STUDENT TEST BOOKLET

READING SECTION (40 questions)

READING PASSAGE 1

You should spend about 20 minutes on **Questions 1-13**, which are based on Reading Passage 1 below.

The Science of Altering Life: An Introduction to Genetic Engineering

Genetic engineering, also known as recombinant DNA technology, is the process of manually adding new DNA to an organism. The goal is to add one or more new traits that are not already found in that organism. This technology has been the subject of intense debate since its inception, with proponents highlighting its potential to revolutionize medicine, agriculture, and industry, while critics raise concerns about its ethical implications and potential unforeseen consequences.

The fundamental principle of genetic engineering is the ability to manipulate an organism's genome, the complete set of genetic instructions in an organism. This is achieved by isolating a specific gene from one organism and inserting it into the DNA of another. The process typically involves the use of a vector, such as a plasmid or a virus, to carry the desired gene into the host organism's cells. Once inside, the gene integrates into the host's DNA and begins to produce the protein it codes for, thereby conferring the new trait.

One of the most significant applications of genetic engineering has been in the field of medicine. The production of human insulin for the treatment of diabetes is a classic example. Prior to the advent of genetic engineering, insulin was extracted from the pancreases of pigs and cows, a process that was expensive and could cause allergic reactions in some patients. By inserting the human insulin gene into bacteria, scientists were able to produce large quantities of pure human insulin, making the treatment safer and more accessible. Gene therapy, which involves replacing a faulty gene with a healthy one, holds promise for treating a wide range of genetic disorders, such as cystic fibrosis and sickle cell anemia.

In agriculture, genetic engineering has been used to create genetically modified (GM) crops with enhanced traits, such as resistance to pests, diseases, and herbicides. This has the potential to increase crop yields, reduce the use of chemical pesticides, and improve the nutritional content of food. For example, Golden Rice, a variety of rice that has been genetically engineered to produce beta-carotene, a precursor of vitamin A, could help to combat vitamin A deficiency in developing countries. However, the use of GM crops has been met with resistance from some quarters, with concerns about their potential impact on the environment and human health.

The ethical considerations surrounding genetic engineering are complex and multifaceted. One of the main concerns is the potential for unforeseen consequences. Altering the genetic makeup of an organism could have unintended effects on the organism itself, as well as on the ecosystem in which it lives. There are also concerns about the potential for genetic engineering to be used for non-therapeutic purposes, such as creating “designer babies” with specific traits. The issue of who controls this powerful technology and how it should be regulated is a subject of ongoing debate.

Despite the controversies, genetic engineering continues to be a rapidly advancing field with the potential to address some of the world’s most pressing challenges. As our understanding of genetics deepens, so too will our ability to harness the power of this technology for the benefit of humanity. The key will be to proceed with caution, ensuring that the development and application of genetic engineering are guided by a strong ethical framework and a commitment to responsible innovation.

Questions 1-13

Questions 1-6

Do the following statements agree with the information given in Reading Passage 1?

In boxes 1-6 on your answer sheet, write

- **TRUE** if the statement agrees with the information
- **FALSE** if the statement contradicts the information
- **NOT GIVEN** if there is no information on this*

1. Genetic engineering is a process that occurs naturally in many organisms.
2. The primary aim of genetic engineering is to remove undesirable traits from an organism.

3. Plasmids are the only type of vector used in genetic engineering.
4. The use of animal-derived insulin was a flawless method for treating diabetes.
5. Golden Rice was developed to address a specific nutritional deficiency.
6. The use of genetic engineering is universally accepted.

Questions 7-10

*Choose the correct letter, **A**, **B**, **C** or **D**.*

Write the correct letter in boxes 7-10 on your answer sheet.

