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Bioethics

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Read the text about cloning and then look at some bioethical dilemmas (1–5). Before you consider the dilemmas, your teacher will give you a definition of an important term in this discussion. Read it and summarise it to your partner. Then consider dilemmas 1–5 for a few minutes before discussing them.

The next technological revolution is likely to be in the field of genetic research and engineering. Cloning, the name popularly given to these technologies, is often associated with science fiction horror stories, because it suggests the creation of identical people. In reality, it is impossible to create two identical people. Personality, character and behaviour are not determined only by genetic factors. The real aims of cloning technology are to help in the development of tissue for transplantation, in genetic diagnosis and in biological research. But cloning technology raises some very difficult bioethical questions.

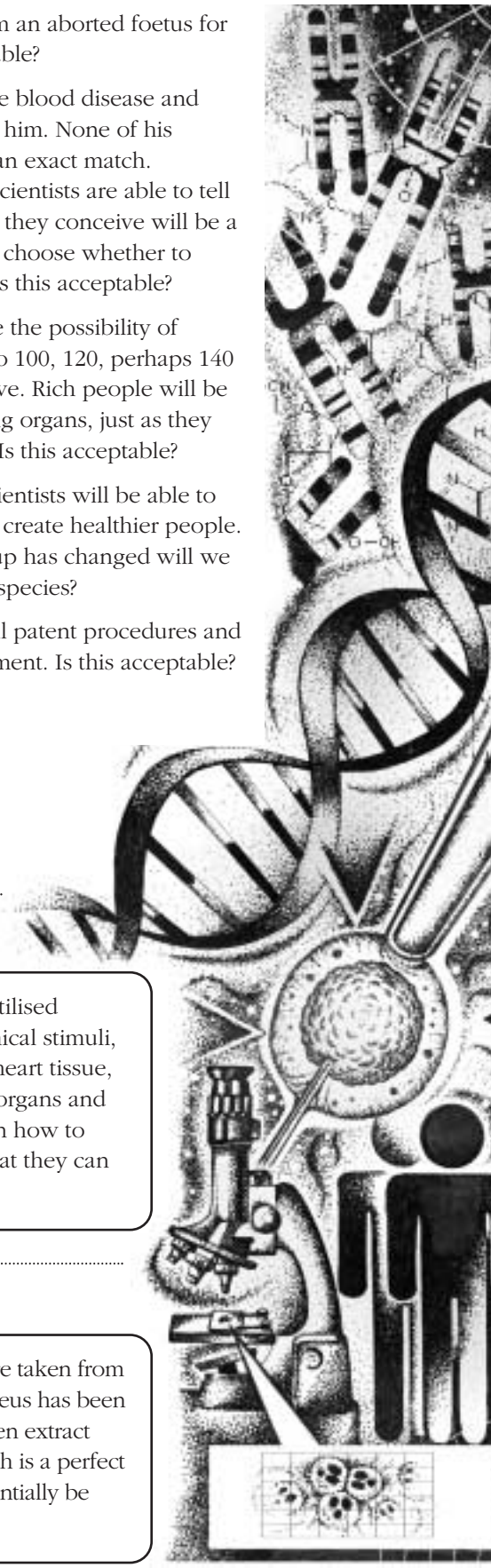
1 Scientists take stem cells from an aborted foetus for their research. Is this acceptable?

2 A two-year-old boy has a rare blood disease and needs a blood donor to save him. None of his brothers' or sisters' blood is an exact match. Through genetic diagnosis, scientists are able to tell the parents if the next foetus they conceive will be a match. The parents can then choose whether to keep or to abort the foetus. Is this acceptable?

3 Therapeutic cloning will give the possibility of extending human lifespan (to 100, 120, perhaps 140 years), but it will be expensive. Rich people will be able to regenerate their failing organs, just as they now pay for plastic surgery. Is this acceptable?

4 With genetic engineering, scientists will be able to eliminate some diseases and create healthier people. But once our genetic make-up has changed will we still be human or a different species?

5 Private health companies will patent procedures and fix their own prices for treatment. Is this acceptable?



Student A

Embryonic stem cells: These are the first cells of life, found in a newly fertilised human egg. Each embryonic stem cell has the capacity, with the aid of chemical stimuli, to transform itself into any type of cell in the body: a skin cell, a blood cell, heart tissue, etc. Once the embryo is fully formed there are no more stem cells as all the organs and bodily functions have been determined. Scientists are very interested to learn how to programme these cells to regenerate old or worn out organs and tissue so that they can cure such illnesses as heart disease and kidney failure.

Student B

Therapeutic cloning: This is a procedure in which cells, usually skin cells, are taken from a patient. The nucleus is extracted and inserted into a fertilised egg whose nucleus has been removed. The cell that is created is permitted to divide repeatedly. Scientists then extract stem cells from the ball of divided cells, and use those cells to grow tissue which is a perfect genetic match for the patient. The cells created by therapeutic cloning can potentially be transplanted into the patient to treat a disease from which the patient suffers.

BIOLOGY

TEACHER'S NOTES

BIOETHICS

Overview

Students discuss difficult ethical questions surrounding genetic engineering and cloning.

Preparation

One copy of the worksheet for each pair of students. Cut the worksheet into three.

Procedure

1 Ask the students what 'cloning' means and what its benefits and drawbacks are. Check/pre-teach: genes/genetic, science fiction, disease, cure, tissue, organs, embryo, foetus, abort, kidney/heart failure, cells, transplant.

2 Ask students to work in pairs. Hand out the top part of the worksheet. Students read the introductory text. To check comprehension, ask students what cloning is and is not, according to the writer.

3 Hand out the definitions of embryonic stem cells and therapeutic cloning to alternate students and ask them to read and summarise their texts to one another.

4 Individually, students consider questions 1–5, then exchange their views in pairs. Monitor the activity.

5 Ask if anyone's opinion on these questions has changed from the beginning of the lesson and why.