

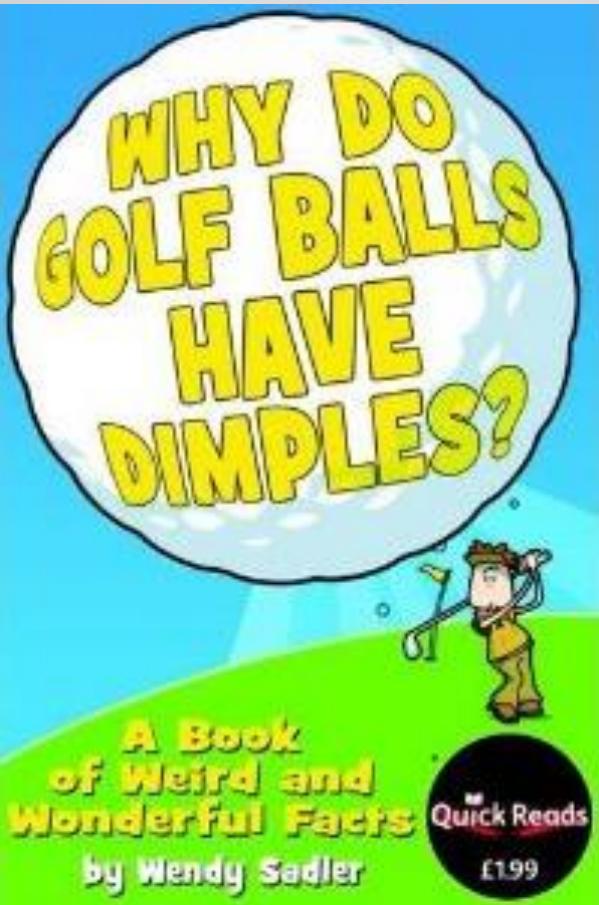
Teaching science communication to physics students

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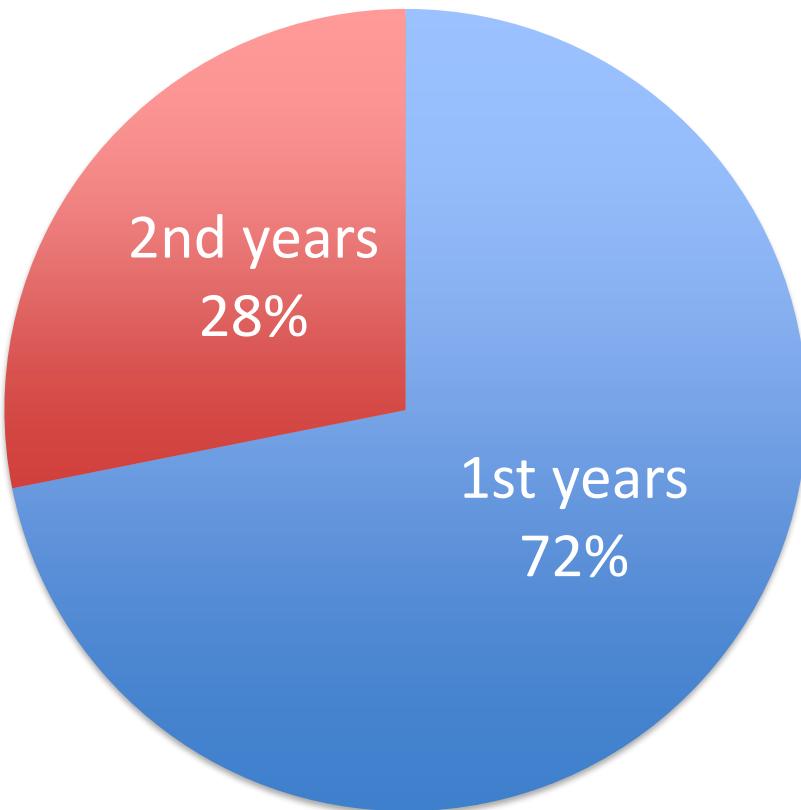


