



# Microbiology in Primary Science

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*Aerial photographers*



# State of the Nation – Primary Science

- A large survey of 1,010 primary teachers was carried out in Sept. 2017 commissioned by the Wellcome Trust.
- Only 1.4 hours per week on average are typically devoted to science in primary school
- Barriers to teaching science:
  - Budgets/resources
  - Space/time
  - Subject importance
  - Subject knowledge/confidence
- 91% of schools have a science leader



# Primary science

93% of pupils agree a lot or agree that they like to understand how things work

87% find science interesting

91% agree that science can help the environment

90 % agree that science can help people make things

80% agree that science can help animals

1,906 pupils aged 7-11 responded to the  
State of the Nation Primary Science survey

**Microbiology education in terms of an understanding of hygiene relating to hands, food and germ transfer?**

Antibiotic resistance??



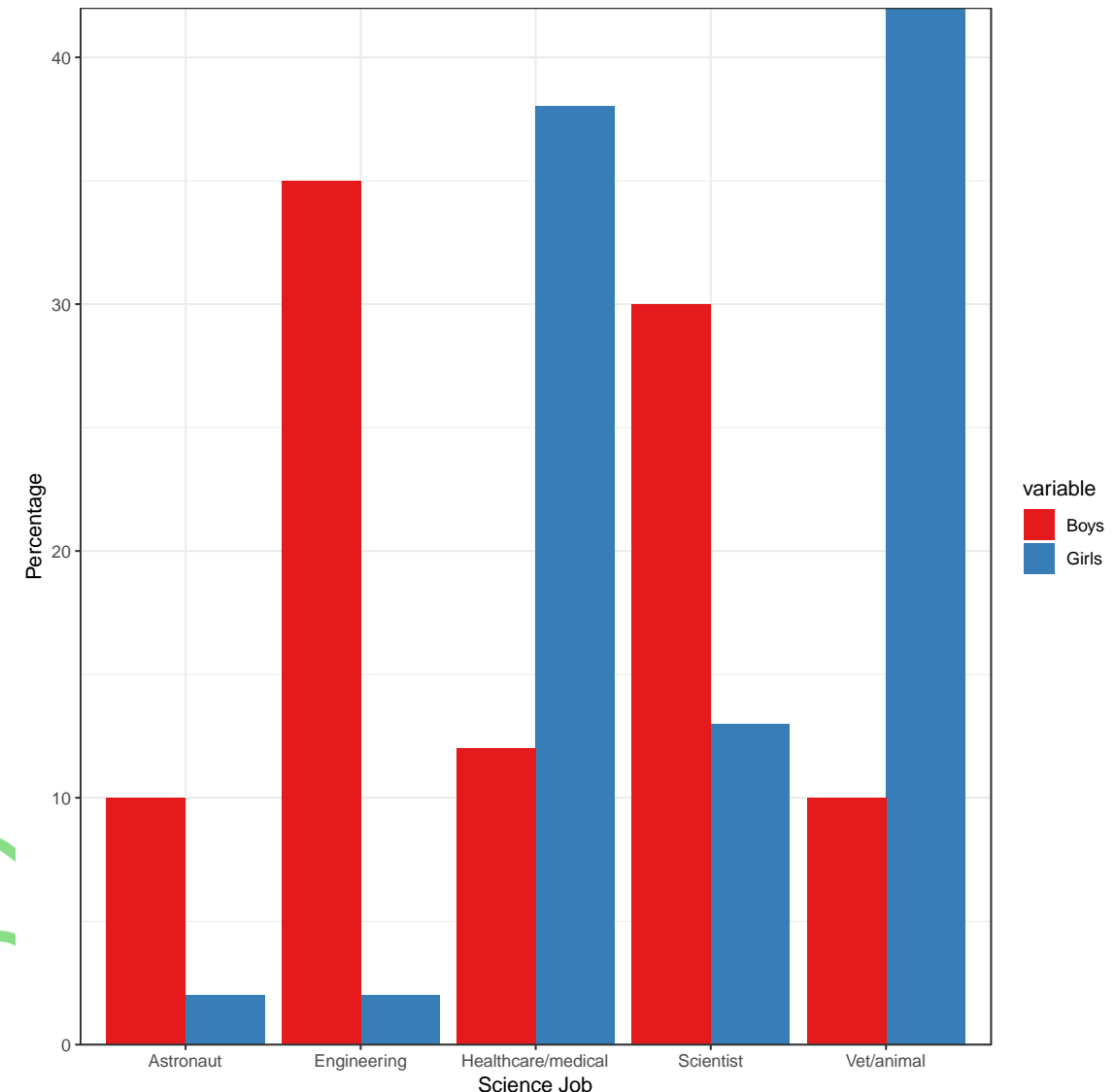
Background of Budget squeezes

- squeezing consumables
- squeezing release time for planning

Time squeeze

# State of the Nation – Primary Science

- National science curriculum for Foundation, key stage 1 & key stage 2
- [PSHE curriculum Health & Wellbeing]
- Schools can introduce additional content within the relevant key stage and many deliver science through dedicated science weeks



# Bread lesson notes

## Bread

- - History
- - Art
- - Different types bread/different cultures
- - Science



*It's a SMALL world*



**NORFOLK  
WELCOMES  
REFUGEES**



# Thoughts about Germs

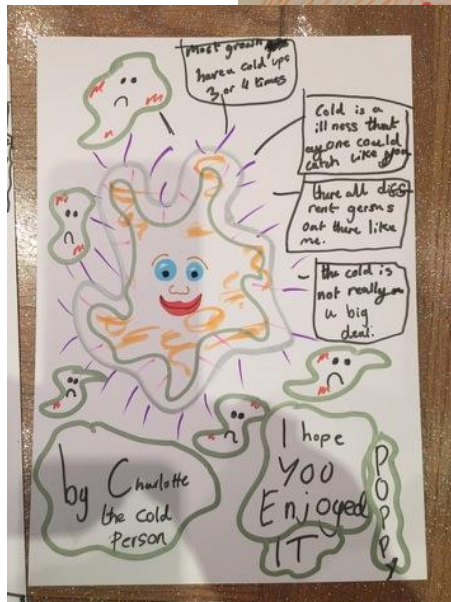
- Children's pictures of 'germs'



