



Self-Driving Cars Debate Kit

Evaluation Report

Debate Kits distributed from November 2019
Evaluation Report: February 2021

- **We estimate that at least 515 Debate Kits have been used with students.**
- **Teachers valued the Debate Kit.** Teachers report that the Kit has encouraged debate and respect for each other's opinions. Teachers value the way in which the Kit "puts STEM learning in a real-life context".
- **Kits have been used across a range of age groups from KS2 to KS5, and with adult learners.**
- **Reception to competitions were mixed.** 21 entries were received for the KS2/3 competition to design a road sign, however no entries were received for the KS4/5 competition to report on the debate.

Background

The Self-Driving Cars Debate Kit was funded by the Institute of Physics, the Royal Institution, and Lloyd's Register Foundation. It was produced alongside the CHRISTMAS LECTURES Zone (secrets.imamathematician.uk), in partnership with the 2019 RI CHRISTMAS LECTURES series: *Secrets and lies?*

IOP Institute of Physics



The Royal Institution
Science Lives Here



Lloyd's Register
Foundation

The Self-Driving Cars Debate Kit asks the question: ***Should our town centre be for self-driving cars only?*** Covering relevant topics such as technology, physics, economics, and more; this Debate Kit helps students explore the societal, ethical, and factual issues around AI technology. The Kit includes eight characters with different viewpoints to encourage a balanced discussion around the question. It provides teachers with a resource to run a debate around the future of self-driving cars. The structure shows students how to build a discussion and back up their opinions with facts.

All the facts in the Kit were researched and teachers were provided with a list of references and additional resources relating to the Kit: cars.imascientist.org.uk

In addition to the Debate Kit, additional resources were created to support the debate lesson, including a class quiz to encourage students to reflect on their opinions, and competitions for students in KS2 to KS5.

Contents

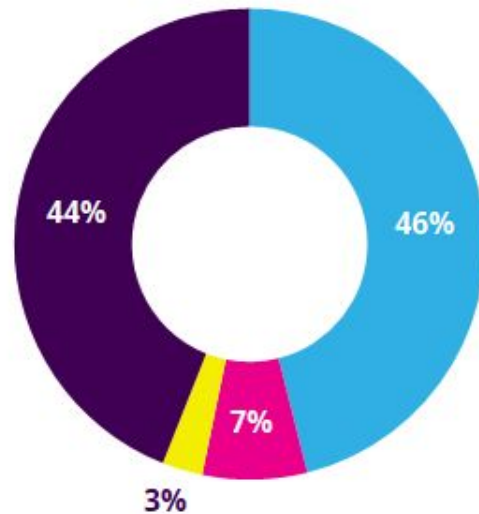
Distribution	3
Usage	4
Aims and achievements	9
Contact	12

Distribution

2,250 Debate Kits were printed in October 2019, and distributed from November 2019.

To date, distribution routes have been as follows:

- 995 Kits have been distributed to teachers in the UK following direct requests.
- 155 Kits included in teacher packs and sent to teachers participating in *I'm a Scientist* and *I'm an Engineer* in March 2020.
- 60 Kits distributed to third parties (including STEM Hubs, science centres, and for use in teacher workshops).
- 700 Kits were sent to the Royal Institution, and 250 to the Institute of Physics (Funders).



- Direct requests
- March 2020 participating teachers
- Third parties
- Funders

Additionally, digital versions of the Debate Kit are available to download free-of-charge from the Debate Kit website:

debate.imascientist.org.uk/the-kits/#cars

At time of writing, the Debate Kit has been downloaded 330 times.¹

330

digital downloads

¹ Web analytics data: 1 November 2019 – 15 January 2021 (All versions)

Usage

How many Kits were used?

Typically in evaluating Debate Kit usage, a random sample of 100 teachers are surveyed around 12 months after receiving a kit to ascertain whether they used the debate kit with their students. This provides a measure which can be used to estimate usage among all teachers who received a debate kit.

Due to additional pressures put on teachers during the 2020/21 COVID-19 pandemic we took the decision not to make further requests of teachers' time, and this survey was not carried out.

