Population

REACH OUT

The Earth at night © **NASA**

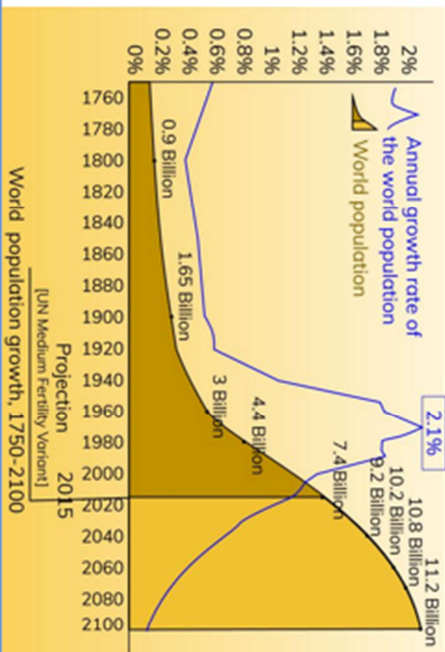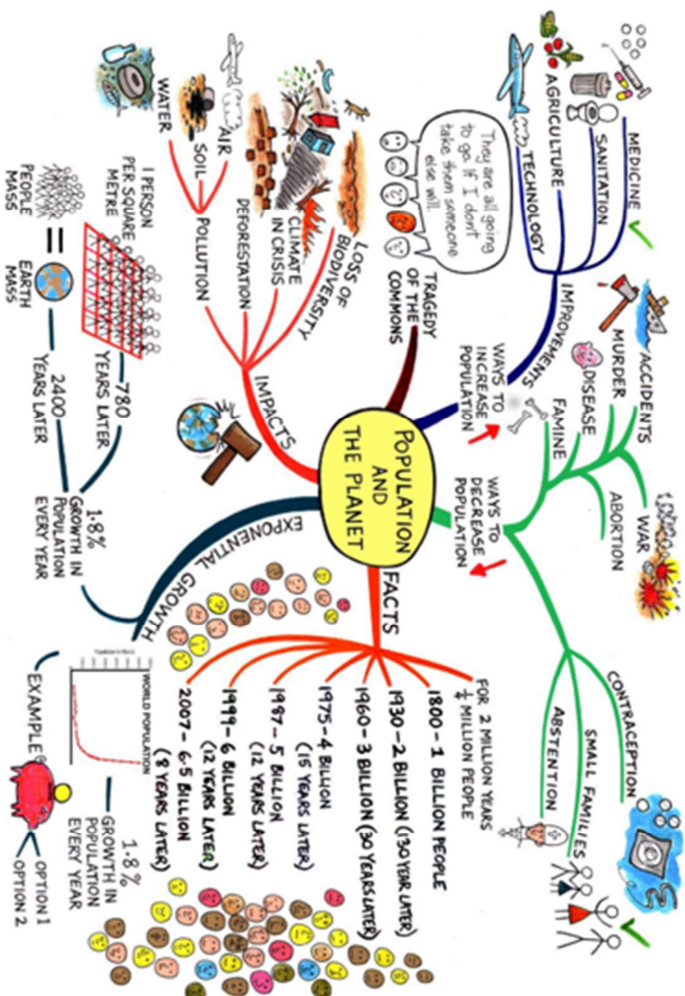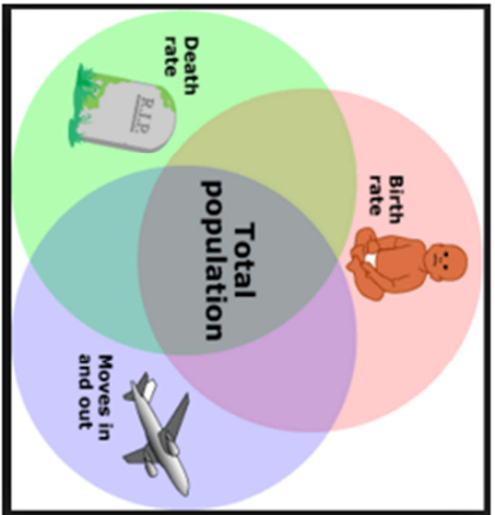## YEAR 6

SPRING TWO

NAME:

CLASS:

Population Challenges

Rapidly growing population	1) Hard for authorities to plan when populations grow quickly 2) Increased pressure on resources, land and services (such as health and education) 3) Increased pollution
Ageing population	1) Increased pressure on health services 2) Fewer people in the population working and paying taxes 3) Increased poverty amongst older people.
Feeding the population	1) 1 in 9 people still go hungry every day 2) Global population still increasing but food production is not increasing as quickly 3) Food is not evenly distributed.

POPULATION AND THE PLANET

WAYS TO INCREASE POPULATION — TECHNOLOGY, SANITATION, MEDICINE, AGRICULTURE, IMPROVEMENTS

WAYS TO DECREASE POPULATION — DISEASE, FAMINE, ACCIDENTS, MURDER, WAR, ABORTION, CONTRACEPTION, SMALL FAMILIES, ABSTENTION

IMPACTS — WATER, AIR, SOIL, POLLUTION, DEFORESTATION, CLIMATE IN CRISIS, LOSS OF BIODIVERSITY, TRAGEDY OF THE COMMONS ("They are all going to go if I don't take them someone else will.")

1 PERSON PER SQUARE METRE = PEOPLE MASS = EARTH MASS
780 YEARS LATER — 1·8% GROWTH IN POPULATION EVERY YEAR
2400 YEARS LATER

EXPONENTIAL GROWTH / FACTS

FOR 2 MILLION YEARS ≠ 1 MILLION PEOPLE
1800 – 1 BILLION PEOPLE
1930 – 2 BILLION (130 YEARS LATER)
1960 – 3 BILLION (30 YEARS LATER)
1975 – 4 BILLION (15 YEARS LATER)
1987 – 5 BILLION (12 YEARS LATER)
1999 – 6 BILLION (12 YEARS LATER)
2007 – 6·5 BILLION (8 YEARS LATER)

WORLD POPULATION

1·8% GROWTH IN POPULATION EVERY YEAR
EXAMPLE — OPTION 1, OPTION 2

Total population

Death rate — Birth rate — Moves in and out

Annual growth rate of the world population / World population

World population growth, 1750-2100
Projection 2015 [UN Medium Fertility Variant]

0.9 Billion, 1.65 Billion, 3 Billion, 4.4 Billion, 7.4 Billion, 9.2 Billion, 10.2 Billion, 10.8 Billion, 11.2 Billion

2.1%

Years: 1760, 1780, 1800, 1820, 1840, 1860, 1880, 1900, 1920, 1940, 1960, 1980, 2000, 2020, 2040, 2060, 2080, 2100

