Section 1 Population and Settlement: contents

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How do we calculate natural change?

You need to know some key terms to do with population. For each of those listed below, write a definition. You could use a geographical dictionary or the internet to check your definitions.

Birth rate:

....

....

....

Death rate:

....

....

....

Natural increase:

....

....

....

What do you think is meant by **natural decrease**?

....

....

....

When you have learned your definitions, work in pairs and quiz each other until you know each one accurately.

Calculating natural change

Natural change can mean *either* **natural increase** *or* **natural decrease**. (You defined these terms in **Worksheet 1.1**.)

Using demographic (population) statistics, we can calculate whether a country is experiencing natural increase or natural decrease. We need figures for birth rate (BR) and death rate (DR).

How to do the calculation:

Natural change = $\dfrac{BR - DR}{10}$

- If the answer is *positive* (that is, BR is greater than DR) then we have *natural increase* – the population is growing.
- If the answer is *negative* (that is, DR is greater than BR) then we have *natural decrease* – the population is decreasing.

The answer is divided by 10 because BR and DR are measured per 1000 people. For natural change we use percentages (%).
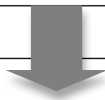
Example:

Indonesia: BR = 20.7/1000/year   DR = 7.3/1000/year

Natural change $= \dfrac{BR - DR}{10} = \dfrac{20.7 - 7.3}{10} = \dfrac{13.4}{10} = +1.34\%$

This positive answer means that Indonesia is growing at a rate of 1.34% per year – that is, it is experiencing *natural increase*.


Now calculate natural change for Estonia and Pakistan.
Which country is in a state of natural increase and which is in natural decrease?

	Estonia	**Pakistan**
Birth rate:	8.7/1000/year	35.9/1000/year
Death rate:	11.6/1000/year	9.6/1000/year

Your calculations:

- Natural change for Estonia is:

- Natural change for Pakistan is:

Your conclusions

You have just had a class discussion on why, until recently, birth rates have stayed high in poorer countries.

1 Complete the five boxes with the key factors you have identified.

2 Use the space in the larger shapes to add an explanation on each factor.

High birth rate
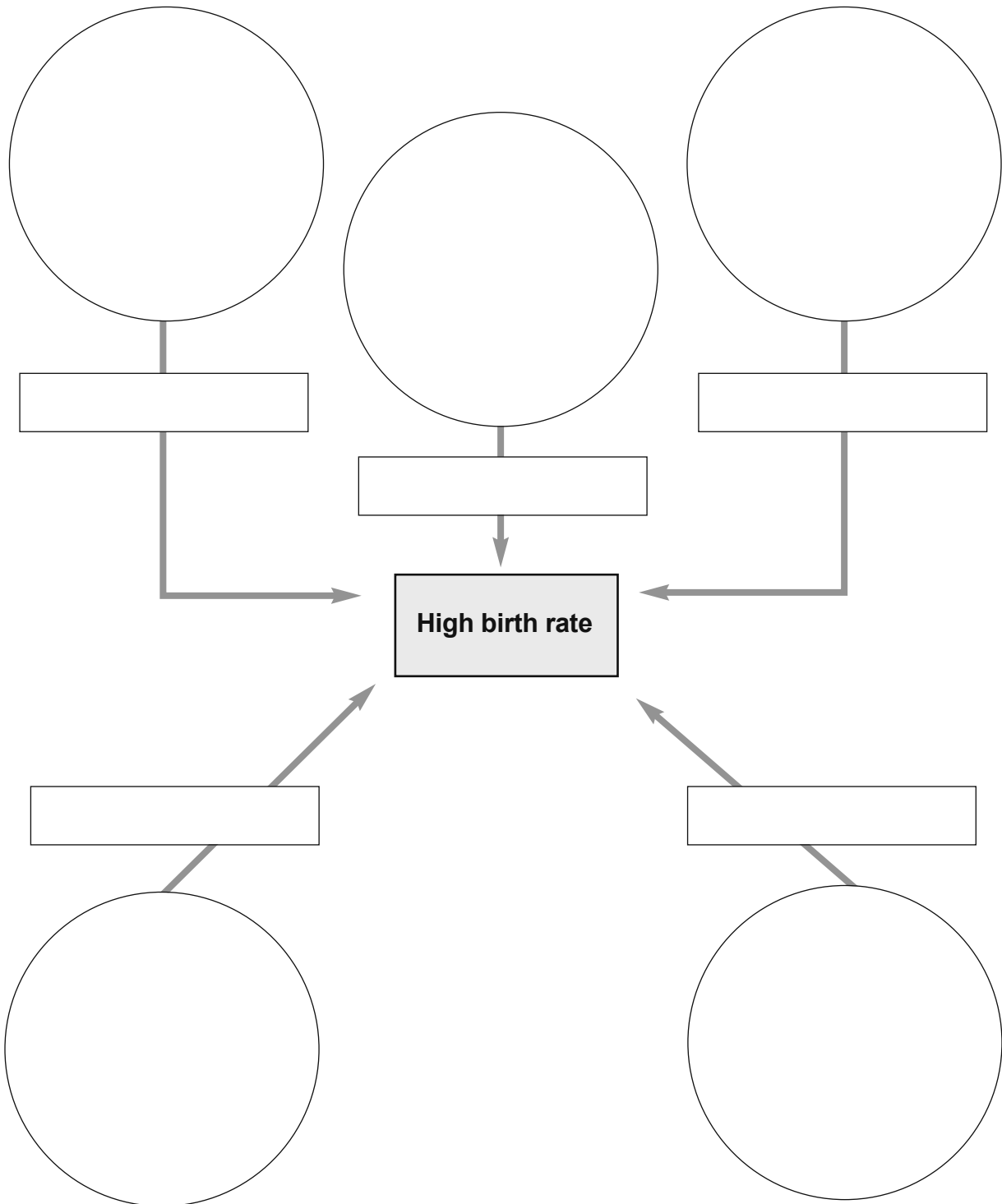
Read the extract about Singapore below and then answer the questions that follow.

SINGAPORE is a south-east Asian city state off the southern tip of the Malay peninsula, 137 km north of the Equator. It is made up of 63 separate islands, many of them very small.

The country was for a time ruled by the British, and the Japanese took it over during the Second World War. Then for a while it was part of Malaysia, but in 1963 it became independent. Since then it has had a massive increase in wealth, being labelled one of the 'Asian Tigers', the first four Newly Industrialising Countries (NICs) in the world, along with South Korea, Taiwan and Hong Kong.

The economy depends on both manufacturing and services. Singapore is a world leader in several areas – for example, it is the world's fourth leading financial centre. It is the third most important world oil refining centre, one of the five busiest ports, and it has more millionaire households per head of the total population than any other country! The World Bank says that Singapore is the easiest place in the world to do business.

Some 5 million people live in Singapore, only 2.91 million of whom were born there; immigration has been massive. New land has been created through reclamation, sometimes joining small islands close to each other. Its land area has increased from 581.5 km^2 in the 1960s to 704 km^2 today. Twenty-three per cent of the land area consists of forests and nature reserves.

1 Think about the characteristics of a densely populated/over-populated country. List the facts in the box above which suggest that Singapore may be over-populated.

(Hint: you could try to calculate the population density of Singapore – the number of people per km^2.)

2 With such a small area, Singapore has few physical resources, but that is not reflected in its booming economy.

(a) List the evidence in the text above that suggests that Singapore has a thriving economy.

(b) Singapore has no oil reserves, but it is a huge oil-refining state. Explain how it manages this.

(c) Singapore has a high level of immigration. What does this suggest to you about job opportunities?

3 What evidence in the text suggests that Singapore is not running out of space?

4 Do people have a good quality of life?

5 Which of the following categories do you think Singapore falls into:

(a) under-populated

(b) over-populated

(c) it has an optimum population?

