

MATHS SESSION 2: MEASURING DEVELOPMENT

Age range: 11–16 years

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| <p>Outline Learners will consider what development means, explore different ways of measuring it and then discuss the benefits and limitations of some different development indicators. Learners will use a ‘Development Trumps’ game to compare development indicator values for different countries and discuss possible reasons why some countries are more ‘developed’ than others. Finally learners will use scatter graphs to identify and describe patterns and relationships between different development indicators.</p> | | |
| <p>Learning objectives</p> <ul style="list-style-type: none"> To recognise that measuring development is complex and that there are a number of different ways in which it can be measured, depending on how the term ‘development’ is defined. To make and test conjectures about patterns and relationships between different development indicators. | <p>Learning outcomes</p> <ul style="list-style-type: none"> Learners will discuss what development means and identify some different ways in which it can be measured. Learners will compare some different development indicators. Learners will use scatter graphs to identify and describe patterns and relationships between different development indicators. | |
| <p>Key questions</p> <ul style="list-style-type: none"> What does development mean? How could you measure development? What are the benefits and limitations of the different development indicators? What patterns and relationships do you think there might be between the different development indicators? How would you describe the relationship between two different development indicators? | <p>Resources</p> <ul style="list-style-type: none"> <i>Maths slideshow A</i> (slides 22–29) Resource sheets: <ul style="list-style-type: none"> <i>Exploring development indicators</i> <i>Development Trumps indicators</i> <i>Development data 1 and 2</i> <i>Scatter graphs 1 and 2</i> <i>Development Trumps cards 1 to 4</i> Activity sheets: <ul style="list-style-type: none"> <i>Describing patterns</i> <i>Scatter graph template</i> Excel spreadsheet: <i>Comparing development indicators</i> | |
| <p>Curriculum links</p> | | |
| <p>England KS3 Mathematics <i>Pupils should be taught to:</i> Reason mathematically</p> <ul style="list-style-type: none"> Identify variables and express relations between variables algebraically and graphically. Explore what can or cannot be inferred in statistical and probabilistic settings. <p>Statistics</p> <ul style="list-style-type: none"> Describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs. | <p>Wales KS3 Mathematics Developing numerical reasoning</p> <ul style="list-style-type: none"> Generalise in words, and use algebra, to describe patterns that arise in numerical, spatial or practical situations. Draw conclusions from data and recognise that some conclusions may be misleading or uncertain. <p>Using data skills</p> <ul style="list-style-type: none"> Interpret diagrams and graphs. Examine results critically, select and justify choice of statistics, recognising the limitations of any assumptions and their effect on the conclusions drawn. | <p>Scotland Mathematics and Numeracy</p> <ul style="list-style-type: none"> I can work collaboratively, making appropriate use of technology, to source information presented in a range of ways, interpret what it conveys and discuss whether I believe the information to be robust, vague or misleading. MNU 3-20a I can evaluate and interpret raw and graphical data using a variety of methods, comment on relationships I observe within the data and communicate my findings to others. MNU 4-20a |

Note:

- *These are suggested activities and resources to support your teaching rather than guide it. Additional teaching input may be required to develop learners' knowledge, skills and understanding of some of these concepts.*
- *For this session, learners will need an understanding of the term 'development', introduced in the Introduction session. You might also like to consult the Background notes for teachers.*

Activity 2.1 (15 min)

Measuring development

Note: This activity is almost the same as Geography activity 2.1.

- Show slide 23 and explain that the Young Lives researchers have collected a lot of data in each of the four countries (Ethiopia, India, Peru and Viet Nam) to find out what the quality of life is like for young people from some poorer communities. As the study has been carried out over 15 years, the researchers have also been able to see how their quality of life is changing.
- Explain that people often talk about how 'developed' a country is as a way of describing its standards of living. Learners were introduced to the term 'development' and the Sustainable Development Goals in the *Introduction session*. Remind learners that different people have different views about what development means. A summary of the definition of development used by this resource is provided on slide 24. For further information on development, see *Background notes for teachers*.
- Ask learners for ideas about ways of measuring how 'developed' a country is or the quality of life of the people living there. Show slides 25 and 26 and explain that these are examples of some of the development indicators that are used.
- Organise learners into pairs and give each pair a copy of *Exploring development indicators*. Ask learners to read the information about each indicator and discuss the questions on slide 27.
- Share learners' ideas as a whole class. Draw out the point that there are many different ways of measuring development. Emphasise how the indicators used are linked to definitions of development and that people don't agree on this. For most of the 20th century, development was measured only in terms of GDP (national income), either overall or per capita. However, in more recent years, many people have come to see and measure development in much wider terms, for example in terms of health, education and the environments in which people live. A variety of other indicators are now used, such as the Human Development Index and the Happy Planet Index. For further information, see *Background notes for teachers*.

Activity 2.2 (30 min)

Development Trumps

Note: This activity is the same as Geography activity 2.2. This game can be played in groups of four or as a whole class. You will need to print and cut out a set of Development Trumps cards for each group or else one set for the whole class.