Percentages: 0%, 0.2%, 0.4%, 0.6%, 0.8%, 1%, 1.2%, 1.4%, 1.6%, 1.8%, 2%

Keywords

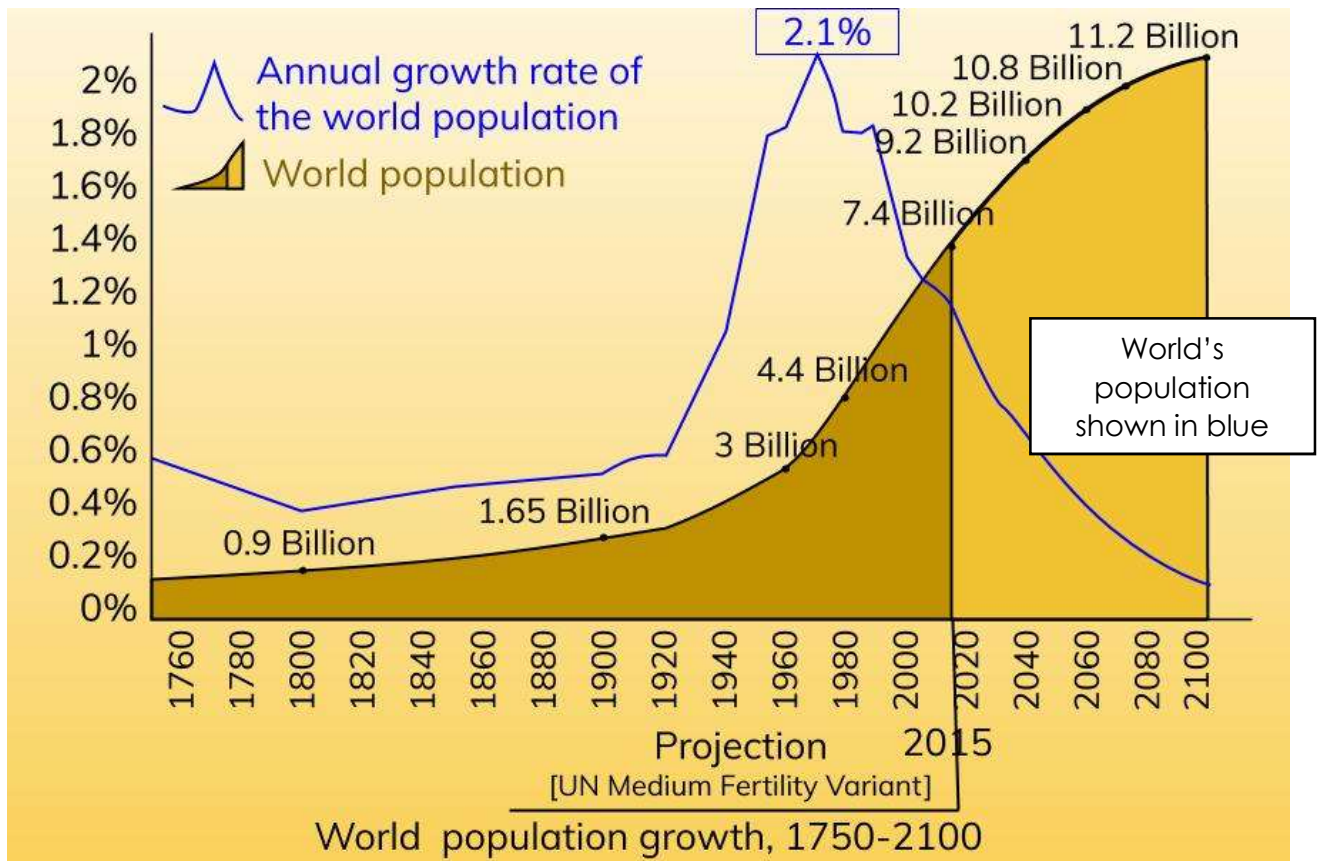| Keyword	Definition
Birth rate	The number births per 1000 people per year.
Death rate	The number of deaths per 1000 people per year.
Infant mortality rate	The number of babies that die before their first birthday, per 1000 live births per year.
Natural increase	When there are more births than deaths, so the population grows.
Natural decrease	When there are more deaths and births, so the population shrinks.
Life expectancy	The average age that a person is expected to live to.
Inequality	A lack of fairness or equality.
Population	The people who live in a particular place.
Migration	The movement of people (or animals) from one place to another.
Population distribution	How people are spread out.
Population density	The number of people living in one square kilometre.
Rural area	An area of countryside or a village.
Urban area	An area of town or city.
Sparsely populated	Very few people live in the area. For example: rural areas such as the Scottish Highlands.
Densely populated	Many people live in the area. For example: cities such as Manila in the Philippines and Milan in Italy.

Lesson Question	You will learn:	Learning Review
Where are all the people?	How many people live on the planet Where people are distributed globally How the global population has changed in size and distribution	
Why does population change?	Why populations grow Reasons why death rates and birth rates change How the UK`s population has changed	
What is a population pyramid?	What a population pyramid is Why population pyramids are useful How to create a population pyramid	
What challenges can a growing population present?	That increased population density creates challenges Why slums develop around rapidly growing cities How pollution can become a serious challenge	
What challenges can an ageing population present?	What an ageing population is Why an ageing population can present challenges Examples of challenges	
How do we feed the planet?	There is global inequality in access to food The challenges of food production The challenges of food distribution Possible solutions to the problem	

Reach Academy Feltham

Look at the graph below.

What has happened to the world's population overall?

World population growth, 1750-2100
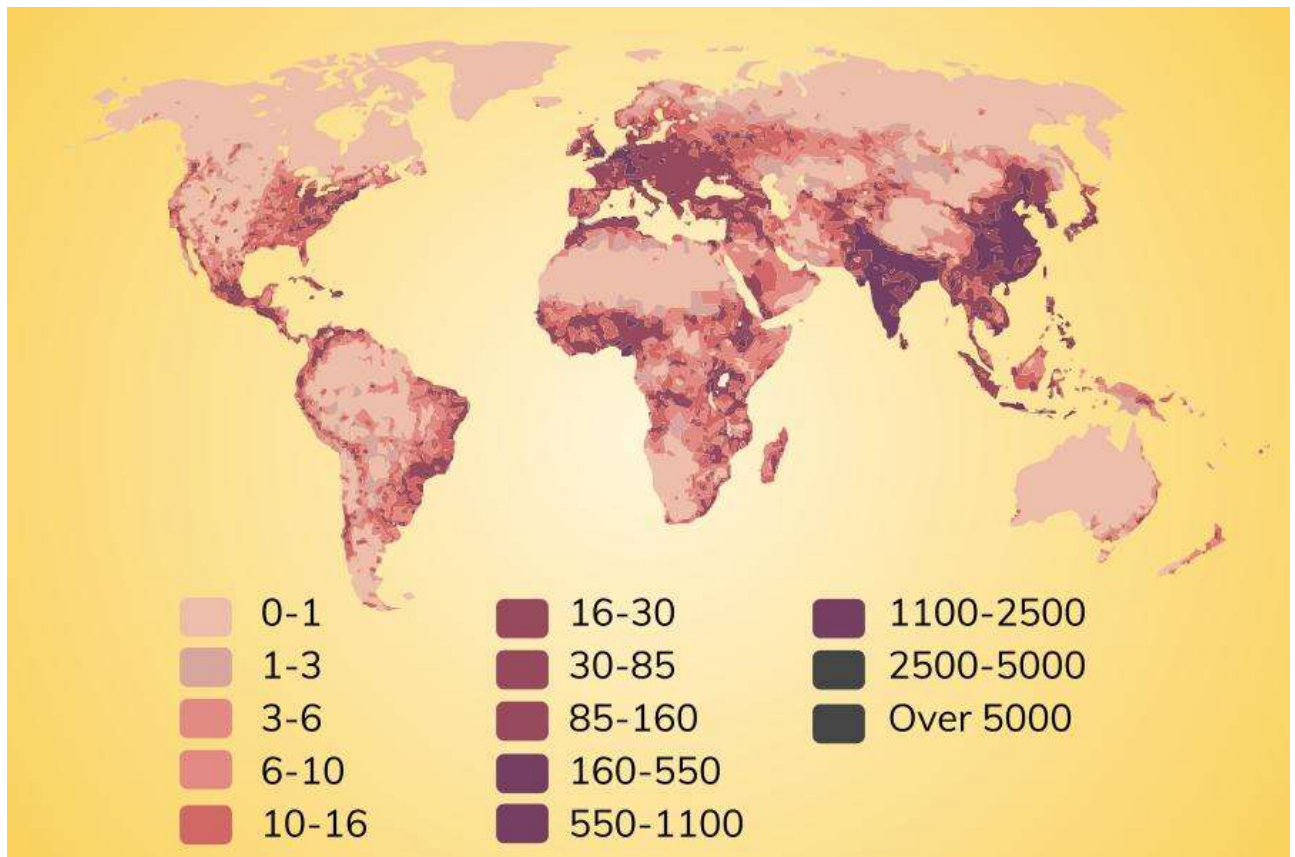
Why do you think this has happened?

