

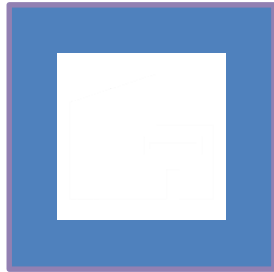


Data Education for All

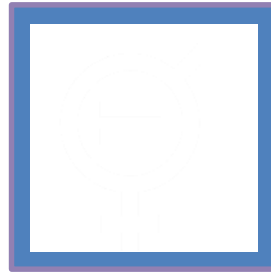
Bringing the benefits of the City
Region Deal to local learners

Professor Judy Robertson, Moray House School of Education

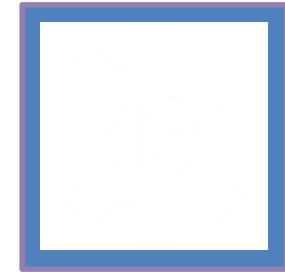
DDI Skills Gateway: Our Approach to Inclusive Growth



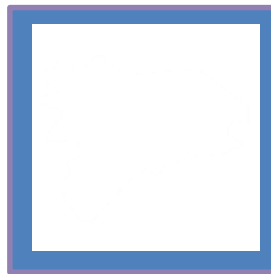
**Opportunity for all
at School and FE**



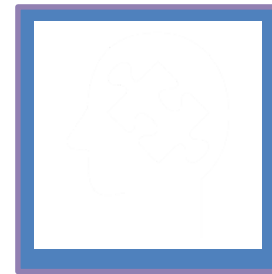
**Gender equality
across all stages**



**Those at risk of
'automation'**



**Across the whole
city region**



**Opportunities for
people with disabilities**



The proposal

All children in the City Region will have the opportunity to excel in data education, regardless of their gender, location or financial circumstances.

121k

Learners across the region over 8 years





DATA

Data Scientist: The Sexiest Job of the 21st Century

by Thomas H. Davenport and D.J. Patil
FROM THE OCTOBER 2012 ISSUE

MODERN DATA SCIENTIST

Data Scientist, the sexiest job of the 21st century, requires a mixture of multidisciplinary skills ranging from an intersection of mathematics, statistics, computer science, communication and business. Finding a data scientist is hard. Finding people who understand who a data scientist is, is equally hard. So here is a little cheat sheet on who the modern data scientist really is.

MATH & STATISTICS

- ☆ Machine learning
- ☆ Statistical modeling
- ☆ Experiment design
- ☆ Bayesian inference
- ☆ Supervised learning: decision trees, random forests, logistic regression
- ☆ Unsupervised learning: clustering, dimensionality reduction
- ☆ Optimization: gradient descent and variants

PROGRAMMING & DATABASE

- ☆ Computer science fundamentals
- ☆ Scripting language e.g. Python
- ☆ Statistical computing packages, e.g., R
- ☆ Databases: SQL and NoSQL
- ☆ Relational algebra
- ☆ Parallel databases and parallel query processing
- ☆ MapReduce concepts
- ☆ Hadoop and Hive/Pig
- ☆ Custom reducers
- ☆ Experience with xaaS like AWS



DOMAIN KNOWLEDGE & SOFT SKILLS

- ☆ Passionate about the business
- ☆ Curious about data
- ☆ Influence without authority
- ☆ Hacker mindset
- ☆ Problem solver
- ☆ Strategic, proactive, creative, innovative and collaborative

COMMUNICATION & VISUALIZATION

- ☆ Able to engage with senior management
- ☆ Story telling skills
- ☆ Translate data-driven insights into decisions and actions
- ☆ Visual art design
- ☆ R packages like ggplot or lattice
- ☆ Knowledge of any of visualization tools e.g. Flare, D3.js, Tableau

MarketingDistillery.com is a group of practitioners in the area of e-commerce marketing. Our fields of expertise include marketing strategy and optimization; customer tracking and on-site analytics; predictive analytics and econometrics; data warehousing and big data systems; marketing channel insights in Paid Search, SEO, Social, CRM and brand.





A data literate person:

“understands, explains, and documents the utility and limitations of data by becoming a critical consumer of data, **controlling his/her personal data trail, finding meaning in data, and taking action based on data.** The data-literate individual can identify, **collect, evaluate, analyze, interpret, present, and protect** data.” (ODI 2015).





Why UoE?