- Explain that learners are going to play a 'Development Trumps' game to explore how 'developed' some different countries around the world are.
- Talk through the meaning of each indicator displayed on the *Development Trumps cards*. A description of each indicator is provided in *Development Trumps indicators*. For each indicator agree as a class whether or not the highest or lowest score is best:
 - Life expectancy (highest score is best)
 - GDP per capita (highest score is best)
 - Human Development Index (highest score is best)
 - Expected years of schooling (highest score is best)
 - Access to water: % (highest score is best)
 - Infant mortality: deaths per 1,000 live births (lowest score is best)
 - Access to electricity: % (highest score is best)
 - CO₂ emissions per capita (lowest score is best).
- *Group of four version*
 - Dealer distributes the cards so that players have eight each.
 - Player on the left of dealer decides which of the indicators they are playing.
 - Player calls out the name of their country and their score.
 - Players then call out the best score they have in that category.
 - Player with the highest/lowest score (depending on which is better) in that category takes the cards.
 - Learners should begin to understand that having the worst score for an indicator can be frustrating.
- *Whole class version*
 - Distribute cards among learners.
 - Ask the learner with the highest life expectancy to stand at one side of the classroom.
 - Next ask other learners to line up in order of their life expectancy.
 - Once they have done this, ask learners if they can remember where particular countries are along the line.
 - Change and play for GDP per capita. Before learners start again, ask:
 - Which countries do you expect to be near the front of the line?
 - Which countries do you expect to be near the back?
- Stop the game and ask learners to consider the questions on slide 28 as they continue playing the game with the other indicators.
- Allow time at the end of the game for learners to share and reflect on their thoughts and observations about playing the game and their ideas about the questions on slide 28.

Activity 2.3 (60 min)

Comparing development indicators

- Organise learners into pairs and give each pair a copy of *Development data*. Explain that this table contains the data from the 32 countries featured on the *Development Trumps cards*.
- Ask learners to look at the values for life expectancy and GDP per capita. Discuss the following questions:
 - Which country/countries has/have the highest GDP per capita? Which country/countries has/have the lowest GDP per capita?
 - Which country/countries has/have the highest life expectancy? Which country/countries has/have the lowest life expectancy?
 - What are the values for GDP per capita and life expectancy in the UK?
 - What are the values for GDP per capita and life expectancy in the Young Lives countries (Ethiopia, India, Peru and Viet Nam)?
 - How would you describe this relationship?
 - How else could you represent this data?
- Explain that a scatter graph can be used to show the relationship between two sets of variables. Show slide 29 and say that this scatter graph shows the data for life expectancy and GDP per capita for the 32 countries. Ask learners to look at the graph and decide whether or not there is a link between these two variables. Explain that a link can also be described as a correlation.
- Ask learners how they would describe the relationship between the two variables. Point out that in general there is a positive correlation between life expectancy and GDP per capita in the 'poorer' countries. In other words, life expectancy increases as GDP per capita rises (or the higher the GDP per capita, the higher the life expectancy). However among the 'richer' countries (those with a higher GDP per capita) this relationship weakens. Discuss possible reasons for this changing relationship. *What other factors might affect life expectancy?*
- Ask learners whether or not the scatter graph 'proves' that a correlation exists between life expectancy and GDP per capita, and discuss why this isn't the case.
- Ask learners to choose another pair of development indicators from the *Development data* table. They should first discuss in their pairs what pattern or relationship they think there will be and why. Learners should then draw a scatter graph of the data and describe the relationship in their own words. They could highlight the values for the four Young Lives countries (Ethiopia, India, Peru and Viet Nam) and the UK on each scatter graph.
- Ask learners to repeat this for different pairs of indicators. They can use the table in *Describing patterns* to record their descriptions of the relationships.
- At the end of the activity, choose learners to share their descriptions of the relationships and discuss possible reasons for these relationships. Encourage learners to consider outliers and what factors might contribute to these.
- Alternatively learners could use *Comparing development indicators* spreadsheet to create their scatter graphs electronically, recording their descriptions of the relationships in *Describing patterns* as before.

Differentiation

- *Make it easier:* Tell learners to use the Scatter graph template and the rounded data in Development data 1 to draw their scatter graphs. Alternatively, rather than drawing their own scatter graphs, learners could explore the scatter graphs provided in Scatter graphs 1 and 2, recording their descriptions in Describing patterns as before.
- *Make it harder:* Tell learners to use the original data in Development data 2 to draw their scatter graphs.

Further ideas

- Ask learners to develop their skills in rounding numbers and measures to an appropriate degree of accuracy by rounding the figures in *Development data 2* to one decimal place or to the nearest whole number (or ten or a hundred).
- Ask learners to investigate the correlations between other development indicators. Useful data sources include:
 - data.worldbank.org
 - hdr.undp.org/en/data

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Exploring development indicators

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|---|---|
| <p>GDP per capita (Average income per person per year)</p>  <p>Credit: Sam Tarling</p> | <p>Percentage of population with access to drinking water</p>  <p>Credit: Shumon Alam/Oxfam</p> |
| <p>Life expectancy at birth</p>  <p>Credit: Percy Ramirez/Oxfam</p> | <p>Infant mortality rate (number of children per 1,000 births who die before their first birthday)</p>  <p>Credit: © Young Lives/Pham Viet Anh</p> |
| <p>Percentage of population with access to electricity</p>  <p>Credit: Rajendra Shaw/Oxfam</p> | <p>Percentage of children enrolled in primary education</p>  <p>Credit: © Young Lives/Farhatullah Beig</p> |
| <p>How equal opportunities are for males and females (gender equality)</p>  <p>Credit: © Young Lives/Sarika Gulati</p> | <p>Number of physicians per 1,000 people</p>  <p>Credit: Robin Hammond/PANOS</p> |
| <p>Average CO₂ emissions per person</p>  <p>Credit: Tony Webster</p> | <p>Number of Internet users</p>  <p>Credit: © Young Lives/Pham Viet Anh</p> |
| <p>Number of mobile phone subscriptions</p>  <p>Credit: Caroline Irby</p> | <p>Percentage of population who live in extreme poverty (on less than US\$1.90 a day)</p>  <p>Credit: Tom Pietrasik/Oxfam</p> |

Development Trumps indicators

- **GDP per capita (average income per person)**

This indicator is a measure of the average annual income of each person in a country. It is often measured in US\$. GDP per capita is widely used to describe how developed a country is. For most of the 20th century, development was measured only in terms of GDP per capita, but more recently people have started to use a variety of other indicators (see below). Using GDP per capita as an indicator, countries can be classified as High Income Countries (HICs), Middle Income Countries (MICs) or Low Income Countries (LICs).

