

5 Robert Boyle and Oxford: Why was Oxford such an Important Centre of Activity for Scientists in Seventeenth Century England?

For Teachers

Lesson Title:

Area of Learning: change; explanation; evidence

Aims: to gain an understanding of the central significance of Oxford as a forum for the exchange of ideas between major scientists in seventeenth century England; to explain why and how Oxford rose to prominence in this way; to make links between features across historical periods.

Vocab: lectureship, medicinal, professorship, collegiate, university; physic, statistics,, facilities, facilitated, experiments; focal point, colleague

Time Frame: at least one hour plus homework

Pupil tasks: pupils complete three tasks - (1) in pairs they think about what makes a good centre of learning in modern times through a role play exercise
(2) pupils are told that Robert Boyle resided in Oxford; they investigate seventeenth century sources that reveal why Oxford became an outstanding centre of science during his residence there
(3) using the information they have extracted from the sources, pupils explain, through discursive extended writing, why Oxford may have become a centre of science and why residence there might have been attractive to Boyle

(1) During initial classroom discussion when pupils work in groups for the role play, teachers should point out key features that create a leading centre of learning: eg positions for teachers and salaries/endowments to support them; steady stream of students; appropriate courses, success in exams; good facilities including a good laboratory and library; training and interaction of teachers/exchange of ideas about how and what to teach; enthusiastic teachers and pupils. These could be written on one side of the board.

(2) Teachers may then wish to write a few brief sentences on the board, stating that Boyle was resident in Oxford and that the town was a focal point for scientists during the period. Pupils could copy this down. The rhetorical question 'why was Oxford attractive to scientists during this period?' may also be copied down. After this, the class can analyse the sources as a group, through questioning by the teacher. They can then complete the grid on the sources. After this, a piece of extended writing can be tackled, answering the question in task three.

When analysing the sources worksheet with students, teachers should draw parallels between the features of a good modern 'centre of learning' that students have outlined themselves and the characteristics of Oxford in the seventeenth century. For example, teachers should point out that in 17th-century England, only Oxford and Cambridge universities existed and that by that time, because the middle classes sought a university education as an entry to successful public and professional life, an increasing number of students were taking degrees there. Point out also that Oxford was far more attractive to scientists than Cambridge, for it offered more endowed professorships and lectureships; had more facilities for experiments for those who wished to do them; had a rapidly- growing copyright library; was the meeting place for many scientists, including Boyle and William Harvey, who worked and studied at the university and were members of the colleges.

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Task 1: Work in pairs. Pretend you have been appointed as the headmaster/headmistress of a new private science and technology school to be opened in one year's time. You have been given a large and adequate budget to set up the school and run it for one year. Make a list of the things you will need to organise in order to make the school successful. Consider: facilities (for experiments and research), how to recruit increasing numbers of good and dedicated students; how to recruit and keep good teachers; how to train good teachers so they know about the latest developments in teaching; how to measure your school's success.

Discuss your ideas with the teacher and the rest of the class. Are there any things in particular that seem especially important to make a success of the school as a centre of learning for science?

Task 2: Robert Boyle lived in Oxford between 1655 and 1668 and met with university lecturers and students during that time. In the mid seventeenth century, Oxford University became a leading centre for scientific enquiry. Using the ideas you formed in the earlier task, a worksheet of sources and a worksheet grid, you are going to investigate why this occurred. Look at the sources with your teacher and then complete the grid on sources.

Task 3: Explain *why* Oxford became a centre of scientific innovation in the seventeenth century. Use the material in the sources grid that you completed to help you explain the answer to this question. In order to do this well, you will need to use the word *because* several times. Give *examples* (use the phrase 'for example') and provide *details* about the special features of Oxford that attracted scientists by referring to the information in the sources on the sources sheet.

WORKSHEET – SOURCES

SOURCE 1 A letter from Seth Ward (professor of Astronomy at Oxford) to his colleague Sir Justinian Isham, on 27 February 1652

'our Club in Oxford consists of about 30 persons; we have ... gone over ... most of the books of natural philosophy and ... mathematics, collecting ... information from authors as we have in our library and sometimes trying their experiments ... Besides this Great Club we have a group of about 8 persons who have joined together to equip a laboratory for making chemical experiments'. *Notes and Records of the Royal Society*, 7 (1949), 69

SOURCE 2 Statistics Concerning Science teaching at Oxford and Cambridge

	Oxford	Cambridge
Before 1600	3 teaching positions (including lectureships and professorships)	2
1640s	7	2

Extract from a modern secondary source: R. G. Frank, *Harvey and the Oxford Physiologists* (Berkeley and Los Angeles, 1980), pp. 45-46

SOURCE 3 The number of students at Oxford

1540s	40 B.A. students	20 M.A. students
1620s	240 B.A. students	150 M.A. students

extract from a modern secondary source: R. G. Frank, *Harvey and the Oxford Physiologists* (London, 1980), p. 49.

SOURCE 4 The Oxford University *Physic Garden*.

'In this, many herbs and plants which had medicinal properties were grown. Cambridge did not have such a garden. Students could go to the garden and use a book, the *Catalogus* (1648) [catalogue] to locate the herb they needed to make into medicine.'

Simplified extract from a modern secondary source: R. G. Frank, *Harvey and the Oxford Physiologists* (Berkeley and Los Angeles, 1980), p. 49.

SOURCE 5 A depiction of Oxford in the Seventeenth Century



Wadham College, Oxford where John Wilkins was Warden and where the Oxford group met.
Engraved by David Loggan, from his *Oxonia Illustrata* (1675).

SOURCE 6 The Bodleian Library at Oxford.

During the sixteenth century, many of the books in the Oxford library had been destroyed. In the early seventeenth century a man called *Thomas Bodley* donated much money and books to help the library replenish its stocks. He arranged for a copy of *all* books published in England to be deposited in Oxford's library. The library was named after him and called the *Bodleian*; it contained all the latest scientific books. Simplified extract from a modern secondary source: R. G. Frank, *Harvey and the Oxford Physiologists* (Berkeley & Los Angeles, 1980), p. 46.



A modern photograph of Oxford, with the Bodleian Library in the distance.

WORKSHEET – GRID

Use the sources to complete this grid.

Source	What does it tell me about?	What clue does this give me about the rise of Oxford as a centre of learning for scientists in 17 th century England?
1		
2	The increase in the number of teaching positions at the university.	There were more teachers of science in Oxford than there were in Cambridge, therefore more students could study it there. More scientists were attracted to Oxford as they were able to find a job.

Source	What does it tell me about?	What clue does this give me about the rise of Oxford as a centre of learning for scientists in 17th century England?