Engaging Tomorrow's Scientists

Why STEM is Good for You and the World

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Engaging Tomorrow's Scientists

- Who we are
- What is STEM engagement?
- Why is STEM engagement important?
- How can we, working in Healthcare Science, increase STEM engagement?
- Short group activity

What is STEM?

Science

Technology

Engineering

Maths

Why does STEM matter?

- Not enough young people pursing STEM careers
  - STEM industries crucial for **economic growth**
  - Population scientific literacy has social and economic advantages
- Profile of those in STEM careers too narrow
  - Several **minorities under-represented**
  - Social injustice

Reference: https://www.kcl.ac.uk/sspp/departments/education/research/aspires/ASPIRES-final-report-December-2013.pdf

In the U.S.A…

- STEM related **jobs grew** at three times the rate of non-STEM jobs between **2000** and **2018**

- In **2018** it is estimated that **2.4 million** STEM jobs went **unfilled** (Smithsonian Institute)

In the UK…

- **£990m** spent on, or committed to, key STEM-specific interventions between 2007 and autumn 2017
- **442,000** undergraduate enrolments in STEM subjects in 2015/16
- **24%** of graduates in STEM subjects known to be working in a STEM occupation 6 months later (National Audit Office)

Reference: National Audit Office. *Delivering STEM skills for the economy*. Published 17/01/18. Available from: https://www.nao.org.uk/wp-content/uploads/2018/01/Delivering-STEM-Science-technology-engineering-and-mathematics-skills-for-the-economy-Summary.pdf

The NHS in Scotland

- NHS GG&C Employability Leads require **20%** of this years **School Leavers** to ultimately work for the healthboard

- Modern apprenticeship
- HND/HNC
- Degree

What is STEM engagement?

medical devices for the NHS

Real careers start here
Real careers start here

#bigbangwest
DYW

NHS
GO
FOR

Why is STEM engagement good for me?

- **Continuous Professional Development**
- Showcase your interesting, ‘cool’ job
- Contribute to creating a young, evolving and diverse workforce for the **NHS**
- Fulfilling and fun

Why is STEM engagement needed?

Why is there a STEM gap?

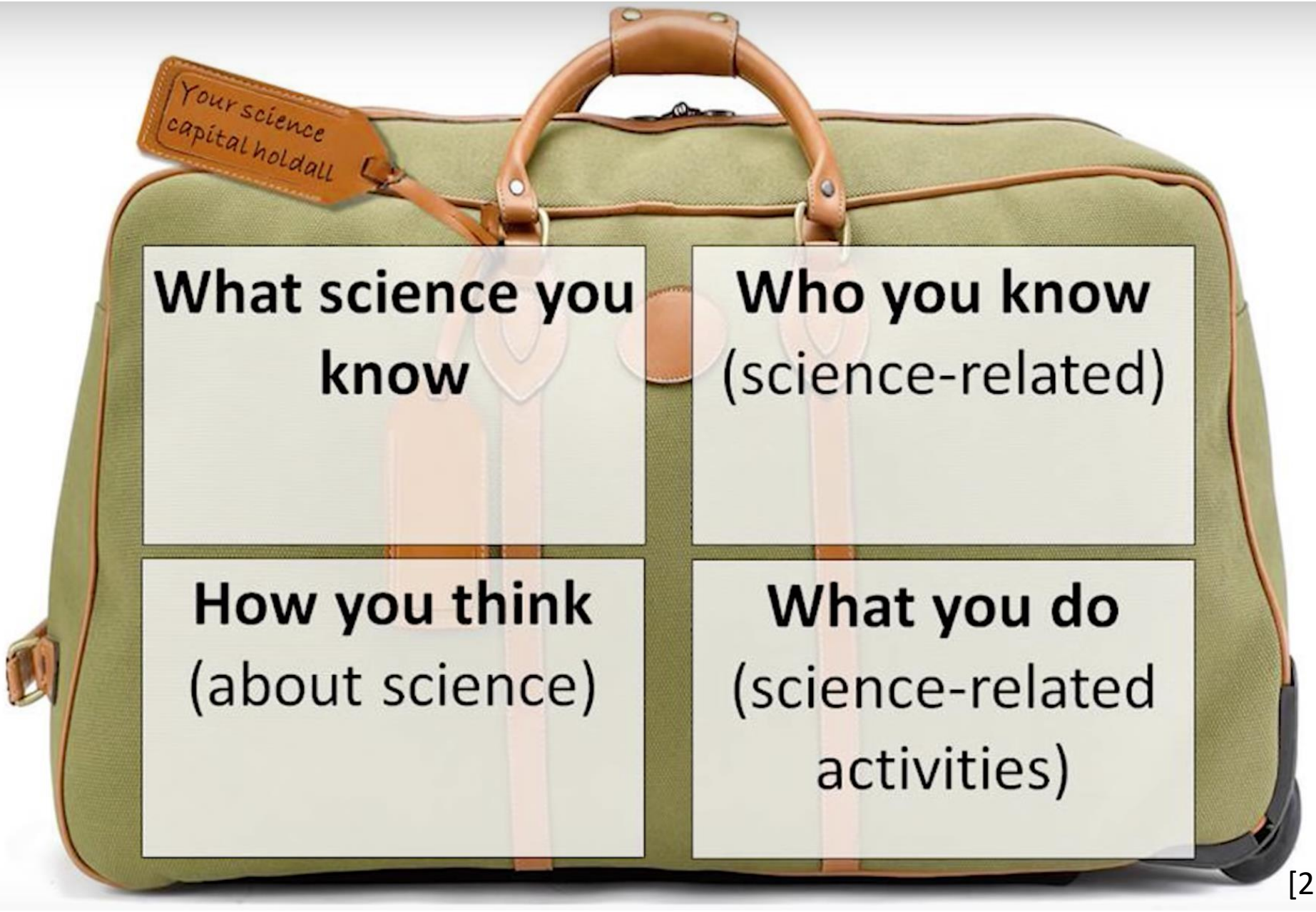
- Most **young people** have high aspirations – just not for science
- Negative views of school science and scientists are **NOT** the problem
- Family **'science capital'** is key
- Most students and families are not aware of where science can lead
- The brainy image of scientist and science careers puts many young people off
- The (white) male, middle-class image of science careers remains a problem