- **Life expectancy at birth**

This is the average number of years a newborn baby in a country would be expected to live if mortality patterns at the time of its birth remain the same in the future.

- **Human Development Index**

The Human Development Index (HDI) takes into account a number of different indicators. It was created in 1990 when many people were starting to challenge the widespread use of GDP as the only measure of development. Countries are given a value between 0 and 1 based on their life expectancy, literacy rates and wealth per capita. The higher the HDI the more developed the country is.

- **Access to improved water source**

This is the percentage of a country's population with access to an improved water source. Improved water sources are those that are protected in some way from outside contamination, such as water piped directly to houses, public taps and boreholes.

- **Infant mortality rate**

This is the number of children per 1,000 live births in a country who die before they reach their first birthday.

- **Expected years of schooling**

This indicator shows the number of years of schooling a child of school age can expect to receive in their lifetime in a country.

- **Territorial CO₂ emissions per capita**

This indicator shows the average amount of carbon dioxide (CO₂) in tonnes emitted annually per person in a country. The territorial emissions only include those which are produced within the country in question. For example if a country imports and uses products from another country its territorial emissions won't include the emissions from the manufacture of those products in the other country.

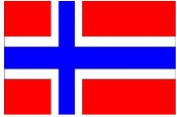
- **Access to electricity**

This is the percentage of a country's population with access to electricity.

Development Trumps cards 1

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|---|---|--|--|
| <p style="text-align: center;">ETHIOPIA</p>  <p>Life expectancy (years): 64 GDP per capita (US\$): 565 Human Development Index: 0.435 Access to improved water source (%): 57 Infant mortality (per 1,000 live births): 41 Expected years of schooling: 8.5 CO₂ emissions (tCO₂/person/year): 0.1 Access to electricity (%): 27</p> | <p style="text-align: center;">INDIA</p>  <p>Life expectancy (years): 66 GDP per capita (US\$): 1,596 Human Development Index: 0.586 Access to improved water source (%): 94 Infant mortality (per 1,000 live births): 38 Expected years of schooling: 11.7 CO₂ emissions (tCO₂/person/year): 1.9 Access to electricity (%): 79</p> | <p style="text-align: center;">PERU</p>  <p>Life expectancy (years): 75 GDP per capita (US\$): 6,551 Human Development Index: 0.737 Access to improved water source (%): 87 Infant mortality (per 1,000 live births): 13 Expected years of schooling: 13.1 CO₂ emissions (tCO₂/person/year): 2.1 Access to electricity (%): 91</p> | <p style="text-align: center;">VIET NAM</p>  <p>Life expectancy (years): 76 GDP per capita (US\$): 2,052 Human Development Index: 0.638 Access to improved water source (%): 98 Infant mortality (per 1,000 live births): 17 Expected years of schooling: 11.9 CO₂ emissions (tCO₂/person/year): 1.8 Access to electricity (%): 99</p> |
| <p style="text-align: center;">UNITED KINGDOM</p>  <p>Life expectancy (years): 81 GDP per capita (US\$): 45,603 Human Development Index: 0.892 Access to improved water source (%): 100 Infant mortality (per 1,000 live births): 4 Expected years of schooling: 16.2 CO₂ emissions (tCO₂/person/year): 7.3 Access to electricity (%): 100</p> | <p style="text-align: center;">BRAZIL</p>  <p>Life expectancy (years): 74 GDP per capita (US\$): 11,385 Human Development Index: 0.744 Access to improved water source (%): 98 Infant mortality (per 1,000 live births): 15 Expected years of schooling: 15.2 CO₂ emissions (tCO₂/person/year): 2.4 Access to electricity (%): 100</p> | <p style="text-align: center;">SINGAPORE</p>  <p>Life expectancy (years): 82 GDP per capita (US\$): 56,287 Human Development Index: 0.901 Access to improved water source (%): 100 Infant mortality (per 1,000 live births): 2 Expected years of schooling: 15.4 CO₂ emissions (tCO₂/person/year): 3.2 Access to electricity (%): 100</p> | <p style="text-align: center;">CHINA</p>  <p>Life expectancy (years): 75 GDP per capita (US\$): 7,594 Human Development Index: 0.719 Access to improved water source (%): 96 Infant mortality (per 1,000 live births): 9 Expected years of schooling: 12.9 CO₂ emissions (tCO₂/person/year): 7.2 Access to electricity (%): 100</p> |