Bonny, 8



Ruby, 9



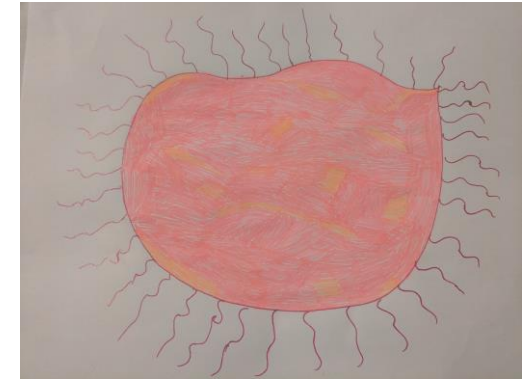
Charlotte, 9



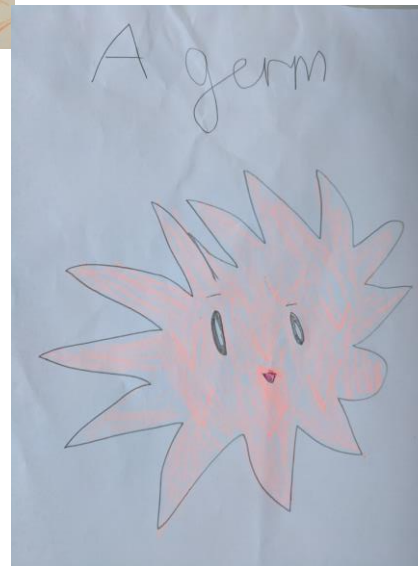
Evie, 8



"It should look like a snail"  
Kara, 5



"All germs look different"  
Poppy, 9



Hedy, 8



"I know what germs look like; they are round with spikes on them"  
