# Lesson Plan: How can and should genetic information be used?

**UCL Museums and Collections**

**Lesson – Biology / Science; Citizenship** 60 mins

How can and should genetic information be used? Group based discussions surrounding specific ethical questions.

## Overview

In this lesson students will read cards placing them in a situation requiring an informed ethical choice concerning how genetic information is used, GMO’s or genetic diseases. As a small group they will discuss whether they agree or disagree with the character’s viewpoint and why, before deciding where on a scale the group’s position falls.

## Objectives

By the end of this lesson, students will be able to:

- Apply specific knowledge of genetics and disease to debate ethical implications of new technologies.
- Use scientific knowledge to take part in informed discussions as part of a group.

## Knowledge and understanding

- Students will gain an understanding of the application and implication of genetic technologies; how genetic information can potentially be used in society, and the difficulties of making related decisions.

## Curriculum links – Key Stage 4 Science (e.g. OCR GCSE Science A: B1 You and your genes)

**How Science Works:**

3 Communication skills: Pupils should be taught to:

1. recall, analyse, interpret, apply and question scientific information or ideas
2. present information, develop an argument and draw a conclusion.

4 Applications and implications of science: Pupils should be taught:

1. the use of contemporary scientific and technological developments and their benefits, drawbacks and risks
2. to consider how and why decisions about science and technology are made, including those that raise ethical issues, and about the social, economic and environmental effects of such decisions

## Curriculum links – Key Stage 4 Citizenship

**Key Processes**

1 Critical thinking and enquiry: Students should be able to:

1. question and reflect on different ideas, opinions, assumptions, beliefs and values when exploring topical and controversial issues and problems.
2. evaluate different viewpoints, exploring connections and relationships between viewpoints and actions in different contexts (from local to global).

## Introduction (5/10 mins):

Ask them to list the potential uses of genetic information in health and for society.

Explain the difference between genetic diseases like CF and Huntingdon’s, and genetic predispositions to diseases.

## Activities (45 mins):

Split the class into two or three groups of 10-16 students. Each group gets a set of UCL Museums Genetic Controversy cards and associated disease notes. The “Agree/Yes” and “Disagree/No” cards are placed at either end of the table, representing the two poles of a spectrum.

In turn, each student reads a card aloud, and the implications of the decision are discussed by the group, before they decide on where on the spectrum the card should be placed (to what extent they agree). Each situation is given three to five minutes, depending on time available and number of cards used.

**Method:** Each group has a facilitator (teacher or HAP), who will play devil’s advocate to introduce provocative ideas or relevant information, to allow students to reach the full implications of the situation. The facilitator has access to the cards with prompts, and the disease notes. Students are encouraged to listen to each other, and that there are no wrong answers. Students should not cite names of people they know.

**Special considerations:** Teachers’ knowledge of students may mean that they should consider avoiding use of some cards because of family histories or situations.

**Resources:** UCL Museums Genetic Controversy Cards (cut out from the sheets) – one set per group.

Associated disease cards, Spectrum cards and facilitator prompt cards.

## Evaluation (5 mins)

As a whole class, following the activity discuss with students whether they considered many of the situations black or white, and how a lack of consensus on these topics was dealt with in their groups. How would this apply when making decisions in real society?

The students’ grasp of the topics covered will be demonstrated by their comments as part of the discussions.