Based on evaluation of previous Debate Kits, we estimate that on average 36% of Kits requested by teachers are used.²

By applying this figure to the 848 teachers who requested the Self-Driving Cars Debate Kit before the pandemic, we estimate that 305 have been used with their classes.

If we estimate that 18% of the 1,165 Kits sent out by other routes before the pandemic — half the usage of the directly distributed Kits — we find a figure of 210 of these Kits being used.

Through this broad approximation then, we have an estimate of around 515 of the Debate Kits which were sent out before the pandemic having been used with students.

Usage reminders

Automated reminder emails were sent to teachers, checking first that they received their Debate Kit, and later, whether they had made use of the Kit. After responding to say whether or not they have used the Kit, teachers were invited to fill in a feedback survey.

The main purpose of these follow up emails is not in establishing kit usage, but to serve as a reminder for teachers to use their Kits, and to direct teachers who had used the Kits to a feedback survey.

² Average direct request usage estimate for 6 most recent evaluated Debate Kits: 36%; this estimate is halved for kits sent to third parties.

Reasons for not using the Kit

Where teachers reported not having used the Kit, the most common response given was that they intend to use the Kit later on. Since March 2020, opportunities to use the Kit will have been reduced due to school closures in response to the global COVID-19 pandemic.

How Kits have been used

27 teachers provided feedback after reporting that they had used the Debate Kit.

Feedback shows that Kits have been used with students from year 5 (aged 9–10) through to year 13 (aged 17–18), as well as with FE colleges and adult groups. Most commonly (10/27 teachers) the Kits were used with students in years 9 and 10 (aged 13–15).

24 of 27 teachers reported that they intended to use the Kit again, no teachers reported that they would not use it again.

Usage of additional resources and competitions

Resource site

A website was created to support the debate lesson, comprising information from the debate cards, as well as links to additional resources, the class quiz and competitions: cars.imascientist.org.uk

Between November 2019 and February 2021, the resource site received 2,020 page views from 464 users.³

2,020
page views
464 users

³ Web analytics data: 1 November 2019 – 24 February 2021

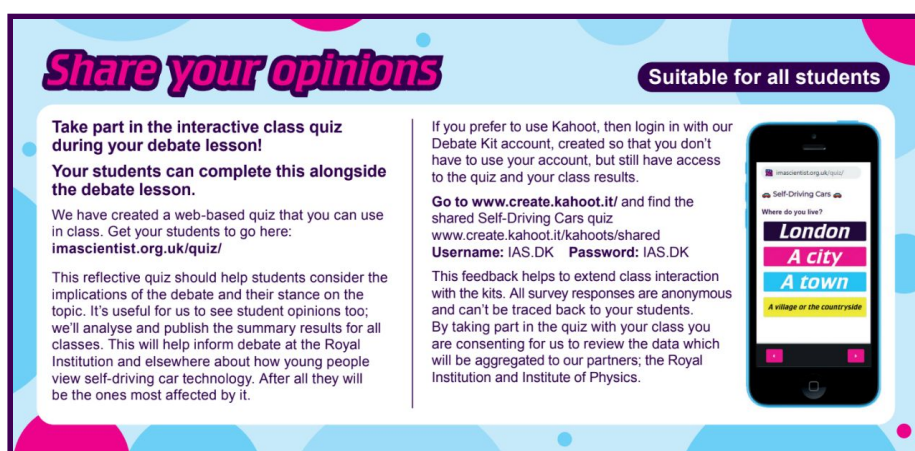
Class quiz

A quiz was created for teachers and students to use during the debate lesson. At three stages during the debate — before starting the activity, at the midpoint, and at the end of the debate — students were asked:

- When they think self-driving cars will be commonplace in their community
- Whether they think self-driving cars will be a good thing for them
- What they think is the most likely benefit of self-driving cars
- What they think is the biggest risk of self-driving cars

The quiz encourages students to reflect on their opinions and consider the implications of the debate and their stance on the topic.

The quizzes received 112 entries from 6 classes.



Share your opinions

Suitable for all students

Take part in the interactive class quiz during your debate lesson!
Your students can complete this alongside the debate lesson.