Development Trumps cards 2

| | | | |
|---|--|---|--|
| <p>NORWAY</p>  <p>Life expectancy (years): 81 GDP per capita (US\$): 97,363 Human Development Index: 0.944 Access to improved water source (%): 100 Infant mortality (per 1,000 live births): 2 Expected years of schooling: 17.6 CO₂ emissions (tCO₂/person/year): 11.5 Access to electricity (%): 100</p> | <p>PAKISTAN</p>  <p>Life expectancy (years): 67 GDP per capita (US\$): 1,334 Human Development Index: 0.537 Access to improved water source (%): 91 Infant mortality (per 1,000 live births): 66 Expected years of schooling: 7.7 CO₂ emissions (tCO₂/person/year): 0.9 Access to electricity (%): 94</p> | <p>UZBEKISTAN</p>  <p>Life expectancy (years): 68 GDP per capita (US\$): 2,038 Human Development Index: 0.661 Access to improved water source (%): 87 Infant mortality (per 1,000 live births): 34 Expected years of schooling: 11.5 CO₂ emissions (tCO₂/person/year): 3.6 Access to electricity (%): 100</p> | <p>NIGERIA</p>  <p>Life expectancy (years): 52 GDP per capita (US\$): 3,203 Human Development Index: 0.504 Access to improved water source (%): 69 Infant mortality (per 1,000 live births): 69 Expected years of schooling: 9.0 CO₂ emissions (tCO₂/person/year): 0.5 Access to electricity (%): 56</p> |
| <p>MEXICO</p>  <p>Life expectancy (years): 77 GDP per capita (US\$): 10,230 Human Development Index: 0.756 Access to improved water source (%): 96 Infant mortality (per 1,000 live births): 11 Expected years of schooling: 12.8 CO₂ emissions (tCO₂/person/year): 3.8 Access to electricity (%): 99</p> | <p>ITALY</p>  <p>Life expectancy (years): 82 GDP per capita (US\$): 34,960 Human Development Index: 0.872 Access to improved water source (%): 100 Infant mortality (per 1,000 live births): 3 Expected years of schooling: 16.3 CO₂ emissions (tCO₂/person/year): 5.8 Access to electricity (%): 100</p> | <p>SOUTH AFRICA</p>  <p>Life expectancy (years): 57 GDP per capita (US\$): 6,478 Human Development Index: 0.658 Access to improved water source (%): 93 Infant mortality (per 1,000 live births): 34 Expected years of schooling: 13.1 CO₂ emissions (tCO₂/person/year): 8.5 Access to electricity (%): 85</p> | <p>IRAN, ISLAMIC REP.</p>  <p>Life expectancy (years): 74 GDP per capita (US\$): 5,315 Human Development Index: 0.749 Access to improved water source (%): 96 Infant mortality (per 1,000 live births): 13 Expected years of schooling: 15.2 CO₂ emissions (tCO₂/person/year): 7.9 Access to electricity (%): 100</p> |

Development Trumps cards 3

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|---|--|---|--|
| <p>SIERRA LEONE</p>  <p>Life expectancy (years): 46 GDP per capita (US\$): 775 Human Development Index: 0.374 Access to improved water source (%): 63 Infant mortality (per 1,000 live births): 87 Expected years of schooling: 7.5 CO₂ emissions (tCO₂/person/year): 0.1 Access to electricity (%): 14</p> | <p>RUSSIAN FEDERATION</p>  <p>Life expectancy (years): 71 GDP per capita (US\$): 12,736 Human Development Index: 0.778 Access to improved water source (%): 97 Infant mortality (per 1,000 live births): 8 Expected years of schooling: 14.0 CO₂ emissions (tCO₂/person/year): 12.7 Access to electricity (%): 100</p> | <p>UNITED STATES</p>  <p>Life expectancy (years): 79 GDP per capita (US\$): 54,629 Human Development Index: 0.914 Access to improved water source (%): 99 Infant mortality (per 1,000 live births): 6 Expected years of schooling: 16.5 CO₂ emissions (tCO₂/person/year): 16.4 Access to electricity (%): 100</p> | <p>UNITED ARAB EMIRATES</p>  <p>Life expectancy (years): 77 GDP per capita (US\$): 44,204 Human Development Index: 0.827 Access to improved water source (%): 100 Infant mortality (per 1,000 live births): 6 Expected years of schooling: 13.3 CO₂ emissions (tCO₂/person/year): 19.8 Access to electricity (%): 98</p> |
| <p>CHILE</p>  <p>Life expectancy (years): 80 GDP per capita (US\$): 14,528 Human Development Index: 0.822 Access to improved water source (%): 99 Infant mortality (per 1,000 live births): 7 Expected years of schooling: 15.1 CO₂ emissions (tCO₂/person/year): 5.1 Access to electricity (%): 100</p> | <p>BULGARIA</p>  <p>Life expectancy (years): 74 GDP per capita (US\$): 7,713 Human Development Index: 0.777 Access to improved water source (%): 99 Infant mortality (per 1,000 live births): 9 Expected years of schooling: 14.3 CO₂ emissions (tCO₂/person/year): 5.7 Access to electricity (%): 100</p> | <p>NEPAL</p>  <p>Life expectancy (years): 68 GDP per capita (US\$): 697 Human Development Index: 0.540 Access to improved water source (%): 92 Infant mortality (per 1,000 live births): 29 Expected years of schooling: 12.4 CO₂ emissions (tCO₂/person/year): 0.2 Access to electricity (%): 76</p> | <p>MONGOLIA</p>  <p>Life expectancy (years): 68 GDP per capita (US\$): 4,129 Human Development Index: 0.698 Access to improved water source (%): 64 Infant mortality (per 1,000 live births): 19 Expected years of schooling: 15.0 CO₂ emissions (tCO₂/person/year): 4.4 Access to electricity (%): 90</p> |

