5 TOOLS USED IN SOCIAL SCIENCES

This section contains activities that practice using social science tools:

- Activities to maximize the use of data.
- Activities to better understand how numbers are used in the social sciences.
- Activities to visualise information in different ways.
- Interactive data activities.

These activities are organised under four different types of tools:

- **1. Timelines** highlight, group and prioritise important events and put them in order. They are used to study personal, community, and national histories.
- **2. Statistics** are data collected through surveys and observation. By interpreting statistics, we can make connections and predictions about communities and societies.
- **3.** To visualise and organise statistics, we can create different types of **charts and graphs**. These tools help students to discover patterns in data, and explore the importance of these patterns.
- **4.** Reading **maps** is an important life skill. This section focuses on the different types of maps that appear in geography, history, and development studies.



Together, these tools help develop the skills necessary to:

- identify how events cause other events, and look at their effect on society.
- ask questions about, organise and analyse data.
- compare and contrast information.
- choose and create appropriate charts and graphs to visualise statistics.
- read and create different kinds of maps for different purposes.
- connect students' own lives and experiences to the social sciences.

Each section starts with some activities where students generate their own tools using information or data about themselves, their communities or their ideas. This is called personalisation. After that, we look at activities to help students understand and use these tools, that you can adapt to the topic you are teaching.

5.1 Timelines

Why Use Timelines?

Timelines show us important moments in history, when they happened, and how much time passed between these events. Days, months and years can be organised on timelines. Timelines also help students to learn about new events and how to connect events they have studied already. Then, we can analyse the order in which events and changes occur. This section shows how to:

- adapt a timeline from a text.
- connect events and dates.
- put events in order.
- Bring personal and community histories into the classroom.

Often, timelines are easier to follow and to read than a long text, and can be helpful tools when introducing or a reviewing a topic.

Timelines can be made to scale, meaning that all space on the line equals a specific amount of time. For example, if the timeline is 20 centimeters long and covers a period of 20 years, one centimeter on the line would equal one year. If a timeline covers all human history, 1 centimetre might equal 500 years.

Timelines can be vertical, with events starting at the top and moving toward the bottom, like the one on the right.



They can also be horizontal, and the same information can be read from left to right, like the one below:



Timelines are learning and storytelling tools that can encourage cooperative and communicative group work. They also can be added to student presentations and afterward can be displayed in the classroom as a record of what has been studied.

Personalising Social Science Lessons: Timelines

Before – or after – your students use timelines to present the lives of others, give them practice using personal timelines. Applying these skills to their own lives and communities can help students understand cause and effect relationships, make connections between their lives and outside events, and reflect on their own priorities.

5.1.1 Personal Timeline

a. Students identify the most important events in their lives, e.g:

- significant family events (births, deaths, marriage)
- significant education events (starting at a school, graduation)
- significant work events (starting or ending a job)
- significant social events
- achievements
- living arrangements (leaving or moving somewhere)

b. Students choose at least ten important events, and put them on a timeline.



Practicalities: students work individually.

2013

Bloom: applying, analysing, creating

Cyclone Nargis

formed Youth Network



c. Encourage students to add pictures and decorations. Put these up on the walls. Students go around looking at each others' timelines.

Follow-up

Ask the class questions, e.g.:

- Who has the biggest family?
- Who has had a lot of different jobs?
- Who overcame a difficult problem? What was it?
- Who has lived in a lot of different places?
- Who has been very busy during the last five years?

Variation

Do this as an interview. In pairs, students ask each other questions, and create timelines of each others' lives.



Notes on the Text

This text is adapted from a website of biographies (life stories) of famous people.

Anther useful site for biographies is wikipedia.org, but because Wikipedia is open source (open for anyone to change), you must take care when using it as a reference.

The language is approximately preintermediate level English, or CEF $\vec{A}2$.

Biography of Nelson Mandela

Nelson Mandela was one of the most loved and respected people in the world. For countless reasons he was and remains a hero to many. He experienced many things in his nine decades, from being tortured to becoming president of the country he loved.

Nelson was born in 1918 into a South Africa that was divided along black and white racial lines. He said he had a wonderful childhood and was a good runner and boxer. He learnt more of the terrible apartheid system when he went to university to become a lawyer in 1943. This led to his campaigning for equal rights and his involvement in the African National Congress (ANC). He became the leader of the ANC in 1950.

The South African government tried to keep Mandela from spreading his message of equality for blacks and racial unity. In 1962, he was sentenced to 27 years in prison. He became famous around the world as an icon of the struggle for freedom in South Africa. Rock stars, actors, politicians and ordinary people campaigned to free him and end apartheid. He was released from prison in 1990.

Nelson Mandela's call for racial reconciliation won him the hearts of millions. He won the Nobel Peace Prize in 1993, and over 250 more awards. A year later, he became his country's first ever black president and served in office until 1999. In his retirement. continued he to tirelessly campaign for many global causes until old age slowed him down. He died on the 5th of December, 2013, aged 95.