We have created a web-based quiz that you can use in class. Get your students to go here: imascientist.org.uk/quiz/

This reflective quiz should help students consider the implications of the debate and their stance on the topic. It's useful for us to see student opinions too; we'll analyse and publish the summary results for all classes. This will help inform debate at the Royal Institution and elsewhere about how young people view self-driving car technology. After all they will be the ones most affected by it.

If you prefer to use Kahoot, then login in with our Debate Kit account, created so that you don't have to use your account, but still have access to the quiz and your class results.

Go to www.create.kahoot.it/ and find the shared Self-Driving Cars quiz
www.create.kahoot.it/kahoots/shared
Username: IAS.DK **Password:** IAS.DK

This feedback helps to extend class interaction with the kits. All survey responses are anonymous and can't be traced back to your students. By taking part in the quiz with your class you are consenting for us to review the data which will be aggregated to our partners; the Royal Institution and Institute of Physics.

Above: Flyer advertising the class quiz, included in Debate Kits

Competitions

Two competitions were held alongside the Self-Driving Cars Debate Kit. One aimed at KS2 and KS3 invited students to design a road sign; while students in KS4 and KS5 were invited to report on their class's debate.

These competitions were advertised on the resource website, and flyers were included with copies of the Debate Kits distributed to teachers. The deadline for entries in both competitions was February 2020.

Competition to design a road sign

Competition: Design a road sign! Aimed at KS2 and KS3

Should self-driving cars be allowed in our town centre? Yes or No, we're going to need signs telling people.

Get your students to design a road sign based on whether they are for or against self-driving cars where they live. It can be based on what was decided in the debate, or their own opinion.

Their design should be on A4 or A3 plain white paper.

To help the judges understand the thought process behind the design students should provide some notes to explain their design.

For more information and full Terms and Conditions visit cars.imascientist.org.uk

Entering is easy. Take a photo of your students entry. Make sure the notes are readable, and email it to roadsign@imascientist.org.uk. The winning design will be laser cut by the Royal Institution and presented to the school along with a copy of the Christmas Lectures Trilogy.

Photo from [shutterstock.com](https://www.shutterstock.com)

ENTRIES CLOSE on Monday 17th February 2020

Promoter: Mangorolla CIC, 7 - 9 North Parade Buildings, Bath, BA1 1NS

Above: Flyer advertising the road sign competition, included in Debate Kits

Students in KS2 and KS3 were invited to design a road sign telling people whether their town is for or against self driving cars; it could be based on what was decided in the debate, or on their own opinion.

21 entries were made to the competition.

The winning design will be laser cut by the Royal Institution, and presented to the school along with a copy of the CHRISTMAS LECTURES Trilogy.

Reportage

Report your debate Aimed at KS4 and KS5

Writing about science is a key skill and career opportunity. Ask a student or two to report on your class's debate!

We want to know: how did the debate go, what happened, was there an obvious bias, did opinions change, were there any new issues that were raised? We're looking for views and opinions, not just an overview. You could take some inspiration from a report that was published by iNews - imascientist.org.uk/inews

Your students can present their report anyway they choose. For example: a newspaper article, a video or an audio report.

ENTRIES CLOSE on Monday 17th February 2020

It's important for your students to be accurate. The entries will be analysed and will feed into the RI Youth Summit on Artificial Intelligence taking place in March 2020.

To enter simply send the report to SDCreport@imascientist.org.uk. A panel will judge the best entry who will receive a WHSmith voucher for £25 and a copy of the Christmas Lectures Trilogy. Entries close on Monday 17th February 2020 For more information and full Terms and Conditions visit cars.imascientist.org.uk

2019 CHRISTMAS LECTURES SECRETS AND LIES THE ROYAL INSTITUTION HANNAH FRY

Promoter: Mangorolla CIC, 7 - 9 North Parade Buildings, Bath, BA1 1NS

Above: Flyer advertising the reportage competition, included in Debate Kits

Aimed at KS4 and KS5, teachers were asked to invite students to report on their class's debate; to write about how the debate went, what happened, whether there was an obvious bias, whether opinions changed, or whether any new issues were raised. Entries could take the form of a newspaper article, video, or audio report.

