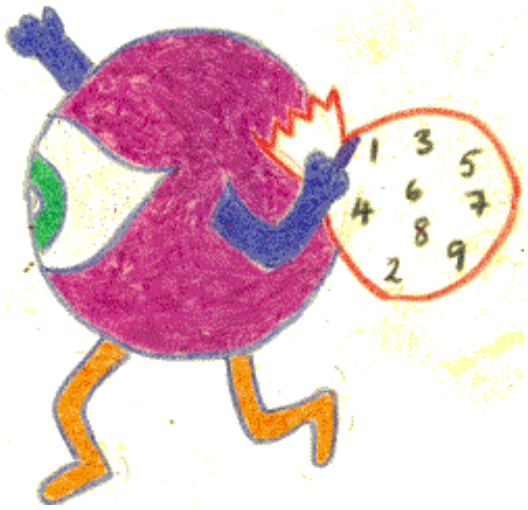
Relevant & Engaging Statistics & Data Handling

Using your Learners' own Data



Centre for Statistical Education

Chapter 2

Second Edition: published in the UK in 2009 by

The Royal Statistical Society Centre for Statistical Education
The University of Plymouth
Plymouth
PL4 8AA
UK

We would like to thank the many contributors to this book. These include: Doreen Connor, Neville Davies, John Marriott, Alan Catley (Chapter 4) and Mark Crowley (Chapter 6) and those who reviewed and helped in it's production including Alison Davies, Claire Webster, Peter Holmes & Elizabeth Gibson.

This booklet is aimed at all secondary level teachers: there are hints and tips that we hope will be useful to support the teaching and learning of statistics and data handling. We hope that you find the material useful. Please email or write to us with suggestions for improvements. We will try to respond to all communications.

Doreen Connor
The Royal Statistical Society Centre for Statistical Education
The University of Plymouth
2009

email info@censusatschool.org.uk

www.censusatschool.org.uk

www.rsscse.org.uk

Chapter 2

Using your Learners' own Data

The title of this booklet is "**Relevant and Engaging Statistics & Data Handling"**, and for the learners in your classroom nothing is more relevant or real than themselves! Using data from and about your learners is one of the easiest ways to engage and motivate them to learn. Children are fascinated by data about themselves and also keen to compare themselves to their peers. To this end the Royal Statistical Society Centre for Statistical Education (RSSCSE) started the ***CensusAtSchool*** project in 2000 in conjunction with the Office for National Statistics. The project, originally a one-off, was linked to the UK population census of 2001. Due to its popularity with teachers and learners during that first phase the project has grown and developed. It is now a dynamic, ongoing and exciting initiative running in a number of countries across the world and widely used in schools across the UK.

The main aims of **CensusAtSchool** are to:

- Involve learners in collecting data about themselves and improve their understanding of a data gathering process, its purpose and benefits to society;
- Foster a positive attitude to statistics through using real data that is of interest to learners;
- Enhance the process of statistical enquiry across the curriculum;
- Encourage effective Information and Communication Technology (ICT) teaching and learning, including the use of the Internet;
- Provide access to large and meaningful data sets;
- Enable comparisons between the learner responses in different countries

In this chapter we will give a brief rundown of the background of the project and follow this with a run through how various aspects can be used in your classroom. The project has its home on an Internet site and this is where you can access all the materials mentioned throughout the chapter. We give the current web address below but the project can equally easily be found by entering 'CensusAtSchool' into any search engine. As our primary aim is to help learners come to love and know how to use statistics there is no charge for any aspect of this project; all materials are freely available. There are online questionnaires, fun quizzes, masses of curriculum resources with ideas for teachers to use in the classroom and much much more:

www.censusatschool.org.uk

Background to the Project

The original ***CensusAtSchool*** questionnaire (Phase 1 Autumn 2000) consisted of a single A4 sheet with simple questions covering information about pupils, their households and their school life. While some of the questions were identical to those in the UK population census, others were designed purely to appeal to the learner's own interests and enthusiasms. Over 2000 primary, secondary and special schools registered for the project and over 60,000 children took part using the Internet site www.censusatschool.org.uk . Since then many other countries have embraced the project with necessary adjustments to reflect local culture and traditions.

These countries include; Queensland, South Australia, South Africa, New Zealand, Canada and later the whole of Australia as well. In March 2007 the first Workshop to discuss the International aspects of CensusAtSchool was held in Melbourne, Australia and consequently in the Phase 8 questionnaire there are 11 international questions included which all involved countries will incorporate within their questionnaires. This will enable closer and valid comparisons to be made between the children participating in CensusAtSchool. The international aspect of the project is generating interest from many other countries and we hope that a number of them will also set up versions of censusatschool. Do visit the websites of the participating nations (you can access these directly from our web portal) and have a look at their projects and the excellent curriculum ideas and resources they have provided.

