

DATA POWER

TEACHERS' OVERVIEW

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Aims of *Data Power*

- To support teachers to fulfil demands of the computing national curriculum in England, ICT to Enhance Learning in Scotland and the Digital Competencies Framework in Wales.
- To use real-life data to engage learners and enable them to see the practical relevance of computing in the world around them.
- To encourage participatory, investigative and collaborative teaching and learning styles.
- To promote critical thinking about issues related to inequality.

Introduction

The power of data

Data is everywhere around us, shaping the world in which we live. Whether online or offline, each one of us has an ever growing data footprint. From setting government budgets to stocking supermarket shelves, from adverts on social media to traffic lights, the vast amount of data collected about us has an increasing influence on our world.

There has never been a greater need to support young people to make sense of data and, understand its use (as well as its potential misuse). Collecting, analysing, evaluating and presenting data are essential skills in the UK's computing curricula and important elements of the curricula of maths and other subjects too. Created with input and support from Computing At School, this inspiring resource for 9-13 year olds demonstrates the purpose of computing through the use of real-life data from different countries and communities in the world.

Learners will consider what data is collected about our lives and how this data is used. They will collect and present data to show how they spend their time during a typical day, before thinking about how “time use” data might vary among young people in different parts of the UK and elsewhere in the world. Learners will then think about what we “need” to do well in life and how data can help communities, governments and organisations to make decisions when planning for the future. They will be introduced to the Young Lives project and will use data visualisation tools to explore time use data from young people in Ethiopia, India, Peru and Viet Nam.

Learners will also find out about the importance of data in raising awareness of issues and challenging decision makers to take action. Finally, learners will investigate “well-being” data from the four Young Lives countries as well as the UK, and create infographics to raise awareness of some of the inequalities which exist between the lives of young people.

What is Young Lives?

Young Lives is an international research project studying the causes and consequences of children’s poverty. For over 15 years, researchers have followed the lives of nearly 12,000 children in four countries. The project is led by a team in the Department of International Development at the University of Oxford in the UK, in association with research and policy partners in four study countries: Ethiopia, India, Peru and Viet Nam.

The research has followed all 12,000 children and has involved repeat visits to their communities every three years. Survey data has been collected about their lives, families, communities and schools through interviews with all the children, as well as their parents and some community representatives. Further in-depth work has been carried out with a smaller number of children in each country during which researchers spent roughly a week in the community, working with the children both individually and in groups with their peers. They have also interviewed other members of their families and communities. This provided the sort of insight and information that is hard to capture in a large survey questionnaire.

Find out more about Young Lives: www.younglives.org.uk

How is the Young Lives data used?

- *Planning for the future*

The aim of Young Lives is to provide evidence for governments and international organisations in order to help them to improve policies and programmes for children. The researchers have gained enormous insight into the lives of found out a lot about the individual children and their families; such as where and how they live, the problems they face and whether they consider their lives to be good or bad. They have explored the children’s hopes and fears, as well as their dreams for the future.

Governments and organisations use data, such as that from Young Lives, to help them decide how to allocate money and resources. They also rely on data to set targets for development and monitor progress towards these. In September 2015, country leaders came together to agree the Sustainable Development Goals (SDGs). The SDGs are a set of goals which aim to make our planet fair, healthy and sustainable by 2030. Data is used to measure progress on the SDGs every year, with the aim of achieving all the goals by 2030.

Find out more about the SDGs: sustainabledevelopment.un.org/sdgs

Oxfam’s vision is a world without poverty. It works with partner organisations and communities in over 90 countries to respond to emergencies, support people to take medium and long-term actions

to lift themselves out of poverty and campaign to tackle the root causes of poverty. Data, like that from Young Lives, helps Oxfam to identify which countries, communities or groups of people are in the most need of support.

- *Raising awareness of inequality*

Organisations such as Oxfam also use data to raise awareness of issues such as inequality and climate change; highlighting the impacts on communities around the world and challenging decision-makers to take action.

A key issue that Oxfam works on is inequality, which refers to wide differences in a population in terms of their wealth, income and access to essential services such as health and education. These differences can occur between communities in the same country, or between countries. Inequality can also apply to unequal opportunities (life chances) and outcomes.

