



# Thinking Science

(James Ladyman, Thinking Science project, 2016-2020)

## [Themes]

Co-production  
Long-term Impact  
Schools Engagement

## Co-producing curriculum-linked resources builds partnerships, improves science education & makes lasting impact in schools

**[Aim & Approach]** Professor Ladyman's research in the [Centre for Science and Philosophy](#) led to the creation of the '[Thinking Science](#)' teaching resources. Collaborating directly with educators and academy chains to enhance teaching practice (rather than delivering outreach sessions for pupils) has proved a successful and efficient way to incorporate Philosophy of Science research in the curriculum, achieving significant impact from schools' engagement.



**[Practical Details]** This 4½ year-long project cost ca. £34.5K. Between 2016 and 2020 various small internal university grants (incl. [IAA](#), [BILT](#)) funded workshops, design costs & a part-time (0.3 FTE) Project Officer.

**[Key Partnerships]** The [Cabot Learning Federation](#) (CLF) academy chain's Head of Science was closely involved in developing and testing the resources. University of Bristol [PGCE Science](#) tutors integrated it into their initial teacher training programme.

**[Activity & Outcomes]** The [resources](#) were designed in collaboration with science teachers in Bristol through knowledge sharing workshops and subsequent classroom testing. This input established how current philosophical research could enhance curriculum topics, and what form of activities would be most practical for teachers to use. The iterative process produced a set of thought-provoking questions that easily integrate into lessons. The resources were presented at education [conferences](#), promoted by the [National STEM Learning Centre](#), and received an [outstanding review](#) in the Association for Science Education's leading [journal](#). To date, 2,000 copies have been distributed and 380 teachers have benefited from 'Thinking Science' training, which is now embedded in Bristol's Science PGCE course. The partnership with CLF led to them entirely redeveloping their science curriculum for all 20 schools, to integrate philosophical thinking into teaching.

**[Support]** The project was a close partnership with Public Engagement, with a part-time Project Officer seconded from the team. They set up collaborations with teachers, schools and PGCE courses; advised on content; developed and delivered training. Other team members supported evaluation and the production of a REF Impact Case Study.

**[Impact]** Teachers report learners are more confident to discuss difficult questions in science and that the philosophical approach helps "*students who are often disengaged with science to get involved and understand the topics better.*" (CLF Head of KS3 Science). Prof. Ladyman says "*The project has greatly deepened my understanding of how philosophy of science can be used in science education. It has widened my experience as an educator and taught me a lot about working with schools and teachers.*". Engaging with teachers to change their practice is an effective way to work with schools to embed research in the classroom and create long-term impact, particularly when academy chains with multiple schools are involved. The success of this project has led to the creation of similar resources on other topics, using the same tried and tested methodology.

## Public Engagement

Strengthening research with conversations that count