Development Trumps cards 4

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|--|---|--|---|
| <p style="text-align: center;">AUSTRALIA</p>  <p>Life expectancy (years): 82 GDP per capita (US\$): 61,887 Human Development Index: 0.933 Access to improved water source (%): 100 Infant mortality (per 1,000 live births): 3 Expected years of schooling: 19.9 CO₂ emissions (tCO₂/person/year): 14.6 Access to electricity (%): 100</p> | <p style="text-align: center;">PHILIPPINES</p>  <p>Life expectancy (years): 69 GDP per capita (US\$): 2,871 Human Development Index: 0.660 Access to improved water source (%): 92 Infant mortality (per 1,000 live births): 22 Expected years of schooling: 11.3 CO₂ emissions (tCO₂/person/year): 0.9 Access to electricity (%): 88</p> | <p style="text-align: center;">BOLIVIA</p>  <p>Life expectancy (years): 67 GDP per capita (US\$): 3,236 Human Development Index: 0.667 Access to improved water source (%): 90 Infant mortality (per 1,000 live births): 31 Expected years of schooling: 13.2 CO₂ emissions (tCO₂/person/year): 1.7 Access to electricity (%): 91</p> | <p style="text-align: center;">YEMEN REP.</p>  <p>Life expectancy (years): 63 GDP per capita (US\$): 1,408 Human Development Index: 0.500 Access to improved water source (%): 55 Infant mortality (per 1,000 live births): 34 Expected years of schooling: 9.2 CO₂ emissions (tCO₂/person/year): 1.0 Access to electricity (%): 48</p> |
| <p style="text-align: center;">HAITI</p>  <p>Life expectancy (years): 63 GDP per capita (US\$): 824 Human Development Index: 0.471 Access to improved water source (%): 58 Infant mortality (per 1,000 live births): 52 Expected years of schooling: 7.6 CO₂ emissions (tCO₂/person/year): 0.2 Access to electricity (%): 38</p> | <p style="text-align: center;">JAMAICA</p>  <p>Life expectancy (years): 73 GDP per capita (US\$): 5,290 Human Development Index: 0.715 Access to improved water source (%): 94 Infant mortality (per 1,000 live births): 14 Expected years of schooling: 12.5 CO₂ emissions (tCO₂/person/year): 2.6 Access to electricity (%): 93</p> | <p style="text-align: center;">GERMANY</p>  <p>Life expectancy (years): 81 GDP per capita (US\$): 47,627 Human Development Index: 0.911 Access to improved water source (%): 100 Infant mortality (per 1,000 live births): 3 Expected years of schooling: 16.3 CO₂ emissions (tCO₂/person/year): 9.2 Access to electricity (%): 100</p> | <p style="text-align: center;">JAPAN</p>  <p>Life expectancy (years): 83 GDP per capita (US\$): 36,194 Human Development Index: 0.890 Access to improved water source (%): 100 Infant mortality (per 1,000 live births): 2 Expected years of schooling: 15.3 CO₂ emissions (tCO₂/person/year): 9.8 Access to electricity (%): 100</p> |

Development data 1

| Country | GDP per capita (current US\$ – to the nearest \$100) ¹ | Life expectancy (years – to the nearest whole number) ¹ | Human Development Index (to two decimal places) ² | Access to improved water source (% of population – to the nearest whole number) ¹ | Infant mortality per 1,000 live births (to the nearest whole number) ¹ | Expected years of schooling of children (to the nearest whole number) ² | Territorial CO ₂ emissions (tCO ₂ /person/year – to the nearest whole number) ³ | Access to electricity (% of population – to the nearest whole number) ¹ |
|----------------------|---|--|--|--|---|--|--|--|
| Australia | 61,900 | 82 | 0.93 | 100 | 3 | 20 | 15 | 100 |
| Bolivia | 3,200 | 67 | 0.67 | 90 | 31 | 13 | 2 | 91 |
| Brazil | 11,400 | 74 | 0.74 | 98 | 15 | 15 | 2 | 100 |
| Bulgaria | 7,700 | 74 | 0.78 | 99 | 9 | 14 | 6 | 100 |
| Chile | 14,500 | 80 | 0.82 | 99 | 7 | 15 | 5 | 100 |
| China | 7,600 | 75 | 0.72 | 96 | 9 | 13 | 7 | 100 |
| Ethiopia | 600 | 64 | 0.44 | 57 | 41 | 9 | 0 | 27 |
| Germany | 47,600 | 81 | 0.91 | 100 | 3 | 16 | 9 | 100 |
| Haiti | 800 | 63 | 0.47 | 58 | 52 | 8 | 0 | 38 |
| India | 1,600 | 66 | 0.59 | 94 | 38 | 12 | 2 | 79 |
| Iran, Islamic Rep. | 5,300 | 74 | 0.75 | 96 | 13 | 15 | 8 | 100 |
| Italy | 35,000 | 82 | 0.87 | 100 | 3 | 16 | 6 | 100 |
| Jamaica | 5,300 | 73 | 0.72 | 94 | 14 | 13 | 3 | 93 |
| Japan | 36,200 | 83 | 0.90 | 100 | 2 | 15 | 10 | 100 |
| Mexico | 10,200 | 77 | 0.76 | 96 | 11 | 13 | 4 | 99 |
| Mongolia | 4,100 | 68 | 0.70 | 64 | 19 | 15 | 4 | 90 |
| Nepal | 700 | 68 | 0.54 | 92 | 29 | 12 | 0 | 76 |
| Nigeria | 3,200 | 52 | 0.50 | 69 | 69 | 9 | 1 | 56 |
| Norway | 97,400 | 81 | 0.94 | 100 | 2 | 18 | 11 | 100 |
| Pakistan | 1,300 | 67 | 0.54 | 91 | 66 | 8 | 1 | 94 |
| Peru | 6,600 | 75 | 0.74 | 87 | 13 | 13 | 2 | 91 |
| Philippines | 2,900 | 69 | 0.66 | 92 | 22 | 11 | 1 | 88 |
| Russian Federation | 12,700 | 71 | 0.78 | 97 | 8 | 14 | 13 | 100 |
| Sierra Leone | 800 | 46 | 0.37 | 63 | 87 | 8 | 0 | 14 |
| Singapore | 56,300 | 82 | 0.90 | 100 | 2 | 15 | 3 | 100 |
| South Africa | 6,500 | 57 | 0.66 | 93 | 34 | 13 | 9 | 85 |
| United Arab Emirates | 44,200 | 77 | 0.83 | 100 | 6 | 13 | 20 | 98 |
| United Kingdom | 45,600 | 81 | 0.89 | 100 | 4 | 16 | 7 | 100 |
| United States | 54,600 | 79 | 0.91 | 99 | 6 | 17 | 16 | 100 |
| Uzbekistan | 2,000 | 68 | 0.66 | 87 | 34 | 12 | 4 | 100 |
| Viet Nam | 2,000 | 76 | 0.64 | 98 | 17 | 12 | 2 | 99 |
| Yemen, Rep. | 1,400 | 63 | 0.50 | 55 | 34 | 9 | 1 | 48 |