Cardiff physics/music graduate
Techniquest education manager
MSc Science communication
Founding Director *science made simple*
19 books on Amazon
TV/Radio regular
Government advisor on STEM issues





10 credit optional module 1st and 2nd years



32 students in total



Presentation skills

communication theory
audience engagement tools
learning styles
vocal skills and body language
using props and AV resources

Assessed by 3-minute presentation - 25% - Panopto

Writing and the media

basic journalistic skills
critical analysis of news sources
interview skills
research skills
radio formats and podcasting

Assessed by magazine article/blog about research
25%



Formats and audiences

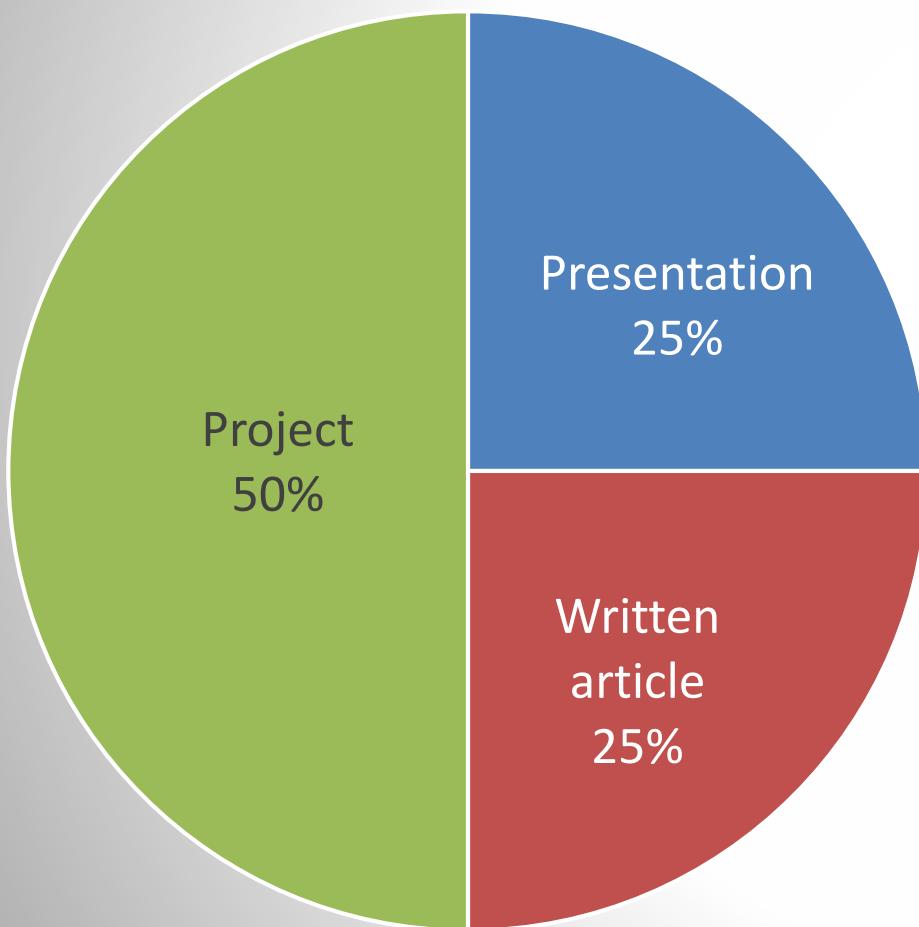
creative formats for outreach
science centres and museums
field trip and exhibit analysis
evaluation techniques
peer-review practice
project management skills

