Lesson 1
The development gap and Africa's digital divide

Starter
The development gap

The key geographical concept serving as a background for this 21st Century Challenge (investigating digital technology in Africa) is **the development gap**.

As a starter activity, find out what students know about global disparities and how they can be measured. They should be thinking primarily about **economic** disparities, measured using gross domestic product (GDP), gross national income (GNI) or a similar measure. Closely associated with this are the **social** disparities, such as differences in life expectancy, literacy and health.

In addition, a broader interpretation of development may encompass differences in human rights, gender equality and democratisation.

It is important for students to grasp that the development gap is a phenomenon that manifests itself at different **scales**. In the second lesson, they will see evidence that suggests Kenya has become a **two-speed society** in its own right (half the population now possess a mobile phone, whereas half do not).

While technology might play a role in closing the development gap between developed countries and poorer countries, it can also contribute to widening inequalities **within** nations. For instance, much new wealth has grown in the emerging economy of India in recent years as a result of ICT-led development (such as the hi-tech out-sourcing that takes place in Bangalore). However, internal disparities within India are now greater than ever before because the poorest rural people have not shared in this new growth. Will this growth pattern be repeated in African countries like Kenya? Very possibly so.

> **Specification advice**
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> **Edexcel, OCR, AQA, WJEC and IBO Diploma** centres will all be investigating aspects of the development gap, its causes and possible solutions. Knowledge of how technology could help different countries meet their Millennium Development Goal targets will be very useful for students following all of these courses.

> **Key terms**
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> **Digital divide** Some people do not have the means to access online information and services. A further distinction can be made between people who have mobile access to fast internet services and those who can only use mobiles to make telephone calls.
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> **Development gap** A term used to describe the polarisation of the world's population into 'haves' and 'have-nots' measured in terms of economic and social development indicators.

> **Teaching tip**
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> The web-link suggested below is a well-known one. It is an excellent graphic for overhead projection as part of a lesson starter investigating global disparities in access to technology.
> http://image.guardian.co.uk/sys-files/Guardian/documents/2008/02/01/SEA_CABLES_010208.pdf

Main activity

(1) The importance of the Millennium Development Goals

The Millennium Development Goals (MDGs) are eight specific goals to be met by 2015 that aim to combat extreme poverty across the world.

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV and AIDS, malaria and other diseases
- Ensure environmental sustainability
- Develop a global partnership for development

These goals were created at the UN Millennium Summit in New York in 2000. The Millennium Declaration, adopted by the world leaders, promised to: 'free all men, women, and children from the abject and dehumanizing conditions of extreme poverty.' The declaration was adopted by 189 nations and signed by 147 heads of state. At the UN MDG Summit in September 2010, world leaders reaffirmed their commitment to the Goals. Table 1 provides a progress report for sub-Saharan Africa (2010).

Goals	Progress update
Sub-Saharan Africa recently improved the fastest among all developing regions in many areas of social development, especially those related to **diseases** and **health**. But there are still wide disparities.	• Sub-Saharan Africa leads the world in steadily reducing new HIV infections. • Between 2000 and 2009, sub-Saharan Africa had the largest decreases in malaria deaths of any region. • The number of people in the region with access to safe drinking water increased from 252 million to 492 million between 1990 and 2008, growing from 49 to 60 per cent of the population. • However, in cities, the poorest 20 per cent of households are 12 times less likely to enjoy piped drinking water at home than the richest 20 per cent. • And 62% of the urban population still lives in slums, the highest rate of any region.
Some positive **education** gains were made between 1999 and 2009.	• However, almost half of the world's out-of-school children (32 million) live in sub-Saharan Africa. • And girls' school enrolment in sub-Saharan Africa remains the second lowest of all regions at the primary education level and the lowest at the secondary and tertiary education levels.
Efforts to reduce **child mortality** in the region have met with mixed results.	• Four countries achieved more than a 50 per cent reduction between 1990 and 2009. • However, one in eight children in sub-Saharan Africa still dies before the age of five in 2009, around 18 times the average found in developed countries.