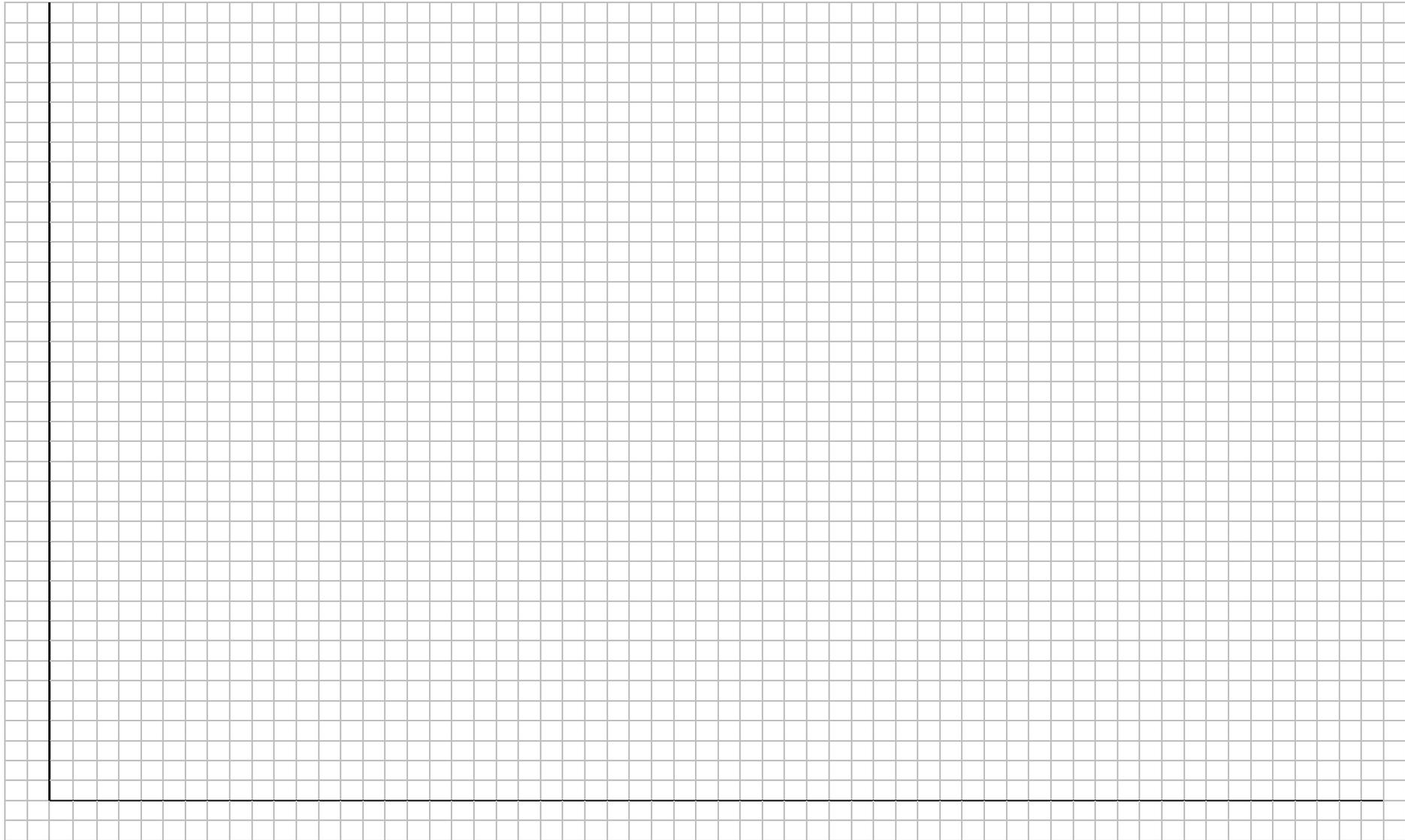
Data sources: ¹World Bank Open Data (2012-2015): data.worldbank.org ²UNDP Data (2013): hdr.undp.org/en/data ³Global Carbon Atlas (2013 - 2013 – data accessed 3rd December 2015): www.globalcarbonatlas.org