- Because we are driving data driven innovation across the region, which has the potential to disrupt jobs in the future
- We have a chance to make this a positive disruption – data education can help local people be part of the innovation





Education, more than outreach

- The University already does great work in schools outreach
- With some effort, we can:
 - Make it sustainable (not just one off sessions)
 - Build on learning, year by year
 - Help teachers and learners with curriculum outcomes
 - Make it equitable (for “ordinary” schools)





An example

DATA





Newbattle, Digital Centre of Excellence

Newbattle High School
A Digital Centre of Excellence

HOME WELCOME CONTACT CALENDAR INFORMATION

HOME
Newbattle High School
Newbattle Community Campus
Newbattle Way
Easthouses
Dalkeith
EH22 4SX
T: (0131) 561 6700
E: newbattle_hs@midlothian.gov.uk
Head Teacher: Mr Gib McMillan

WELCOME TO OUR SCHOOL

DIGITAL CENTRE

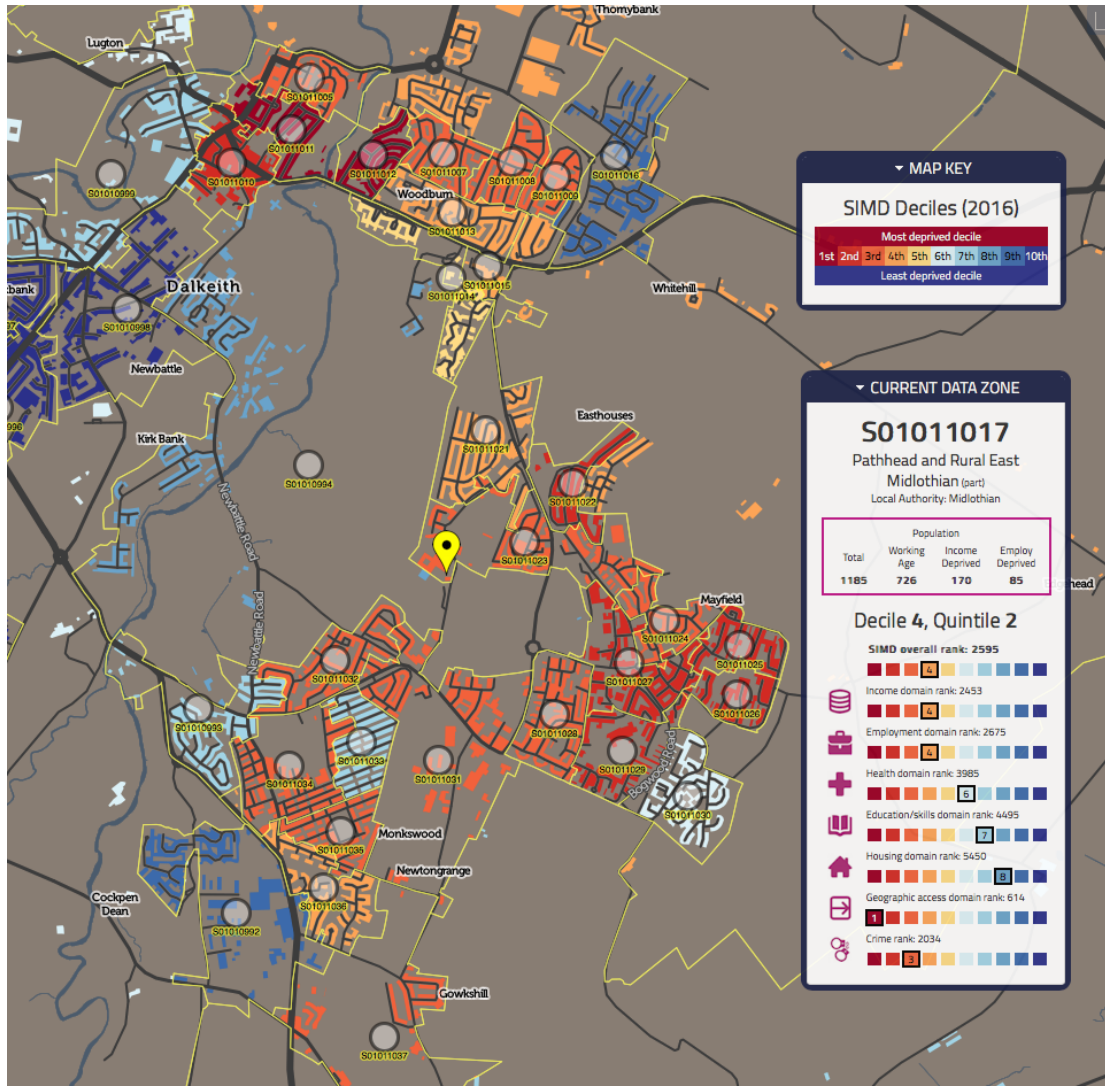
LATEST NEWS
Latest News

DIGITAL LITERACY

GLOW

GOOGLE FOR EDUCATION

G Suite
@Newbattle



Why physical activity matters

Physical activity
for children and young people
(5–18 Years)

BUILDS CONFIDENCE & SOCIAL SKILLS	STRENGTHENS MUSCLES & BONES	MAINTAINS HEALTHY WEIGHT
DEVELOPS CO-ORDINATION	IMPROVES SLEEP	
IMPROVES CONCENTRATION & LEARNING	IMPROVES HEALTH & FITNESS	MAKES YOU FEEL GOOD

Be physically active

Spread activity throughout the day

Aim for at least 60 minutes everyday

All activities should make you breathe faster & feel warmer

PLAY	RUN/WALK	BIKE	ACTIVETRAVEL
SWIM	SKATE	SPORT	PE
SKIP	CLIMB	WORKOUT	DANCE

Include muscle and bone strengthening activities
3 TIMES PER WEEK

Sit less

LOUNGING

Move more

Find ways to help all children and young people accumulate at least 60 minutes of physical activity everyday

UK Chief Medical Officers' Guidelines 2011 **Start Active, Stay Active: www.bit.ly/startactive**



What is the best visual representation for this data?



What advice should we give children about how to make positive changes based on data?

What about parents?
Or teachers?

What kinds of personal health data are children interested in?

Who do children want to share the data with?

Where is this data stored, and who gets access to it?

Sweatcoin

Spend
on gadgets, etc.

Convert
steps into currency

Track
steps and spend

Turn
activity into a game

OFFERS
First week specials

Apple Watch 1 left \$5000	Vivo Barefoot Shoes 10 left \$200
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Available today

450 SKINS Gift Card	4000 Micro Scooter for...	10 MTV Trax Premium App
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EARNED TODAY