1. What is the main purpose of using a vector in genetic engineering? A. To identify the desired gene B. To carry the desired gene into the host organism C. To remove the faulty gene from the host organism D. To produce the protein the gene codes for

2. According to the passage, what is a significant advantage of genetically engineered insulin? A. It is cheaper to produce than animal-derived insulin. B. It is more effective than animal-derived insulin. C. It is less likely to cause allergic reactions. D. It can be produced in a shorter amount of time.

3. Which of the following is mentioned as a potential benefit of GM crops? A. Increased biodiversity B. Reduced need for irrigation C. Improved resistance to extreme weather conditions D. Reduced use of chemical pesticides

4. What is the main ethical concern mentioned in the passage regarding genetic engineering? A. The high cost of the technology B. The potential for unforeseen consequences C. The lack of public understanding of the technology D. The potential for job losses in the agricultural sector

Questions 11-13

Complete the summary below.

*Choose **NO MORE THAN TWO WORDS** from the passage for each answer.*

Write your answers in boxes 11-13 on your answer sheet.

Genetic engineering is a powerful technology with the potential to bring about significant changes in various fields. In medicine, it has enabled the production of pure human insulin and offers hope for treating 11 …….. . In agriculture, it has

been used to create GM crops with enhanced traits, although their use is not without 12 …….. . The ethical implications of genetic engineering, particularly the potential for 13 …….. , are a subject of ongoing debate.

READING PASSAGE 2

You should spend about 20 minutes on **Questions 14-26**, which are based on Reading Passage 2 below.

The GMO Debate: A Revolution in Agriculture?

A Genetically modified (GM) crops, a product of genetic engineering, have become a cornerstone of modern agriculture, sparking a debate that is as fervent as it is complex. Proponents hail them as a solution to global food security, while opponents raise concerns about their potential risks to the environment and human health. The technology involves the insertion of a foreign gene into a plant's genome to confer a desirable trait, such as resistance to pests or herbicides. This has led to the development of crops that can thrive in challenging conditions, potentially increasing yields and reducing the need for chemical inputs.

B One of the most significant advantages of GM crops is their potential to enhance crop yields and reduce losses from pests and diseases. For instance, Bt cotton, which has been genetically engineered to produce a toxin that is lethal to certain insects, has been widely adopted by farmers in many countries. This has led to a reduction in the use of insecticides, which can be harmful to both the environment and farmworkers. Similarly, herbicide-tolerant crops allow farmers to use broad-spectrum herbicides to control weeds without damaging their crops, simplifying weed management and reducing labor costs.

C Beyond pest and herbicide resistance, genetic engineering is also being used to improve the nutritional content of crops. 'Golden Rice', for example, has been engineered to produce beta-carotene, a precursor to vitamin A, which is deficient in the diets of many people in developing countries. This could have a significant impact on public health, reducing the incidence of blindness and other diseases associated with vitamin A deficiency. Other research is focused on developing crops with enhanced levels of other nutrients, such as iron and zinc.

D Despite the potential benefits, the widespread adoption of GM crops has not been without controversy. One of the main environmental concerns is the potential for gene flow from GM crops to their wild relatives, which could lead to the development of

‘superweeds’ that are resistant to herbicides. There are also concerns about the impact of GM crops on non-target organisms, such as beneficial insects and soil microorganisms. The long-term effects of GM crops on biodiversity are still not fully understood, and more research is needed to assess the potential risks.

E From a human health perspective, the safety of GM foods is a major point of contention. While regulatory agencies in many countries have deemed GM foods to be as safe as their conventional counterparts, some critics argue that there has not been enough long-term research to rule out the possibility of adverse health effects. The issue of labeling is also a subject of debate, with some consumers demanding that all GM foods be clearly labeled so that they can make an informed choice. The potential for GM foods to cause allergic reactions is another concern, although there is little evidence to suggest that this is a widespread problem.