Development data 2

| Country | GDP per capita (current US\$ - to the nearest \$) ¹ | Life expectancy (years – to the nearest whole number) ¹ | Human Development Index (to two decimal places) ² | Access to improved water source (% of population – to the nearest whole number) ¹ | Infant mortality per 1,000 live births (to the nearest whole number) ¹ | Expected years of schooling of children ² (to one decimal place) | Territorial CO ₂ emissions(tCO ₂ /person /year – to one decimal place) ³ | Access to electricity (% of population – to the nearest whole number) ¹ |
|----------------------|--|--|--|--|---|---|---|--|
| Australia | 61,887 | 82 | 0.93 | 100 | 3 | 19.9 | 14.6 | 100 |
| Bolivia | 3,236 | 67 | 0.67 | 90 | 31 | 13.2 | 1.7 | 91 |
| Brazil | 11,385 | 74 | 0.74 | 98 | 15 | 15.2 | 2.4 | 100 |
| Bulgaria | 7,713 | 74 | 0.78 | 99 | 9 | 14.3 | 5.7 | 100 |
| Chile | 14,528 | 80 | 0.82 | 99 | 7 | 15.1 | 5.1 | 100 |
| China | 7,594 | 75 | 0.72 | 96 | 9 | 12.9 | 7.2 | 100 |
| Ethiopia | 565 | 64 | 0.44 | 57 | 41 | 8.5 | 0.1 | 27 |
| Germany | 47,627 | 81 | 0.91 | 100 | 3 | 16.3 | 9.2 | 100 |
| Haiti | 824 | 63 | 0.47 | 58 | 52 | 7.6 | 0.2 | 38 |
| India | 1,596 | 66 | 0.59 | 94 | 38 | 11.7 | 1.9 | 79 |
| Iran, Islamic Rep. | 5,315 | 74 | 0.75 | 96 | 13 | 15.2 | 7.9 | 100 |
| Italy | 34,960 | 82 | 0.87 | 100 | 3 | 16.3 | 5.8 | 100 |
| Jamaica | 5,290 | 73 | 0.72 | 94 | 14 | 12.5 | 2.6 | 93 |
| Japan | 36,194 | 83 | 0.90 | 100 | 2 | 15.3 | 9.8 | 100 |
| Mexico | 10,230 | 77 | 0.76 | 96 | 11 | 12.8 | 3.8 | 99 |
| Mongolia | 4,129 | 68 | 0.70 | 64 | 19 | 15.0 | 4.4 | 90 |
| Nepal | 697 | 68 | 0.54 | 92 | 29 | 12.4 | 0.2 | 76 |
| Nigeria | 3,203 | 52 | 0.50 | 69 | 69 | 9.0 | 0.5 | 56 |
| Norway | 97,363 | 81 | 0.94 | 100 | 2 | 17.6 | 11.5 | 100 |
| Pakistan | 1,334 | 67 | 0.54 | 91 | 66 | 7.7 | 0.9 | 94 |
| Peru | 6,551 | 75 | 0.74 | 87 | 13 | 13.1 | 2.1 | 91 |
| Philippines | 2,871 | 69 | 0.66 | 92 | 22 | 11.3 | 0.9 | 88 |
| Russian Federation | 12,736 | 71 | 0.78 | 97 | 8 | 14.0 | 12.7 | 100 |
| Sierra Leone | 775 | 46 | 0.37 | 63 | 87 | 7.5 | 0.1 | 14 |
| Singapore | 56,287 | 82 | 0.90 | 100 | 2 | 15.4 | 3.2 | 100 |
| South Africa | 6,478 | 57 | 0.66 | 93 | 34 | 13.1 | 8.5 | 85 |
| United Arab Emirates | 44,204 | 77 | 0.83 | 100 | 6 | 13.3 | 19.8 | 98 |
| United Kingdom | 45,603 | 81 | 0.89 | 100 | 4 | 16.2 | 7.3 | 100 |
| United States | 54,629 | 79 | 0.91 | 99 | 6 | 16.5 | 16.4 | 100 |
| Uzbekistan | 2,038 | 68 | 0.66 | 87 | 34 | 11.5 | 3.6 | 100 |
| Viet Nam | 2,052 | 76 | 0.64 | 98 | 17 | 11.9 | 1.8 | 99 |
| Yemen, Rep. | 1,408 | 63 | 0.50 | 55 | 34 | 9.2 | 1.0 | 48 |

Data sources: ¹World Bank Open Data (2012-2015): data.worldbank.org ²UNDP Data (2013): hdr.undp.org/en/data ³Global Carbon Atlas (2013 - 2013 – data accessed 3rd December 2015): www.globalcarbonatlas.org

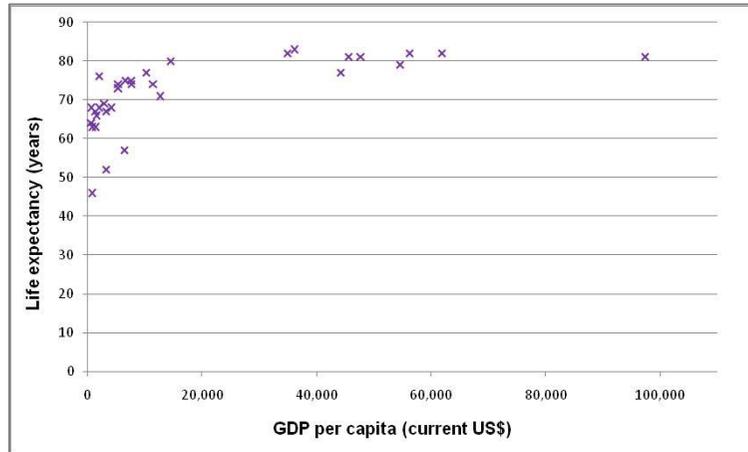
Scatter graph template



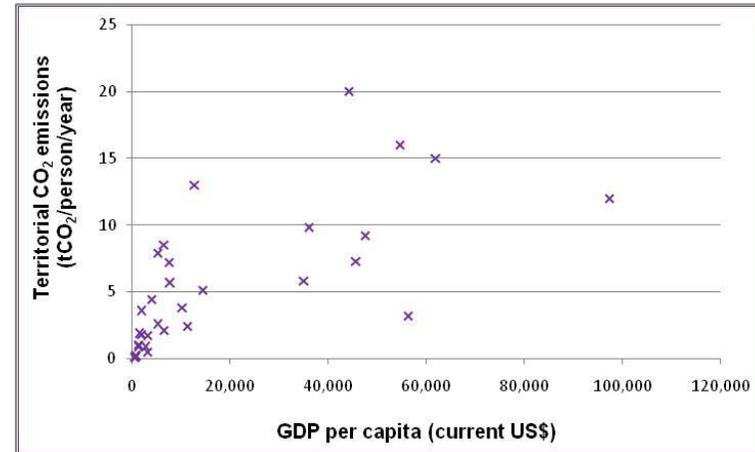
Year

Scatter graphs 1

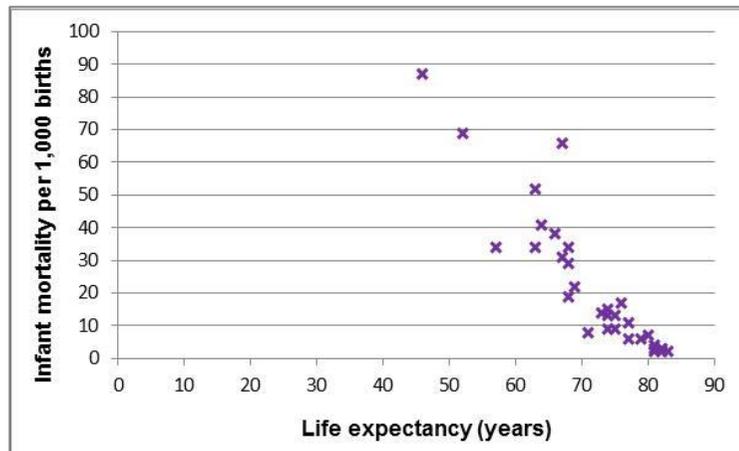
Comparing life expectancy and GDP per capita