Adapted from: http://www.famouspeoplelessons.com/n/nelson_mandela.html

5.1.2 Design a Timeline

- a. Students look at the information they need to put on their timeline, and discuss these questions:
 - How much information will we include on the timeline?
 - What scale is necessary?
 - What design of timeline best presents the information?
- b. Groups design a timeline to present the information.
- c. Groups explain to the class why they chose this design.

- Objective: students decide the best format to present information
- Practicalities: students work in groups
- Bloom: applying, analysing

5.1.3 Text to Timeline

- a. Students identify the most important events in the text.
- b. They design a timeline and put the events, with the years they happened, on it.

Encourage students to write events on the timeline in their own words, rather than copying directly from the text.

Variation

Tie a piece of string across the length of the class.

Set the scale. For example, the length of two hands could equal ten years on the string.

Students write important events on paper and hang from the string.

You can also do this with tape on the floor or walls of the classroom.



Objective: students identify and order events

- Practicalities: students work individually or in pairs or groups
- Bloom: understanding, applying, analysing

5.1.4 Order the Events

a. Write events on pieces of paper. Don't use the exact same words as in the text. Make enough for one set per group.



He goes to university to study law.



Objective: students order event

- Practicalities: students work in groups
- Preparation: make sets of events on pieces of paper ; one set per group

Objective: students recount

Practicalities: students work in two or more teams. Teams

stand at the opposite end of the room to the board

timelines on the board, ones

Preparation: draw blank

Bloom: remembering

per team

and order events

Bloom: remembering, understanding

b. Groups put the pieces of paper in order.

Variation

To make this **less controlled**, give groups some blank pieces of paper. Groups add other important events.

Do this as a pre-task prediction activity. Students order the events before they read the texts, or get information about the topic. After they get the information, they check whether their order was correct.

5.1.5 Timeline Race to the Board

- a. In equal sized teams, students stand opposite the board.
- b. Say one of the years or months listed in the text. The first student in each team runs to the board, and writes the event that happened on the correct place in the timeline.
- c. The rest of the team calls out advice.
- d. Say another date, and the next student in each team writes it on the timeline.
- e. Continue until all members have had a turn. The team with the correct order, and the most correct events, is the winner.





Variation

To make this **more controlled**, say the events, and the teams write the dates on the timeline.

5.1.6 Classify the Events

- a. Groups make a list of important events.
- b. Students decide on a colour code for events, e.g.:
 - blue pen or paper for events in personal life (e.g. was born, got married)
 - red pen or paper for events involving violence or injustice
 - green pen or paper for events that promoted peace
- c. Students put events in the correct colours.

Objective: students classify events on a timeline

- Practicalities: students work in groups; each group needs colour markers or paint, or different coloured paper
- Bloom: understanding, analysing



5.1.7 The Most Important Event

- a. Put important timeline events on pieces of paper around the room.
- b. Students stand next to the event they consider the most important.
- c. Students explain the reason they chose this event.
- d. If students change their opinion as a result of listening to others' opinions, they go and stand next to their new choice.

Objective: students prioritise events

- Practicalities: students move around the room
- Preparation: write important events on separate pieces of paper and put them around the room
- Bloom: evaluating



5.1.8 Add to the Timeline

Provide another source, or sources, of information. This could be a written text, a documentary or guest speaker, or student research.

Students put more events on their timelines.



Objective: students add events to a timeline

- Practicalities: students work individually or in pairs or groups
- Preparation: find more sources of information about the topic

Variation

Students add events from national, regional or world history, and compare the events.

If the class is focusing on personal or local events, bring an elder from the community as a guest speaker. Arrange for them to talk about a specific period in history that they have lived through, or to share their life story in general. Students prepare interview questions ahead of time to guide or review the speaker's story. Students take personal notes on the lecture or presentation. After the speaker has left, students work together as a class to compare their notes, and recreate the speaker's stories and experiences on a timeline.



Bloom: understanding, applying, analysing

5.1.9 Change an Event: Alternative History

- a. Students change one event in the timeline.
- b. Students imagine the rest of the events that might follow this change, and make a new timeline based on what they think could have happened.

Objective: students imagine an alternative version of events

- Practicalities: students work individually, or in pairs or groups
- Bloom: creating



Variation

Make a timeline of future events. Students predict how the situation might develop in the future, and put these events on their timelines.



5.2 Statistics

What Are Statistics?

Statistics are numbers, collected in large amounts. Without statistics, we only have stories to support our conclusions and ideas. Statistics give us evidence which we can analyse.

Data about people is often collected from part of a population to give us a information about the whole population. This part is called a sample. Measuring a sample costs less money and takes less time than getting information from the entire population (Getting information from an entire population is usually done in a census).