1. **Use the graph of World Population Growth, 1750 to 2100 to answer the questions.**

a) What was the world's total population in 1800? _____

b) What was the world's total population in 1960? _____

c) What is the predicted total population by 2100? _____

d) In what year was the world's annual growth rate at its highest? _____

e) By how much has the world's total population grown between 1800 and 2015? _____

Map: Global Population Distribution shown using number of people per km^2

👁 **2. Use the map of Global Population Distribution to complete the sentences.**
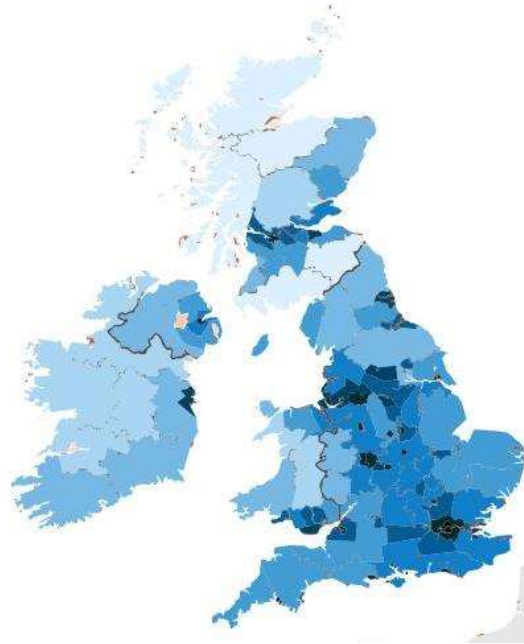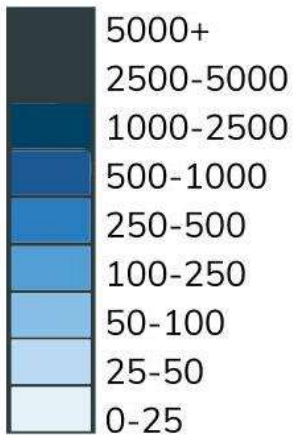
Two countries with the highest population density are _____

_____

Two countries with the lowest population density are _____

_____

The population density in the majority of Japan Is _____per kilometre squared.

Greenland has a population density of _____per kilometre squared.

Population Density

Key:
- 5000+
- 2500-5000
- 1000-2500
- 500-1000
- 250-500
- 100-250
- 50-100
- 25-50
- 0-25

Map: British Isles population density in 2011 using people per km^2

3. What do you notice about the population distribution of the British Isles? Add arrows to annotate the areas that have more people and the areas that have less people. Use the key to help you.

Helpful words: most; many; few; some; majority; sparsely populated; densely populated

Hab/km^2
- 0-20
- 20-40
- 40-60
- 60-100
- 100-160
- 160-300
- 300-700
- 700+

Map: Population distribution of Mexico using people per km^2

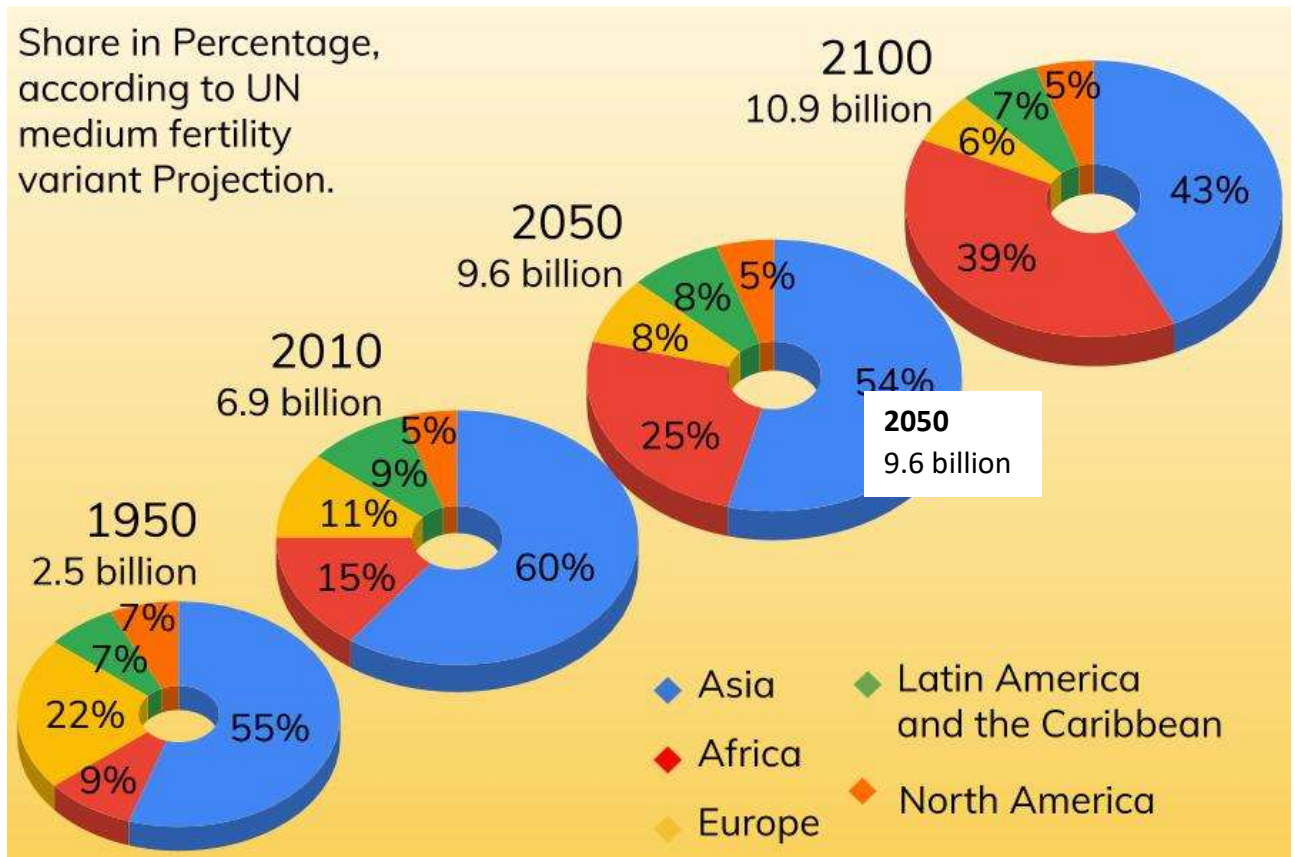👁 **4. What do you notice about the population distribution of the Mexico?**

Helpful words: most; many; few; some; majority; sparsely populated; densely populated

5. State one similarity and one difference between the population distributions of the UK and Mexico.

One similarity between the population distributions of the UK and Mexico is…

However, one difference between the population distributions of the UK and Mexico is…

Share in Percentage, according to UN medium fertility variant Projection.