A rapidly growing gap between rich and poor is being seen in many countries around the world. We now live in a world where the richest 62 people own the same wealth as the poorest half of the world's population (3.6 billion people).¹ Seven out of 10 people live in countries where economic inequality has increased in the last 30 years. If the entire wealth of the planet were divided into two, almost half would go to the richest 1 per cent and the other half to the remaining 99 per cent of the population.² Inequality is also an increasing problem in the UK. The richest five families in the UK are now wealthier than the bottom 20 per cent of the population (12.6 million people).³

For further background information about inequality, see the *Background notes for teachers* in Oxfam's *More or Less Equal?* maths resource: www.oxfam.org.uk/education/resources/more-or-less-equal-maths

Curricular links

This resource focuses on the subject of computing and supports the following areas of the national curricula in England, Scotland and Wales. The activities also develop learners' computational thinking: the skills and techniques to help learners solve problems effectively, with or without the aid of a computer. Some activities could easily be linked to other areas of the curriculum, such as maths, English and PSHE or citizenship. There are many ways in which learning and understanding could be further developed in computing as well as other subjects and each session provides ideas and suggested resources for this.

- *In England*

Pupils should be taught to:

KS2 Computing

- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

¹ *An Economy for the 1%: How privilege and power in the economy drive extreme inequality and how this can be stopped* (Deborah Hardoon, Ricardo Fuentes-Nieva and Sophia Ayele, Oxfam International, 2016)

² *Working for the few: Political capture and economic inequality* (Ricardo Fuentes-Nieva and Nick Galasso, Oxfam International, 2014) policy-practice.oxfam.org.uk/publications/working-for-the-few-political-capture-and-economic-inequality-311312

³ *A Tale of Two Britains: Inequality in the UK* (Sarah Dransfield, Oxfam, 2014) policy-practice.oxfam.org.uk/publications/a-tale-of-two-britains-inequality-in-the-uk-314152

KS3 Computing

- Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users.

- *In Wales*

Numeracy Framework

- Using data skills: collect and record data, present and analyse.

Digital Competencies Frameworks

- Data and information literacy - explore and analyse data sets.

- *In Scotland*

ICT to Enhance Learning

- As I extend and enhance my knowledge of features of various types of software, including those which help find, organise, manage and access information, I can apply what I learn in different situations.

TCH 1-03a / TCH 2-03a

- I explore and experiment with the features and functions of computer technology and I can use what I learn to support and enhance my learning in different contexts.

TCH 1-04a / TCH 2-04a

- I can create, capture and manipulate sounds, text and images to communicate experiences, ideas and information in creative and engaging ways.

TCH 1-04b / TCH 2-04b

- I can explore and use the features of a variety of familiar and unfamiliar software to determine the most appropriate to solve problems or issues.

TCH 3-03a

- I enhance my learning by applying my ICT skills in different learning contexts across the curriculum.

TCH 3-04a

Structure of *Data power*

The resource consists of:

- Three unit plans (including any accompanying resource and activity sheets)
- A slideshow (for use in all three units)
- Three spreadsheets (for use in *Units 2* and *3*)
- A short video clip (*Talking about Young Lives*) and accompanying *Video background notes* (for use in a further activity idea in Unit 2 to extend older learners)
- *Evaluating your learning* (to assess learning at the end of each unit)

We have tried to keep the resources as flexible as possible, so teachers can create personalised learning journeys for their learners. Teachers may decide to omit some activities depending on the

time available and their learners' existing knowledge, understanding and needs. *It is assumed that teachers will choose to spread the activities in a unit over more than one lesson.*

Each unit starts with an overview and includes learning objectives, learning outcomes, key questions and curricular links. Suggested activities are provided with approximate timings but do not include the time that may be needed for additional teaching about some of the concepts. As the units are designed for flexible use across more than one lesson, the total time taken to complete all the activities may vary. No starters and plenaries are included as it is assumed that teachers will want to plan these individually.

Unit overviews:

Unit 1 – Thinking about data

Learners will discuss what data is. They will explore examples of data collected about their lives, and consider how this data is used by different people and organisations. Learners will collect and present data to show how they spend their time during a typical day. Finally, they will compare their “time use” data with others in the class and speculate how “time use data” might vary among young people in different parts of the UK and elsewhere in the world.

Unit 2 – Data about Young Lives

Learners will think about what they need to do well in life and the difference between “needs” and “wants”. They will then consider how they would spend a community’s money and how data might support their decision making. Next, learners will be introduced to Young Lives and start to think about how the data collected during this project is being used by governments and organisations (such as Oxfam) to support communities. Finally, learners will use data visualisation tools to explore and present “time use” data from the Young Lives communities. They will compare “time use” data from boys and girls, as well as from children living in urban or rural communities, and discuss possible reasons for any differences.

