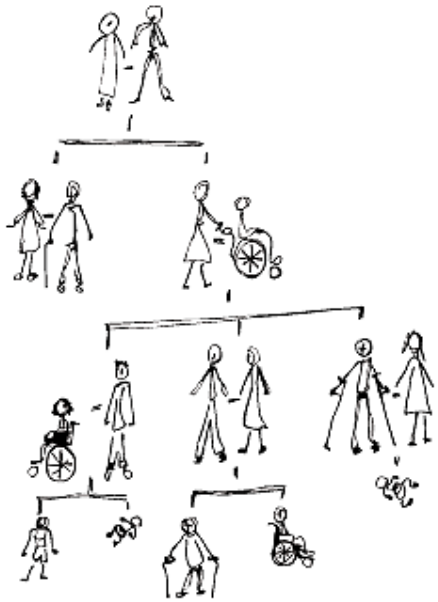
CROSS-CURRICULAR MATERIALS FOR KEY STAGE 4

(SCOTTISH CERTIFICATE OF EDUCATION - STANDARD GRADE)



Genes and You

Teaching about genetics from a human perspective

by Gill Mullinar

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GENETIC CHROMOSOMAL CONDITION CARDS

GENETIC CHROMOSOMAL CONDITION CARDS ON THE FOLLOWING:

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SICKLE CELL ANAEMIA

Sickle Cell Anaemia

WHAT IS SICKLE CELL ANAEMIA?

Sickle Cell Anaemia (pronounced er-nee-meeya) is an inherited blood disorder in which there is a defect in the structure of haemoglobin. Haemoglobin is a protein which is contained in the red cells of the blood. It picks up oxygen from the air in the lungs and carries it around the body to where it is needed. A person with Sickle Cell Anaemia has sickle haemoglobin in their blood (so-called because the red blood cells change from round to 'sickle' or crescent-shaped when they give up their oxygen). As the red blood cells in a person with Sickle Cell do not last as long as ordinary red blood cells, that person may become anaemic from time to time.

HOW IS SICKLE CELL ANAEMIA PASSED ON?

The pattern of inheritance for Sickle Cell Anaemia is autosomal recessive.
A person who inherits one faulty gene for sickle cell will be a carrier. Carriers are usually unaffected but can pass the faulty gene onto any children they may have. If one or both parents is a carrier, there is a 50% (1 in 2) chance that each child of theirs will also be a carrier. Carriers of Sickle Cell are sometimes said to have 'sickle cell trait'.

A child who inherits two copies of the faulty gene (one from from each parent) will have Sickle Cell Anaemia. If both parents are carriers, there is a 25% (1 in 4) chance of this happening.

SICKLE CELL ANAEMIA

A PERSON WITH SICKLE CELL ANAEMIA MAY BE AFFECTED IN SOME, OR ALL, OF THE FOLLOWING WAYS:

- Intelligence is not affected and most young people with the condition attend ordinary school and participate fully in normal school life. However, some will have Sickle Cell 'crises', perhaps quite often or maybe only every few years. A Sickle Cell 'crisis' is the sudden onset of any of the following:
- Pain. Because of their shape, sickle cells sometimes get stuck in the smaller blood vessels and block normal blood flow. The oxygen supply to nearby vessels is cut off which can cause severe pain in the arms, legs, back and stomach. Sickle Cell Anaemia can also cause the hands and feet to swell and make joints stiff and painful.
- Infections. People with Sickle Cell Anaemia may be on regular medication to try and avoid infections which can be severe.
- Anaemia. It is normal for people with Sickle Cell to be anaemic, but if it gets worse, it may make them feel tired and ill.
- Jaundice. People with Sickle Cell Anaemia often have mild jaundice which can make the whites of their eyes look yellowish. This is not usually a problem but can make them self-conscious and some young people may even be bullied at school because of it.
- Over time, damage to vital organs in the body can occur. Other long-term effects can include gall stones, slow growth, strokes and eye problems.
- The outlook for sickle cell patients regarding quality and length of life has been much improved as the condition becomes better understood, active management is introduced and parents are informed. The life expectancy in 1973 was 17 years, in 2005 it is 50 years.
- It is estimated that 348 sickle cell babies are born each year, that is 1 in every 2380 births.

OTHER INFORMATION

Sickle Cell Anaemia is most common in people of African or African-Caribbean origin, but may also occur in people of Mediterranean, Middle Eastern, Latin American and Asian descent. This is probably because being a carrier of Sickle Cell gives some protection against malaria.
One out of every 300-400 black Britons is born with Sickle Cell Anaemia. About 1 in every 8-10 black Britons are carriers of the sickle cell trait. Being a carrier is not the same as having Sickle Cell Anaemia. Carrying the Sickle Cell trait usually causes no health problems and will never develop into Sickle Cell Anaemia. But a person with Sickle Cell trait can pass the trait onto any children they may have. If their partner also carries the Sickle Cell trait, there is a 25% (1 in 4) chance that each and every child of theirs will have Sickle Cell Anaemia. There is no cure for Sickle Cell Anaemia. Treatment consists or medications to control pain and infections, and sometimes blood transfusions. Getting cold and wet can make the condition worse, so a person with Sickle Cell

SICKLE CELL ANAEMIA continued

Anaemia should avoid strenuous outdoor games particularly in bad weather. Swimming is okay as long as the person stays warm and gets dry quickly.
People with Sickle Cell Anaemia need to drink much more than usual and more often to avoid becoming dehydrated. Adolescents can have problems with their peers as puberty is delayed by 2 – 3 years. The kidney's reduced ability to concentrate urine not only means frequent trips to the toilet but also "bedwetting" can be a problem.

Listen to what people with Sickle Cell Anaemia say about their condition.

If a student with the condition becomes suddenly unwell or complains of severe joint or chest pain, contact his/her parent/guardian or hospital doctor straightaway.
Support, and do not isolate, people with Sickle Cell Anaemia. If a student misses lessons or lectures, help him/her to make up the work.

If you are interested in finding out more about Sickle Cell Anaemia, you can write (enclosing an A4 stamped addressed envelope) to: The Sickle Cell Society, 54 Station Road, London NW10 4UA www.sicklecellsociety.org