

# science made simple

Huw James

Becky Davies



science made simple



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who



why - mission



what



why shows and  
how we do it



does it work



what else?






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# who / am...

 Biomedical Sciences Department,  
Cardiff University

 STEMNET

 I'm a scientist, Get me out of  
here

 Techniquest

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# who / am...

-  Studied at Centre for Astronomy and Space Education
-  Formerly of Techniquest
-  Engineering Explained Co-ordinator
-  Affiliated with:
  - The British Science Association (Branch and General Committee)
  - Science Café Wales;
  - The British Council (Climate Challenge Europe);
  - Engineers Without Borders;
  - SEARCH.





# Who we are...

-  University spin-out
-  Team of 11 staff 3 Offices in Britain –  
Cardiff, Norwich and Bolton
-  Work across UK and overseas
-  250 shows a year, reached over 150,000 so far
-  Established in 2002, Ltd in 2004
-  Work across UK and overseas with British Council



# Working Internationally



# Cardiff Advisory Group



Colin Johnson (Chair) - The British Science Association, ASTC, former CEO Techniquest



Professor Teresa Rees - Pro-vice Chancellor, Cardiff University



Eric Coombes - Head of Science, Whitchurch High School



Nick Bodycombe - EU funding, RACD, Cardiff University



# the mission...



*inspire* a new  
generation  
of scientists  
and engineers



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# the mission...



*engage a  
wider public  
with STEM as  
part of popular  
culture*



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# the mission...



*translate the complexities of STEM research*



science made simple

- old
- male
- eccentric hair
- wears a lab coat
- is really clever
- slightly sad and geeky
- no friends
- blows things up





- all ages
- sometimes female!
- normal looking
- doesn't know everything
- gets things wrong
- sociable
- works in teams
- creative



# Who's who?

Patron: Adam  
Hart-Davis

Becky Holmes (Part Time)  
(Marketing)

David Price (Full time)  
(Noth-West Region/Training)

Debbie Syrop - visualise  
Project Manager

Nigel Davies  
Accountant

Wendy Sadler, Director

Helen Lloyd (Full time)  
Operations Manager

Huw James (Full time)  
Engineering Explained

James Piercy  
(East Region/Training)

Dan Reed (0.4)  
Office Manager

Advisory  
Groups

Becky Davies (Full Time)  
...

Gareth Smith - visualise  
Stage and Technical Manager

Helen James (0.2)  
Administrator



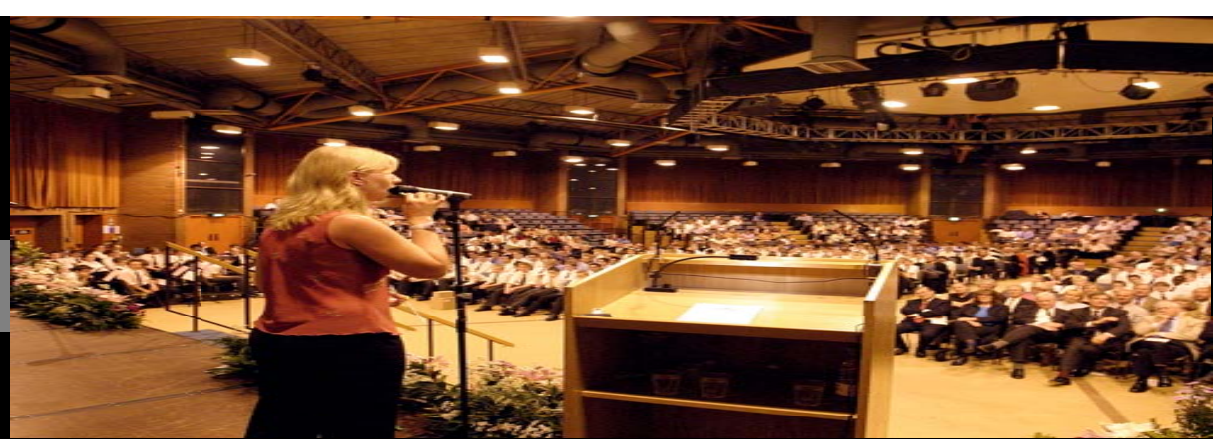
# the shows...