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Sub-Saharan Africa still has the highest **maternal mortality** level in the world.	• There were 640 maternal deaths per 100,000 live births in sub-Saharan Africa in 2008. • This is more than twice the average in the developing regions and 38 times the average in the developed regions.
Sub-Saharan Africa is not on track to meet the **poverty-reduction** target.	• In 2005, 51% of its population lived in extreme poverty (living on less than $1.25 a day), down only seven points from 58% in 1990. • Although aid to developing countries reached a record high in 2010, only $11 billion has been received of the $25 billion increase promised to sub-Saharan Africa at the 2005 Gleneagles G8 Summit, owing mainly to shortfalls from some European donors that give large shares of their aid to Africa. • On a positive note, recent World Bank projections are slightly more upbeat, forecasting that the extreme poverty rate in the region will fall below 36% by 2015, based on economic growth performance and trends.

Table 1:   Recent progress made towards MDG targets in sub-Saharan Africa
http://www.un.org/millenniumgoals/MDG2011_SSA_EN.pdf

The overall verdict? Far more needs to be done if the MDG goals are to be met by 2015. In the next part of the main activity, we ask: *can digital technology play a key role in helping move things forward?*

Main activity
(2) Can digital technology help bridge Africa's development gap?

"I remember sitting on a farm outside Mombassa with some farmers, they didn't have water, they didn't have power but they each had a mobile phone. They were talking excitedly about connecting to the rest of the world to sell their crops. They had this huge sense of potential." (Rory Cellan-Jones, BBC News)

In countries where the lack of any effective communications infrastructure has traditionally been one of the biggest obstacles to economic growth, mobile technology is helping to change lives for the better:

• Money can now be directly transferred between phone users (many millions of Kenyans regularly use Vodafone's M-Pesa money transfer service).
• Fishermen and farmers use mobiles to check market prices before selling produce (there are parallels here with Fair Trade, as producers are able to avoid exploitation by "the middle man" once they have learned the true market value of their produce. Compared with Fair Trade, however, this is a less dependent form of empowerment, and is representative of true "bottom-up" action).
• Greater mobile uptake can even support democracy: political parties finally have a means of getting their message across to more people; many political commentators noted that ICT and social networks such as Facebook played an

important role toppling autocratic and dictatorial regimes in north Africa during the 2011 "Arab Spring".

Case study: "One Laptop per Child"

Professor Nicholas Negroponte is the founder of the Miami-based NGO called "One Laptop Per Child", whose "top down" mission statement is to empower the world's poorest children through education. Funded by TNCs such as Google and News Corp, roughly 1.6 million children   and teachers in Latin America are currently   part of an OLPC project, and another 500,000 in Africa and the rest of the world.

Teaching tip

Watch the lecture given by Professor Nicholas Negroponte in full at: http://www.21stcenturychallenges.org/focus/nicholas-negroponte-one-laptop-per-child/

Investigate the One Laptop Per Child (OLPC) initiative at: http://one.laptop.org/about/mission

OLPC success stories include Uruguay (which aims to provide every elementary school child with a laptop), Peru (where OLPC have helped over 8,300 schools), Argentina, Mexico, and Rwanda. Other significant projects have been started in Gaza, Afghanistan, Haiti, Ethiopia, and Mongolia.

Professor Negroponte explains that "each OLPC laptop has 100 books on it. That doesn't take much space, it's pretty trivial. But when you ship 100 laptops to an African village, which we have done many times, each laptop has 100 different books, so that's 10,000 books."

His organisation focuses on providing children with the tools and resource they need to unlock their learning capability. But there are broader development goals here, too.

- In Peru, about half of all OLPC children are in turn teaching their parents how to read and write. Children are therefore becoming agents of change.
- Anecdotally, truancy falls to zero in African schools once OLPC have provided laptops, because "the kids love these computers".

Professor Negroponte stresses that it costs very little - just $1 a week to buy, maintain and update the laptop over its life-time of several years.

"In Uruguay, one child of 7 had to complete a project on cows. Her father told her that her luck was in, as their cow was due to give birth that night. She stayed up all night and videoed the birth of the cow. As a class they figured out how to upload it onto Facebook. The clip got 100,000 hits. The child's self-esteem benefited. She was not a good student before but, oh boy, she is good now." (Professor Negroponte)

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Case study: "Community knowledge workers" help bring economic development to Uganda

About 400 so-called "community knowledge workers" in Uganda are using Android phones loaded with an open-source data-collection application that feeds data into a system called Salesforce. The phones are powered by batteries that can be recharged in a variety of ways, including solar and bicycle (see photograph).

Developed by the Seattle-based Grameen Foundation Technology Center, the project offers farmers microloans to buy an Android phone loaded with information about when and how to plant crops, care for farm animals and find markets for products.