Entries were to be assessed by a panel of judges, with the best entry winning a copy of the CHRISTMAS LECTURES Trilogy, and a £25 WHSmith's voucher.

As of the deadline, no entries had been submitted. The response has been disappointing but probably reflects a lack of value to the teachers of participating.

Aims and achievements

Value of the Kit

Teachers were asked what they felt the value of the Kit was in terms of curriculum outcomes or other benefits to students.

Respondents commented that they valued the included facts and statistics which could be used to challenge or support views and opinions. As well as the way in which the Debate could be used to add additional context to the curriculum.

I think it provides context to the curriculum. It allows them to think about what they are learning in the classroom and see the application of theories/principles etc. in the real world and think about and address all the issues that might arise from AI technology.

Gives them a chance to look at both sides of the argument of something that is really happening.

Puts STEM learning in a real-life context...

It allows students to broaden their understanding on sustainability of cars in the future and the debate of ethics and issues associated with future developments.

It was part of their emerging technologies lesson. It was very useful to give them both sides of the technology.

Use of technology and gets students to think about areas of employment for the future.

Teachers also commented that the Debate supports development of confidence and social skills, as well as respect for a range of opinions:

The debating itself encourages exploration of an idea or concept, respect for each other's opinions and focuses on current issues.

The students had a great debate where they were able to articulate the views of the characters provided, argue their points and then speak passionately about their own opinions.

Used with less able science class who really engaged with cards and were able to compile a list of advantages and disadvantages. They then produced a short report giving their opinions. Good use of social skills.

...a great way to give a purpose to practising speaking and listening skills.

Great use of soft skills and research skills. Pupils really enjoyed this topic and chose to take it much further.

Wider thinking, discussions and linking in other understanding, knowledge and areas of the curriculum.

In the case of my adult learners it helped them argue in an opinion that they did not hold themselves. It is particularly useful in aiding their ability to discuss unfamiliar ideas across age ranges.

One teacher noted that using the Kit had helped improve their own confidence of using debates in lessons:

It has improved my confidence in using debates as a way of developing knowledge and understanding in a certain area of science and also in helping pupils to develop their understanding of the science behind the debate title.

Teacher ratings

Teachers were asked to give different aspects of the Debate Kit a star rating out of 5; looking at accessibility of language, relevance to curriculum, quality of lesson plan, balance of views, useful supporting resources, and relevance to other school outcomes. Average scores for the 27 teachers who provided ratings are shown below.

The Self-Driving Cars Debate Kit scored highly in all aspects with the highest ratings received for the balance of views in the kit, and the usefulness of the supporting resources.

Relevance to curriculum

Average score: 4.2/5



Relevance to other school outcomes

Average score: 4.3/5



Balanced views in kit

Average score: 4.6/5



Quality of lesson plan

Average score: 4.4/5



Useful supporting resources

Average score: 4.6/5



Accessibility of language

Average score: 4.4/5



Further feedback

Teachers were asked what they liked about the Kit. Respondents noted that the theme is a current topic, and appreciated the range of arguments for and against. Teachers also noted the accessibility and ease of use of the Kit.

There was a broad range of differing scenarios, encouraging pupils to look from more than their own, or a narrow perspective.

All of the resources - useful to have resources for a lesson especially looking at both sides of a topic.

The links in which we made with other safety concerns in the discussion.

Easily accessible resources provided a great starting point for the students to debate.

Great topic matter and relevant to today.

Clear instructions, information, easy to use.

I loved the balanced views as it challenges us all to think in different ways.

When asked for additional comments, one teacher noted that as a result of the debate they are going to invite a parent who works in the autonomous vehicle industry to be interviewed by the class.

Contact

I'm a Scientist, Science Debate Kits
are produced by:

Mangorolla CIC.

7-9 North Parade Buildings, Bath, BA1 1NS, UK
+44 (0) 1225 326 892 | +353 (0)76 670 5832

Contact:

Shane McCracken, Director

shane@mangorol.la