In the UK the project has gone from strength to strength, with the RSSCSE running a new phase in each subsequent academic year. The project is also frequently used by the DCSF (Department for Children, Schools and Families) in their National Strategy training documents for teachers.

The worldwide database, which contains well over a million responses, can be sampled over the Internet for use in creating teaching and learning materials. It enables teachers and pupils across the world to enhance their data handling skills leading to improved statistical literacy and thinking. The involvement of different countries vastly increases the potential for exchange of information between school-aged children and is a unique way to assess global, social and other changes. It has the added bonus of providing ICT opportunities, and is motivational for both teachers and children alike.

The website at **www.censusatschool.org.uk** provides access to all resources and each country's own ***CensusAtSchool*** website. Do take a look and get involved. The project is totally free to all UK Schools and offers a unique and different experience for your pupils.

Using CensusAtSchool

Below is a rundown of various ways that the project can be used in your classroom to help engage and motivate children to learn more about statistics and data handling.

www.censusatschool.org.uk

Teachers - whether this is your first visit to the site, are trying to get to grips with the new layout or you just aren't sure if you're making the most out of the resources, these pages are for you!

CensusAtSchool is an online survey that started in 2001 in conjunction with the UK population census. Since then, a new phase of questionnaire has been launched each year and we have a database of around a million lines of data from the UK and overseas for you to use in your classroom.

There are 3 main ways to get involved in CensusAtSchool, ***Take Part***, ***Get Data*** and use our ***Resources***.

Take Part by answering one of our *questionnaires* or completing our *quizzes and puzzles*. Each questionnaire has a different theme - they are mostly targeted at secondary students though you will find some primary and post 16 versions in there too. You may like to look at the results of the phase - see *get data* section. To **take part:**

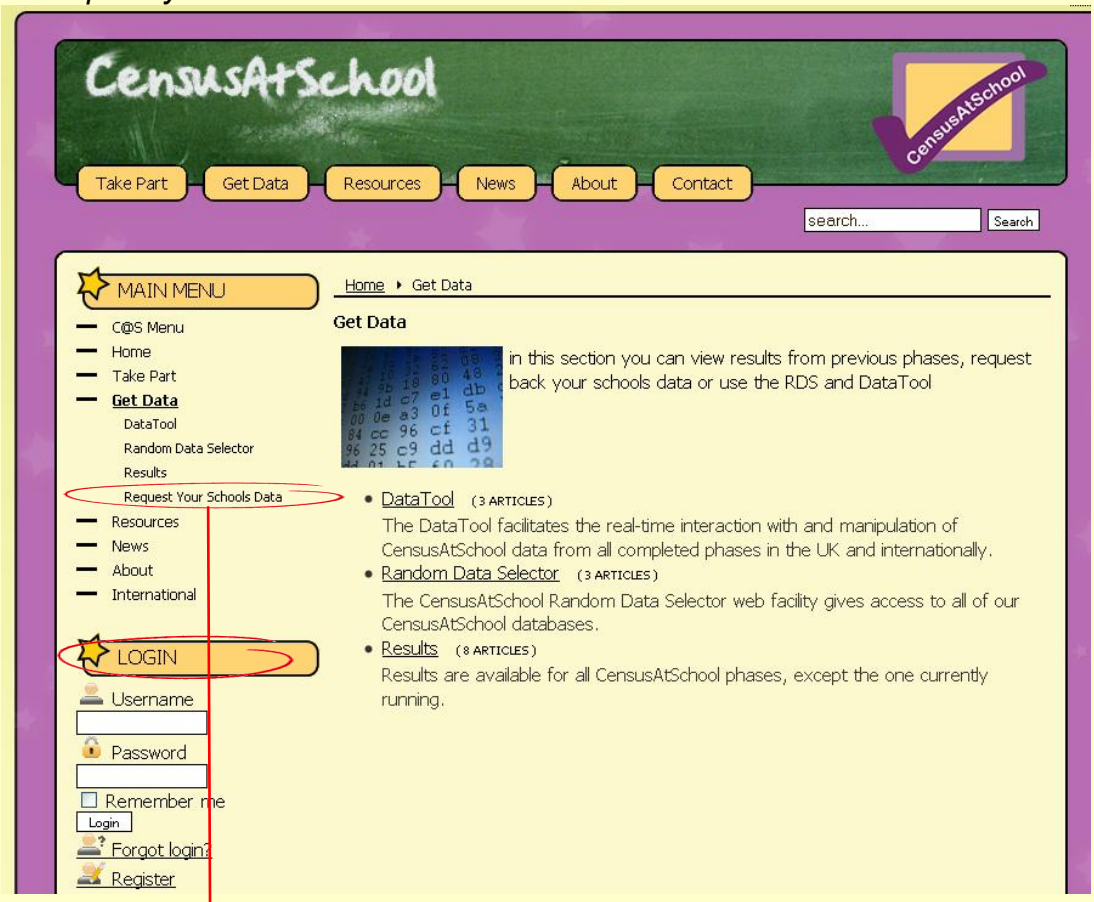
1. Register school
2. Select phase
3. Login and complete questionnaire