If you live in the UK you may feel you live in an over- or under-populated area. It depends where you are located. We also need to remember, how we perceive the level of over/under-population is not always accurate. Consider the examples of Liberia, Canada and Tanzania in the Student Book, pages 9–12.

Regions of the UK can be sparsely populated, for example, the Scottish Highlands or Snowdonia in North Wales. Others are certainly densely populated, like the South East of England, especially within London. However, nowhere in the UK can be classed as overpopulated.

This worksheet shows you facts, figures and photos relating to Bangladesh. You are the decision-makers. Decide on these issues:

1 Is Bangladesh over-populated or not? Whatever your decision, you need to give your evidence based on the materials on this worksheet, or anything you find in your own research.

2 If you were a member of a Bangladeshi government think-tank whose task was to develop the country and improve standard of living and HDI, suggest a programme that would help to improve people's lives. You can express your ideas in any way you choose – e.g. a spider diagram, a fact tree, or a written argument.

Factbox 1:

Over 90% of Bangladesh has >400 people/km^2. Most of this country is agricultural. There are three cities with over one million inhabitants: Dhaka, the capital; Khulna and Chittagong.

The area of Bangladesh is 144,000 km^2, half the size of the UK and less than twice the size of Ireland. In this area live 151 million people, compared with 62 million in the UK and 4.5 million in Ireland (2010). Most people live in rural areas and 67% survive as subsistence farmers.

Factbox 2:

Bangladesh is one of the poorest countries in the world in terms of per capita income. Most live as peasants in the countryside. An increasing number migrate to the cities in the hope of a better life. Much of the money they earn is sent back to the villages to help support their families in the basics of life – health, education.

Factbox 3:

If Ireland had the same population density as Bangladesh, it would contain 70 million people, instead of its 4.5 million!

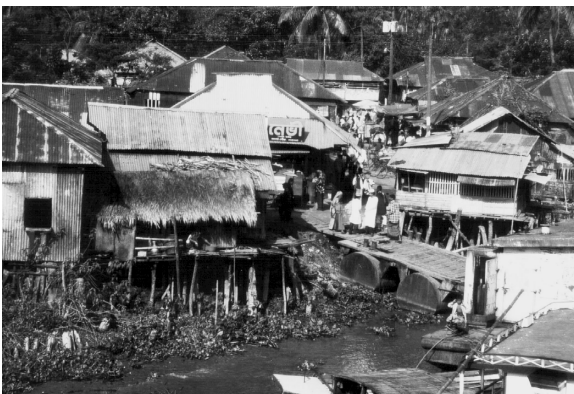Photo **1**   Rural Bangladesh

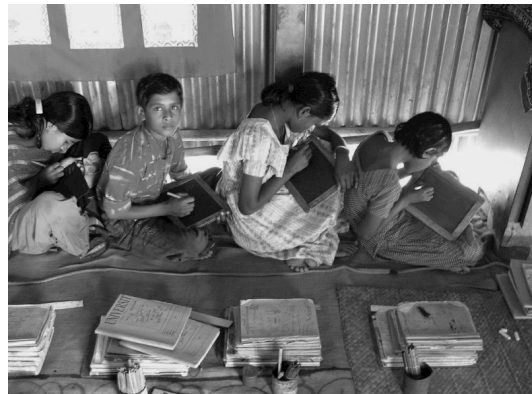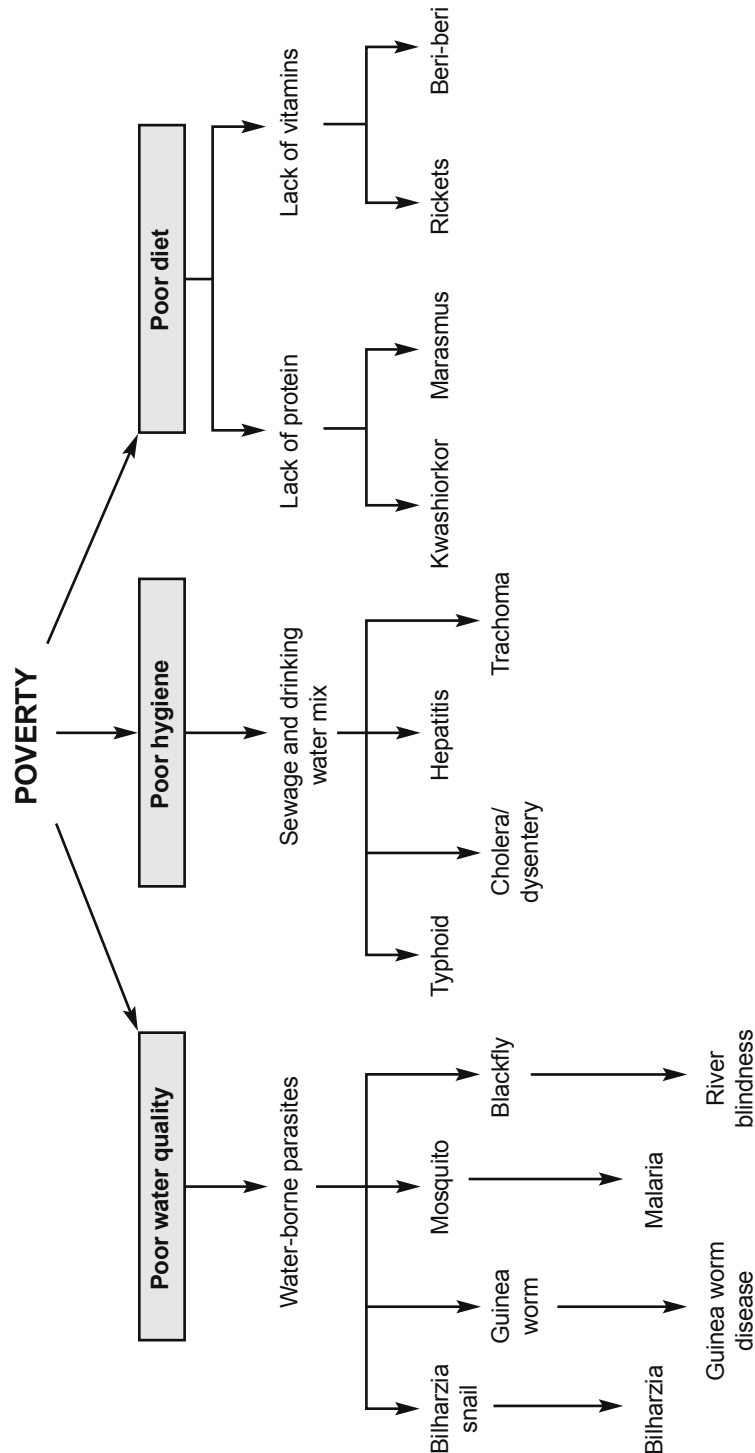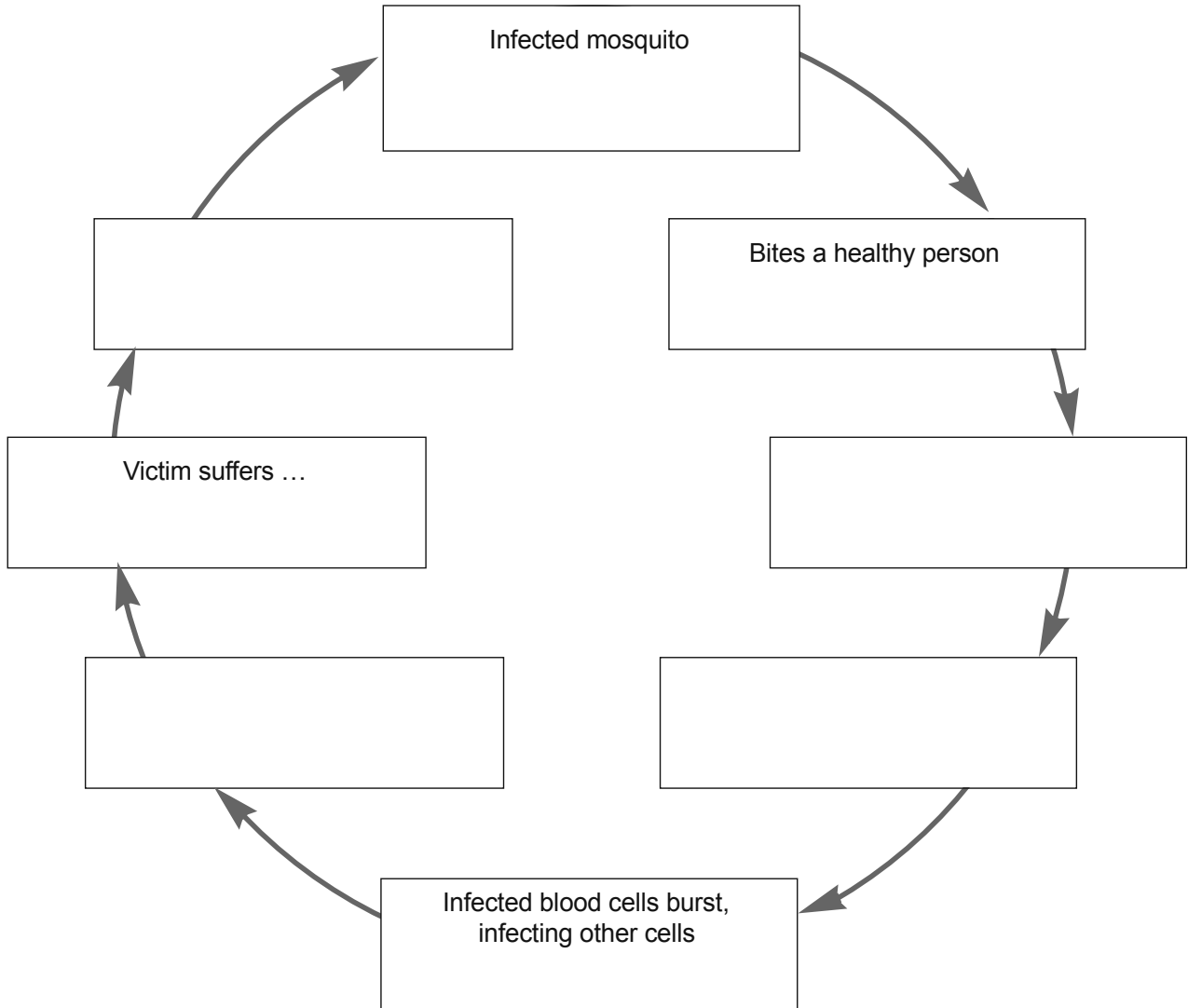image: Ahron de Leeuw/CC by SA-2.0