## 5 to 11 years

Music To Your Ears  
On Your Marks  
It's Only Water!... Or Is It?  
Who Wants to be a Superhero!?  
Bubbles and Balloons  
Cartoon Science  
Izzy's adventures

## 11 to 18 years

Music To you Ears  
Science of Sport  
Beyond The Rainbow  
A Rough Guide to Engineering  
E4L: Cradle To Grave  
Sound at the Extremes  
Gravity: Beyond the Apple  
Herschel's Telescope  
Top Ten Myths  
Einstein Made Simple  
Bloodhound  
Spooks and Spies



Bubbles and Balloons  
Cartoon Science

Science of Sport  
Music To Your Ears

Spooks and Spies



popular - things kids are interested in



easy to get the science in around the subject



provide survival



no funding



can't just keep doing same shows



GRAVITY  
Beyond  
The  
Apple



Work with researchers - disseminate and translate cutting edge research;



Funding;



Difficult to sell;



Limited shelf life;





[www.engineeringexplained.co.uk](http://www.engineeringexplained.co.uk)



Engineering presentations for schools and festivals



Mission - to explain what engineering **IS** to schools and public



To build a skills base of new engineering communicators



To reach around 20,000 students in two years



To investigate opinions about engineering



Engineering Explained

[www.engineeringexplained.co.uk](http://www.engineeringexplained.co.uk)

I thought engineering was about machines but now I think I might be one!"  
Student

CARDIFF UNIVERSITY  
PRIFYSGO CAERDYFF

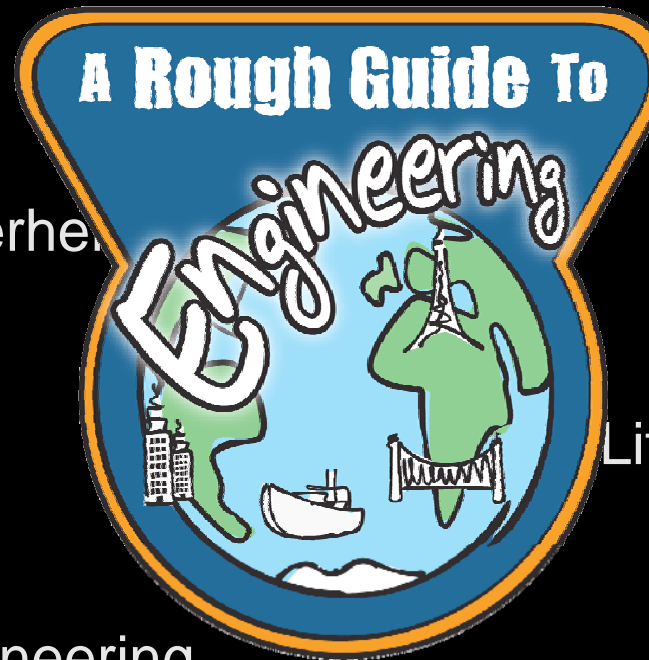
productions projects presentations promotion productions projects presentations

Green  
Name  
Number



Engineering  
Explained

[www.engineeringexplained.co.uk](http://www.engineeringexplained.co.uk)



Shows

Who wants to be a Superhero?