Unit 3 – The power of data

In this unit, learners will create simple infographics which raise awareness of some of the inequalities that exist between people’s lives. Learners will first consider how and why governments and organisations use data to make decisions when planning for the future. They will investigate some ways in which “well-being” is quantitatively measured and consider questions about data from the four Young Lives countries, as well as the UK. Learners will then discuss what inequality means and how it can exist both between and within countries. They will explore how organisations, such as Oxfam, use infographics to raise awareness of inequality, before going on to create infographics of their own.

Differentiation

Where possible the activities and resources are differentiated to help you meet the needs of different learners in the class. This might also be useful in adapting some of the activities to meet the needs of younger and older learners.

Many of the activities assume that learners will have access to a computer or tablet. However, where possible, alternatives have been provided to enable learners to complete activities without computer access.

Age group

These resources are suitable for use with learners aged 9 to 13 years old. Curricular links are provided for the KS2 and KS3 curricula in England, and the relevant curricula in Wales and Scotland. However, many of the activities could also be adapted for use with younger or older learners.

Evaluation

A set of “evaluation wheels” to assess learning at the end of each unit is provided in *Evaluating your learning*. There is also a blank evaluation wheel for teachers to create their own evaluations to meet the particular needs of learners.

Important teaching notes

- *These activities and resources are intended to support your teaching, rather than guide it. Additional teaching may be required to develop learners’ knowledge, skills and understanding of some concepts.*
- *Some of the data in this resource, such as the data from the World Bank, is subject to change. Therefore, if your learners are finding data from the internet themselves, you may find that their figures differ slightly from those published in this resource, which were correct at the time of publication.*
- *All of the web links provided were correct at the time of publication.*

Other useful Oxfam Education resources

- *Everyone Counts*

This maths resource for 8 to 12 year olds supports key elements of the maths curriculum with real-life statistics and stories. Using data about children living in Young Lives communities in Ethiopia, India, Peru and Viet Nam, learners will develop their skills and understanding of topics such as time and data handling.

- Find out more: www.oxfam.org.uk/education/resources/everyone-counts

- *More or Less Equal?*

More or Less Equal? is a set of maths, geography and English resources for 11 to 16 year olds. The resource uses real life data and case studies from the Young Lives project to engage learners and enable them to see the practical relevance of geography, maths and English in the world around them.

- Find out more:

www.oxfam.org.uk/education/resources/more-or-less-equal-maths

www.oxfam.org.uk/education/resources/more-or-less-equal-geography

www.oxfam.org.uk/education/resources/more-or-less-equal-english

Data power – Detailed resource outline

Unit overview	Learning objectives	Learning outcomes	Key questions	Activities	Resources
<p>Unit1: <i>Thinking about data</i></p>	<ul style="list-style-type: none"> To understand what data is and how it can be processed to create information. To become familiar with some data collected by organisations and how this data is used. To develop skills in collecting and presenting data. To recognise that “time use” data will vary among young people and to be aware of some possible reasons for any differences. 	<ul style="list-style-type: none"> Learners will recognise what data is and how can it be processed to create information. Learners will describe some examples of data about their lives which are collected by organisations and explain how this data is used. Learners will collect and present data about their daily time use. Learners will compare their “time use” data with others and identify possible reasons for any differences between young people in their class, the UK and elsewhere in the world. 	<ul style="list-style-type: none"> What is data? Why do people collect data and how do they use it? What data is collected about me? How do I spend my day? What similarities and differences do you think there might be between our daily time use and that of young people in other parts of the UK or the world? 	<ul style="list-style-type: none"> Activity 1.1: <i>What is data and why do people collect it?</i> Activity 1.2: <i>How do I spend my day?</i> 	<ul style="list-style-type: none"> <i>Data power</i> slideshow: slides 2 to 13 Activity sheets: <ol style="list-style-type: none"> <i>My day</i> <i>My time use bar chart</i>
<p>Unit 2: <i>Data about Young Lives</i></p>	<ul style="list-style-type: none"> To develop skills in using data visualisation software to present and compare daily time use for children in the Young Lives communities. To understand the difference between “needs” and “wants” and to be aware that some people around the world are unable to access basic “needs”. To develop skills for working in a group to discuss ideas and make decisions. To know what Young Lives is and understand the ways in which data collected during this project might be used by governments and organisations. 	<ul style="list-style-type: none"> Learners will use data visualisation software to present and compare “time use” data from children in the Young Lives communities. Learners will list some things we “need” to be doing well in life. Learners will work with others in a group to rank spending priorities for an imaginary community. Learners will identify similarities and differences in daily time use between different groups of young people, as well as exploring potential reasons for these. 	<ul style="list-style-type: none"> How would you present this data? What do we “need” to do in life? How would you spend a community’s money? What data might help you to decide? What is Young Lives? What similarities and differences are there in daily life and time use between different groups of children from the Young Lives communities? 	<ul style="list-style-type: none"> Activity 2.1: <i>What do we need to do well in life?</i> Activity 2.2: <i>Sharing out the money</i> Activity 2.3: <i>Welcome to Young Lives</i> Activity 2.4: <i>Comparing time use</i> 	<ul style="list-style-type: none"> <i>Data power</i> slideshow: slides 14 to 32 Resource sheets: 1. <i>Meet Afework</i>; 2. <i>Meet Tufa</i>; 3. <i>Meet Ravi</i>; 4. <i>Meet Harika</i>; 5. <i>Meet Luz</i>; 6. <i>Meet Manuel</i>; 7. <i>Meet Hung</i>; 8. <i>Meet Lien</i>; 9. <i>Time use and gender</i>; 10. <i>Urban and rural time use</i> Activity sheets: 1. <i>Sharing out the money</i>; 2. <i>Young Lives time use bar chart</i> Spreadsheets: 1. <i>Time use and gender</i>; 2. <i>Urban and rural time use</i>

