population



## Define population

A species that occupy the same habitat at the same time



Define community (Higher/Supplement)





Define community (Higher/Supplement)

All the different populations in an ecosystem



Define ecosystem (Higher/Supplement)



Define ecosystem (Higher/Supplement)

Both the community and their physical environment e.g. a pond



State 3 factors that affect population growth rates



State 3 factors that affect population growth rates

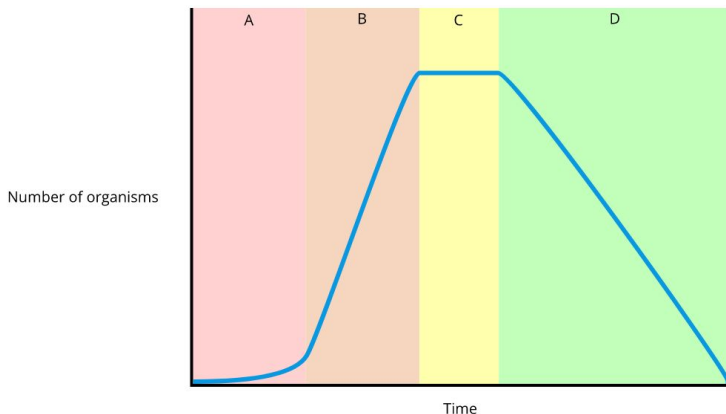
Disease

Predation

Availability of food

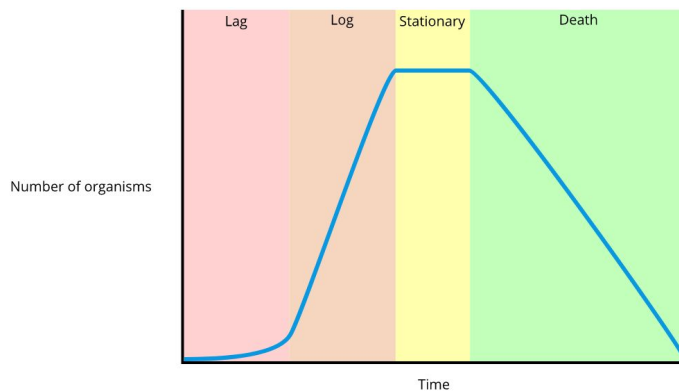


Name the sections of this chart showing population growth in an environment with limited resources (Higher/Supplement)

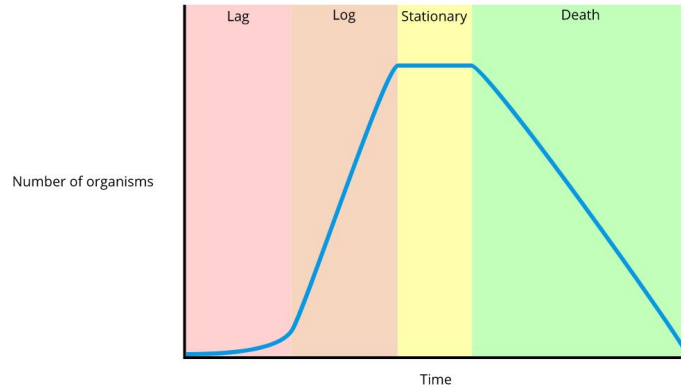


Name the sections of this chart showing population growth in an environment with limited resources  
(Higher/Supplement)

A	Lag phase
B	Log phase
C	Stationary phase
D	Death phase



# Describe the lag phase in population growth (Higher/Supplement)



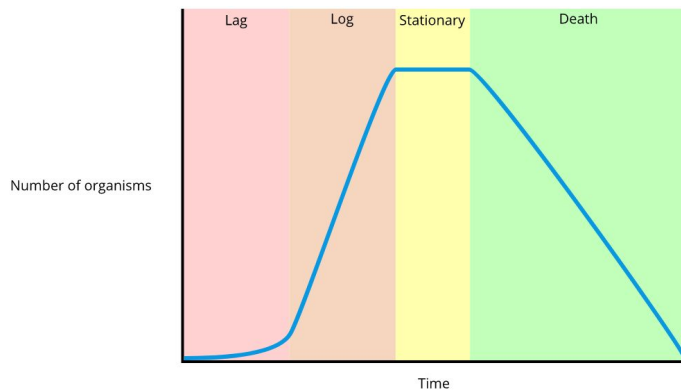


Describe the lag phase in population growth  
(Higher/Supplement)

