



Royal College of Pathologists' 'Split Your Genes' Workshop: Notes for teachers

Introduction

'Split Your Genes' is an online workshop developed by the [Royal College of Pathologists](#) for secondary school students as part of the digital version of the 2020 [Science4u School Science Conference](#). Through a series of online talks, videos and quizzes, students will get to grips with some key aspects of genetics and inheritance through learning about sickle cell disorder, which affects red blood cells and makes them less able carry oxygen.

In this online presentation, students can also learn about the importance of blood, how pathologists test for genetic conditions such as sickle cell disorder, the impact this disorder has on patients' lives, and how pathologists and healthcare scientists work to help these patients.

They'll hear from pathologists and from people living with sickle cell disorder and will also be offered some optional hands-on activities to try. Students who complete all of the quizzes before 15 July 2020 will be entered into a prize draw to win a £100 Amazon Voucher. The workshop has been put together in collaboration with haematologists, chemical pathologists and representatives from the [Sickle Cell Society](#).

The workshop will take around 40 minutes to complete.

Steps for teachers – how to get your students to take part

Please read the below information and have a look through the materials attached and in the Google Drive (link is below). From 4th May the [workshop page link](#) will be live for you to send to your students.

Please send this link: <https://www.rcpath.org/discover-pathology/events-landing-page/split-your-genes-online-workshop.html> to those students who were booked to attend the School Science Conference. Please do not send to any other students for the time being. We will let you know if we are able to allow wider sharing of the resources.

Please emphasise to students:

1. The workshop is fun and will help them with their GCSE studies
2. They have a chance to win a £100 Amazon voucher if they complete quizzes 1 and 2 **and the student feedback survey**. Only those who work through these and provide their full name and school will be in with a chance of winning
3. There is also an opportunity to win a goody bag of science and art materials if they enter the #BloodCellModel competition
4. If possible please ask them to let you know how they find the workshop; we won't be able to share the results of the student feedback survey until July so if you can get students to feedback to you remotely this will help you assess the value of the workshop in terms of curriculum enrichment and student learning.

We would be grateful if you could also fill out the [teacher survey](#) after your students have carried out the workshop.

Curriculum links



This activity covers the following areas of the KS4 curriculum:

- Genetics and evolution/Inheritance, chromosomes, DNA and genes:
- Heredity as the process by which genetic information is transmitted from one generation to the next;
- The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection.

Learning Objectives

- Learning about gene inheritance: phenotypes, genotypes, dominant and recessive traits, homozygous and heterozygous allele pairs;
- Understanding how Punnett squares are used in genetics;
- Learning about real-life diseases and the roles pathologists play in testing for these;
- Learning about genetic diversity and natural selection and the role these play in prevalence of disease;
- Learning to question and discuss issues that may affect their own lives and the wider world (in particular in relation to sickle cell disorder).

More information about how the workshop will work.

The PowerPoint-based slideshow will be accessed via [this link](#) from 4th May and will be available for students to work through until 15th July.

All videos and quizzes will be accessed via links on slides within this PowerPoint, which will run as a PowerPoint 'show' with voiceover narration. The PowerPoint presentation can be downloaded from [this Google Drive](#) and the transcript of the voiceover is also available from the same Google drive folder.

Please note: while we do ask students to provide their name and the name of their school at the end of the quizzes we do not ask for email addresses or any other contact details, and the data collected will be kept in our secure servers and not shared in any way. We will only contact the teacher whose student is selected as the winner of the prize draw for them to pass on the good news and arrange for the prize to be delivered to the student.

Order of activities:

- Introductory slides on pathology and genetics (with voiceover).
- General quiz on genetics based on the introduction linked to from the slideshow (quiz is on SurveyMonkey). Students are asked for their name and name of their school at the end so we know they have completed this quiz.
- Four selfie videos accessed via links to where they're saved on the [RCPATH YouTube](#) (*note these videos are unlisted/ private so please don't share links outside of the groups of students who are signed up for the School Science Conference for the time being*). The videos are:
 - Videos from consultant haematologists Dr Shubha Allard and Dr Cath Booth - Background on blood in general, NHSBT work, their role and importance of NHSBT

- Videos from chemical pathologists Dr Rachel Carling and Dr Yvonne Daniels on what the neonatal blood spot test is, and how the results are useful.
- Slides about sickle cell disorder accessed via links to where they're saved on the [RCPATH YouTube](#) (*note these videos are unlisted/ private so please don't share links outside of the groups of students who are signed up for the School Science Conference for the time being*). The videos are:
 - Video from Dr Sara Trompeter, consultant haematologist on her role supporting those with sickle cell disorder
 - Two videos from Sickle Cell Society representatives (June Okochi and Courtney McAlvin) about how sickle cell disorder affects their lives and what false concerns/ views they are sometimes faced with.
- Quiz about Sickle Cell Disorder based on the information in the slides. (Quiz is on SurveyMonkey). Students are asked for their name and name of their school at the end so we know they have completed this quiz.
- Online survey for student feedback (accessed via a link in the slideshow – this is on Microsoft Forms and will take approximately 5 minutes to complete). They will be asked to provide their name and the name of their school if they wish to be included in the prize draw to win a £100 Amazon voucher
- Extra information about extension activities:
 - Making blood cell models out air-drying clay. Students will be invited to enter their blood cell models into our #BloodCellModel competition via social media. A downloadable instruction sheet (also attached alongside this document) will be provided on the website page alongside the slideshow
 - Twister-style game available online (<https://www.rcpath.org/discover-pathology/discover-pathology-resources/activities-and-resources/split-your-genes.html>)

A reminder to please fill in the [Teacher Feedback Survey](#) after your students have completed the online workshop and before the end of July.

Other useful links

- <https://www.rcpath.org/discover-pathology.html>
- <https://www.rcpath.org/discover-pathology/careers-in-pathology.html>
- <https://www.rcpath.org/discover-pathology/discover-pathology-resources/activities-and-resources.html>
- <https://www.healthcareers.nhs.uk/explore-roles/healthcare-science/studying-healthcare-science>
- <http://science4u.info/>
- <https://www.sicklecellsociety.org/>
- https://en.wikipedia.org/wiki/Blood_type_distribution_by_country
- <https://www.nature.com/scitable/topicpage/natural-selection-uncovering-mechanisms-of-evolutionary-adaptation-34539/>
- <https://www.nuffieldfoundation.org/sites/default/files/genetics-of-sickle-cell-anaemia-470.pdf>
- <https://economictimes.indiatimes.com/magazines/panache/swelling-of-hands-feet-fatigue-irritability-everything-you-need-to-know-about-sickle-cell-anaemia/articleshow/64919224.cms?from=mdr>



The Royal College of Pathologists
Pathology: the science behind the cure



science4u.info
showcasing exciting careers in science

- <https://www.nhs.uk/conditions/sickle-cell-disease/>