\$1.80
Earned today

2,003
Total steps

MY BALANCE

\$132.64

Go shopping Send to friend

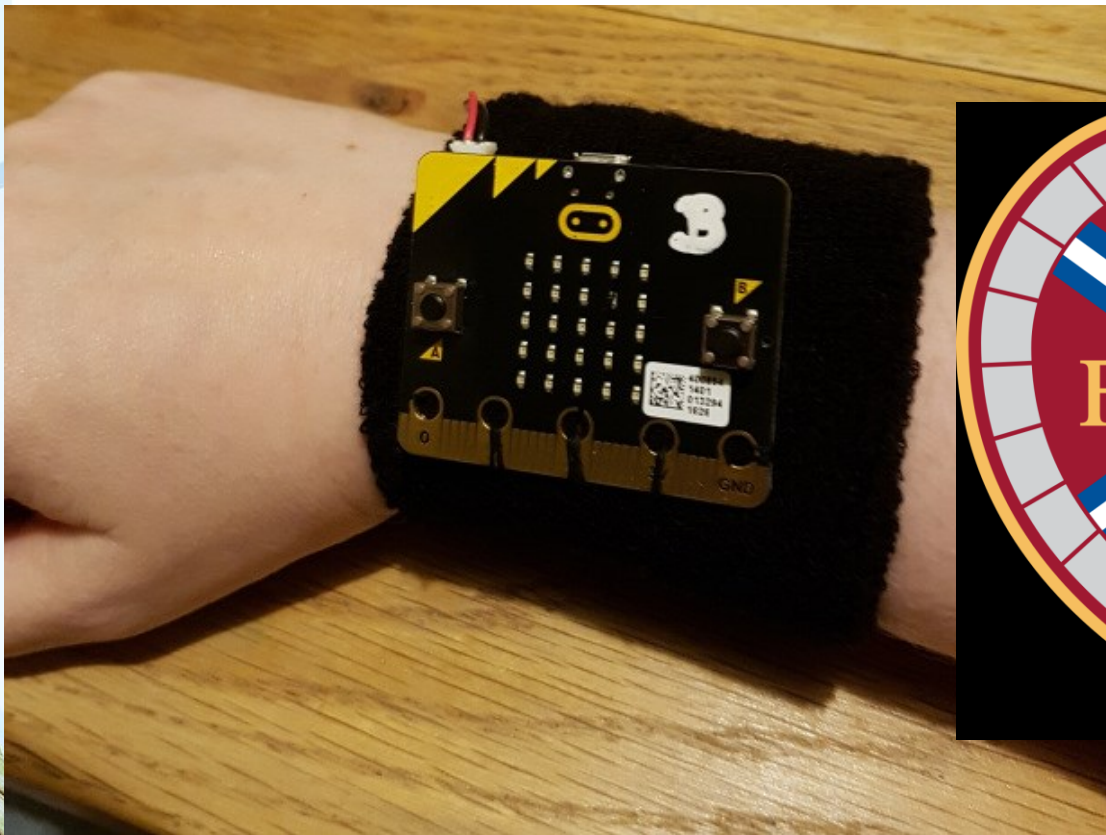
Conversion History

Bought "Self Defence Mastery"	\$40.00
Monthly subscription fee for Shaker level	\$28.00
Received from Ippolyth Innokentiev	\$87.00

MY LEADERBOARD

12 Jess Shaker	3,734
13 Anastasios Quacker	3,567
14 You Shaker	3,457 Outdoors steps
15 Callum Shaker	3,214
16 Natalie Shaker	2,678
17	