Life: From Cradle to Grave

A Rough Guide to Engineering

MadLab Cymru



*“Engineering I thought was to do with machines and I thought it would be a boring job, but now I think I might be one.”*

*10 year old girl*



# visualise

*the beauty of science*

- old favourites - but different
- scaled-up or close up
- chapters or 'acts' with follow-up films
- silent performer, not a time act



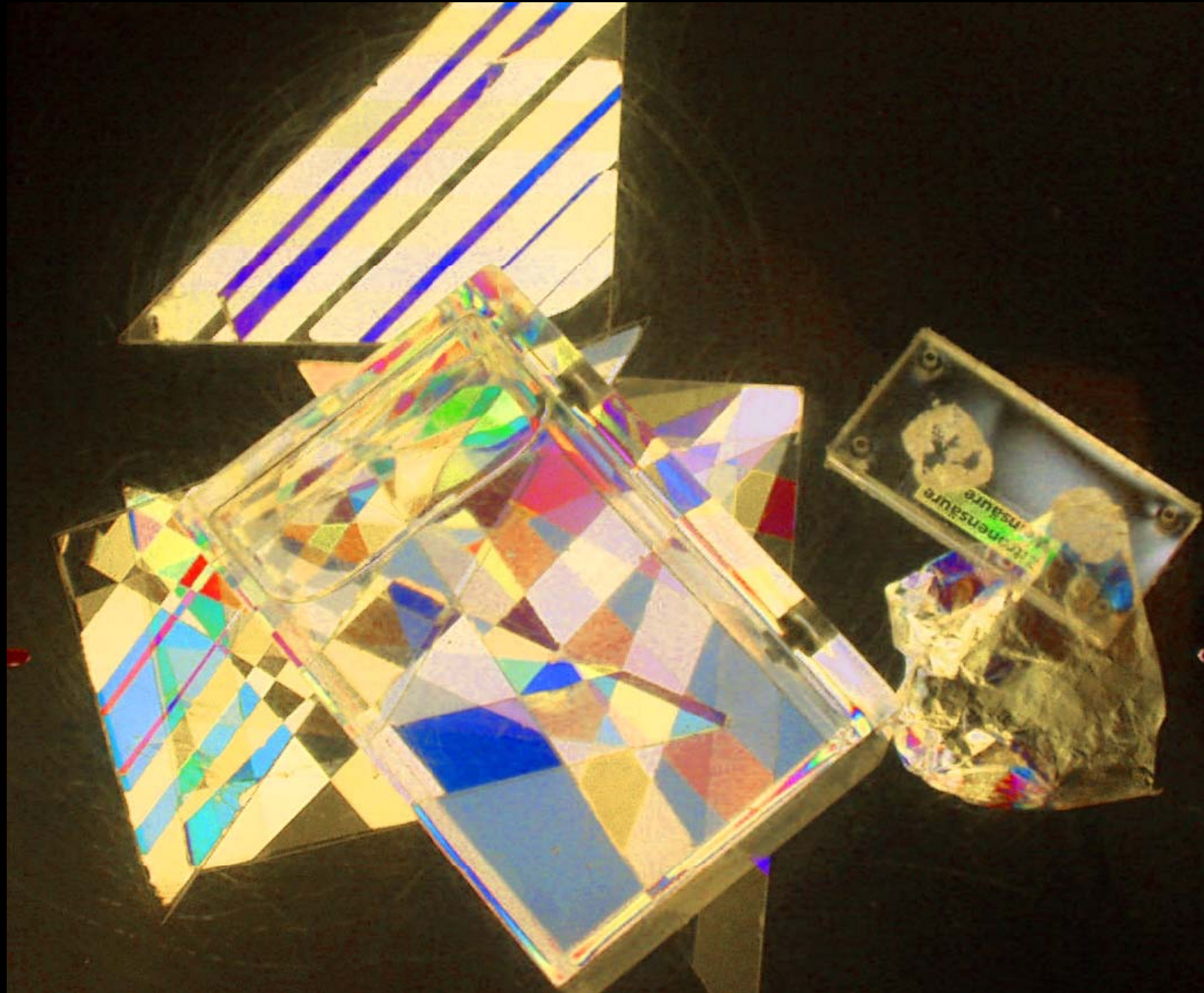
branching



twisting



colour





flow



waves







# Total Theatre Award for Experimentation Shortlist

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- Your perspective: 17-21 Sept
- Day in pictures: 21 September