F The future of genetic engineering in agriculture is likely to be shaped by a combination of scientific innovation, public opinion, and government regulation. New technologies, such as CRISPR-Cas9, are making it easier and more precise to edit plant genomes, opening up new possibilities for crop improvement. However, the success of these technologies will depend on their acceptance by farmers and consumers, as well as the development of a regulatory framework that can ensure their safe and responsible use. As the global population continues to grow, the need for sustainable and productive agricultural systems will become ever more pressing, and genetic engineering is likely to play a key role in meeting this challenge.

Questions 14-26

Questions 14-19

*Reading Passage 2 has six paragraphs, **A-F**.*

Choose the correct heading for each paragraph from the list of headings below.

*Write the correct number, **i-viii**, in boxes 14-19 on your answer sheet.*

List of Headings

i. A controversial solution to food security ii. The future of genetic engineering in agriculture iii. The impact of GM crops on human health iv. Improving the nutritional value of crops v. The potential for ‘superweeds’ vi. Reducing the need for chemical inputs vii. The debate over labeling GM foods viii. Environmental concerns surrounding GM crops

1. Paragraph A
2. Paragraph B
3. Paragraph C
4. Paragraph D
5. Paragraph E
6. Paragraph F

Questions 20-23

*Choose the correct letter, **A, B, C** or **D**.*

Write the correct letter in boxes 20-23 on your answer sheet.

1. What is the main advantage of Bt cotton? A. It is resistant to herbicides. B. It produces its own insecticide. C. It has a higher yield than conventional cotton. D. It requires less water than conventional cotton.

2. What is the primary purpose of developing 'Golden Rice'? A. To increase the income of rice farmers B. To improve the taste of rice C. To address a nutritional deficiency D. To make rice more resistant to pests

3. What is a 'superweed'? A. A weed that is resistant to herbicides B. A weed that grows faster than crops C. A weed that is toxic to animals D. A weed that is difficult to remove by hand

4. What is the CRISPR-Cas9 system? A. A new type of herbicide B. A new method for editing plant genomes C. A new type of GM crop D. A new method for controlling pests

Questions 24-26

Complete the sentences below.

*Choose **NO MORE THAN THREE WORDS** from the passage for each answer.*

Write your answers in boxes 24-26 on your answer sheet.

1. Herbicide-tolerant crops can help to reduce …….. for farmers.
2. The long-term effects of GM crops on …….. are not yet fully understood.

3. The success of new genetic engineering technologies will depend on their acceptance by farmers and …….. .

READING PASSAGE 3

You should spend about 20 minutes on **Questions 27-40**, which are based on Reading Passage 3 below.

The Ethical Frontier: Navigating the Moral Maze of Human Genetic Engineering

The power to rewrite the code of life has long been a dream of science fiction, but with the advent of technologies like CRISPR-Cas9, it is rapidly becoming a reality. Human genetic engineering, the deliberate modification of an individual's genetic material, holds the potential to eradicate devastating genetic diseases and enhance human capabilities. However, it also raises profound ethical questions that society is only just beginning to grapple with. The debate is polarized, with some envisioning a future free from genetic disease, while others fear a slippery slope towards a dystopian world of 'designer babies' and genetic inequality.

A crucial distinction in the ethical debate is between somatic and germline gene editing. Somatic gene editing targets the non-reproductive cells of the body, meaning that any changes made will only affect the individual being treated and will not be passed on to their children. This approach is widely seen as a promising avenue for treating a range of diseases, from cystic fibrosis to Huntington's disease. The ethical concerns surrounding somatic gene editing are relatively limited, focusing primarily on the safety and efficacy of the procedures.

Germline gene editing, on the other hand, is far more controversial. This involves modifying the DNA of sperm, eggs, or embryos, resulting in changes that are heritable and will be passed on to all subsequent generations. The prospect of making permanent alterations to the human gene pool raises a host of ethical, social, and philosophical questions. Proponents argue that it could be used to eliminate hereditary diseases, such as Tay-Sachs and sickle cell anemia, from a family's lineage forever. They contend that it would be unethical to withhold a technology that could prevent so much suffering.