Microbit step counter



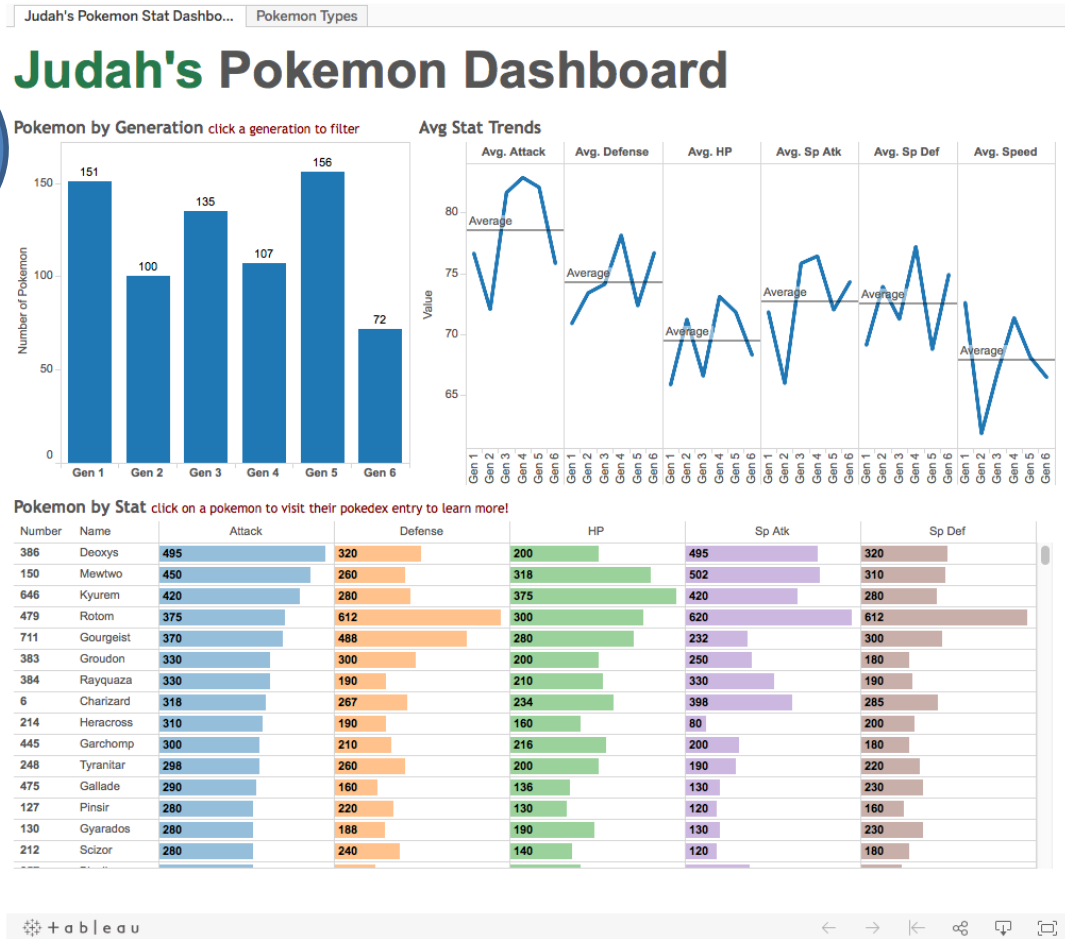


Dreams for the future



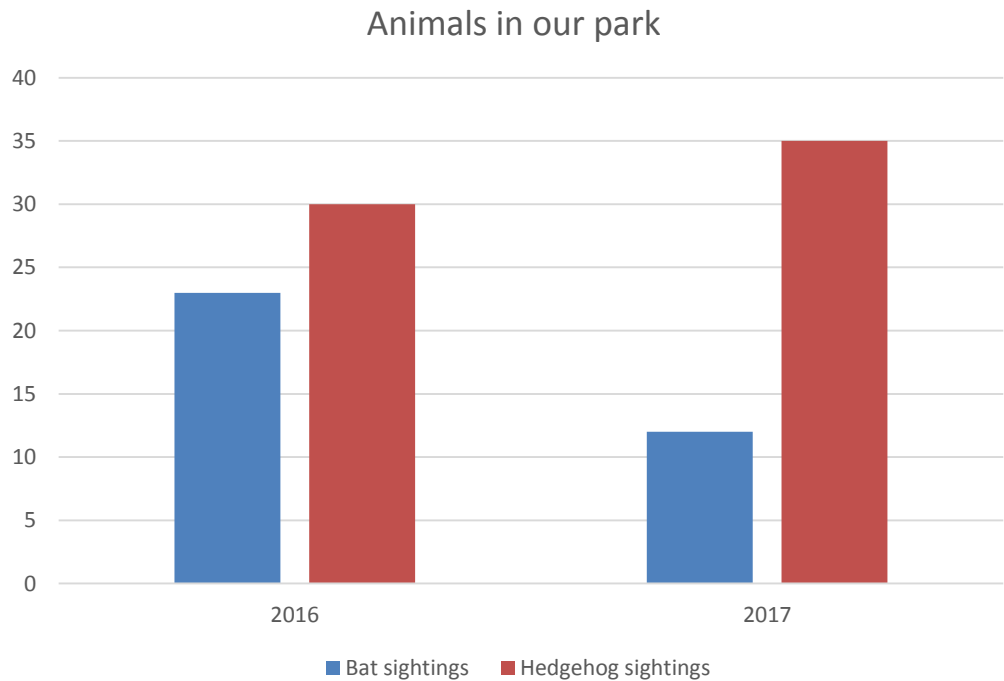
Personally meaningful

I like Mewtwo now, because he's really strong, fast, and really defensive.



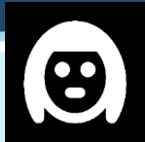
Local data

Look at that, there are fewer bats nesting in the park than there were last year. I wonder why.