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- Explosion in schoolteacher's car
- New foot-and-mouth case confirmed
- Merck abandons HIV vaccine trials
- Savings guarantee plan considered

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Άρθρο Τίτλος: Γράφει: ΕΡΜΑ - Εργαστήρι / Έκδοση: 66 Ημερίδα: 16-10-2007 Τίτλος: ΔΙΑΣΚΕΛΑΣΤΕ... ΕΠΙΣΤΗΜΟΝΙΚΑ!

## ΔΙΑΣΚΕΛΑΣΤΕ... ΕΠΙΣΤΗΜΟΝΙΚΑ!

Πώς μπορεί να φορέσει επιστημονικό όχημα η μεταγερμανόβου σε διασκεδαστικό θέατρο; Θα το δείχνουμε από παρακολούθησή στήριξη της ηρωίδας τους το Science Made Simple στην Αθήνα

Αντί να είναι απλά ένα παιχνίδι, οι επιστήμονες έχουν φτιάξει ένα παιχνίδι που μπορεί να εκπαιδεύσει τους μαθητές για την επιστήμη. Το παιχνίδι είναι το Science Made Simple, που είναι ένα εκπαιδευτικό παιχνίδι που μπορεί να φορέσει επιστημονικό όχημα. Το παιχνίδι είναι το Science Made Simple, που είναι ένα εκπαιδευτικό παιχνίδι που μπορεί να φορέσει επιστημονικό όχημα.

Μια νέα... επιστήμη

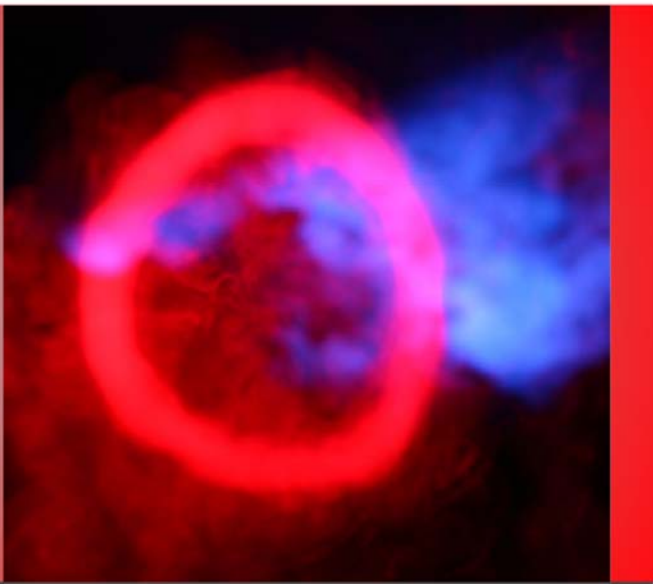
Οι επιστήμονες έχουν φτιάξει ένα παιχνίδι που μπορεί να εκπαιδεύσει τους μαθητές για την επιστήμη. Το παιχνίδι είναι το Science Made Simple, που είναι ένα εκπαιδευτικό παιχνίδι που μπορεί να φορέσει επιστημονικό όχημα.

"it takes a lot to impress your average nine-year-old. But this show does the trick" *Three Weeks*



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How can you make a doughnut out of air?