Photo **2**   A village school

image: Mark Nobil/CC by SA-2.0

Types of disease affecting people in LEDCs

The 'tree' of diseases of poverty

POVERTY

Poor diet
- Lack of vitamins
  - Beri-beri
  - Rickets
- Lack of protein
  - Marasmus
  - Kwashiorkor

Poor hygiene
- Sewage and drinking water mix
  - Trachoma
  - Hepatitis
  - Cholera/dysentery
  - Typhoid

Poor water quality
- Water-borne parasites
  - Blackfly → River blindness
  - Mosquito → Malaria
  - Guinea worm → Guinea worm disease
  - Bilharzia snail → Bilharzia

1. All the diseases in the diagram above weaken people and stop them working and contributing to their family and community. Find out which of these diseases usually lead to death and therefore affect population growth.

2. Choose one disease from each of the three main groups and research it further, concentrating on its impact on the family of the person who has the disease.

The malaria cycle

Use the details in diagram **B** on p. 14 of the Student Book to complete the cycle diagram below.

```
                    ┌─────────────────────┐
                    │  Infected mosquito   │
                    └─────────────────────┘

      ┌─────────────────────┐      ┌─────────────────────┐
      │                     │      │ Bites a healthy person│
      └─────────────────────┘      └─────────────────────┘

  ┌─────────────────────┐              ┌─────────────────────┐
  │  Victim suffers …    │              │                     │
  └─────────────────────┘              └─────────────────────┘

  ┌─────────────────────┐              ┌─────────────────────┐
  │                     │              │                     │
  └─────────────────────┘              └─────────────────────┘

                ┌──────────────────────────┐
                │ Infected blood cells burst,│
                │   infecting other cells   │
                └──────────────────────────┘
```

Why do you think this diagram is called the malaria 'cycle'?

....

....

....

....

Map showing location of Kerala

N
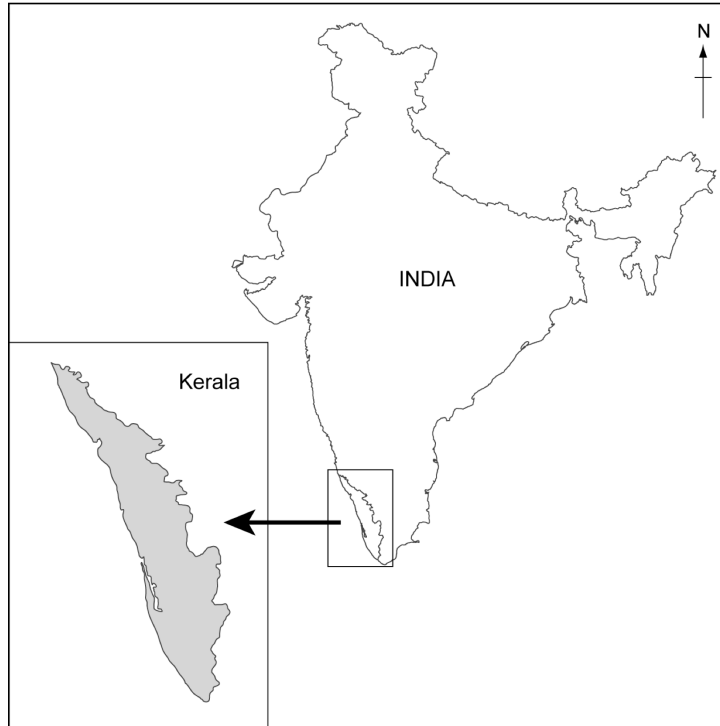
INDIA

Kerala

Population policy in Kerala

Many Indian states have an active anti-natalist population policy, but the most successful has been in Kerala. Kerala's government is socialist/communist and it was elected democratically. It has tackled population growth from two different angles.

One of these is very similar to China's one-child policy: contraception is free and widely available. Women are encouraged to attend family planning clinics and get information but they are not forced to do so.

Women in Kerala are better educated than women in India as a whole: 85% are literate compared with only 50% nationally. This means they know more about a healthy diet and hygiene, so the infant mortality rate has reduced. This removes the pressure on parents to have many babies in case some die. Better education allows women to work outside the home and earn money for their families. Working mothers tend to have fewer children.

The status of women in Kerala has risen and therefore the preference for sons over daughters has almost gone. There is much less prejudice against women than ever before.

The map and text above give you some background information on the Indian state of Kerala.
Use the details on Kerala's population policy to help you answer these questions.

1 List the ways in which Kerala's anti-natalist policy is different from that of China.

2 China's policy has both positive and negative sides. Do you think the same can be said of Kerala?

3 Which of the two policies do you feel has been more successful and why?

Section 1
Population and Settlement

Topic 1.1 Population dynamics

Migration: push and pull factors

Working with a partner, list in the boxes below the push and pull factors that can influence migration.

Push!

Pull!