The organisms are adjusting to their environment



# Describe the log phase in population growth (Higher/Supplement)

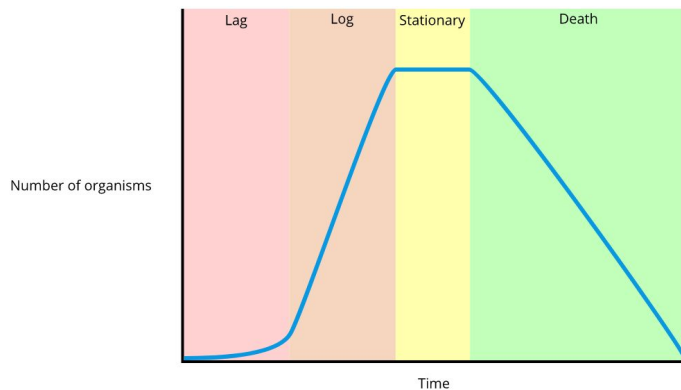


Describe the log phase in population growth  
(Higher/Supplement)

The growth of the population is  
increasing at a fast (exponential) rate



# Describe the stationary phase in population growth (Higher/Supplement)

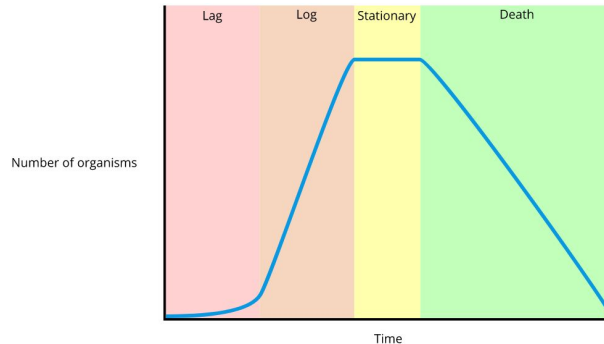


Describe the stationary phase in population growth  
(Higher/Supplement)

The amount of births and deaths are  
equal



# Describe the death phase in population growth in an environment with limited resources (Higher/Supplement)

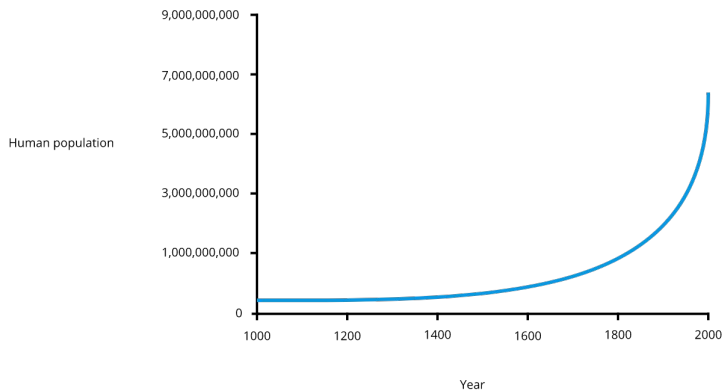


Describe the death phase in population growth  
(Higher/Supplement)

Once the resources begin to be used up, organisms begin to compete for resources and organisms will die as resources become scarce



# Describe the shape of the following graph showing human population growth





Describe the shape of the following graph showing human population growth

- The shape of the graph is an upwards exponential curve
- This shows that the population size is increasing more and more rapidly



State 4 implications of a rapidly increasing population size



## State 4 implications of a rapidly increasing population size

- More land needed for living
- Greater demands on healthcare
- Greater demands on education
- More resources needed which puts pressure on the environment