However, critics of germline gene editing raise a number of serious concerns. One of the most significant is the issue of safety. The long-term consequences of altering the human genome are unknown, and there is a risk of introducing unintended mutations that could have unforeseen and potentially harmful effects. The case of the first

genetically edited babies, born in China in 2018, sparked a global outcry and highlighted the dangers of proceeding without a clear scientific and ethical consensus.

Beyond the safety concerns, there are also fears that germline gene editing could lead to a new form of eugenics, where parents are able to select for desirable traits in their children, such as intelligence, athleticism, or physical appearance. This could exacerbate existing social inequalities, creating a genetic divide between the 'haves' and the 'have-nots'. The prospect of 'designer babies' raises questions about what it means to be human and whether we should be striving for genetic perfection.

The regulation of human genetic engineering is a complex and evolving area. There is a broad international consensus that germline gene editing for reproductive purposes should not be permitted at this time. However, there is also a recognition that the technology is advancing rapidly and that a public dialogue is needed to establish a clear ethical framework for its future use. As we stand on the cusp of a new era in human evolution, it is essential that we proceed with caution, wisdom, and a deep sense of responsibility.

Questions 27-40

Questions 27-32

Do the following statements agree with the information given in Reading Passage 3?

In boxes 27-32 on your answer sheet, write

- **YES** if the statement agrees with the views of the writer
- **NO** if the statement contradicts the views of the writer
- **NOT GIVEN** if it is impossible to say what the writer thinks about this*

1. The author believes that human genetic engineering is a mature technology with no risks.
2. Somatic gene editing is more ethically contentious than germline gene editing.
3. The author is wholly in favor of germline gene editing for the prevention of hereditary diseases.
4. The birth of the first genetically edited babies was a celebrated scientific achievement.
5. The author believes that 'designer babies' are a desirable outcome of genetic engineering.

6. The author advocates for a cautious and responsible approach to the development of human genetic engineering.

Questions 33-36

*Choose the correct letter, **A**, **B**, **C** or **D**.*

Write the correct letter in boxes 33-36 on your answer sheet.

1. What is the key difference between somatic and germline gene editing? A. Somatic gene editing is more expensive than germline gene editing. B. Somatic gene editing is only used for cosmetic purposes. C. Somatic gene editing affects only the individual, while germline gene editing is heritable. D. Somatic gene editing is less effective than germline gene editing.

2. What is the main argument in favor of germline gene editing? A. It could be used to create 'designer babies'. B. It could eliminate hereditary diseases from a family's lineage. C. It is a safe and well-established technology. D. It is a way to enhance human intelligence.

3. What is the primary safety concern associated with germline gene editing? A. The high cost of the procedure B. The risk of introducing unintended mutations C. The potential for allergic reactions D. The difficulty of finding willing participants for clinical trials

4. What is the current international consensus on germline gene editing for reproductive purposes? A. It should be encouraged. B. It should be permitted in certain circumstances. C. It should not be permitted at this time. D. It should be left to individual countries to decide.

Questions 37-40

Complete the notes below.

*Choose **NO MORE THAN TWO WORDS** from the passage for each answer.*

Write your answers in boxes 37-40 on your answer sheet.

The Ethics of Human Genetic Engineering

- **Somatic gene editing:**
    - Targets non-reproductive cells

    - Changes are not 37 ……..
    - Fewer ethical concerns
- **Germline gene editing:**
    - Modifies DNA of sperm, eggs, or embryos
    - Changes are passed on to 38 ……..
    - Raises concerns about safety and the potential for 39 ……..
- **Regulation:**
    - International consensus against germline gene editing for 40 …….. at present
    - Need for a public dialogue to establish an ethical framework

LISTENING SECTION (40 questions)

SECTION 1 Questions 1-10

Complete the form below.