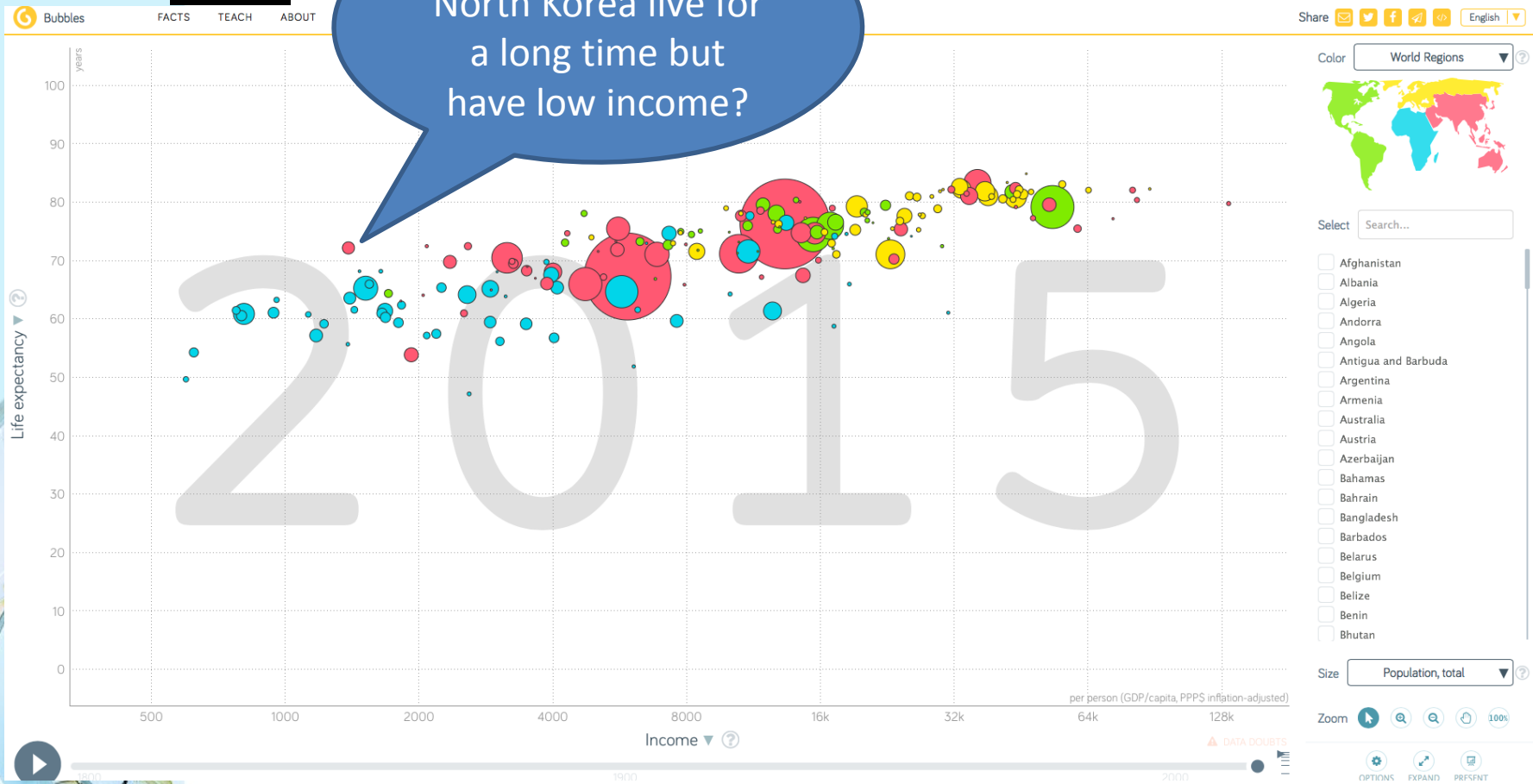


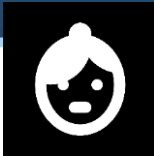
Warning: this data is completely made up by me. No furry/spikey creatures were harmed in the manufacture of this data





Why do people in North Korea live for a long time but have low income?





Science was great today. I saw a totally new galaxy!



ENGLISH | POLSKI

GALAXY ZOO.org

Hi starstryder | Home | The Science | How to Take Part | Galaxy Analysis | Forum | Press | Blog | FAQ | Links | Contact Us | Logout | Profile

- Galaxy Tutorial
- Galaxy Analysis
- Galaxy Zoo - Thank You
- Show My Galaxies

Galaxy Analysis

Welcome to Galaxy Zoo's view of the Universe. If you're here you should already have seen the **Tutorial**, but feel free to go and remind yourself. There's no need to agonise for too long over any one image, just make your best guess in each case.



Galaxy Ref: **58772938767769742**

Choose the Galaxy Profile by clicking the buttons below

 CLOCK

 ANTI

 EDGE ON / UNCLEAR

SPIRAL GALAXY



ELLIPTICAL GALAXY

 STAR / DON'T KNOW

 MERGERS

Show Grid Overlay on the next Image



How can we scale this to 528 schools?

- a well-designed and coherent curriculum from nursery upwards
- inspiring and exciting teaching materials
- teachers who are confident and competent in data education;
- productive collaborations between the University staff and students, City Region schools and local employers and charities;
- robust evaluation
- internationally leading research and knowledge-sharing to deepen our understanding of how data impacts society





Questions?

I 
DATA

If you know of an interesting data set which kids should learn about, email Kate Farrell digitalkatie@gmail.com, subject line: IT Futures