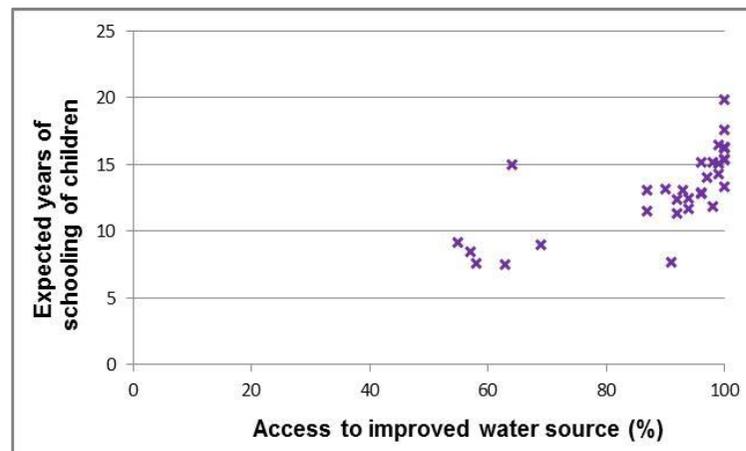
Comparing territorial CO₂ emissions and GDP per capita



Comparing infant mortality and life expectancy

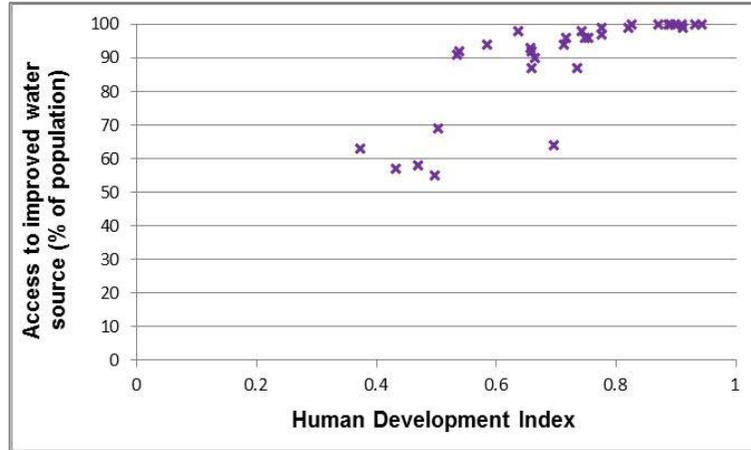


Comparing expected years of schooling and access to water

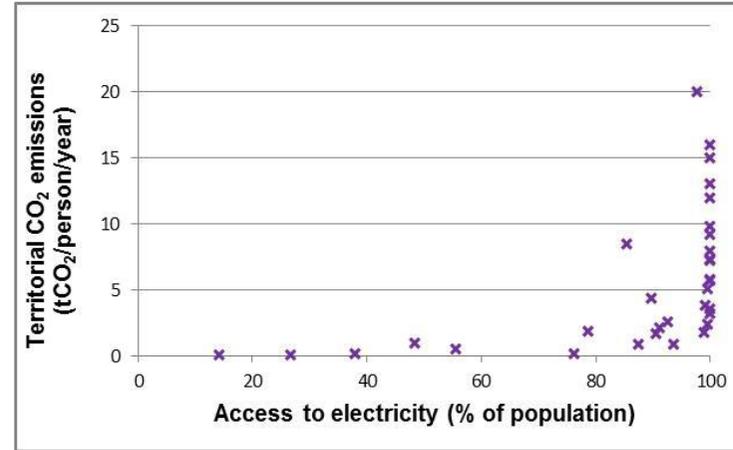


Scatter graphs 2

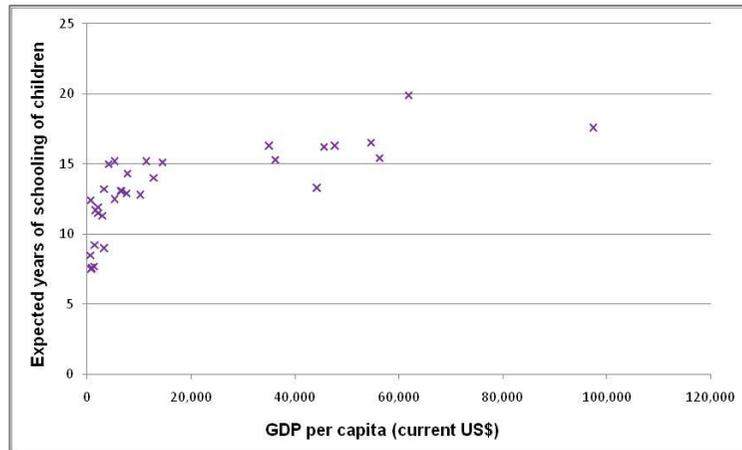
Comparing Human Development Index and access to water



Comparing territorial CO₂ emissions per capita and access to electricity



Comparing expected years of schooling and GDP per capita



Comparing Human Development Index and infant mortality