Section 1
Population and Settlement
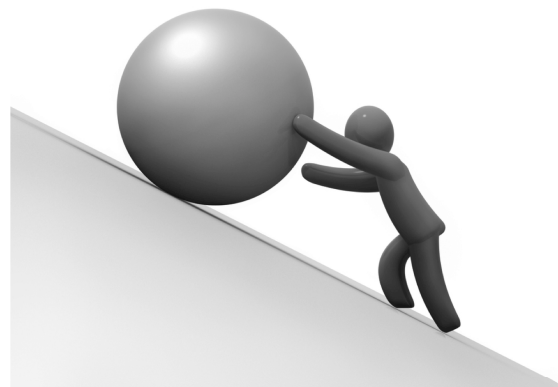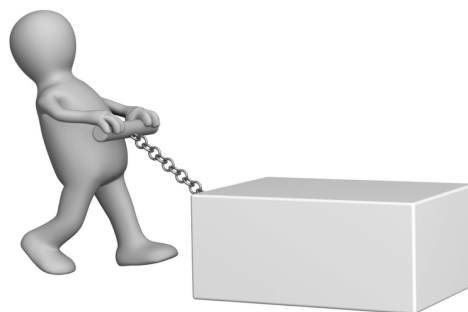
Draw the head of your migrant and then fill in the speech bubble with their experiences of moving to the kind of city shown in the photograph.
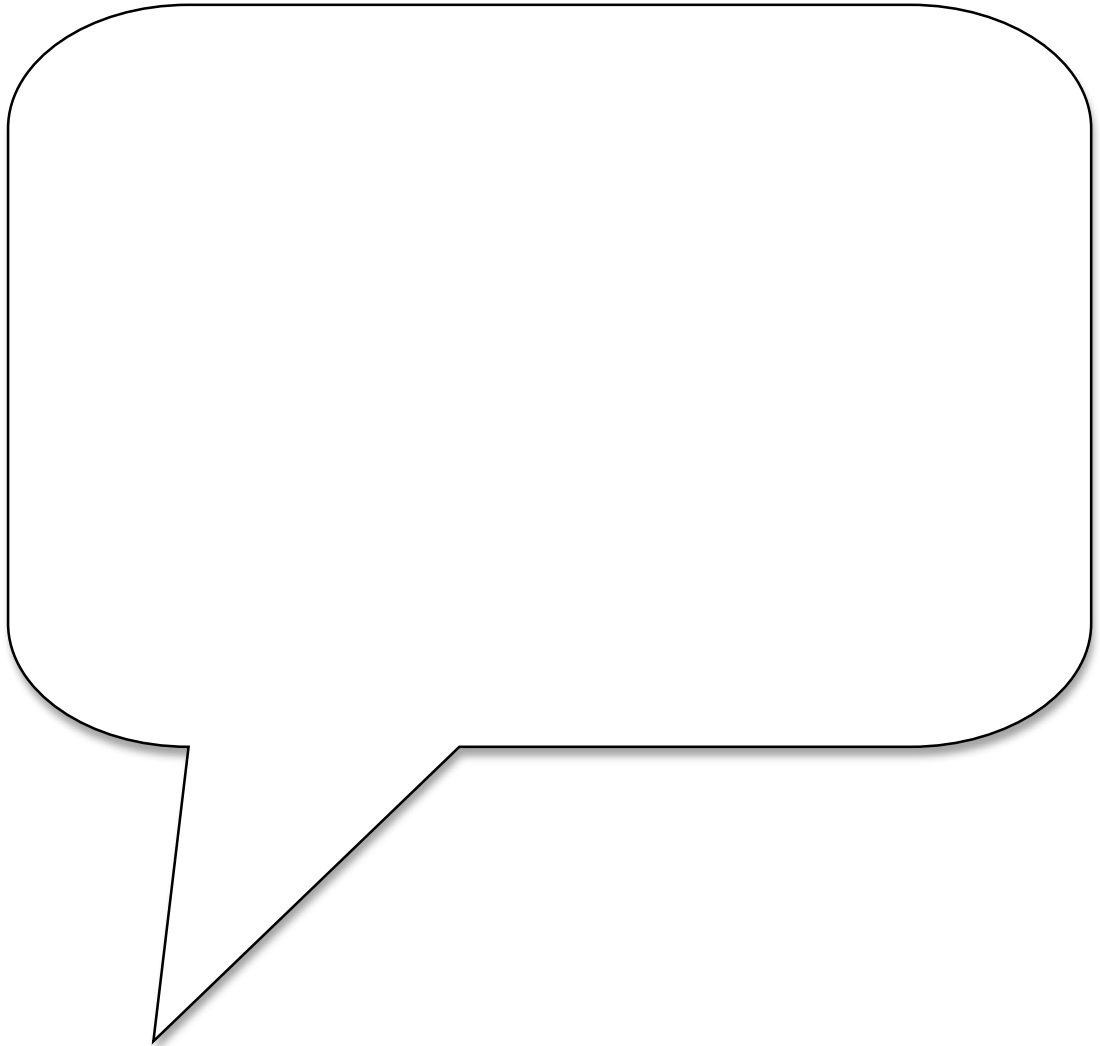

image: Evo Flash/CC by 2.0

Section 1
Population and Settlement

Refugees and other types of international migration

Search the internet and other resources to find examples of international migrations, both forced and voluntary, from around the world, together with their causes and impacts. Use the information you find to complete the table below.

Country (or countries) involved	Causes of forced migration	Effects of forced migration on migrants, the country of origin and the country of destination

Add labels/annotations to the map below to display the information on Senegalese migration found in the Student Book. You can use different colours to highlight the causes, benefits and problems of the migration, and information about the country itself.

Label the pyramid below to show its characteristics. 'Height' has been started for you.

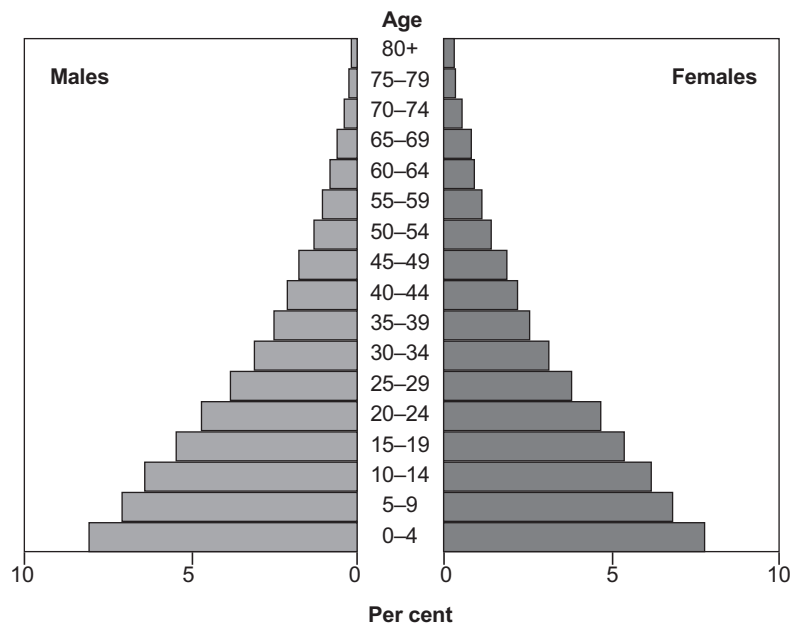**Height**: *a few people live to old age, but only about* ......% ....

....

....

....

....

Apex (top):

....

....

....

....

....

Age

	Age	
Males	80+	Females
	75–79	
	70–74	
	65–69	
	60–64	
	55–59	
	50–54	
	45–49	
	40–44	
	35–39	
	30–34	
	25–29	
	20–24	
	15–19	
	10–14	
	5–9	
	0–4	

10   5   0   0   5   10

Per cent

Base:

....

....

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....

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Sides:

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....