Before we gather statistics, we often start with a hypothesis or a question. For example, we might want to know what percent of a city's population can drive a motorbike.





We could try to find answers through observation. The researcher counts the people at a busy part of town and records how many people are driving motorbikes and how many people are on foot, riding a bicycle or in a car or bus.

We can create a survey. Here, the researcher might ask a sample of people whether they can drive a motorbike, and record the results.

In this example, a survey would give us better

results. Through observation, we would be inferring that those people who were walking or riding bicycles were doing so because they could not ride a motorbike. This might not be true, and would affect the credibility of our data.

Teachers and students should be aware of bias in statistics. Bias is a positive or negative feeling toward something in a way that makes the feeling unfair or prejudiced. Also, just because statistics show us that two things are related does not always mean that one caused the other. It usually means that further research and data are needed to better understand the issue!

Personalising Social Science Lessons: Statistics

Students can use statistics to represent the data of others and analyse their importance. They can also collect and analyse data about themselves and each other. These activities can provide a more thorough understanding and useful insights into their lives and communities. In activities 5.2.1 to 5.2.4. ,students can collect and create new statistics related to their own situations. Activities 5.2.5 to 5.2.11 focus on analysing existing statistics.

5.2.1 Prepare to Collect Statistics

a. As a class, choose a question to research. It can be a problem, a hypothesis, or just a simple question.

What topics should we study next semester?

What percentage of people walking downtown are wearing traditional clothing?

b. Choose the place to do the research, e.g. the class, the school, the community, the environment.

classes 2a and 2b

on the main road

- c. Choose the best method to collect statistics:
 - Observation: for something you can see.
 - Survey: for something you need to ask questions about.
- d. Students decide who is going to do which part of the data collection, either individually or in groups.



Objective: students define a research question and decide on a research method

Practicalities: students work in groups or as a class.

Bloom: applying, creating

5.2.2 Statistics Through Observation

- a. Students restate what they plan to observe.
- b. Students write down what they see. Use a process for observation:
 - Watch for it
 - Count it
 - Document it
- c. Students put their data into a table, chart or graph.

Objective: students observe and collect data

- Practicalities: students go where they can observe, individually or in pairs or groups
- Bloom: analysing, evaluating, creating



5.2.3 Statistics Through Survey

a. Students restate what they plan to survey,

What topics should we study next semester?

- b. They write down the answers to their survey question.
- They add up totals for each answer. C.
- d. Students put their data into a table, chart or graph.
- e. Discuss what the results show.

Land rights are an important issue in the country now

I wonder if the teacher will do anything on it? We should ask her. Objective: students survey and collect data

- Practicalities: students go where they can survey, individually or in pairs or groups
- Bloom: analysing, evaluating, creating

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5.2.4 Use a Population Sample in a Survey

a. Choose a research question that everyone in the class can answer.

What topic do you most want to study next?

- b. Ask the question to 10 % of the class size:
 - If the class is less than 15 students, ask one student.
 - If the class is 15-24 students, ask two. If 25-34, ask three.
- c. Write their answers on board.
- d. Increase the sample size to 20 percent of the class size, ask the question and write answers on the board.
- e. Repeat this with 30%, then 50%, then the whole class.
- f. Discuss what happens to the data as the sample size is increased.



Variation

Survey a population sample in the community. Record results in a chart or graph.

Objective: students explore population samples

- Practicalities: students work as a class
- Preparation: choose an easy research question that all students can answer
- Bloom: analysing, evaluating, creating

EXAMPLE DATA	Country Niger Uganda Afghanistan Timor-Leste	Births/1,000 Population 45 44 39 34
lotes on the Data	Yemen Irag	31 27
he information was	Laos	25
ound at the CLA	Philippines	24
orld Mactbook	South Africa	19
$\begin{array}{c} \text{ebsite} (c_1 a. gov). \\ \text{t} b a a b a culture (c_1 a. gov). \end{array}$	Turkey	19
t has a useful,	Indonesia	17
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formation about	China	12
very country in the	Australia	12
very country in the	Canada	10
orru.	Hong Kong	9
	Hungary	9
	Germany	8
	Japan	8

5.2.5 What's the Purpose?

- a. Show students the data without the title or accompanying text..
- b. Students look at the data, and infer its main focus..

Comparing birth rates in different countries

Follow-up

Students infer the reason the data was collected.

5.2.6 Predict the Data

a. Introduce the data and point out the scale so students are aware of the range of data.

0-45 births per 1,000 people

- b. Groups guess the statistic for some of the entries Remind them to limit their guesses to numbers within the scale. Groups explain why they guess that amount.
- c. Write each group's guess on the board. Calculate the average from the groups' guesses.
- d. Compare the class average predictions to the real data.