Unit overview	Learning objectives	Learning outcomes	Key questions	Activities	Resources
<p>Unit 3: <i>The power of data</i></p>	<ul style="list-style-type: none"> To develop skills in using software to create an infographic. To be aware of some “well-being” data that governments, organisations and communities use to plan for the future. To know what inequality means and recognise some of the inequalities that exist between and within the Young Lives countries and the UK. 	<ul style="list-style-type: none"> Learners will create simple infographics which raise awareness of some of the inequalities that exist between people’s lives. Learners will consider some measures of “well-being” that governments, organisations and communities use to plan for the future. Learners will explore “well-being” data from the Young Lives countries and the UK. 	<ul style="list-style-type: none"> What data do you think might be useful to governments and organisations when planning for the future? What does inequality mean? What inequalities exist between and within countries? How and why might organisations use infographics to present data? What infographic could you create to raise awareness of the inequalities which exist between countries? 	<ul style="list-style-type: none"> Activity 3.1: <i>Measuring well-being</i> Activity 3.2: <i>Raising awareness</i> 	<ul style="list-style-type: none"> <i>Data power</i> slideshow: slides 33 to 41 Resource sheet: <i>1. Measuring well-being</i> Activity sheet: <i>1. Planning your infographic</i> Spreadsheet: <i>1. Measuring well-being</i>

Global citizenship

This is a global citizenship resource written for teachers of computing with 9 to 13 year olds. Education for global citizenship is a methodology to help young people to develop as active global citizens. Oxfam suggests a Learn-Think-Act approach to help structure global citizenship activities and give young people the opportunity to learn about issues, think critically about how to solve them, and act as responsible global citizens. Actions may simply be to find out more or think more deeply about an issue. They may also involve making others more aware of an issue or engaging in specific fundraising or campaigning activities. For more information, see:

www.oxfam.org.uk/education/global-citizenship

The key elements of responsible global citizenship are:

Knowledge and understanding	Skills	Values and attitudes
<ul style="list-style-type: none"> • Social justice and equity • Identity and diversity • Globalisation and interdependence • Sustainable development • Peace and conflict • Human rights • Power and governance 	<ul style="list-style-type: none"> • Creative and critical thinking • Empathy • Self-awareness and reflection • Communication • Co-operation and conflict resolution • Ability to manage complexity and uncertainty • Informed and reflective action 	<ul style="list-style-type: none"> • Sense of identity and self-esteem • Commitment to social justice and equity • Respect for people and human rights • Value diversity • Concern for the environment and commitment to sustainable development • Commitment to participation and inclusion • Belief that people can bring about change

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- For further information about Oxfam Education, including a wide range of other curriculum-linked resources: www.oxfam.org.uk/education
- For further information about the Young Lives project: www.younglives.org.uk/
- For further information about Computing At School: www.computingschool.org.uk/

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