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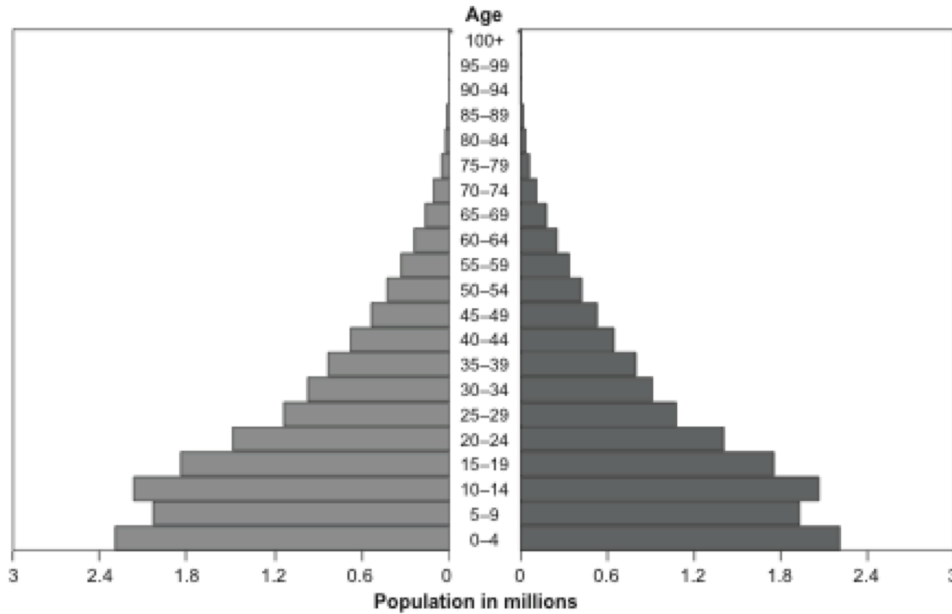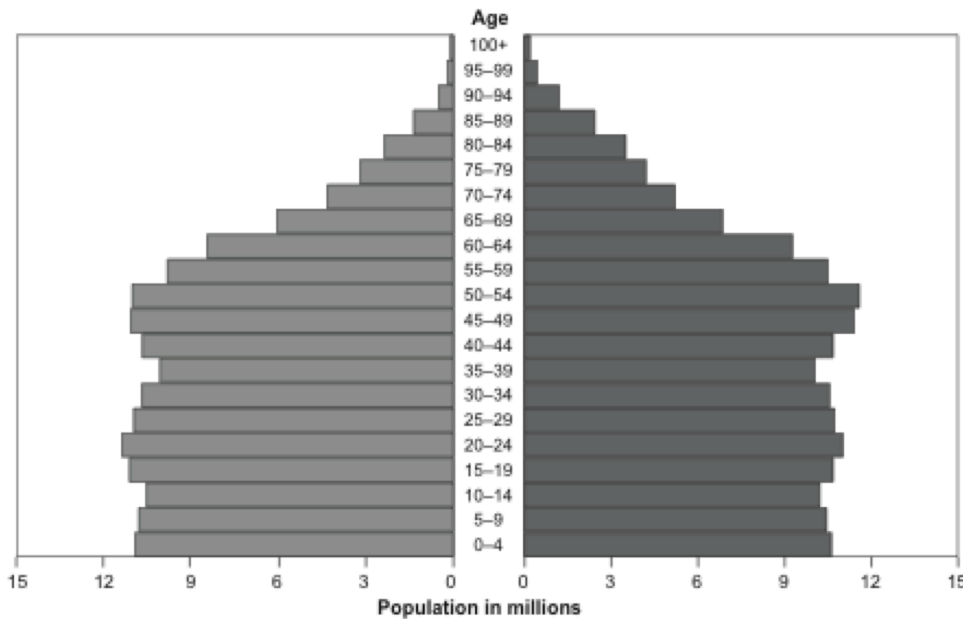
....

1 Add labels to the Afghanistan graph to describe and explain what it shows.

An LEDC pyramid – Afghanistan 2011

Age

100+
95–99
90–94
85–89
80–84
75–79
70–74
65–69
60–64
55–59
50–54
45–49
40–44
35–39
30–34
25–29
20–24
15–19
10–14
5–9
0–4

3   2.4   1.8   1.2   0.6   0   0   0.6   1.2   1.8   2.4   3

Population in millions

An MEDC pyramid – United States 2011

Age

100+
95–99
90–94
85–89
80–84
75–79
70–74
65–69
60–64
55–59
50–54
45–49
40–44
35–39
30–34
25–29
20–24
15–19
10–14
5–9
0–4

15   12   9   6   3   0   0   3   6   9   12   15

Population in millions

2 Label both pyramids with their Male and Female sides.

3 Divide each into these categories:
- Young dependants
- People of working age
- Retired/dependant people

4 Comment on the contrasting patterns between the two pyramids.

5 *Annotate* means to label in some detail. Annotate each of these pyramids to say more about their characteristics.

1 You will need a copy of a world map for this activity. Refer to pp. 30 of the Student Book.

  (a) On your map and using a coloured pen or pencil, mark and label the areas at Stage 1 shown on map **C**.

  (b) Referring to an atlas and using four different colours (one for each of the Stages 2–5), shade in and label the countries whose pyramids are shown in diagrams **A** and **B**, and also the following:

   • Stage 2: Afghanistan, Democratic Republic of Congo, Ethiopia, Peru

   • Stage 3: Algeria, Bolivia, Botswana, Chile, China, Colombia, Ecuador, Egypt, Ghana, India, Indonesia, Kenya, Libya, Mexico, Morocco, Pakistan, Paraguay, Sudan, Tunisia

   • Stage 4: Argentina, Australia, Brazil, Canada, New Zealand, Thailand, USA and all Western European countries not yet at Stage 5 (see below)

   • Stage 5: Italy, Japan, Germany, Sweden

  (c) Give your map a suitable title and key.

2 Use your completed world map to write a few short paragraphs about the global distribution of the communities or countries at each stage of economic development. Name continents and use compass directions to describe their location.

Photo 1: New middle-class residential district in São Paulo, Brazil

image: Mariordo/CC by-SA 3.0

Photo 2: Improved favela (shanty town) in São Paulo, Brazil

image: Andreyoshimoto/CC by-SA 3.0

Answer these questions using photos 1 and 2 above.

1   Describe the types of housing in each photo. Think about appearance, space available to each household, services likely to be provided, open green space for children to play.

2   List the advantages and disadvantages of living in each type of housing area in São Paulo.

3   Where would you rather live and why?

Photo 3: Middle-class housing in the UK

image © Alison Rae

Photo 3 shows typical family houses in the suburbs (outer residential areas of a town or city) in the UK. Typically, each is a separate building, has three bedrooms and two living rooms downstairs, a small garden and some space for a car.

4   How does this accommodation compare with the housing in Photos 1 and 2?

5   How do all three types of housing compare with typical housing in your country?

1   Now you have read the Student Book pages 32–3, think about your home area. Give the place where you live a rating on the scale set out below, for each of the factors that was mentioned in the book.

Factor	Scale of 1 to 10 (1 = poor, 10 = ideal)									
	1	2	3	4	5	6	7	8	9	10
Soils										
Water supply										
Flat land										
Near coast/river										
Fossil fuels available										
Minerals available										
Large cities close by										

2   On the basis of the scores you have given, would you expect the area where you live to have a high or low population density? Explain your answer.

----

3   What are the key factors that explain the way your home area has developed over time?

Section 1
Population and Settlement

Annotation and *labelling* are *NOT* the same things. Annotation is much more detailed and can include some explanation.

Below you will find two pictures of densely populated urban districts of Singapore. Each has one annotation done for you.

Add more arrows and *annotate* them to show the population density characteristics of these two locations.

High-rise offices and apartments mean small areas of land can be used for multiple businesses and homes. This is high-density, efficient use of land.

Central Singapore

Some green area from gardens, grass verges and trees and shrubs planted to provide shade and extra greenery. This softens the urban landscape and makes people feel they are not living too close to each other.

Singapore suburbs

Top image: Public domain/CC by 2.0   Bottom image: Terence Ong/CC by-SA 3.0

Topic 1.4 Population density and distribution

Section 1
Population and Settlement

Below is a list of three settlement pattern names, three photos of different settlements, and three descriptions of settlement shapes.