Assessed by proposal and pitch to panel - 50%

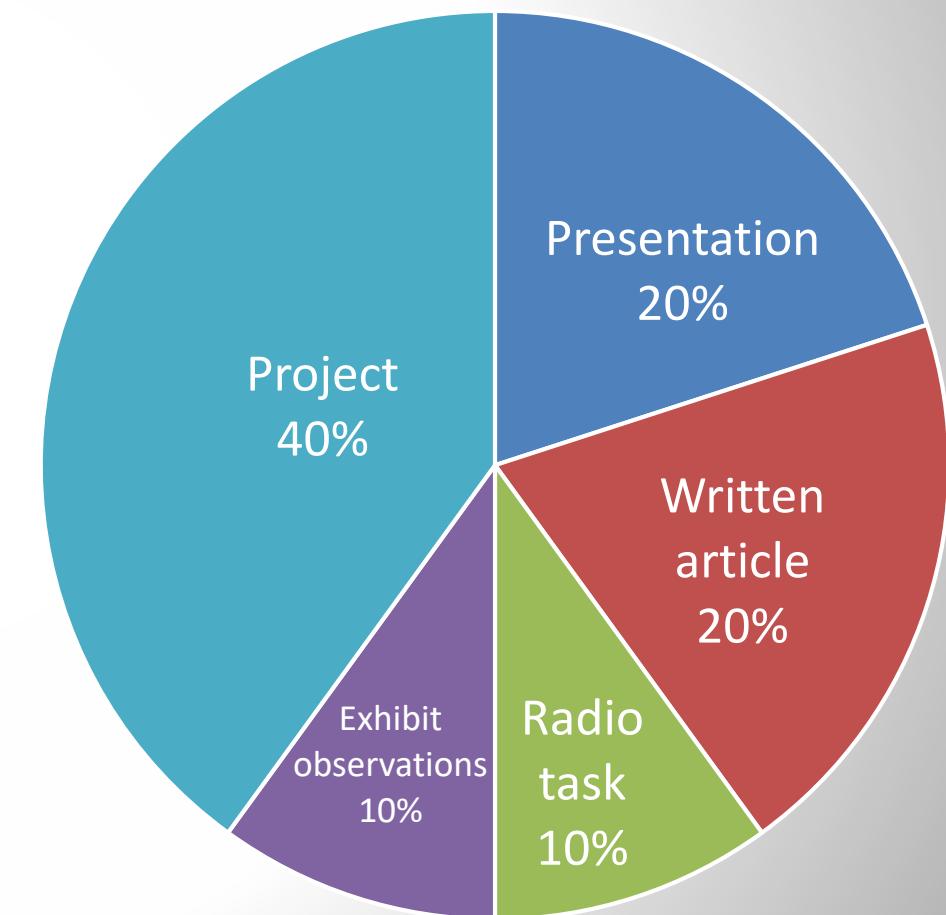


Communicating Science

1st year assessment



2nd year assessment





Key skills

- Understanding physics
- Presentation skills
- Creativity
- Communication skills
- Interpersonal skills
- Professionalism
- Writing skills
- Problem solving
- Project management
- Team working
- Time management

Career paths

teacher

journalist

policy maker

entrepreneur

researcher



Name:

Communicating Science - Analysis of interactive exhibits
Choose two exhibits at Techniquest that involve some physics and familiarise yourself with them. You will be observing visitors using these exhibits and reflecting on what you see.

Name of exhibit (or brief description) – name can usually be found at top of label

Physics concepts covered by the exhibit

Describe how the exhibit grabs attention. How long do visitors stay (Dwell time)?

What do you observe visitors doing? Is this the intended outcome of the exhibit do you think?

Wk	Date	Description	Assessment
1	31 st Jan	Introduction to module and context for public engagement. Introduction to presentation skills	Set assessment 1: 3 minute presentation
2	7 th Feb	Presentation skills part II. Slide design, audience interaction, voice and body skills. Using props safely.	
3	14 th Feb	Delivery of short presentations – to be videoed	Deliver assessment 1
4	21 st Feb	Introduction to science in the media. Where do science stories come from and how credible are they	
5	28 th Feb	Developing science writing skills – interviews with researchers which is required for assessment 2 content	Feedback from assessment 1 Set assessment 2
6	7 th Mar	Science on the radio and podcasts - Guest lecture Chris North and Rhys Phillips (Radio Cardiff)	
7	14 th Mar	Creative methods and formats used for engagement Introduction to IOP grant scheme for final assessment.	Feedback from assessment 2 Submit assessment 2 Set assessment 3 (groups)
8	21 st Mar	Science centres, museums and exhibits as communication tools Group planning time	
9	28 th Mar	Field trip to Techniquest – exhibit observation exercise	
10	4 nd April	Overview of evaluation methods for engagement to help with final assessment. Group planning time	
11	11 th April	Delivery of group presentation on proposals for public engagement projects to assessment panel	Submit assessment 3: Group project