The *Get Data* section will tell you how to get your data back!

Real data is what CensusAtSchool is all about. Click '**Get Data**' and choose whether to:

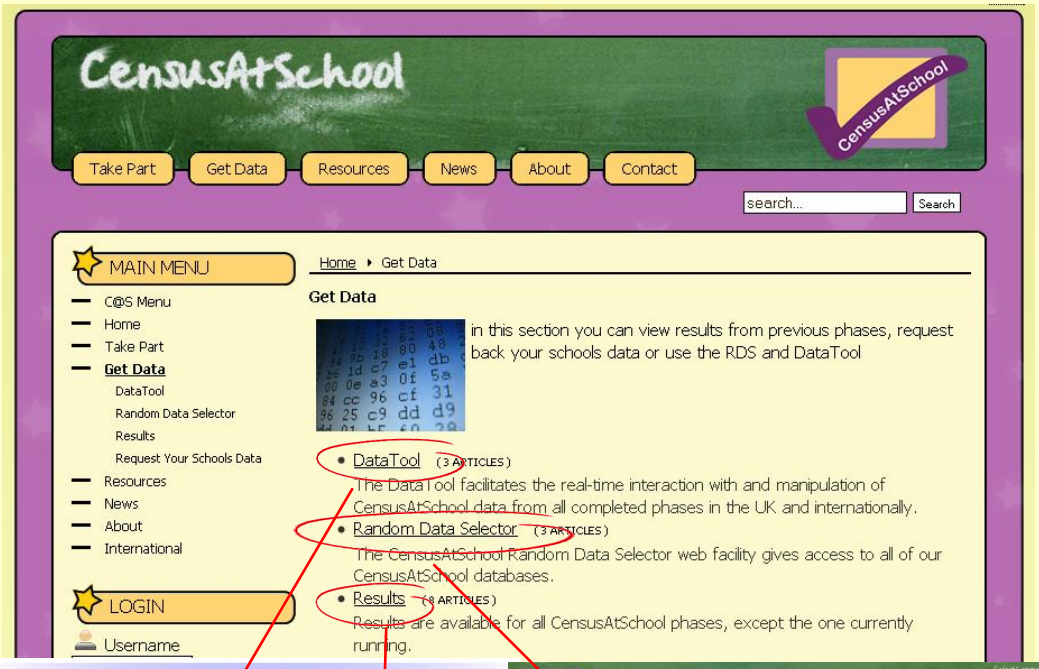
- request your own data back
- choose a random sample of survey data
- use the data tool to manipulate the data
- review the results of a previous phase

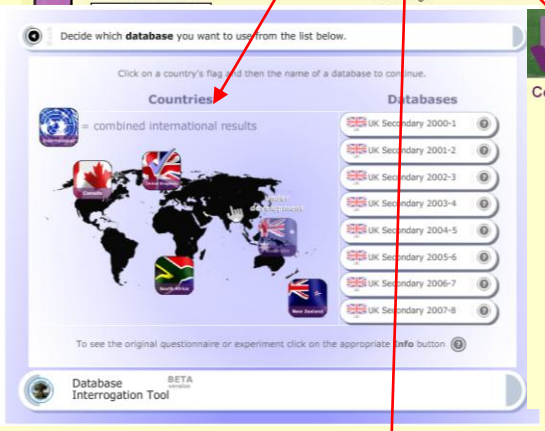
To *request your data back…*



To get your data back, you first need to **login** (using the same details you obtained when you registered to take part in the questionnaire). Follow the *request your schools data* link and fill in the form specifying which phase of data you require. There is a security check on this page. The data will be returned to you within 72 hours in a standard spreadsheet format which can be used in packages such as Excel.