1 Your task is to match the names, photos and their descriptions, so that they match.

2 When you have matched them up, sketch and label the outline of each settlement pattern.

Settlement shape categories

A Linear

B Dispersed

C Nucleated

Photo 1: Capel Cefnywaen, Wales, UK

Photo 2: Champlain, Quebec, Canada

Photo 3: Romainmôtier, Switzerland

Village shape descriptions

X In several parts of the world, settlement has developed along a main communication route – a road, railway or canal – running along a valley, the coast or a lakeshore. For example, in the Netherlands and Thailand it is common to build along canals and drainage ditches, and in South Wales along the flat floors of the narrow, steep-sided valleys. The result is a long, narrow village, often with no obvious centre.

Y Buildings are grouped together – in the past this was often for defensive reasons. In the UK and in India these villages are often 3–4 km apart, to leave enough land in between for producing food. They have a clear centre with shops and services. They are often located at road junctions.

Z This pattern occurs in more remote rural areas where physical conditions and making a living are difficult. These areas are quite sparsely populated. People live in individual buildings (often farms) or in small groups of just a few families (hamlets). Farms in western Canada and the USA are laid out like this because they are at the centre of large areas of the farm's land. Rainforest tribes live in one main building occupied by an extended family of 30 to 40 people.

Images: 1 Eric Jones/geography.org.uk; 2 Rene Beaudoin/CC by SA-3.0; 3 Thomas Guignard/CC by SA-3.0

Section 1
Population and Settlement

Part 1 Map **D** on page 44 in the Student Book shows that Chembakolli is a nucleated settlement. All of its buildings and other key land uses cluster together around the central point, the temple. There is very little space in between the different land use areas.

1 Suggest why Chembakolli may have developed in this way. What are the advantages of living in a nucleated village? Can you think of any disadvantages?

2 What characteristics is the site of Chembakolli likely to have that will encourage a nucleated settlement to develop? Think of the advantages of the site, and any situation difficulties that might limit the development and spread of the village.

Part 2 The sketch map below shows settlement pattern in the Edale area of the Pennine Hills in northern England. Villages, hamlets and isolated houses and farms are shown.
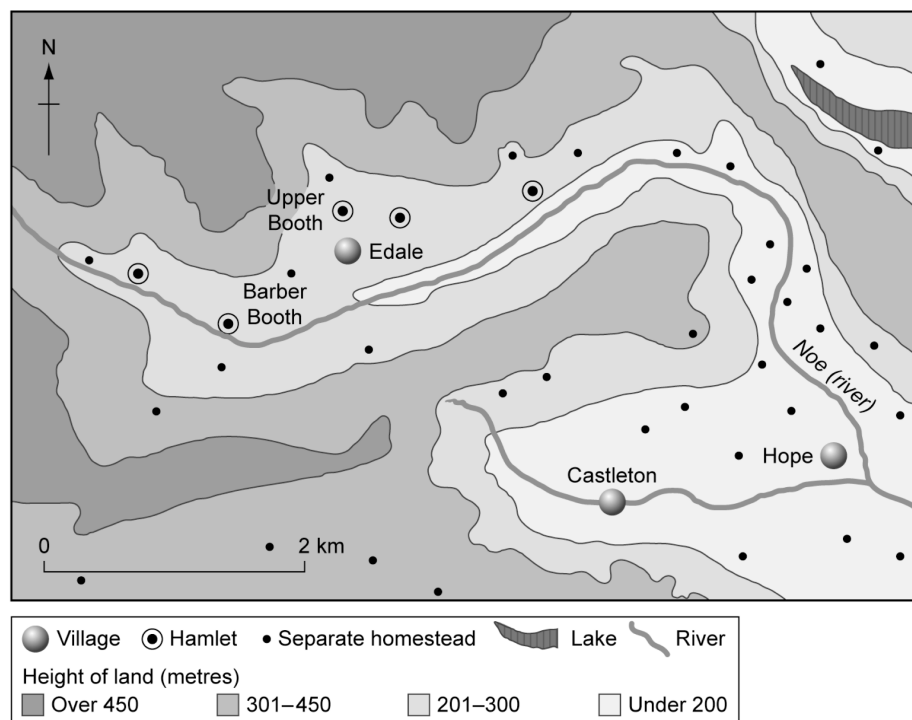
3 Describe the distribution pattern of these settlements.

4 Make a list of reasons explaining the locations of these settlements.

Part 3 5 Using the sketch map above and map **D** in the Student Book, compare the settlement patterns of Edale and Chembakolli.

In 2011 there were 21 *megacities*. Six other cities were almost at megacity status at that date. Depending on the data source, you will find variations in these figures, both in the populations and in the number of cities in the list. This often happens as the exact criteria for the definition of a megacity changes from one data set to another.

We can measure a city's population based either on the number of people within the immediate city boundary, or on the number of people in both the inner and outer city (that is, including the neighbouring settlements). The populations in the table below include the wider urban area.

Top 10 world cities, 2011

Rank	City	Country	Population (millions)
1	Tokyo	Japan	34.2
2	Guangzhou	China	24.9
3	Seoul	South Korea	24.5
4	Delhi	India	23.9
5	Mumbai	India	23.3
6	Mexico City	Mexico	22.8
7	New York	USA	22.2
8	São Paulo	Brazil	20.8
9	Manila	Philippines	20.2
10	Shanghai	China	18.8

1 In which section of the settlement hierarchy would these megacities fit best? (Consider level 1 is at the top, going downwards.)

2 Find out the population of your home settlement.

   (a) Classify it as one of the following levels in the settlement hierarchy:

      (i) isolated house/farm   (v) city

      (ii) hamlet   (vi) conurbation

      (iii) village   (vii) megacity.

      (iv) town

   (b) Try to find out its population using the internet or local census records.

   (c) State where your home settlement fits within the regional/national hierarchy. Compare its position with the megacity level.

3 Work out the settlement hierarchy within your home region.

   Note: A *region* is an area that has a number of distinctive characteristics. It can be as small as the settlements within a small valley, or it may be as large as the whole of the Amazon Basin, with its common rainforest vegetation.

   (a) Identify the extent of your region.

   (b) List the settlements within it.

   (c) Label them as 'isolated', 'hamlet', 'village', etc.

   (d) Where does your own home lie within this version of the settlement hierarchy?

4 (a) Draw a sketch map of your home region. Mark settlements as dots. Choose a colour for each level of the hierarchy and add the correct colour to each settlement.

   (b) Describe the distribution of settlements on your map to illustrate how the settlement hierarchy works in your home area/region.

Section 1
Population and Settlement

Spheres of influence

1 Imagine you live in a village of 5000 people. It has a 20 shops and services for you to use. There is a small town with 20 000 population 10 km away, and a city of 250 000 people 50 km away.

Below is a list of things you need to buy or services you want to use. Put a tick for each item to identify the closest settlement in which you will find what you want.

Settlement	Village	Small town	City
Population	**5000**	**20 000**	**250 000**
Shops and services:			
Post office			
Doctor's surgery			
Hairdresser			
Fruit and vegetables			
Department store			
University hospital			
Secondary school			
Lawyer			
Police station			

2 Write a paragraph to explain the meaning of the term *threshold population* of a shop or service.

3 Define what is meant by the terms *sphere of influence* and *catchment area*.

Sphere of influence:

Catchment area:

Using the Burgess land use model

Burgess based his urban land use model on his studies in the 1920s of the American city of Chicago. Chicago is a lakeshore city, so it did not develop a complete circular shape. At this time many single men had migrated to the city for industrial work, and residential areas for these workers grew. Immigrant communities from certain countries also developed.

From this particular example, Burgess drew his general model which today can be used to explain the growth of many towns and cities.