Variation

Make this a competition. Put students into small groups, which can be "teams." For each statistic prediction, award points to the team with an answer closest to the actual data.

Objective: students identify the main focus of the data

Practicalities: students work individually or in pairs or groups; do this before they see a title or explanation of the data

Bloom: analysing

Objective: students predict statistical information

Practicalities: students work in groups, then as a class; do this before they see the statistics

Bloom: analysing

5.2.7 Interpret the Statistics Objective: students interpret statistical data a. Call out something from the table of statistics. This could be a figure, Practicalities: students need a location, or part of the description. to see the statistical table and b. Students explain how that is relevant, how this is a part of the hear the teacher statistical data. Bloom: evaluating 2 Japan The number of births The country with the in Iraq per 1000 people. lowest birth rate.

Variation

Do this as a written exercise. Give students a list of items, from the table, and they write sentences explaining how these are relevant.

5.2.8 Find the Average

a. Students add data entries together to get a sum.

45+44+39+34+31+27+25+24+19+19+17+17+13+1 2+12+10+9+9+8+8 = 422

b. They count the number of entries.

20

c. They divide by the total number of data to get the average.

423 / 20 = 21.5.

d. They make statements explaining what this information means.

Of the 20 countries in the table, the average birth rate is 21.5 births per 1,000 people.

5.2.9 Calculate Percentages

a. Students identify data they could express as a percentage.

In the US, 13 out of 1000 people give birth each year. In Myanmar, 19 out of 1000 people give birth. This is 6 more people.

- b. They calculate the percentages. Here are two methods:
 - i. Divide the total number by one hundred, and then multiply that number by the number they need to know as a percentage.

(100 / 1000) x 13 = 1.3%

ii. Divide the low number (that you want to know as a percentage) by the high number (the total). Then multiply this number by 100.

(13 / 1000) x 100 = 1.3%

Follow-up

In groups, students work out a percentage based on the data, make it into a poster, and put it on the wall.

Myanmar's birth rate is **O.67** higher than the birth rate in the US.



Objective: students find the average in a data set

Practicalities: students work individually, or in pairs or groups

Bloom: analysing, evaluating

Objective: students calculate

Practicalities: students work

individually, or in pairs or

Bloom: understanding

percentages

groups

5.2.10 Group the Statistics

- a. Elicit categories students could use to group the data. This could be geography, sizes, locations, governance, etc.
 - high and low birth rates
 - continents or regions
 - · countries with democratic and non-democratic governments
- b. In groups, students choose a data grouping. They make a table of their grouped data.
- c. Groups calculate the average for each of their groupings.

Objective: students explore the data for further information

- Practicalities: students work in groups; students might need research facilities (internet or reference books)
- Bloom: analysing, evaluating

Birth Rates by Region						
Afric Count	an tries	Asia-Pacific Countries	European Countries	North American Countries		
Niger	45	Timor-Leste 34 Australia 12	Italy 9	United States 13		
Uganda	44	Japan 8	Germany 8	Canada 10		
average:	44.5	average: 18	average: 8.5	average: 11.5		

Birth Rates by Wealth (GNI per capita)					
over 20,000 USD per year	5,000 – 20,000 USD per year	2000 – 5000 USD per year	less than 2000 USD per year		
United States 13	Iraq 27	Timor-Leste 34	Afghanistan 39		
Hong Kong 9	Turkey 17	Philippines 25	Yemen 31		
Japan 8	China 12	Indonesia 17	Laos 25		
average: 10.3	average: 18.6	average: 8.3	average: 31.6		
		I			

d. Groups present their results to the class.

Follow-up



5.2.11 What is Next?

- a. Ask students:
 - What further questions do you have about this topic?
 - What information is not given by these statistics?
- b. Students interview 3-5 others, and write down their answers.
- c. In groups, students discuss their findings, and choose the most interesting responses.
- d. Groups think of how they could get information about these things
 survey? observation? research? If possible, include specific sources such as websites, books, or media resources.

questic	on	getting info
Do people ha family sizes t want?	ave the they	Survey. Ask samples of families if they want more or fewer children (difficult to do outside the area)
Is access to b control a fac these statisti	pirth etor in ics?	<pre>internet research - do countries with high access to birth control have lower birth rates? Adapted From: http://www.slate.com/articles/news_and_politics/map_of_the_ week/2013/05/abortion_and_birth_control_a_global_map.html</pre>

e. Groups present their results to the class.

Variation

Groups present their results as mind-maps.



Follow-up

Discuss where or how this information could actually be found, including specific sources such as websites, books, or media resources.

Pursue one of the questions as a class research project. Have students look for answers as homework, and report their findings to the class at an assigned date.

Objective: students expand on the information in the data

Practicalities: students interview each other, and then write the results in groups; groups need big pieces of paper and markers; do this activity after analysing some statistics

Bloom: evaluating, creating