## Make a doughnut out of thin air...



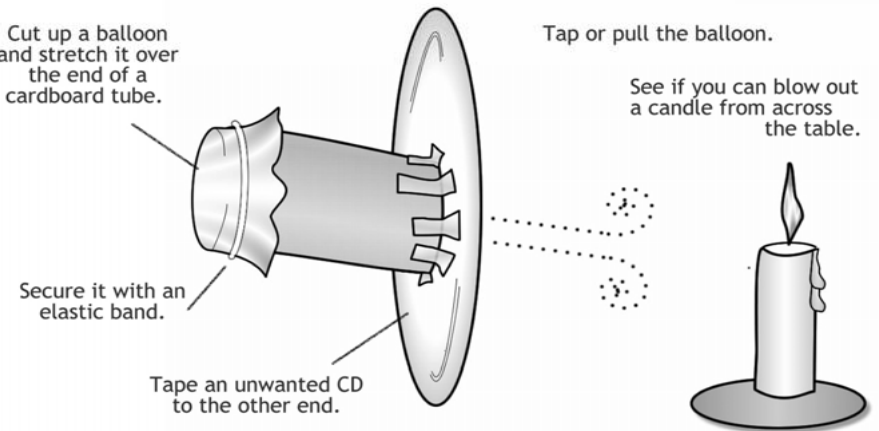
Cut up a balloon and stretch it over the end of a cardboard tube.

Secure it with an elastic band.

Tape an unwanted CD to the other end.

Tap or pull the balloon.

See if you can blow out a candle from across the table.



As the air is forced out of the cannon it is slowed by the edges of the opening. The fast moving air in the centre creates a low pressure which holds the 'doughnut' together as it travels through the air.

Picture - Smoke rings in 'Visualise - the beauty of science' Copyright Kiran Ridley 2007

www.sciencemadesimple.co.uk

How can you make a spiral from a candle and a camera?



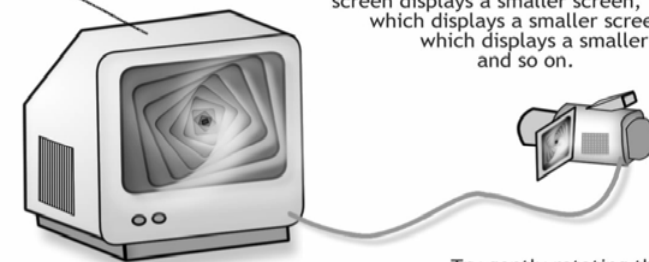
## Look into infinity...

Connect a video camera to the input of a TV monitor  
(You could use a webcam and a computer screen instead.)



Get the screen to display the camera view

Point the camera at the screen so that the screen displays a smaller screen, which displays a smaller screen, which displays a smaller screen and so on.