Reference: https://www.kcl.ac.uk/sspp/departments/education/research/aspires/ASPIRES-final-report-December-2013.pdf

Science Capital

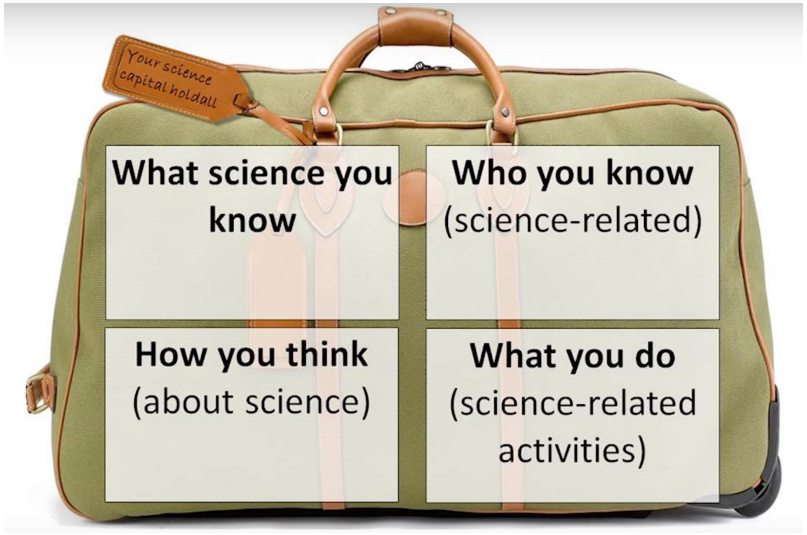
- Louise Archer of Kings College London
- Surveyed 3658 secondary school students age 11-15 in England [1]
- Found:
  - **5%** of pupils had '**high**' science capital
  - **27%** of pupils had '**low**' science capital
- Level of science capital:
  - clearly patterned by **gender**, **ethnicity** and science class set
  - heavily influences post-16 plans with regard to science
  - differs dramatically in whether they feel others see them as a '**science person**'

1. *'Science Capital': A conceptual, methodological, and empirical argument for extending bourdieusian notions of capital beyond the arts.* Journal of Research in Science Teaching, Vol.52, No.7, pp 922-948 (2015)
2. TED^{x} Talk – 'Should we stop trying to make science more fun? https://www.youtube.com/watch?v=g8D3fr-0aJ0


Your science capital holdall
What science you know
Who you know (science-related)
How you think (about science)
What you do (science-related activities)

[2]

What was your science capital?



- In S2 (Year 9)?
- In S4 (Year 11)?

Solutions?

- Shift policy aims from ‘increasing interest’ to **‘building science capital’**
- Earlier intervention – from primary school
- Break the ‘science = scientist’ link
- Embed STEM careers **awareness** in science lessons
- Tackle multiple inequalities
- Bust the ‘brainy’ image of science/science careers
- **Broaden** post-16 science options
- Build science capital with students and families

Reference: https://www.kcl.ac.uk/sspp/departments/education/research/aspires/ASPIRES-final-report-December-2013.pdf

Practical Activity

- Split into small groups
- Try and pair with people from different areas of healthcare science

5 minutes to brainstorm:

- Answers to 3 questions
- Based a real STEM ambassador request

After 5 minutes:

- Find group which has brainstormed the same activity
- Discuss your answers (similarities/differences/omissions)

How would you measure success?

- List **3 things** you learnt from your workshop?
  - Heart facts, gravity and nanotechnology
  - I've learned what to do if someone has fainted, how to do CPR and about DNA
- List some ways you might use this knowledge in **future**?
  - I want to be either a doctor, nurse, **scientist** or an astronaut
  - University and college and high school to get a job with maths and engineering and science
- List any further things you would like to **learn** about after attending the workshop?
  - **How I can become a scientist**
  - What bacteria can kill you, what level of blood pressure could be a deadly level or is a dangerous level

STEM in The Gorbals

- Population **8,500** (approx.)
- Male life expectancy below Glasgow average
- **53%** Single Parent Households
- **30%** income deprivation
- **27%** employment deprivation

My World
Healthy Meal
The Heart

Fire exit
DNA
OUR IMPORTANT HEART
For an ambulance call 999.
Ambulance please.
NANOMATE
NUTRITION
If someone needs help
1st
2nd
3rd

GEORGE SQUARE
STEM
Gorbals