The Burgess urban land use model

Model	Chicago, 1920s
	Single family dwellings
	Second immigrant settlement
	Little Sicily
	Ghetto LOOP
	Apartment houses
	Black belt
	Residential district
	Bungalow section

■	CBD	▨	Area occupied by poorer workers
▨	Industry	▨	Middle-class area
▨	Area of mixed land use including industry and poorer residential	□	Edge of city where wealthier people live – they have the money to be able to commute into the CBD to work

Burgess said that a town or city grows over time, with its key land use zones for business in the centre, and the poorer housing next to that (because the poor cannot afford to travel to work). As one travels towards the edge of the town/city, people become more wealthy, because they can afford to select a pleasant, more rural environment to live in, and can afford to travel to work in the CBD.

Think about your home town/city (or the nearest one to you, if you live in a rural settlement). Can its land use be explained by the Burgess model?

1 Does your town/city have a clear CBD, with shops, offices and government services? If you think it does, list the land uses you can identify there.

2 Does your town/city have different types of housing area: poorer, middle-class and wealthier? Identify the locations of these. Do they fit with the Burgess model?

3 Do the different housing areas go from poorer to wealthier from the inner city to the edge of the city, as the Burgess model does?

Hoyt's urban land use model

Researching a little later than Burgess, Hoyt decided that land use zones could follow transport routes. His model therefore shows that industrial areas develop close to roads, railways, rivers and canals – the main ways of getting raw materials into a city and finished goods out. There are clear similarities and differences between Burgess's and Hoyt's patterns.

The Hoyt urban land use model

- CBD
- Factories/industry (transitional)
- Low-class residential (old inner-city area)
- Medium-class residential (inter-war period)
- High-class residential
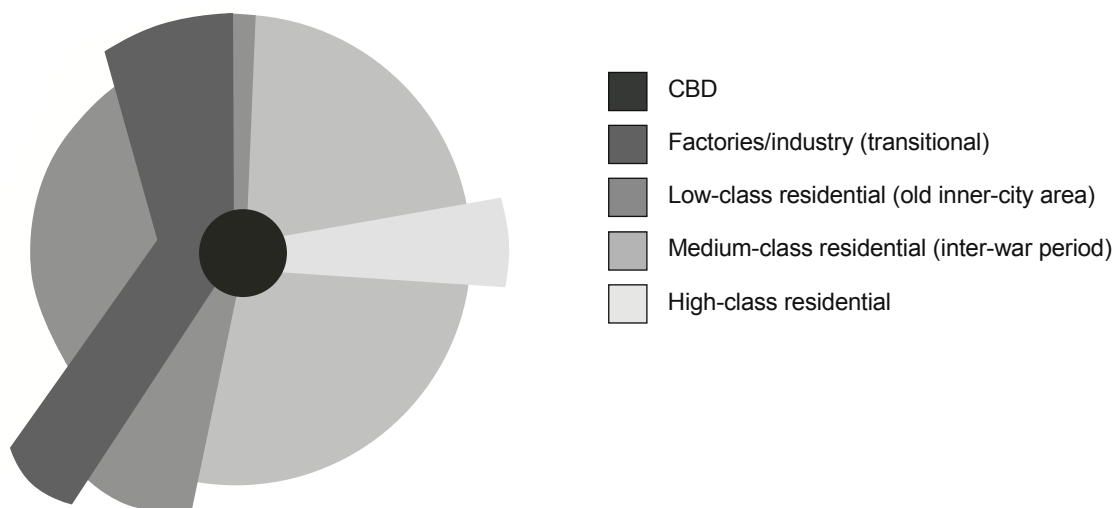
1 Describe the pattern of the Hoyt urban land use model. Remember to state clearly where each land use zone is located, and its position in relation to others. Ask yourself these questions:

(a) Where is the CBD located?

(b) Is the low-class residential area close to the industry? Explain why you think it is located where it is.

(c) Where is the high-class residential zone in relation to the low-class residential zone and the industry? Can you explain these locations?

2 Describe the similarities and differences between the Burgess and Hoyt models.

3 Think about your home town/city, or one close to you that you know well. Which of the two models helps you best to explain the land use – or does neither of them do a very good job?

Section 1
Population and Settlement

Types of pollution in cities

Complete the diagram as follows:

1 In the four inner boxes write the four categories of pollution you have identified in your class discussion – one has been done for you.

2 In the outer circles give examples of pollution you have listed in class – again, one has been done for you. Make sure each one points to the correct type of pollution (inner box).

Litter

Visual pollution

Pollution in cities
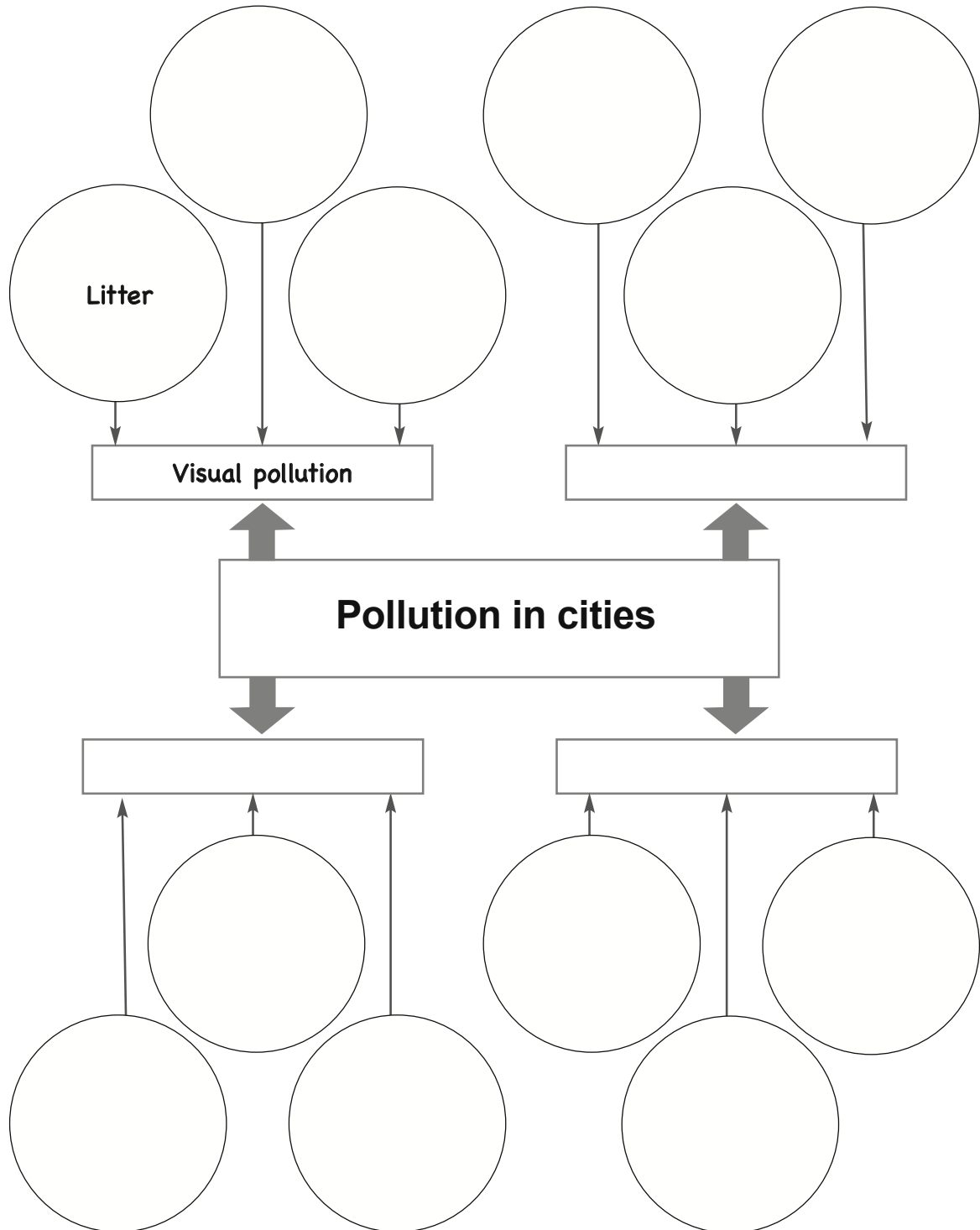
During, or at the end of the lesson, add any more types of pollution you have discovered.