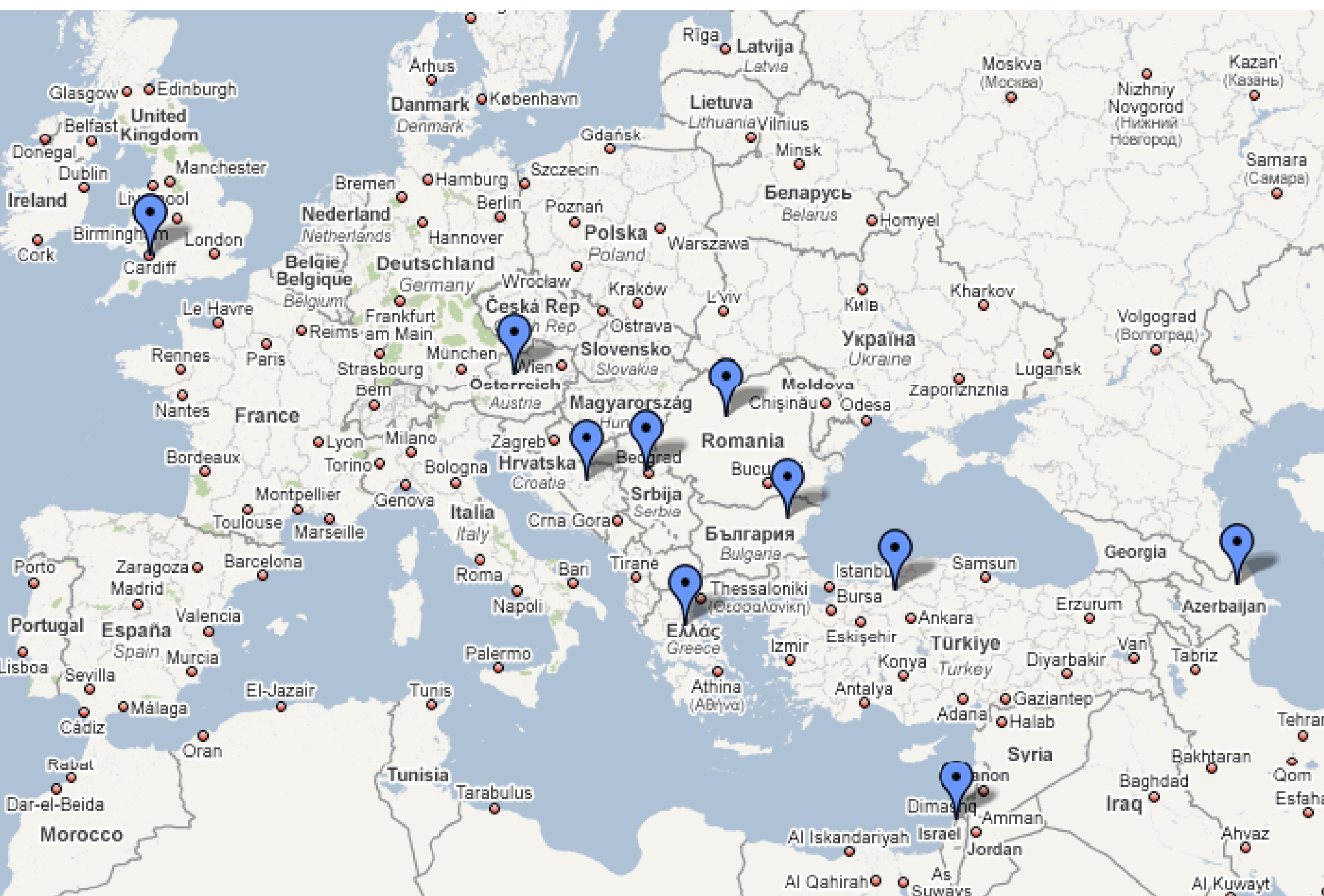


Try gently rotating the camera.

Repeating the same simple shape over and over again creates very intricate and beautiful patterns, called fractals. Lots of things in the natural world have fractal shapes and software designers take advantage of this fact to create virtual worlds with realistic trees, mountains and clouds.

Picture - Video feedback with candle. Copyright D.Syrop 2007

www.sciencemadesimple.co.uk  
www.handsonscience.org.uk



9 countries - 11,152 people





science made simple  
presents

# visualise

**RELOADED**

*"an enjoyable and hypnotic show, mischievously presented and skillfully combining multimedia effects with live science to engage a wide audience" Hairline*

*"...thoroughly engaging" "Awesome!"*

*"It's like the Blue Man Group meets the Christmas lectures"*



2.15pm 1-9, 18-22 Aug

12pm 10-17 Aug (Except 11th)

Box Office 07074 201313

venue 13, Lochend Close, Canongate

[www.sciencemadesimple.co.uk/visualise](http://www.sciencemadesimple.co.uk/visualise)



[www.venue13.com](http://www.venue13.com)



*"It's the science lesson children will so enjoy, they'll never know they've learned something."*

**The Herald**

*"It's not often children's theatre truly inspires but this defies anyone, no matter what their age, not to stare in wonder at an altogether different kind of science class."*



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# Why Shows?