Amelia, 8



# Visit to UG-Teaching Biology

- Visit to undergraduate Biology teaching labs at UEA, Norwich, May 2018



160 nutrient agar plates

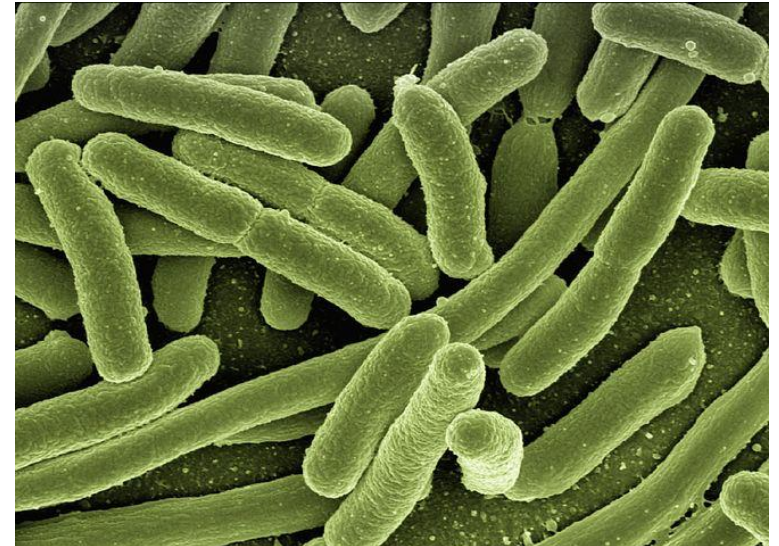
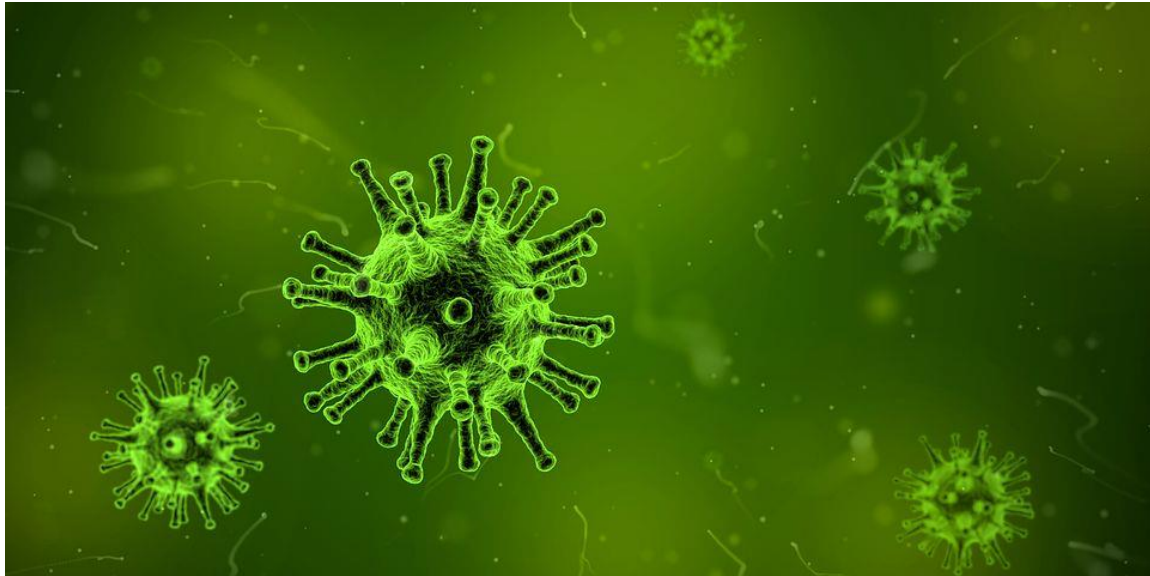
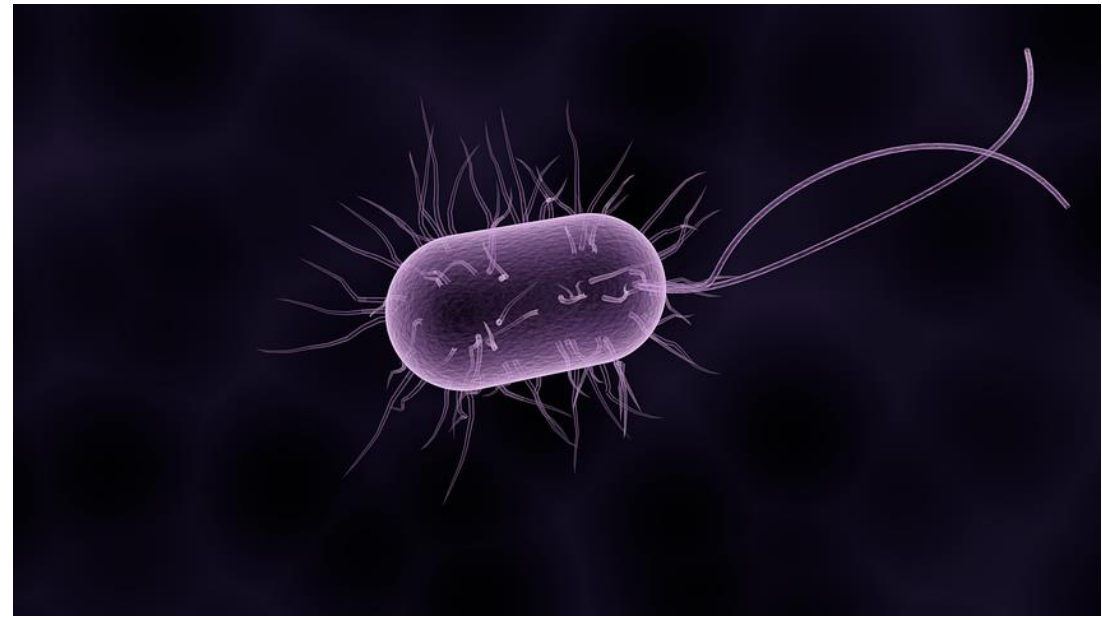
- Lab timers
- Blue pens!