Section 1
Population and Settlement

Living with pollution – a problem, or not?

Read the following extract, written by a person living close to a major world airport.

> *I live in a rural area south of London in the UK. For several years now my home has been under the flight path into London Gatwick airport. Several of my neighbours work at the airport: pilots, baggage handlers, check-in staff, and so on. My town of around 25 000 people has grown significantly in the last 20 years because of Gatwick's expansion. We have better shops and services as a result of this.*
>
> *People working at Gatwick generally commute by car to work and therefore cause air pollution from their vehicles. The planes themselves cause air pollution and some noise.*
>
> *I notice the noise when I'm in my garden and even, sometimes, in the house, but personally I don't mind. I love to travel and I wouldn't deprive others of doing so. It makes me feel a part of a globalised world, being under the flight path.*
>
> *On the other hand, I'm aware that I'm not so close to Gatwick that the plane noise disrupts my life as it does for others who live closer to airports. Nor does the air pollution have an impact on my health.*

In groups, consider the following ideas:

1 This resident doesn't mind the aircraft noise. Would you expect all of her neighbours to agree with her? Why, or why not?

2 List the positive and negative impacts on people living in this town, of being close to an international airport.

3 The resident writing refers to differences she has noticed when Gatwick is closed. Explain what these differences might be, and their impact on everyone mentioned in the extract.

4 Think about a similar situation in a LEDC city. Remember that squatter settlements tend to be on land that has been rejected by wealthier residents. The poorest may be living very close to airports with their noise and air pollution. How do you think shanty town residents would feel about this situation? Does the airport bring them work or other benefits? Is the urban pollution likely to be a problem for them?

Section 1
Population and Settlement

Activities in the rural–urban fringe: extension exercise

In 1977 Paul Cloke, a geographer, devised an **index of rurality** – in other words, a way of measuring exactly how rural or urban an area is. The index is used to show the gradual change from urban land use to more rural land use as distance from the city centre increases.

You can investigate this change around your own town or city. Complete the table below by working from the centre outwards along one or two main routes and recording land use, types of employment and the functions/services available.

Land use	Types of employment	Functions/services

Demographic changes (age groups)	Social changes	Other changes

Try to identify trends in your table.

- Does the area change from urban to rural along the route (or transect)?
- Is land use becoming more or less intensive with distance from the town/city centre?
- Does the mix of jobs available to local people change?
- Do the functions available to people alter?

Write a summary of your findings (on a new sheet, or the reverse of this one).

Add annotations to this worksheet to summarise the causes and possible solutions of traffic jams.

Traffic Congestion

Traffic Solutions
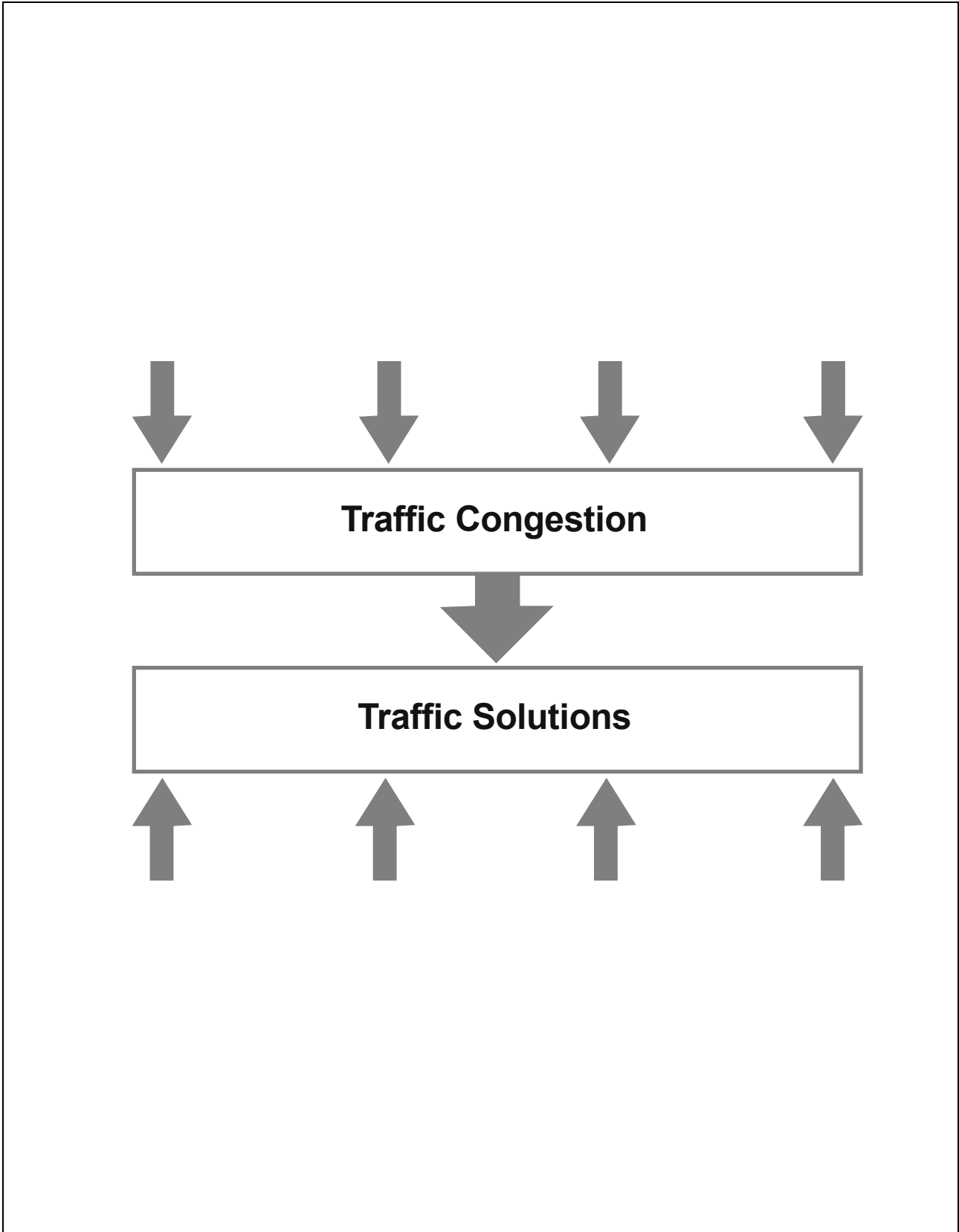
Rural–urban migration crisis!

1 Re-arrange these events in their correct time sequence, and then, on a separate sheet (or the back of this one), display them as a flow diagram:

- If things get any worse, they may have to start living on a pavement or under a bridge.
- The family becomes desperate, but has no money to return to their village.
- The family migrates to the city to escape poverty in rural villages.
- The newcomers find some spare land next to a factory which might have job vacancies.
- There are too many shoe-shiners already, so the children don't bring any money home.
- They search for the nearest communal water tap.
- They have no money left and still have no job.
- They have to keep trying to get work, because there is nothing else they can do.
- They send their children out onto the streets to earn some money shoe-shining.
- They spend what little money they have on food.
- They start to build a shack from nearby waste materials.

2 Your flow diagram represents a very negative view of shanty towns. Now suggest some of the positive aspects to balance out the negative ones:

Section 1
Population and Settlement

Four strategies for sustainability

Write the four strategies for urban sustainability around the heading below. One has been done for you.

Draw arrows from each strategy to the central 'sustainability' box, pointing in towards the box. Why do you think this is the ideal direction for your arrows?

Reducing all forms of pollution - especially air pollution due to emissions from vehicles and factories

Sustainability