*Write **NO MORE THAN TWO WORDS AND/OR A NUMBER** for each answer.*

Genetic Screening Inquiry

Caller's Name:	Sarah 1 ……...
Date of Birth:	2 …….. 1985
Reason for Inquiry:	Considering genetic screening for 3 ……...
Family History:	Mother has 4 ……...
Appointment with:	Dr. Evans
Preferred Appointment Day:	5 ……..
Contact Number:	07700 900 6 ……..
Email Address:	sarah.j@email.com
Information Requested:	- Cost of the screening - The 7 ……... involved - How long it takes to get the 8 ……...
Further Action:	Send a 9 ……... with information
Reference Number:	10 ……..

SECTION 2 Questions 11-20

Questions 11-15

*Choose the correct letter, **A**, **B**, or **C**.*

1. The speaker says that the new community garden project aims to A. provide organic produce for local restaurants. B. educate people about sustainable farming. C. create a space for residents to socialize.

2. What is special about the seeds being used in the garden? A. They are resistant to all common pests. B. They have been genetically modified to grow faster. C. They are heirloom varieties from the local area.

3. The speaker mentions that the garden will have a dedicated section for A. exotic plants. B. medicinal herbs. C. children's activities.

4. How will the garden be watered? A. Using a sprinkler system connected to the mains B. With rainwater collected in special barrels C. By volunteers carrying

watering cans

5. What is the main challenge the project is currently facing? A. A lack of funding B. A shortage of volunteers C. Difficulty in obtaining planning permission

Questions 16-20

What feature is mentioned for each of the following areas of the garden?

*Choose **FIVE** answers from the box and write the correct letter, **A-G**, next to questions 16-20.*

Features

A. Will be used for composting B. Will have a seating area C. Will be a designated quiet zone D. Will have a tool shed E. Will be used for growing fruit trees F. Will have a pond G. Will be the location of the greenhouse

Areas of the Garden

1. Area 1
2. Area 2
3. Area 3
4. Area 4
5. Area 5

SECTION 3 Questions 21-30

*Choose the correct letter, **A**, **B**, or **C**.*

1. What is the main topic of the students' discussion? A. The history of genetic engineering B. The ethical implications of CRISPR technology C. The use of genetic engineering in agriculture
2. What does Chloe find most surprising about CRISPR? A. Its affordability B. Its precision C. Its speed
3. Tom is particularly concerned about the use of CRISPR for A. human enhancement. B. treating genetic diseases. C. creating new species.

4. What example does the tutor give to illustrate a potential benefit of CRISPR? A. Curing cancer B. Eradicating malaria C. Increasing crop yields

5. Chloe is worried that CRISPR could lead to A. a decrease in genetic diversity. B. an increase in social inequality. C. a rise in antibiotic resistance.

6. Tom argues that the public is not well-informed enough about A. the science behind CRISPR. B. the potential risks of CRISPR. C. the regulatory process for CRISPR.

7. The tutor suggests that scientists have a responsibility to A. push the boundaries of what is possible. B. engage in public debate about their work. C. focus solely on the technical aspects of their research.

8. What does Chloe think is the most important ethical principle to consider? A. Justice B. Beneficence C. Non-maleficence

9. Tom believes that there should be a global moratorium on A. all CRISPR research. B. germline editing in humans. C. the use of CRISPR in agriculture.

10. The tutor concludes that the debate over CRISPR is likely to A. be resolved in the near future. B. become more complex over time. C. be dominated by scientists.

SECTION 4 Questions 31-40

Complete the notes below.