Pot of Protozoa and access to microscopes

Raspberry Pi and a detective health game with cards

Microbe Top Trumps (1 x virus and 1 x Bacteria)

There's a zoo everywhere  
but it is too small to see





# Children planning the agar experiment

- Year 3 and 4 - worked in pairs or groups
  - help from friendly parents & a teacher
  - planned timing of settle plate exposure
  - planned who was testing which areas
  - planned a control for their experiment

Decided that some groups would go outside and others would remain inside

# Protozoa



*Amoeba*



*Blepharisma*



*Vorticella*



*Stentor*



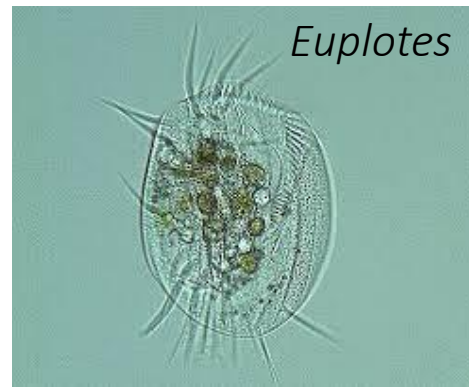
*Euglena*



*Paramecium*



*Euplotes*





# Raspberry Pi Health Game

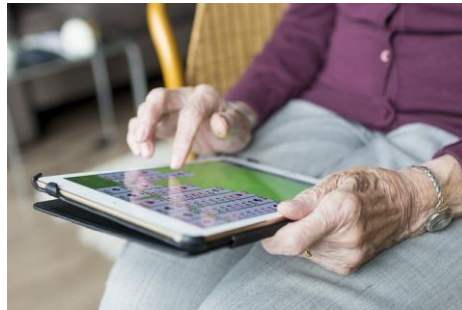
- Health game on Raspberry Pi

20



Raw Chicken

45

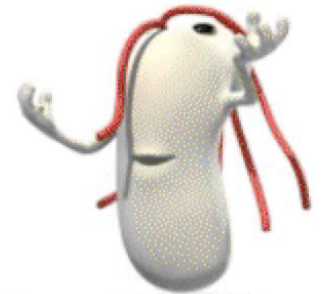


Tablet

6



Toddler

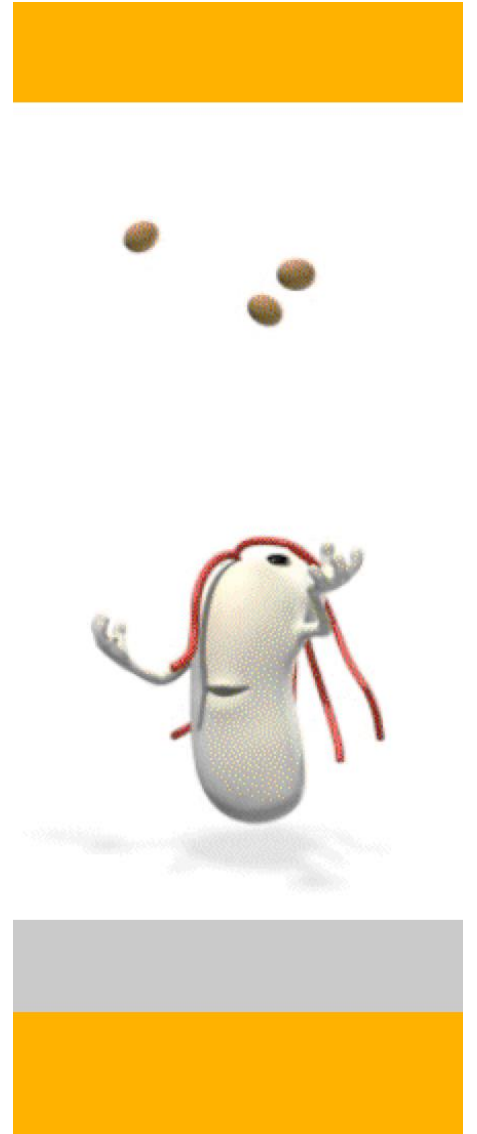


# Raspberry Pi Health Game

- Health game on Raspberry Pi

ATGCATGC \_\_\_\_\_  
GTCATGAC \_\_\_\_\_  
CCAATTGA \_\_\_\_\_  
TGTGATCA \_\_\_\_\_  
GTCGTCCA \_\_\_\_\_  
GTGGTGAC \_\_\_\_\_  
AAAGTATC \_\_\_\_\_  
GTTGTTAT \_\_\_\_\_