Those farmers can then serve as experts in their villages. Other people turn to them with questions about crops or farm animals. The knowledge workers find answers in information loaded on the phones while also gathering information about the farmers they talk to.

Android is an open source technology. This meant that Grameen can hire its own software developers to customize the phones for improved use of power and to make applications usable when the phones aren't connected to the network. The company is hoping to make the project self-sustaining and has begun working with other agencies, including the World Bank, that see value in the network of knowledge workers.

The knowledge workers have interacted with 24,000 households so far and 75% of farmers say they find the information offered by the knowledge workers to be very useful.

The interaction is helping the farmers optimise their crop-planting activities based on weather information. They can also research the real value of their crops at markets, helping them to negotiate better prices. Online veterinary advice helps them provide better care for livestock.

The knowledge workers must take out microloans to help them buy the phones and charging stations. They get paid for their work and paying back the loan in monthly instalments takes about two years.

Adapted from: http://www.cio.co.ke/Main-Stories/android-phones-help-poor-farmers-in-uganda.html

A new UN report paints a positive picture of poor parts of the world finally becoming connected by improved communications technologies. The spread of mobile cellular services is apparently making "great strides towards connecting the previously unconnected" according to the International Telecommunications Union (ITU), an agency of the UN.

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ITU has found that Africa is the world continent currently showing the fastest growth rate for mobile uptake. Market penetration has soared from just one in 50 people at the turn of the century to 41% in 2011.

Table 2: The uneven geography of internet access in Africa
Source: Internet World Stats, 2008

Nation	Population (thousands)	Internet users (%)	Nation	Population (thousands)	Internet users (%)
Algeria	33770	10	Libya	6174	4
Angola	12531	1	Madagascar	20043	1
Benin	8295	2	Malawi	13932	1
Botswana	1842	4	Mali	12324	1
Burkina Faso	15265	1	Mauritania	3365	1
Burundi	8691	1	Mauritius	1274	27
Camerun	18468	2	Morocco	34343	21
Cape Verde	427	9	Mozambique	21285	1
Chad	10111	1	Namibia	2089	5
Comoros	732	3	Niger	13273	1
Congo	3903	2	Nigeria	138283	7
DR Congo	66514	1	Rwanda	10186	1
Côte d'Ivoire	18373	2	São Tomé and Príncipe	206	11
Djibouti	506	2	Senegal	12853	6
Egypt	81713	10	Seychelles	82	39
Equatorial Guinea	616	1	Sierra Leone	6295	1
Eritrea	5028	2	Somalia	9559	1
Ethiopia	78254	1	South Africa	43786	12
Gabon	1486	5	Sudan	40218	4
Gambia	1735	6	Swaziland	1128	4
Ghana	23383	3	Tanzania	40213	1
Guinea	10211	1	Togo	5859	5
Guinea Bissau	1503	2	Tunisia	10383	17
Kenya	37954	8	Uganda	31368	6
Lesotho	2128	3	Zambia	11669	4
Liberia	3335	1	Zimbabwe	12382	11

But access to broadband services in remoter rural areas of Africa is still patchy, as Table 2 shows. There are also broader issues of reliability and "social performance" and value-for-money to consider:

- *Reliability (energy security concerns)* In many areas, intermittent electricity supplies prejudice the usefulness of broadband. Businesses and schools may struggle to deliver their services if beset by constant power cuts.
- *"Social performance"* This phrase refers to the way in which a society actually possesses the skills and knowledge needed to make the technology perform in a useful way. According to some researchers, although ICT facilities have been

delivered to schools, they are not always being used and my not represent value for money. Speaking at the RGS-IBG "Geographical perspectives on ICT" conference recently, Dr David Hollow cited the example of a school in Malawi where new computers were not even turned on for a year after they were delivered.

- *Value for money*   Dr Hollow calculates that it would cost $2.4 billion to provide every Ethiopian child with a laptop, whereas a complete set of school textbooks for every child would cost just £38 million (3% of the laptop cost).

Plenary
'Putting the cart before the horse': the literacy problem

Students can end their lesson by discussing whether they believe that money on ICT and broadband might be better spent on more teachers and textbooks if overall literacy rates in Africa are to be improved.

They could reflect on their own experiences at school, asking whether ICT and interactive forms of learning have really "added value" - or are simply one way of many to develop knowledge and skills.

Looking at the big picture, just how important is it to make sure that schools and young people in the world's poorest countries are provided with connectivity as a matter of urgency?