

1001 Inventions: City 1250

In this activity, students watch a short DVD in which 4 teenagers discuss their forthcoming year on the (fictional) reality TV show *City 1250*. Each teenager tells of their worries about living in a reconstructed city in the Islamic world in the year 1250.

Students then use the resources provided to discover how the science and technology of the time addresses each of the teenagers' worries. They learn about the advances of Muslim scientists in eight vital fields, and consider how their work influenced future scientists.

Objectives

- To learn about the work of Muslim scientists in eight fields between the years 500 and 1500 CE
- To discover how their work influenced future scientists

Curriculum links

- **1.3a** Recognising that modern science has its roots in many different societies and cultures, and draws on a variety of valid approaches to scientific practice
- **2.2b** Evaluate scientific evidence and working methods
- **2.3a** Use appropriate methods to communicate scientific information and contribute to presentations and discussions about scientific issues
- Topics:
 - 1 *Paper, ink and bubble jet printers*
3.2a The particle model provides explanations for the different physical properties and behaviour of matter
 - 2 *Compass and satellite navigation*
3.1b Forces are interactions between objects and can affect their shape and motion
 - 3 *Soap*
3.2b Elements consist of atoms that combine together in chemical reactions to form compounds
 - 4 *Gemstones*
3.2a The particle model provides explanations for the different physical properties and behaviour of matter
 - 5 *Clean air*
3.4c Human activity and natural processes can lead to changes in the environment
 - 6 *Moon and Universe*
3.4b Astronomy and space science provide insight into the nature and observed motions of the Sun, Moon stars, planets and other celestial bodies
 - 7 *Healthy teeth*
3.3c ...Health can be affected by diet, drugs and disease
 - 8 *Pharmacy*
3.2a The particle model provides explanations for the different physical properties and behaviour of matter

Running the activity

Activity A

Tell students that they will watch a short DVD in which 4 teenagers discuss their forthcoming year on the (fictional) reality TV show *City 1250*. Show the DVD. Ask students to identify the main concerns of each character. Tell students that there is **no** follow-up programme; it is up to them to create presentations that could be the basis of the next programme.

Activity B

Introduce Activity B as follows:

In pairs, you will now take on the roles of scientists. Each pair will become expert in one of the areas of concern identified by the characters in the DVD. To become experts, you will read and discuss an information sheet. You will then fill in a Research Findings template. The template is designed to focus your thinking on science origins and processes.

Give each pair **one** of the information sheets 1A – 8B and a copy of one of the templates (research findings A **or** B, depending on whether they have an A or B information sheet). The A information sheets describe science that was known in the year 1250. The B sheets describe modern science developments in related fields. For example, sheet 1A is entitled *Paper and pen* and sheet 1B is about ink jet printers.

Tell students to use the information on their information sheet to complete the template. Encourage students to discuss and think carefully about what they write.

Activity C

Put two pairs of students together to make groups of 4 (1A with 1B and so on). Ask them, in groups of four, to present their findings to each other. Then get them to:

- Examine the similarities and differences between the science/technology known in the Islamic world of the year 1250 and that in similar fields today.
- Prepare a 5-minute TV presentation in which students, still in the role of science experts, tell the characters on *City 1250* how the science known in 1250 (and described on the A information sheets) addresses each of their concerns. Ask students to focus on how the science was done, and also to show how the early Muslim science (as described on the A information sheets) influenced modern science (B information sheets). Tell students that their presentations will form the basis of a (pretend!) follow up programme.
- *Optional:* Produce visual aids or demonstrations to enhance the presentation. For example, it is easy to make the compass described in the lower half of information sheet 2A.

Once students have started this task, give each group a copy of the peer evaluation sheet. Tell them that, during their presentation, other groups will be assessing their performance in the areas described on this sheet.

Activity D

Ask each group to give their presentation. Tell the other groups to assess their performance using the peer evaluation sheet.

Optional: Film the presentations. If the necessary skills and equipment are available, put them together to create 'Programme 2' of *City 1250*.

Activity E

Plenary – lead a discussion focussing on the motivating and enabling factors for doing the science ‘then’ and ‘now’.

Web links

For all topics, the information on www.1001inventions.com is very useful indeed. Also, the articles on www.muslimheritage.com (go to Topics for a complete list) give good teacher background information. Some articles are also accessible to more able KS3 students. See also the web links below:

1A Lampblack ink:

<http://64.233.183.104/search?q=cache:lloMqVlvbYJ:www.saudiaramcoworld.com/issue/200502/gum.arabic.htm+lampblack+ink&hl=en&ct=clnk&cd=13&gl=uk>

1B Bubble jet printers – includes useful animation for students

<http://home.howstuffworks.com/inkjet-printer3.htm>

2B How SatNav works – accessible to more able students

<http://www.tomtom.com/howdoesitwork/>

3B Soap manufacture – useful diagram

<http://www.madehow.com/Volume-2/Soap.html>

4A A page from Al-Biruni’s book on gemstones (translated into English)

http://www.farlang.com/gemstones/biruni-book-gemstones/page_053

4B Lots of data on minerals, including a map of where different minerals come from – interesting for students

http://www.mindat.org/ds_30_Gemstone_Identification_and_Grading.htm

5A Clean air at the Suleymaniye Mosque

<http://64.233.183.104/search?q=cache:SQEhinQSZwUJ:www.petentour.com/birgul/famous%2520character/loadpage.asp%3Fid%3D../general/suleymaniye.htm+lampblack+ink+sinan&hl=en&ct=clnk&cd=5&gl=uk>

5B Natural ventilation in the London building of 2005 – includes links to a magazine articles with diagrams of the building

<http://www.sciencemuseum.org.uk/antenna/building/energy/135.asp>

6B Hubble space telescope – European Space Agency

<http://hubble.esa.int/science-e/www/area/index.cfm?fareaid=31>

7A Norwegian Miswak study – teacher background only

medind.nic.in/ibi/t00/i1/ibit00i1p11.pdf

Swedish Miswak study – teacher background only

http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=ShowDetailView&TermToSearch=15643758&ordinalpos=1&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_RVAbstractPlus

7B History of toothpaste

<http://www.parentingtoddlers.com/toothpaste-history.html>

8B Drug delivery – Concerta (ADHD drug) – teacher background, but includes diagram of a Concerta drug capsule

www.alza.com/pdf/vol_1_1.pdf