The **DataTool** and **Random Data Selector...**





You can choose which data to use in the **DataTool,** as well as choosing how to display your data. The tool has been developed as an alternative to excel and is an easy way to show the effect of sampling. You can even upload your own data!

The Random Data Selector allows you to choose data from any of the 9 UK databases or from the other countries that have run censuses. You can choose the size of sample that you select and you will receive it in csv format.

Each year we do some analysis of the data that you input and create a **results** page. These provide some of the interesting things we have discovered. You can use them to help you choose phases or as a discussion starter in your classroom. Perhaps you might use them to help you hypothesise.

There are a whole range of curriculum resources which have been written to help you use CensusAtSchool data in your classroom. These are grouped by the subject area that they relate to.

You will find hundreds of resources there to choose from – some have solutions too. A couple of our favourites are…


Hanging out the Dirty Data

When you have got some data the first thing you need to do is to check it out and get rid of any obviously wrong or false data. This is called "Cleaning the Data".

In Spreadsheet 'Dirty' several playful pup the data. See if you can spot which rows a which of the following characters:

Pointy Pete : who moves I unnecessary

Obvious Olive : who puts in very o

Silly Samantha : who thinks it is "Donald Duck

Devious Dave :who thinks up

Sparkly Clea

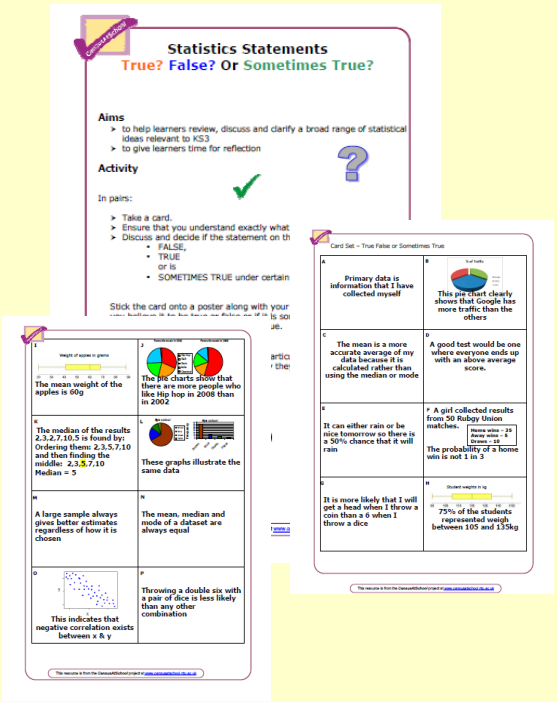
'Dirty' Spreadsheet

Cleaning up the data…

This worksheet exemplifies everything we believe in at CensusAtSchool. Students learn to make decisions about cleaning up real data – encouraged to find the 'mistakes' in the data, they then have to decide what to do about them.

Card Sort activities

These are some of our newest resources based on the standards unit materials where you group into 'sometimes true', 'always true' and 'never true'. You will find a KS3, KS4 and AS level card sort in the resources section of the site – these are ideal


Statistics Statements
True? False? Or Sometimes True?

Aims
- to help learners review, discuss and clarify a broad range of statistical ideas relevant to KS3
- to give learners time for reflection

Activity

In pairs:
- Take a card.
- Ensure that you understand exactly what
- Discuss and decide if the statement on th
  - FALSE,
  - TRUE
  or is
  - SOMETIMES TRUE under certain

Stick the card onto a poster along with your

Primary data is information that I have collected myself

This pie chart clearly shows that Google has more traffic than the others

The mean is a more accurate average of my data because it is calculated rather than using the median or mode

A good test would be one where everyone ends up with an above average score.

It can either rain or be nice tomorrow so there is a 50% chance that it will rain

A girl collected results from 50 Rubgy Union matches.

The probability of a home win is not 1 in 3

It is more likely that I will get a head when I throw a coin than a 6 when I throw a dice

75% of the students represented weigh between 105 and 135kg

The mean weight of the apples is 60g

The pie charts show that there are more people who like Hip hop in 2008 than in 2002

These graphs illustrate the same data

The median of the results 2,3,2,7,10,5 is found by: Ordering them: 2,3,5,7,10 and then finding the middle: 2,3,5,7,10 Median = 5

The mean, median and mode of a dataset are always equal

A large sample always gives better estimates regardless of how it is chosen

Throwing a double six with a pair of dice is less likely than any other combination

This indicates that negative correlation exists between x & y