



Stages	Procedure	Time
Objectives	<ol style="list-style-type: none"> 1. To practice <ol style="list-style-type: none"> a. scanning and skimming for details b. answering comprehension and inference questions c. responding to content of the article orally 	
Warmer	<ol style="list-style-type: none"> 1. Teacher brings genetically modified vegetables or fruit to the class (e.g. purple carrot, alfalfa, corn, Hawaiian papaya, soybeans) or teacher can show students pictures of GMOs vegetables and fruits. 2. Teacher then writes the term “Genetically modified organism / GMO” on the board and asks if students have heard about the term before. 3. Elicit responses and ask students the difference between the normal crops and the GMO crops. 	4 mins
Pre-reading	<ol style="list-style-type: none"> 1. Teacher then gets students to look at the article on page 54. 2. Get students to look at the title and pictures in the article and ask what they think the article is going to be about. 3. Elicit responses. 	3 mins
While-Reading	<ol style="list-style-type: none"> 1. Teacher then puts students into small groups and distributes Task 1. 2. Each group needs to skim and scan for details to complete the definition of each term in Task 1. 	10 mins
Post-reading	<ol style="list-style-type: none"> 1. Elicit and confirm answers to Task 1. 2. Teacher continues with Task 2. Each group discuss and answer comprehension questions in Task 2. 3. Elicit, discuss and confirm answers. 4. Teacher distributes Task 3. 5. Based on the questions in Task 3, teacher gets each group to share their opinions within their groups. 6. Teacher gets representative of each group to share views discussed in their groups. 	18 mins
Wrap	<ol style="list-style-type: none"> 1. Teacher concludes discussion and wraps up lesson. 	5 mins

TASK 1

Look for details from the article to define each term below.

Genetic engineering

Genetically modified crops

Nuclear transfer

Low-methane cattle

Genetically modified dairy cows

Micropigs

Designer babies

TASK 2

Read each paragraph below and choose the correct inference.

1. Why is genetic engineering methods used in crops and plants?

2. How does genetic engineering help the agricultural industry?

3. How was Dolly, the cloned sheep, created?

4. Why is methane bad for the environment?

5. According to the author, the genetically engineered micropigs has "triggered a debate over how this powerful technology should be used". In your opinion, do people support how this technology is used in China?

6. What are the advantages of having 'designer babies'?

7. What is the concern of having 'designer babies'?

8. What are the restrictions that must be considered when using genetic modifications on humans?

9. "There is the danger that once the floodgates are opened and monitoring is more relaxed, designer babies will really become a reality." In your opinion, what danger is this statement referring to?

10. According to the author, genetic engineering would impact the well-being of humans and the planet. What kind of impact do you think genetic engineering will bring to us?

TASK 3

Read the questions below and share your answers and opinions in your group.

1. Do you worry about eating genetically modified food? Why?

2. At the end of the article we see that genetic engineering might allow parents to 'design' their children before their birth – What do you think of this?

3. Do you think genetic engineering should be used in plants, animals and humans? Why?

ANSWERS

Task 1

Genetic engineering:

- the deliberate modification of the characteristics of an organism by manipulating its genetic material

Genetically modified crops:

- plants with DNA that have been modified using genetic engineering methods for agriculture

Nuclear transfer:

- the transfer of the nucleus from an adult cell into an unfertilized premature egg whose nucleus had been removed

Low-methane cattle:

- genetically modified cattle that produces 25% less methane than the average cow

Genetically modified dairy cows:

- cows which are engineered by AgResearch to produce milk without β -lactoglobulin (one of the proteins that many people are allergic to) but with more casein (nutritious protein found in milk)

Micropigs:

- tiny pigs which are genetically engineered from the genes of Bama pigs by scientists in China

Designer babies:

- human babies that have been genetically modified

Task 2

1. It is used to introduce a new trait to plants which does not occur naturally in a species.
2. It will improve production, better nutritional value, longer shelf life, and resistance to drought, frost, or insect pests.
3. Dolly was created through the process of nucleus transfer, where the nucleus of an adult cell of a sheep is transferred into an unfertilized premature egg of another sheep whose nucleus had been removed.
4. It is bad because it is a major source of the greenhouse gases causing global warming.
5. (*This is an inferring question*) In my opinion, some people do not support how this technology is used in China as this has caused a controversial debate within the society.
6. The advantages include fixing genetic defects, eliminating life-threatening conditions or disease, or producing desirable traits.
7. People are worried that designer babies will be 'superhumans' that may replace modern humans.

8. Genetic modifications on humans should be allowed to modify only human embryos destined for implantation in the womb to eliminate serious genetic diseases; and to severe medical conditions for which no other treatment exists. There must also be stringent regulatory and oversight frameworks to make sure rules to use the technology are followed.
9. *(This is an inferring question)* In my opinion, this danger refers to the failure to control and monitor how genetic modification is used and genes of human beings may be artificially modified in the future children.
10. *Students' answer for this question may vary. Any logical answer is acceptable.*

Task 3

Students are to share their personal opinions on these questions.