Mistakes made

Too many guest lecturers, appreciated by some, but leading to inconsistent styles of delivery

First and second years' **assessment** was identical – but second years were more mature in their reflective approach

Too many assessments coming at the end of the course in proximity to exams



What the students said...

“It pushed us out of our comfort zone”

“It was the only module outside of labs that encouraged group work”

“My favourite module – it really helped my employability skills and general confidence”

“Different to the usual math-porridge blandness”

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Engaging our students with engagement

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What's the story?

Over the last 20 years there has been a steady growth in the number of physics **outreach and public engagement** initiatives with the aim of addressing the falling number of UK students choosing physics at HE level.

In parallel there is a **chronic shortage of specialist physics teachers** in schools, and a need to encourage more physics graduates to consider using their skills to inspire the next generation of scientists and engineers.

Cardiff School of Physics and Astronomy has a long history of outreach and engagement activities with a number of large-scale projects running within the school, and an award-winning science communication company – *science made simple* - who work in partnership with their researchers and students.

A new free-standing module called '**Engaging Physics**' was developed to share this in-house expertise and increase the employability skills of our students. The course was offered to first and second year students for the first time in the **academic year 2015-16**.

This poster gives an overview of the course content, shares some of our learning on the successes and failures, and identifies the changes we will make to the course in the coming year.

Core topics covered

Verbal presentations

Students learn about the **theory of communication** and **learning styles** to better understand how to create more engaging presentations. Practical sessions include **vocal and body language skills**, and how props and AV resources can be used more effectively. Skills are assessed with a **peer-reviewed 3-minute presentation**, which is video recorded to enable the students to self-reflect on their own performance.

Writing and the media

Sessions within this topic include basic **writing skills** for different audiences, guidelines on the use of **reading-score tools** to help get the correct level of information, and an exploration of **science in the media**. We feature two guest lecturers from the **School of Journalism and Radio Cardiff**, and the students make a mock radio programme in small groups. They are assessed on a **magazine article** about physics research from the School, which is written for a general-interest audience.



Formats and audiences

During the 11-week course the students explore the various formats used to address the **different issues and audiences** for public engagement. There is a **practical case-study assessment** on a local science centre – **Techniquest**- through a field trip where students critically evaluate the interactive exhibits. As a final assessment they then work in groups to prepare a proposal for the **IOP Public Engagement grants scheme**. They must create the ideas, plan a budget, set out evaluation criteria and then **pitch the idea to a mock panel**.

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teacher

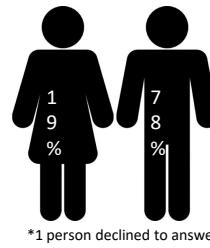
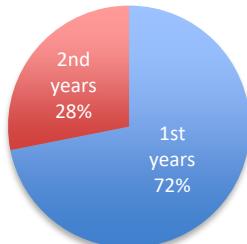
journalist

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Who took the course?



32 students in total

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Changes planned for 16-17

- Differentiated assessment for 1st and 2nd years
- Add reflective journal to create more opportunities for feedback and reflection
- Opportunity to extend ideas into 3rd year outreach projects

What the students said...

"It pushed us out of our comfort zone"

"It was the only module outside of labs that encouraged group work"

"My favourite module – it really helped my employability skills and general confidence"

"Different to the usual math-porridge blandness"