2100
10.9 billion
5%
7%
6%
43%
39%

2050
9.6 billion
5%
8%
8%
54%
25%

2050
9.6 billion

2010
6.9 billion
5%
9%
11%
60%
15%

1950
2.5 billion
7%
7%
22%
55%
9%

- Asia
- Africa
- Europe
- Latin America and the Caribbean
- North America

6. Choose the correct word in each sentence.

a) Asia has had an (**increase/decrease**) in the proportion of the world's population between 1950 and 2010.

b) Africa will have the second (**largest/smallest**) proportion of the world's population by 2100.

c) In 2010 the majority of the world's population lived in (**Europe/Africa/Asia**).

d) The region with the lowest proportion of the world's population in 2010 is (**Africa/Latin America/Northern America**).

e) By 2100, the world's population will have almost (**doubled/tripled/quadrupled**) in size.

Retrieval Practice

1. By 2100 the global population is expected to have reached approximately:
   a) 6 billion
   b) 15 billion
   c) 10 billion
   d) 20 billion

2. Which two regions of the world will have most of the world's people by 2100?

3. Total global population is decreasing.   **True/False**

4. The majority of the world's population currently is located in which region? …………………………………….

5. Which type of area has a low population density, rural or urban areas?   …………………………………..

Glossary

Term	Definition
Emancipation	Becoming free from legal, social and political restrictions.
Contraception	A way to prevent or reduce the likelihood of pregnancy

1. Match the key term with the correct definition.

Birth rate	When there are more deaths than births, so the population shrinks.
Death rate	The people who live in a particular place.
Natural increase	The number of births per 1000 people per year.
Natural decrease	The average age that a person is expected to live to.
Population	The number of deaths per 1000 people per year.
Life expectancy	When there are more births than deaths, so the population grows.

![brain icon] **2. Place the information into the correct column in the table then explain why it causes birth or death rate to increase or decrease. Use the example to help you.**

-improved healthcare	- disease	- war	- more food available
- drought	- contraception available		- lack of clean water
- lack of healthcare	- improved healthcare		- improved hygiene
- changing status of women	- improved sanitation		- lower infant mortality rate
- religious beliefs			

Change in birth rate	Increase /Decrease ⬆⬇ Why?	Change in death rate	Increase / Decrease ⬆⬇ Why?
e.g. improved healthcare	⬇ People do not need to have as many children as most survive.	e.g. improved healthcare	⬇ People's health is improving meaning they live longer.

3. Read the text and complete the activities.

The UK's changing population

The population of Great Britain increased rapidly during the 1800s, with cities like London nearly doubling in number of people living there. In 1811, the population of the UK was 18 million. By 1851, this had increased to 27 million. London had grown in size from around 1.5 million to 2.5 million people.

By 1850, more than half the British population lived in towns and cities and worked in factories and mines. Many cities such as Liverpool, Glasgow and Manchester, had grown in size.

4. Answer the questions below.

During the 1800s was population growth fast or slow in the UK?

_____

Where did most people live in Britain during the 1800s?

rural areas / urban areas

By the 1900 falling birth rates, due to changing social attitudes and the **emancipation** of women, led to a slowing of population growth. Since the 1950s, access to **contraception** and modern medicines have helped keep birth rates and death rates low and as a result population growth has been low.

5. Give two reasons for the slowing of population growth in the UK since the 1950s.

1. _____

2. _____

The UK's population is still increasing but at a much slower rate. Birth rates are currently low in the UK:

- women are marrying later and delaying starting a family due to career building
- the high cost of living makes bringing up children expensive
- couples may prefer to spend money on things such as holidays and cars
- birth control and the contraceptive pill are easily available

While death rates are low as:

- health care is modern and widely available, provided free by the NHS
- people have less physically-demanding jobs
- modern medicines treat many diseases
- people are better educated about health and hygiene
- higher incomes enable people to eat a healthy diet and have good living conditions

Taken from BBC (Sources: https://www.bbc.com/bitesize/guides/z8k9ng8/revision/1 andhttp://www.bbc.co.uk/schools/gcsebitesize/history/shp/britishsociety/populationmigrationrev1.shtml)

6. Explain why the UK's population has changed since 1800.

You should include:

- Whether the population has increased or decreased overall
- Explain the change in rate of population increase or decrease (how fast/slow)
- 4 reasons for these changes

Since 1800, the UKs population has…

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Return to page 3 and complete the Learning Review.

Retrieval Practice

1. Give two reasons for changes in birth rate.

   a. _____

   b. _____

2. What would be higher if there is a natural increase in the population Birth rate or Death rate?

   _____

3. In what year did the UK's population begin to rapidly increase?

   a. 1900
   b. 1850
   c. 1950
   d. 1800

4. Which type of area has a high population density, rural or urban areas?   …………………………………..

5. The majority of the world's population will be located in Africa by 2100.   **True/False**

1. Read the text together.

What are population pyramids?

A population pyramid is a graph that shows the distribution of various age groups in a population (usually of a country or region of the world). The graph tends to form the shape of a pyramid when the population is growing. Males are usually shown on the left and females on the right, and they may be drawn using raw numbers or as a percentage of the total population.
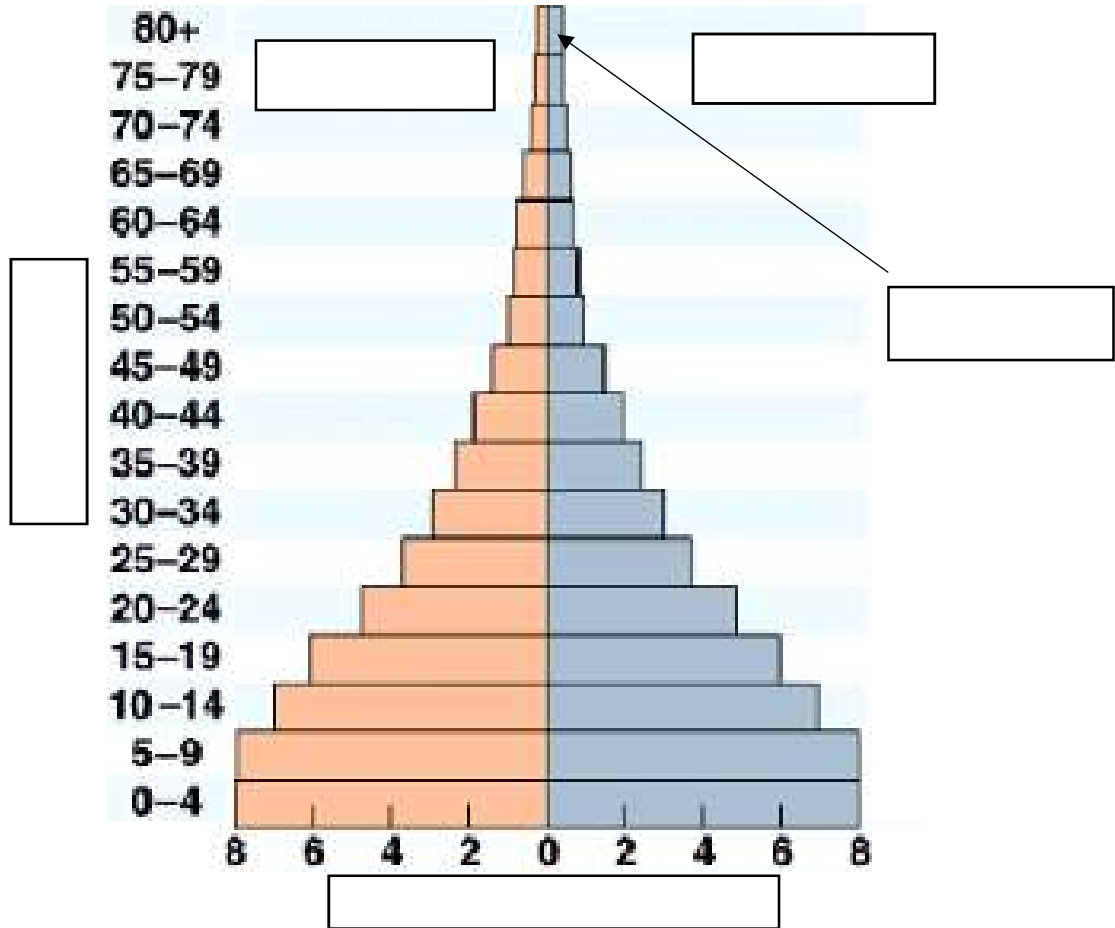
This tool can be used to visualise the general age and distribution of a particular population. Using population graphs can help us understand a country's population and can be used when deciding government policies and strategies for controlling population.

