



# PCR Masterclass: A Question of Taste

Discover your PTC-tasting phenotype and genotype in this full-day genetics workshop.

A full-day, hands-on polymerase chain reaction (PCR) master class for Higher Biology and Higher Human Biology pupils. Using their own DNA, pupils will discover and compare their version of a bitter taste receptor gene (their genotype) to their ability to taste the bitter compound (their phenotype). They will use cutting-edge equipment to carry out the modern laboratory techniques of DNA extraction, PCR, restriction enzyme digestion and DNA gel electrophoresis.

**Learning Level:** S5 Higher

**Availability:** On demand

**Cost:** £8 per pupil

## Learning objectives

- Understand DNA structure and function
- Understand that we can identify genotypes using molecular biology techniques
- Understand how restriction enzymes cut DNA
- Use of restriction enzymes and electrophoresis to detect single nucleotide polymorphisms (SNPs) in their own DNA
- Interpretation of experimental results
- To reveal the world of work in scientific research

## Techniques used

- DNA extraction
- Centrifugation
- Micro-pipetting
- Polymerase Chain Reaction (PCR)
- Restriction digest
- DNA gel electrophoresis

## Workshop activities

- DNA extraction of pupil's own cheek cells using centrifugation to pellet their cells
- Introduction to PCR and using micro-pipetting to set up PCR
- Restriction digest to determine genotype
- Electrophoresis on agarose gels
- Analysis and interpretation of results
- Discussion with scientists from The Roslin Institute





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## Curriculum links

### Higher Biology (2018-2019)

**1 The structure of DNA** (a) Structure of DNA

**2 Replication of DNA** (a) Replication of DNA  
(b) Polymerase chain reaction (PCR)

**3 Gene expression** (e) Phenotype is determined by the proteins produced as the result of gene expression.

**6 Mutations** (a) Mutations (b) Single gene mutations

**8 Genomic Sequencing** (c) Comparison of genomes from different species (d) Individual genome analysis

### Higher Human Biology (2018-2019)

**2 Structure and replication of DNA**

(a) Structure of DNA (b) Replication of DNA  
(c) Polymerase chain reaction (PCR)

**3 Gene expression** (e) Phenotype is determined by the proteins produced as the result of gene expression.

**4 Mutations** (a) Mutations are changes in the DNA that can result an altered protein being synthesized (b) Single gene mutations

**5 Human genomics** (b) Individual genome analysis

## Developing the Young Workforce – “I can” statements

**The following statements are supported through EBSOC’s workshops:**

- ‘I can identify the skills I have learnt across the curriculum, how these relate to the world of work and can apply these appropriately during work placements and other work-related learning.’
- ‘I can confidently access and interpret the information I need to make well informed choices about my learning options, pathways and how these relate to possible future careers.’
- ‘I can work towards achieving qualifications which support me to achieve my future career aspirations.’

Get hands-on  
with real-life  
science