value for money  
entertainment  
live role models  
flexible delivery

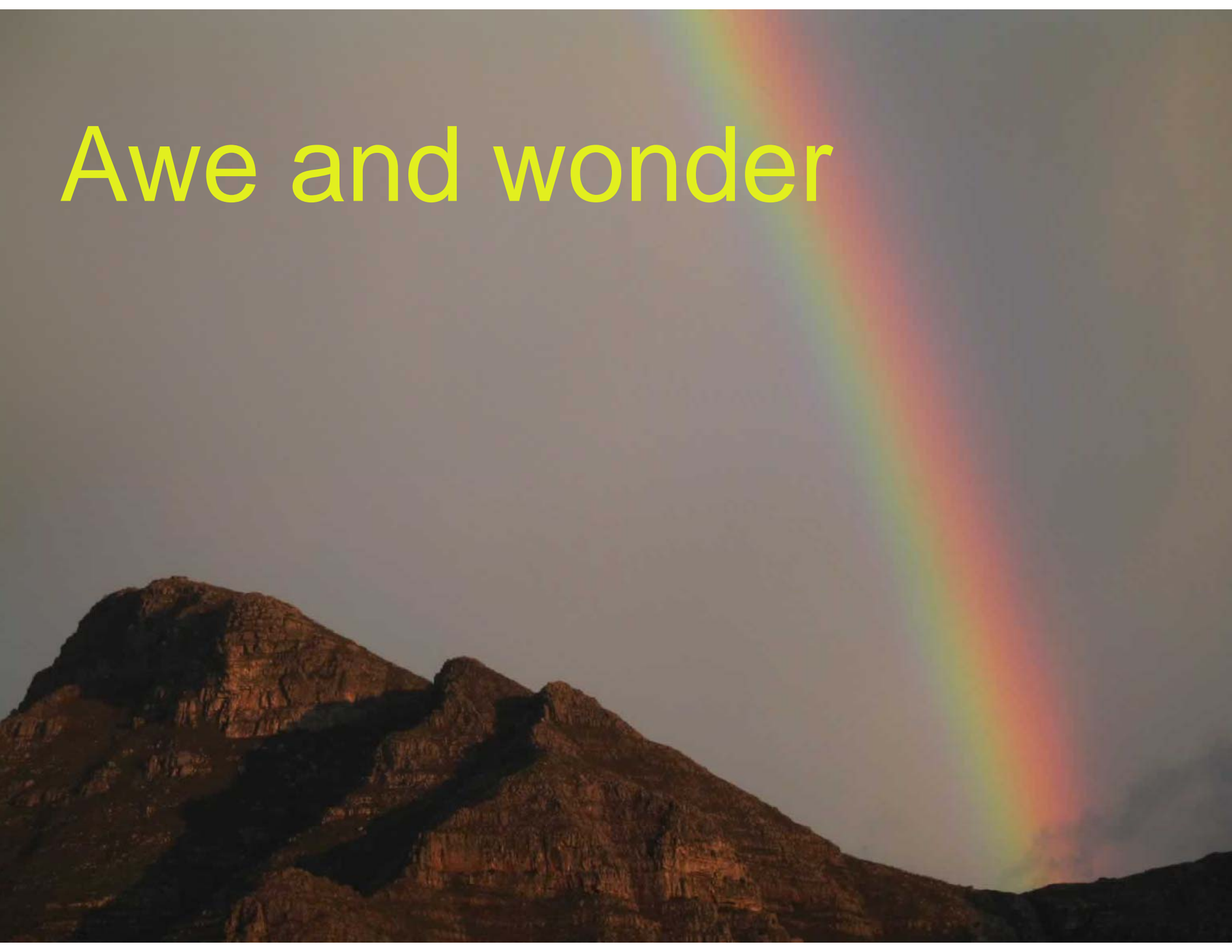
“Learning about science in the context of other subjects can help learners to appreciate the creative aspects of science”



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Awe and wonder



High Impact



# demo categories

Code	Name	The audience...
C	Curiosity	are surprised
H	Human	interacts
A	Analogy	understands
M	Mechanics	contextualises
P	Phenomena	experiences



# does it work

generic  
learning  
outcomes



# does it work?



“All the experiments were so amazing, I wish I could watch them all over again!”

