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## Extending Science lessons with Virtual Reality

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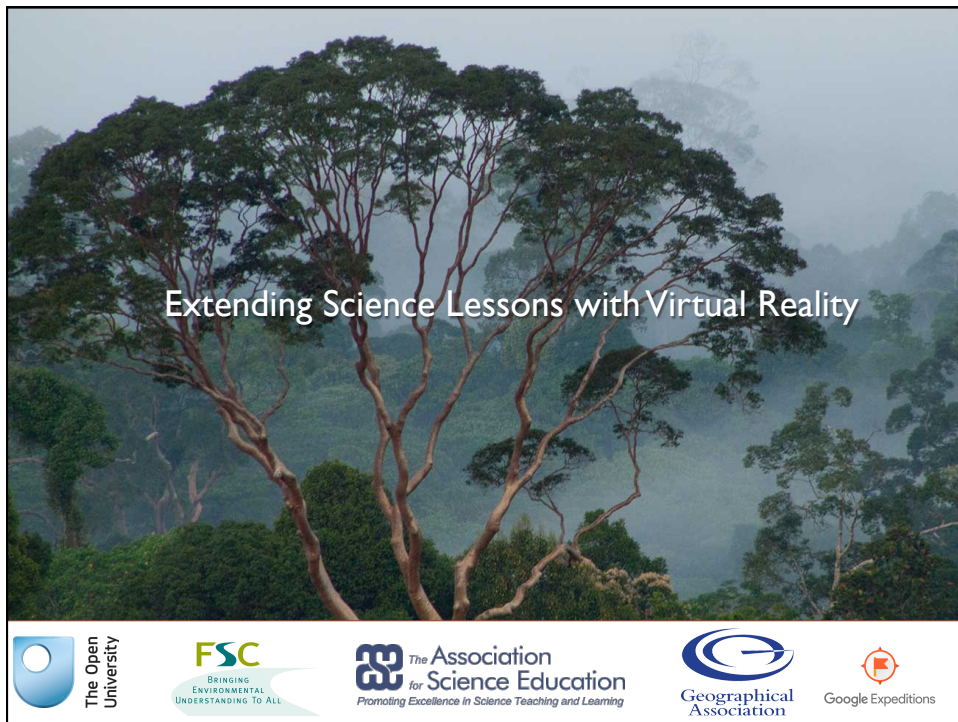
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## Extending science lessons with virtual reality

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ASE: Marianne Cutler and Richard Needham (also at Vicia Learning Solutions Ltd.)  
*Funded by Google and The Open University, UK*  
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The Open University  
FSC  
BRINGING ENVIRONMENTAL UNDERSTANDING TO ALL  
The Association for Science Education  
Promoting Excellence in Science Teaching and Learning  
Geographical Association  
Google Expeditions

## Agenda

- What is virtual reality?
- Google Expeditions
- Our research goals
- Group discussion
- Preliminary research outcomes

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## What is virtual reality?

A simulated environment on a **computer** or mobile platform (e.g., smartphone, tablet):



Second  
Life



Virtual Skiddaw:  
3D Geology Field  
Trips (Unity 3D)

Mobility

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# What is virtual reality?

A simulated environment on a computer or **mobile platform** (e.g., smartphone, tablet):



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# Google Expeditions



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## Google Expeditions

- Photospheres (360° view)
- Three-dimensional representation
- Real places or simulations
- First person exploration

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## Our research goals

- Whether and how virtual reality-based Google Expeditions (GEs) can be integrated in the Science curriculum (classrooms)
- Whether and how virtual reality-based GEs can complement physical field trips
- Whether and how virtual reality can support CPD of teachers
- Recommendations for the user interface design of GEs

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## Our research goals

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## Our research goals

- Whether and how virtual reality-based Google Expeditions (GEs) can be integrated in the Science curriculum (classrooms)
  - Teaching science concepts and phenomena
  - Support inquiry-based learning and students' curiosity

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## How you could help us?

- Trying it out today (**Demo**)
- Thoughts on the fit with the curriculum

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## Group discussion

Think of one of the difficult concepts in Science:

How could Google Expeditions (or Virtual Reality, in general) help you to teach that concept?

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## Group discussion

How would you use Google Expeditions to encourage inquiry-based learning?

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## Group discussion

What are the challenges that you would face in integrating Google Expeditions in your curriculum?

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## Preliminary research outcomes

### Inquiry-based learning activities with students

#### Lesson Example:

- Learning outcome: How solar energy is converted into electricity
- Teaching resource: “El Romero Solar Photovoltaic Plant”
- Student activity: Write down **questions** related to the learning outcome

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## Preliminary research outcomes

### Inquiry-based learning activities with students

- We analyse the **question type**



Low-order questions

*“How much does a solar power plant cost?”*

High-order questions

*“What evidence is there to show that [solar energy] is more efficient than burning fossil fuels?”*

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## Preliminary research outcomes

Google Expeditions in class:

- More questions than in a usual lesson
- More high-order questions
- More engagement from lower ability students

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