3. Use the text on page 12 to label the population pyramid below.

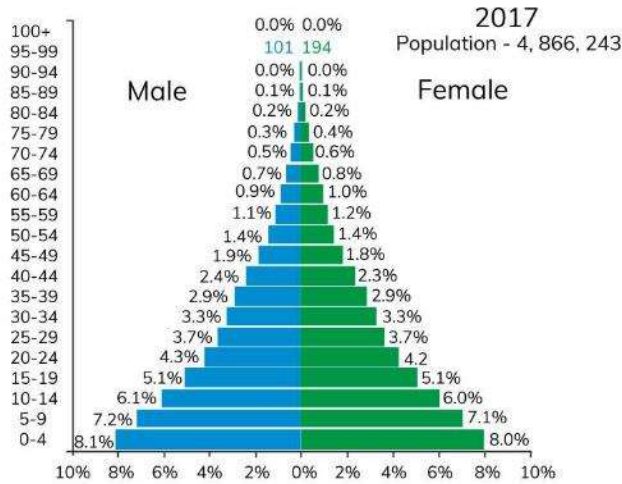Helpful words: males; females; age; percentage of population; highest life expectancy
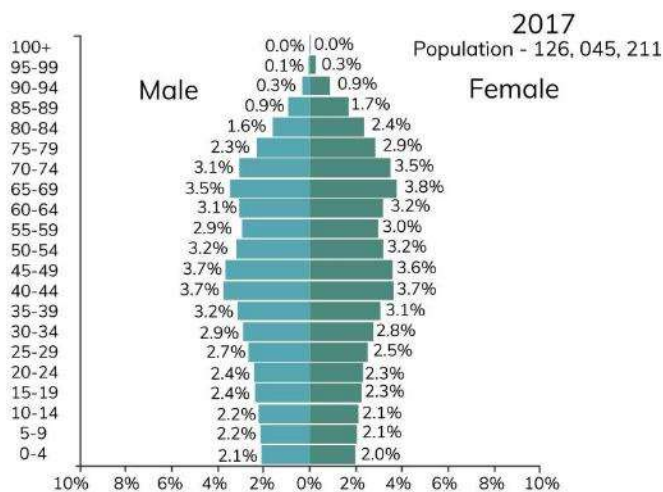
Graph: Population pyramid

4. Look at the two population pyramids and answer the questions.

Graphs: Population pyramid from 2017 for the Congo (top) and Japan (bottom)

Congo, 2017

Japan, 2017

a) Which population pyramid has the highest percentage of people aged between 0-4? (**Congo/Japan**)

b) Which population pyramid shows a lower life expectancy? (**Congo/Japan**)

c) Which age group is the largest in Japan? _____

d) What does a wider base of a population suggest about birth rates? (higher birth rates/lower birth rates)
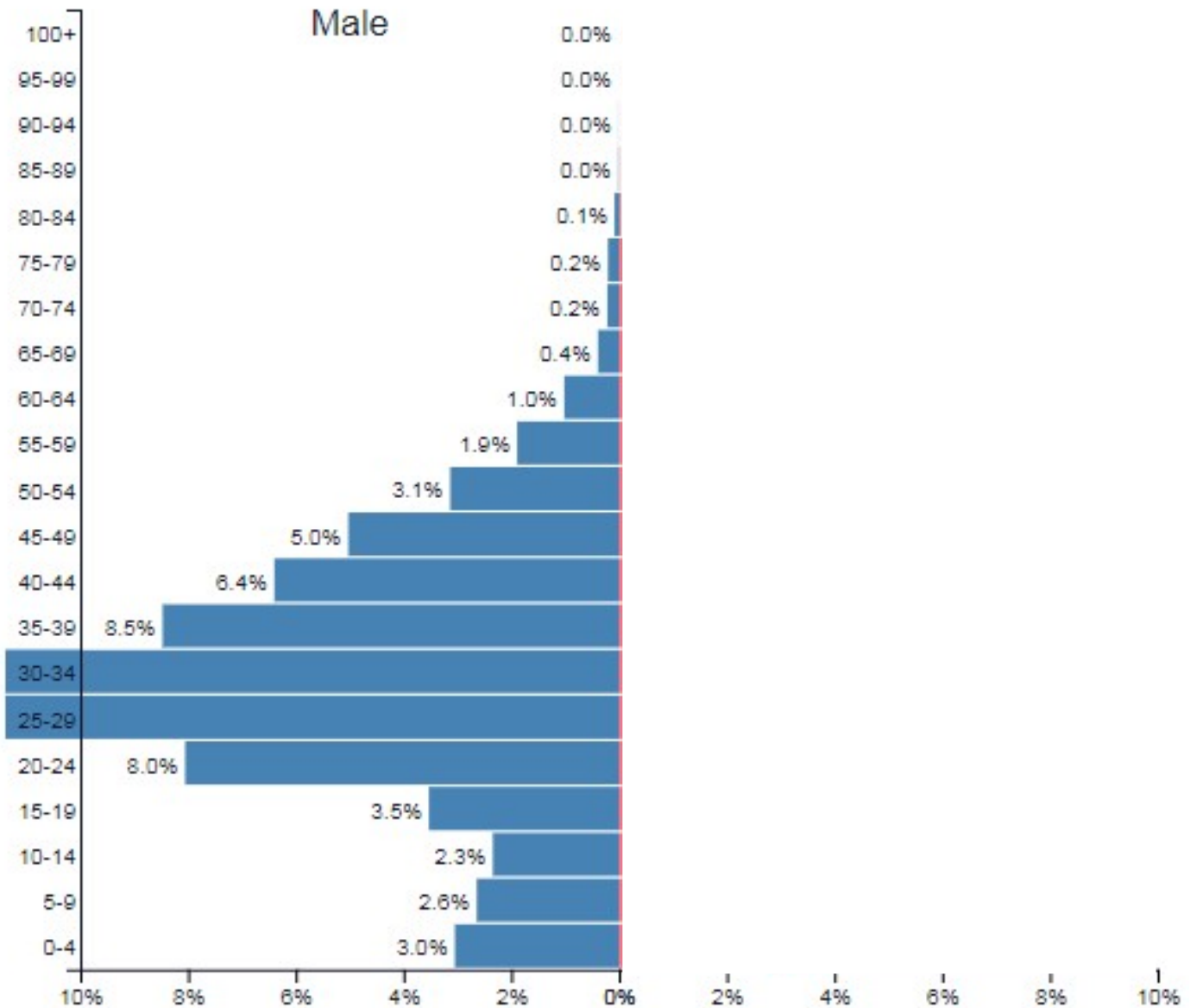
e) What has happened to Japans birth rate in the past 20 years? (**increased/decreased**)