**Codewords**

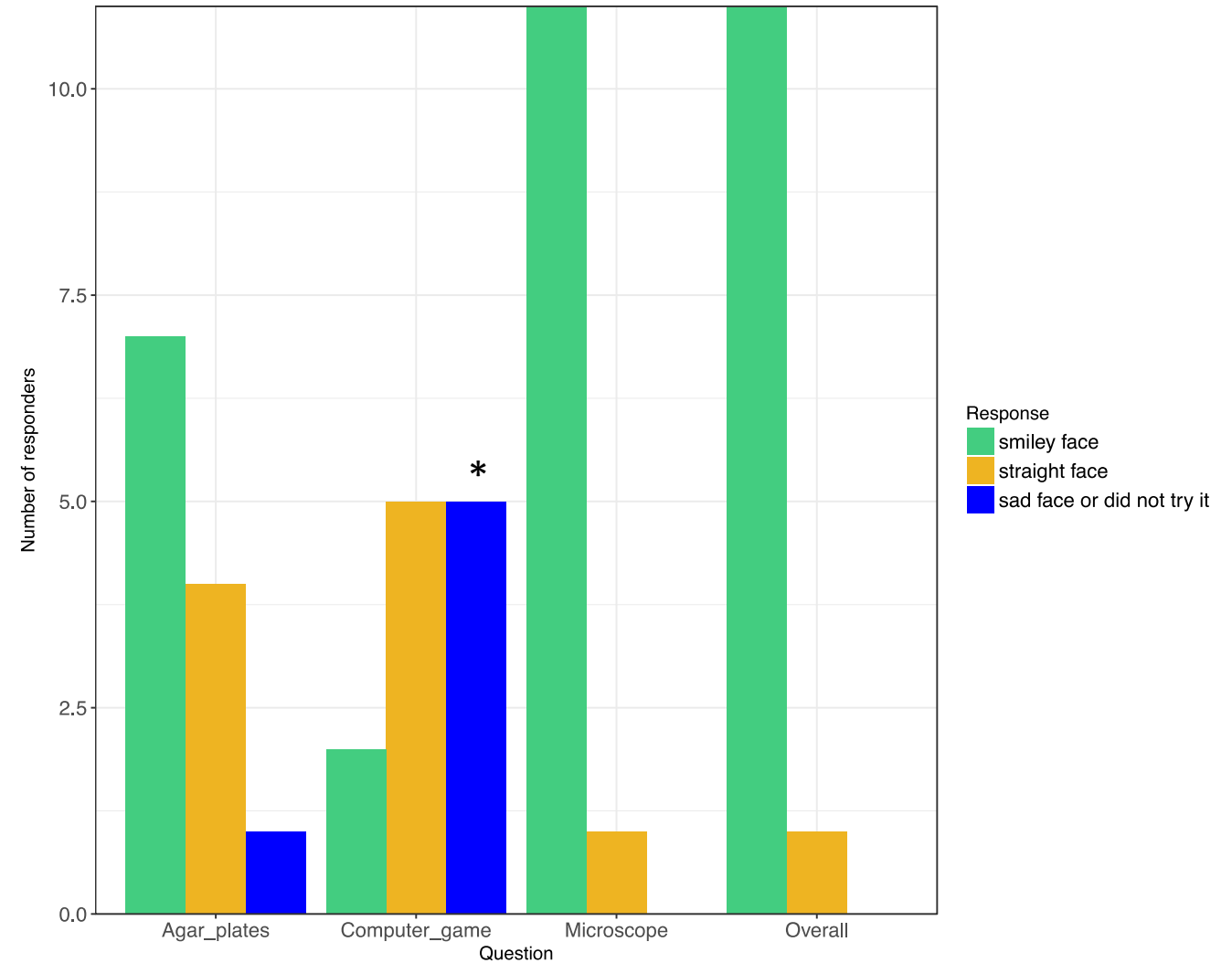


# Survey

Did you like visiting the labs  
Did you like the experiments  
with agar plates?  
Did you like looking  
down the microscope?  
Did you like the computer game?

## Extra comments:

Will we come again?  
Will we ever come back?  
I love microscopes!  
Will we come again and test our ones we made?





# Return visit



Returned with grown plates (30°C for over a week)

Children counted colonies, looked at different colonies and compared plates

## *Inside the lab*

- There were few colonies even in the bin
- There were more colonies from the windowsill
- Time of exposure didn't make much difference (timings were not that long)

## *Outside the lab*

- Outside in the open air there were more colonies, time exposure made a bit more difference
- The winning plate was taken from under a bush



# Future trip!

- Investigate handwashing and test best practice for drying hands (Y6)
- Children plan the experiments (working scientifically)
- Dirty hands consistently between washes!



# Acknowledgements

- Microbiology Society
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- UEA Biology undergraduate teaching staff  
& Prof Kay Yeoman

