



Human genetic dilemmas

Teacher guide

This guide accompanies the Genetics Dilemma cards and the Genetics Dilemmas Background Information booklet.

About the activity

The activity involves learners in a discussion where they are asked to consider a series of dilemmas most of which relate to genetic disorders. The Background Information Booklet provides the learners with essential information which will enable them to approach the dilemmas from an informed position. Some of the dilemmas are more challenging than others. The students are invited to rank the dilemmas in order of difficulty. Additionally for some of the genetic conditions data is provided and this might assist the learners if they wished to take this topic forward as part of an investigative assignment.

Clearly this activity may raise sensitive personal issues for some learners and teachers/tutors are advised to consider these before using the activity.

Curriculum links

HIGHER HUMAN BIOLOGY

• UNIT 2 - Physiology and Health

3. The biology of controlling fertility
 - c. In vitro fertilisation (IVF) - Surgical removal of eggs from ovaries after hormone stimulation. Incubation of zygotes and uterine implantation. Pre-implantation genetic diagnosis (PGD). The use of IVF in conjunction with PGD to identify single gene disorders and chromosomal abnormalities.
4. Ante- and postnatal screening
 - (b) Postnatal screening
 - Individuals with high levels of phenylalanine are placed on a restricted diet.
 - Diagnostic testing for metabolic disorders, including phenylketonuria (PKU), an inborn error of metabolism.
 - The use of pedigree charts to analyse patterns of inheritance in genetic screening and counselling. Patterns of inheritance in autosomal recessive, autosomal dominant, incomplete dominance and sex-linked recessive single gene disorders.
7. Pathology of cardio vascular disease (CVD)
 - (d) Control of cholesterol levels and familial hypercholesterolaemia.
 - Cholesterol synthesis and its function in the cell membrane and in steroid synthesis.
 - Roles of high density lipoproteins (HDL) and low density lipoproteins (LDL). LDL receptors, negative feedback control and atheroma formation. Ratios of HDL to LDL in maintaining health, the benefits of physical activity and a low fat diet. Reducing blood cholesterol through prescribed medications.
 - Genetic screening of familial hypercholesterolaemia (FH) and its treatments.

Classroom set up

If possible learners should work in groups of about 4 sitting together around a table. A complete set of Genetics Dilemma cards is given to each group of students.

Instructions

- 1) Place the 'Most Challenging Dilemma' and 'Least Challenging Dilemma' cards at opposite ends of the table.
- 2) One person in each group begins taking the genetics dilemma cards and reading out one of the dilemmas to the group then he or she begins the group discussion.
- 3) The group discusses the dilemma and decides where to place it in the space between the most/least challenging cards.
- 4) The next person in the group reads out the second dilemma, leads the discussion and places the card on the table having decided on the relative challenge posed.
- 5) Step 4 is repeated with a different member of the group until all of the dilemmas have been considered.
- 6) The *Genetics Dilemmas: Background Information* should be available for reference in the event that further information about the dilemma under discussion is needed.
- 7) At the end of the activity all cards should be placed in order from *least* to *most challenging dilemma*. This may require several alterations in the relative positions of the cards.
- 8) Each group of students is asked to record where they placed each dilemma card on the table. If time permits groups can compare their relative orders and engage in further discussion to explore why they have arrived at their decisions.