f) An aging population is a population that has an increasing number of older people in comparison with younger people. Which of the population pyramids shows an aging population? (**Congo/Japan**)

g) A youthful population is a population where there are an increasing number of young people compared with people of working age and older. Which of the population pyramids shows a youthful population? (**Congo/Japan**)

5. Complete the population pyramid for Qatar using the table of data.

Age group	Female Percentage of population	Age group	Female Percentage of population
0-4	2.5	55-59	0.5
5-9	2.3	60-64	0.2
10-14	2.0	65-69	0.1
15-19	1.4	70-74	0.1
20-24	2.3	75-79	0.1
25-29	3.6	80-84	0
30-34	3.1	85-89	0
35-39	2.4	90-94	0
40-44	1.8	95-99	0
45-49	1.2	100+	0
50-54	0.9		

6. Look at the population pyramid you have just drawn. What is unusual about it?

_____

_____

_____

7. Bulges and dips in population pyramids show a large increase or decrease in a particular age group. Read the following statements and decide if they would show an increase or decrease in population.

a) A war has been occurring for the last five years. (increase/decrease)
   i)   Which age groups and sex do you think this would affect most?
   _____

b) There are a large number of jobs doing manual labour for migrant workers. (increase/decrease)
   i)   Which age groups and sex do you think this would affect most?
   _____

c) A country has started a population policy that only allows women to have one child. (increase/decrease)
   i)   Which age group would this affect?
   _____

d) Medical care has been improving for the last 50 years. (increase/decrease)
   i)   Which age groups would this affect?
   _____

e) Which of the previous causes of bulges and dips is the most likely explanation for the bulge in the Qatar population pyramid?

   _____

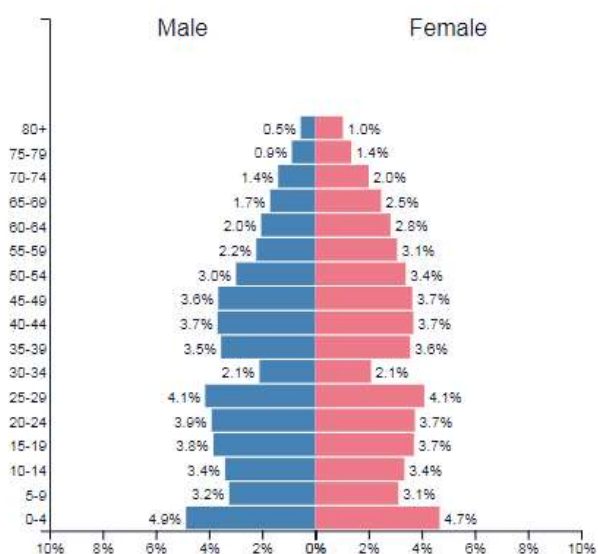**Return to page 3 and complete the Learning Review.**

Retrieval Practice

1. Label the population pyramid with the following labels: high birth rate; males; percentage of population; possible war; females; age.

France ▾
1950   Population: 41,879,607

Graph: Population pyramid of France in 1950
(Source: https://www.populationpyramid.net/france/1950/)

2. What type of population has a population pyramid that is very tall with people living to over 100 and has a narrow base with fewer young people? (**aging population/youthful population**)

3. Give two reasons for changes in death rate.

   a. _____

   b. _____

4. A country that has a high population density is **sparsely populated/densely populated**.

5. The region of the world with the smallest proportion of the world's population currently is : _____

👁 **1. Rapidly growing populations can present many challenges. One of these challenges is the growth of informal settlements, which are also called slums, shantytowns and favelas.**

Look at the photograph below.
Annotate the photograph with the challenges you can see.

Poor access to clean water

Photograph: Street in Kibera, Nairobi, Kenya

Kibera: Challenges of population growth

Kibera is a slum within the city of Nairobi in Kenya. There are around 1.2 million people living in Kibera in an area of 2.5 square kilometres. It is the biggest slum in Africa. Almost 75% of the population are under the age of 18 and around 100,000 children living there are orphans. The Government owns all the land but have struggled to keep up with the rapidly growing population in Nairobi. Due to this, many people live in small shacks built with mud walls. Most houses have a family of eight people living in them. Water had to be collected from the Nairobi dam. The dam water is not clean and causes sickness. Now there are two mains water pipes into Kibera, which have helped improve people's lives. However in most of Kibera, there are still no toilets. Up to 50 shacks share one latrine (hole in the ground).

2. Answer the questions.
a) Why do many people live in small shacks with mud walls?

_____
_____
_____

b) Is Kibera sparsely or densely populated?

_____

Only about 20% of Kibera has electricity and until recently, Kibera had no running water.

3. List three problems that people living in Kibera face.

i) _____

ii) _____

iii) _____

In Kibera, there are no government clinics or hospitals as the government have struggled to keep up with the needs of the population.
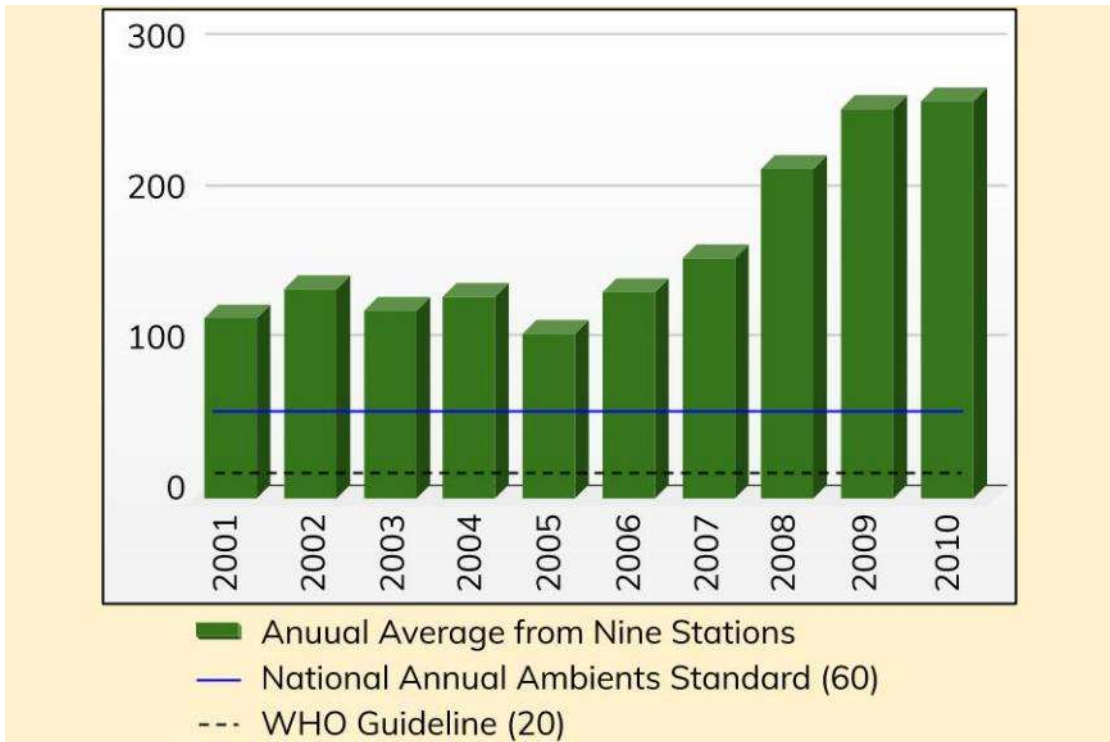
4. What might is be like living in Kibera?