- Year 6 pupil

“You made such a big impact on the pupils. Your presence was definitely good for physics and for science in general.”

- Headmaster

# does it work?

2004

WISE Excellence Award

Welsh Woman of the Year (Science and Technology)

2005

IOP Young Professional Physicist of the Year

2006

Laureate EU Descartes Communication Prize

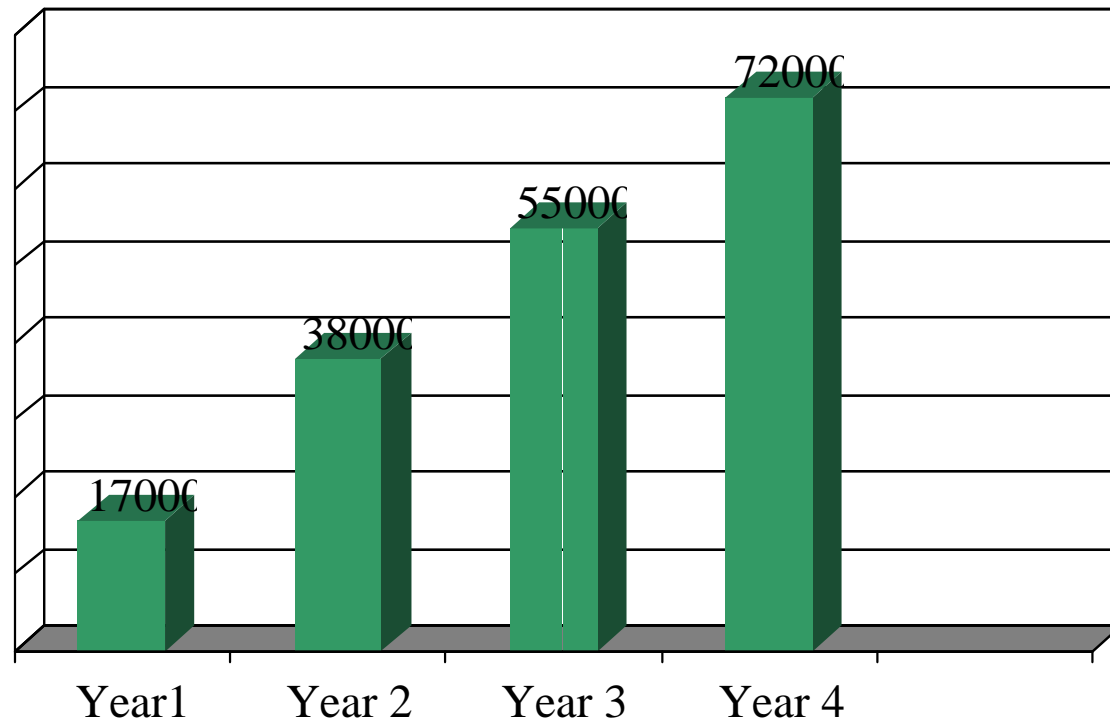
2007

Institute of Acoustics Public Engagement Award

2008

UKRC Woman of Outstanding Achievement

## Audience numbe








March 2008 - 12,817 people in 86 shows!

March 2009 – 13, 995 in 74 shows!



# The Challenges

-  No core funding - job security or overheads
-  Content defined by sponsors
-  Subsidised competition
-  Wales vs England
-  Too many ideas..!



# The Challenges



Draw on other expertise – external professionals



Presenting standards – videoing



LAMDA



BIG

# The Vision

-  To be the UK's leading science outreach company
-  To obtain sponsorship to help schools who can't pay
-  To have at least five regional offices
-  To be reaching 250,000 students a year, and offering Welsh shows
-  To attract the best science communicators
-  To set up more international projects - FP7 framework

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