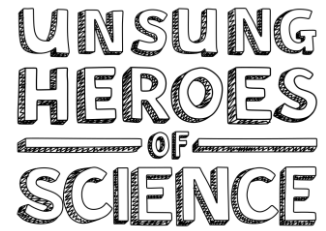


# Full lesson plan



## Science in context

### Learning objectives

- Learn about lesser-known scientists, who may not feature in the usual textbooks and stories, but could be an inspiration to students
- Debate ideas of gender and race in the history of science

### Context

This activity is designed to fill a lesson and take around 45 minutes, but you can stretch or squash it to suit.

A lot of the unsung heroes that feature in these videos have been side-lined because of their gender or race (or both). By understanding the impact of these scientists and exploring the reasons why they are “unsung”, pupils can better understand the human and social context of science in the past, present and future.

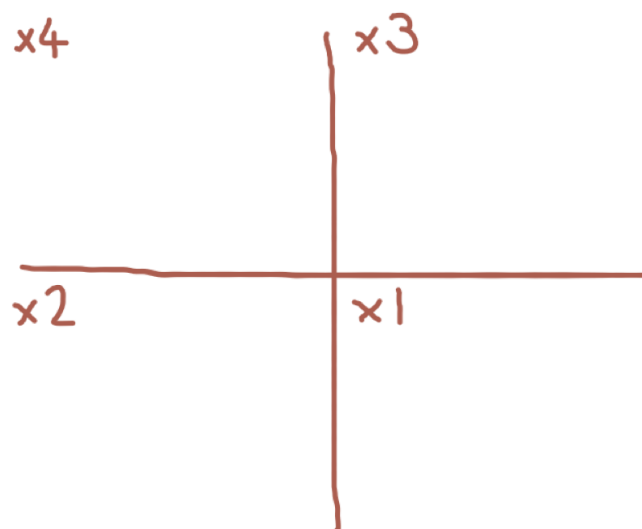
### Resources

- There is a set of optional PowerPoint slides to go with this activity
- The worksheets from the 10-minute activities could be used in this activity
- The videos are available at [www.hertford.ox.ac.uk/unsungscience/videos](http://www.hertford.ox.ac.uk/unsungscience/videos)

### Activity

#### Naming Scientists (10 mins)

- Split the class into four groups.
- In their teams, give them five minutes to write down the names of as many scientists as they can. (Personal connections don't count.)
- The scores are as follows:
  - 2 points per scientist
  - 3 bonus points if that scientist was not named by anyone else
- Draw a table on the board to collect their results



- If a scientist is named by all four groups, their name goes in the top left (x4)
- If a scientist is named by three / two groups, their name goes in the x3 / x2 squares

- If a scientist is named by only one group, that group gets three bonus points and it goes in the (x1) square

### Discussing the scientists (5 mins)

- Look at the scientists in the x1 square (or x2 if necessary). Who are these lesser-known scientists? What did they do?
  - Briefly research this individually or as a group if it would help
- Can you spot any similarities among the most famous ones?
  - Are they mostly:
    - Male?
    - White?
    - European / American?

### Exploring the videos (15 mins)

This section can either be done as a class or, if you have lots of computers, they can do it in pairs and then feed back to the class.

- Go to [www.hertford.ox.ac.uk/unsungscience/videos](http://www.hertford.ox.ac.uk/unsungscience/videos)
- Choose one video to watch
- Watch the video.
  - You will probably want to make it full screen using the button at the bottom right of the video.
  - The videos all have subtitles, which you can turn on if you want.
- Having watched the video, as a group, answer or discuss (some of) the following questions:
  - What were the scientist's achievements?
  - Would you class them as an 'unsung hero'? Why / why not?
  - Why were / are they unrecognised or under-appreciated?
    - Prompt: Does the history of gender and race in science play a role here?
- Repeat this for a couple of different videos

### Then and now (10 mins)

These can be group discussion points, or could form the basis of some homework.

- What has changed since these scientists were overlooked? What hasn't changed?
- Does it matter that most of the scientists we learn about in school are "pale, male and stale", i.e. old, white men?

### Further reading

- For explorations of gender and race in science, check out 'Inferior' and 'Superior' by Angela Saini. These are good reading for teachers and students alike!

## Useful points of information for the discussions

No women were permitted to become Fellows of the Royal Society (one of the UK's leading science organisations) until 1945. It was founded in 1660.<sup>1</sup>

There are 213 Nobel Laureates in Physics; three of them are women.<sup>2</sup> There are 184 Nobel Laureates in Chemistry; five of them are women.<sup>3</sup>

There is a gender pay gap in science. The median pay gap is around 15%, i.e. the median pay for women is around 15% less than the median pay for men.<sup>4</sup>

There are ethnicity pay gaps in Britain.<sup>5</sup> The Wellcome Trust (which is a large life sciences funder) publishes its ethnicity pay gap.<sup>6</sup> Ethnicity pay gaps are complicated and don't necessarily tell the stories we might expect.

Research funding from the UK's main government funding body, UKRI, is not equitable:

- Success rates for women who apply for grants are consistently and statistically significantly lower than the success rates for men.
- Women consistently receive smaller grants on average than men.
- There are even greater differences in success rates between white principal investigators and those from minority ethnic backgrounds.
- The average amount of grants received by ethnic minority applicants is almost 20% lower than those received by white investigators.

These findings are from an enquiry by the House of Commons Science and Technology Select Committee into UKRI funding.<sup>7</sup>

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<sup>1</sup> <https://royalsociety.org/about-us/history/>

<sup>2</sup> <https://www.nobelprize.org/prizes/physics/>

<sup>3</sup> <https://www.nobelprize.org/prizes/chemistry/>

<https://www.nobelprize.org/prizes/lists/nobel-prize-awarded-women>

<sup>4</sup> <https://www.nature.com/articles/d41586-018-04309-8>

<sup>5</sup>

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/articles/ethnicity-paygapsingreatbritain/2018>

<sup>6</sup> <https://wellcome.ac.uk/sites/default/files/wellcome-ethnicity-pay-gap-report-2019.pdf>

<sup>7</sup> <https://www.parliament.uk/documents/commons-committees/science-technology/Correspondence/191030-UKRI%20to%20Chair%20re%20Impact%20of%20funding%20on%20equality%20diversity%20inclusion%20and%20accessibility.pdf>