_____
_____
_____
_____
_____
_____
_____
_____

5. New Delhi, India has a population of over 18 million. The city has rapidly grown in the last 50 or so years. However, this has not been without problems. More people means more cars, more factories and in turn more pollution. Pollution is measured using the amount of carbon particles in the air (PM – particulate matter). Carbon particulates are released when fossil fuels are burnt along with carbon dioxide.

Look at the graph below.

a) What was the increase in carbon particulates between 2001 and 2010? ……..………..$\mu g/m^3$

b) How far above the WHO (world health organisation) guidelines, is the pollution in 2010? ……..………..$\mu g/m^3$

Graph: Bar graph showing pollution in New Delhi (2001 to 2010).

6. **Why is pollution a problem? List three reasons.**

a) _____

b) _____

c) _____

7. **Explain two challenges of a growing population.**

One challenge of a growing population is…

_____

This is a problem because…

_____

Another challenge is…

_____

This causes problems as…

_____

_____

Retrieval Practice

1. List three challenges of a growing population.

   a) _____

   b) _____

   c) _____

2. A population pyramid shows:
   a) The distribution of people in a country
   b) The distribution of age and gender in a country or region
   c) The distribution of pyramids in a country

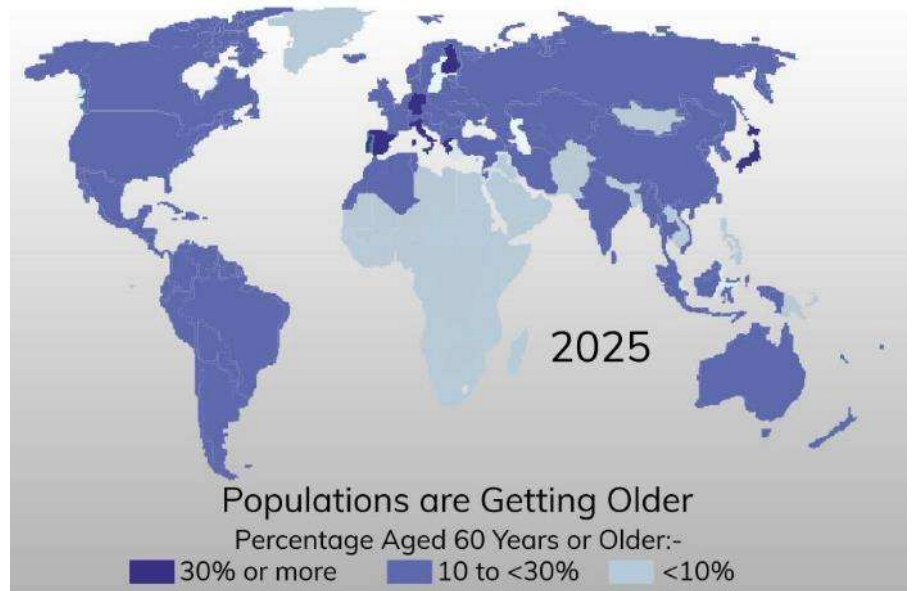3. What must be higher for there to be a natural decrease in population?

   birth rate / death rate

4. Most people live in **urban / rural areas**.

5. What is predicted to happen by 2100 to global population?

   It will have: **increased / decreased**

1. Look at the map.

a) Name three countries that by 2025 will have 30% or more of their population aged 60 or over.

_____

_____

_____

2025

Populations are Getting Older
Percentage Aged 60 Years or Older:-
■ 30% or more   ■ 10 to <30%   ☐ <10%

b) Which continent will mostly still have less than 10% of populations aged 60 and over? _____

Image: Map showing aging populations from the World Health Organisation (WHO)

2. What challenges might these countries face in the future if they have an increasing number of elderly people?

_____

_____

_____

_____

3. Japan is just one example a country with an aging population.

Japan's shrinking population

In 2017, for the second year in a row, Japan saw less than 1 million babies being born a further decrease from previous years. The number of deaths, on the other hand, had increased resulting in a total population decrease of 394,373.

a) What has happened to Japan's population? (increased/decreased)

With fewer babies being born and more people living for longer, Japan is facing many problems. The government has to spend more money on healthcare to help support the elderly population while at the same time there are less people working and paying taxes. With fewer young people, the workforce is shrinking and there are far less people to help care for the elderly.

b) Spending more on healthcare is a challenge caused by an aging population. (True/ False)

c) There are less people of working age in an aging population. (True / False)

The lack of people to help the elderly along with pension shortages has led to an increase in poverty amongst older people.

Japan's government is currently not able to provide for its aging population. Japan is not the only country facing these problems. Other countries such as the UK, the USA and Germany are rapidly approaching similar situations.

d) What has increased in Japan due to pension shortages and a lack of people to help the elderly?

_____

This does not however mean that there is no hope. Pension ages are increasing in many countries with aging populations and people are encouraged to save for their retirement. Migration is being encouraged to increase workforce numbers and governments are starting increase spending for facilities such as nursing homes.

e) List three solutions to the challenges caused by an aging population.

i) _____

ii) _____

iii) _____

It is still uncertain however whether such actions will be able to solve the problems caused by aging populations.

4. Explain the challenges caused by an aging population.

You should include:

- Three challenges of an aging population
- Why these cause problems
- An example of a country where this is happening

An aging population can present many challenges for example...

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

5. Use the model to help improve your answer.

_____
_____
_____
_____
_____
_____
_____
_____
_____
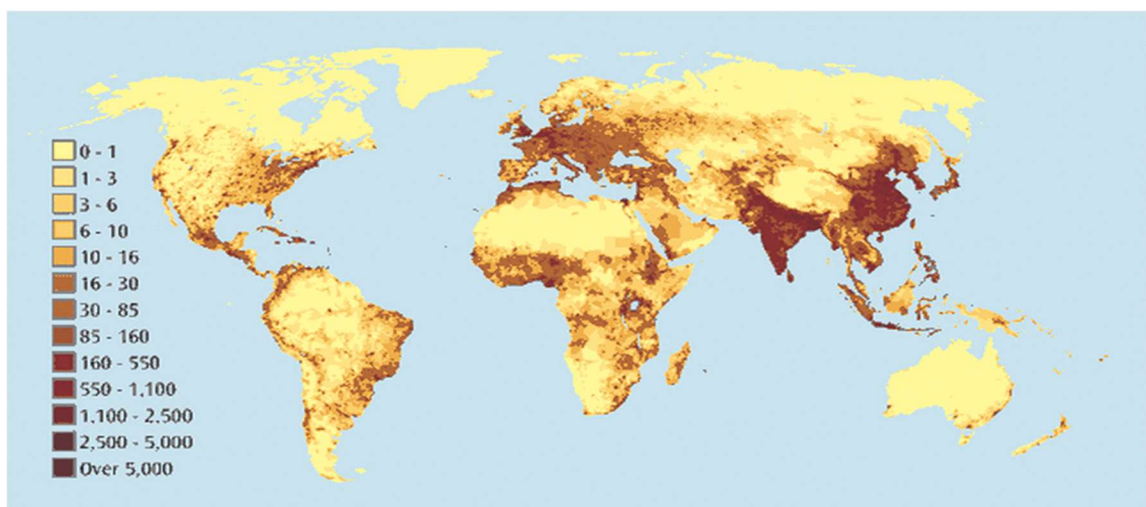_____
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Return to page 3 and complete the Learning Review.

Retrieval Practice

1. List three challenges of an aging population.

   a) _____

   b) _____

   c) _____

2. True or False?
   a) Access to clean water, good sanitation and hygiene are sometimes difficult in areas with rapidly growing populations.   **True / False**
   b) There are pressures of health services due to the high number of elderly people in a growing population.   **True / False**
   c) There are more people using resources like health and education placing pressure on in a growing population. **True / False**

3. What must be higher for there to be a natural increase in population?

   birth rate / death rate

4. What does a wide base on a population pyramid suggest?
   a) A high death rate
   b) A high birth rate
   c) A high life expectancy

5. Look at the map. Overall, is Europe sparsely populated or densely populated?
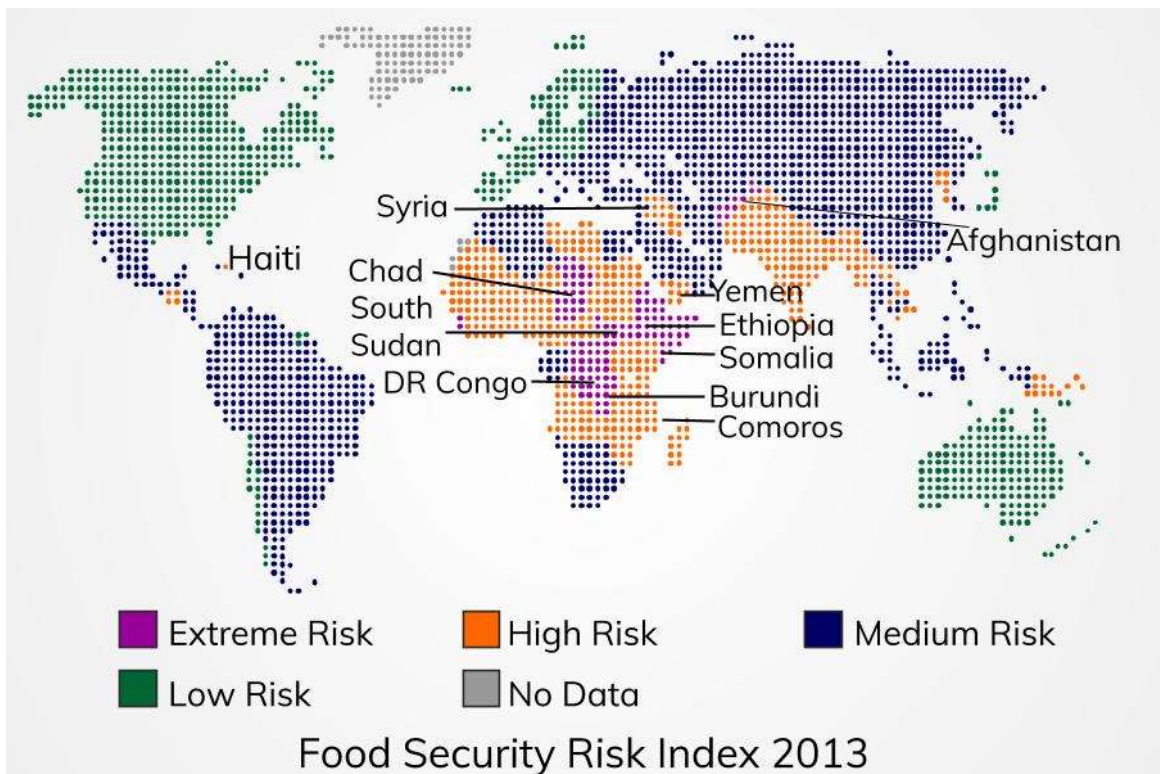
Glossary

Term	Definition
Food insecurity	Being without reliable access to enough affordable and nutritious food
Food security	Having access to enough affordable and nutritious food
Malnourishment	Not having enough food to develop, grow and function normally
Food production	Growing food for people to eat

👁 **1. Complete the sentences using the map below to help.**

Map: Global food security risk index from 2013.

a) Most countries with extreme risk of food insecurity are in the continent of _____. For example, _____ and _____ .

b) However, there are countries with extreme and high risk of food insecurity such as _____ and _____ that are not in Africa.

c) Most of Europe, Canada and the USA are at _____ risk of food insecurity.

d) Most of South America is at _____ risk with the exception of _____.

2. How might population distribution be linked to food distribution?

_____

_____

_____

_____

3. Look at the infographic below and unjumble the sentences to make grammatically correct ones.

current world population   food to feed the   There is enough

_____

 1 in 8   hungry every day   people goes

_____

 food produced   Around 1/3 of   each year is wasted

_____

2,720 kcal per day.   There is enough food   in the world

for each person to have

_____

severely overweight (obese)   people are considered   1 in 14

_____

Infographic: Facts about food security

(Source: PowerPoint Presentation Tools and Resources: https://www.scoop.it/t/biomes-and-food-security-by-georgina-birch)

4a, Read the information below.

The Global Food Crisis

Currently there is enough food produced around the world to feed the growing population. The main problems are that food is not evenly distributed and that a lot of is being wasted.

However, through waste and distribution are currently the main problems, in the future, it is unlikely that we will be producing enough to feed the population without making some changes. There are some solutions to these problems.

4b. State the two main problems causing food insecurity currently.

a) _____

b) _____

Not enough production of food		Not evenly distributed	
Irrigation	Irrigation is a water supply to land through channels to help crops grow. This allows land that could not be farmed before to be used. This provides more food.	**Appropriate technology**	Giving affordable and easy to use machinery to farmers in poorer countries can help improve the amount of crops that are produced. This ensures that farming can become more reliable in countries where there are high levels of food insecurity.
Hydroponics and aeroponics	These are systems that allow plants to grow without soil. This allows countries who have poor soil to grow food. The can however be expensive.	**Support small scale farmers**	Government and charities supporting small scale farmers ensures a more stable supply of food in areas where there are higher risks of food insecurity.

Table: Some solutions to the problems of food insecurity.

5. Fill in which solution is shown in the picture using the table.