*Write **NO MORE THAN TWO WORDS** for each answer.*

The Future of Genetic Technologies

- **Introduction**
  - Rapid advances in genetic technologies are transforming our world
  - Potential to address major global challenges, e.g., disease and 31 ……..
- **Gene Editing**
  - CRISPR-Cas9 is a powerful tool for making precise changes to DNA
  - Potential applications in medicine:
    - Treating genetic disorders, e.g., sickle cell anemia
    - Developing new 32 …….. for cancer

    - Ethical concerns:
        - ‘Designer babies’ and human enhancement
        - Need for a robust 33 ……..
- **Synthetic Biology**
    - Designing and building new biological parts, devices, and systems
    - Examples:
        - Creating microorganisms to produce biofuels
        - Developing new 34 …….. and materials
    - Potential risks:
        - Accidental release of engineered organisms
        - 35 …….. by terrorists or rogue states
- **The Role of the Public**
    - Public engagement is crucial for responsible innovation
    - Need for a more informed 36 …….. about the risks and benefits
    - Importance of transparency and 37 …….. from scientists
- **The Future Outlook**
    - Genetic technologies will continue to evolve at a rapid pace
    - Potential for both great good and great harm
    - The need for 38 …….. is paramount
    - The importance of a 39 …….. approach to regulation
    - The ultimate goal is to use these technologies to create a better and more 40 …….. future for all.

WRITING SECTION

WRITING TASK 1

You should spend about 20 minutes on this task.

The chart below shows the results of a survey on public opinion on the use of genetic engineering in food production in a European country in 2023.

Summarise the information by selecting and reporting the main features, and make comparisons where relevant.

Write at least 150 words.

(A chart would be inserted here showing public opinion on GM foods, with categories such as 'Strongly support', 'Support', 'Neutral', 'Oppose', 'Strongly oppose' and percentages for each.)

WRITING TASK 2

You should spend about 40 minutes on this task.

Write about the following topic:

Some people believe that genetic engineering will have overwhelmingly positive effects on humanity, while others are concerned about the potential for negative consequences. Discuss both these views and give your own opinion.

Give reasons for your answer and include any relevant examples from your own knowledge or experience.

Write at least 250 words.

SPEAKING SECTION

PART 1 (4-5 minutes)

The examiner will ask you some questions about yourself, your home, work or studies and other familiar topics.

Genetic Engineering

- Let's talk about science.
- What do you know about genetic engineering?
- Do you think it is important to learn about science topics like genetic engineering?
- Have you studied science at school?
- Do you think genetic engineering is a positive or negative development?

PART 2 (2-3 minutes)

You will have to talk about the topic for one to two minutes. You have one minute to think about what you are going to say. You can make some notes to help you if you wish.

Describe a film or book you have seen or read that deals with the topic of genetic engineering.

You should say:

- what the film or book was called
- what it was about
- what message it conveyed about genetic engineering

and explain your own opinion on the issues raised.

PART 3 (4-5 minutes)

Discussion topics:

The future of genetic engineering

- What are the potential benefits of genetic engineering for humanity?
- What are the potential dangers of genetic engineering?
- Do you think there should be strict regulations on genetic engineering research?
- To what extent should parents be allowed to choose the characteristics of their children?
- Do you think that genetic engineering will ultimately lead to a better world? Why or why not?

GRAMMAR SECTION (20 questions)

Questions 1-5: Error Correction

Identify the error in each sentence and correct it.

1. The news about genetic engineering were published yesterday.
2. Each of the students have their own opinion on the topic.
3. The scientist, who's research was groundbreaking, won a Nobel prize.
4. If I would have known about the risks, I would have been more careful.

5. The data collected from the experiment is being analyzed as we speak.

Questions 6-10: Sentence Transformation

Complete the second sentence so that it has a similar meaning to the first sentence, using the word given. Do not change the word given. You must use between two and five words, including the word given.

1. The government should regulate genetic engineering more strictly. **be** Genetic engineering …… by the government.
2. The scientist said that she had made a major breakthrough. **claimed** The scientist …… a major breakthrough.
3. It is possible that the experiment will fail. **could** The experiment …… fail.
4. I haven't seen a more impressive scientific discovery. **most** This is the …… I have ever seen.
5. They started the research project two years ago. **been** They …… the research project for two years.

Questions 11-15: Fill in the Blanks

Complete the sentences with the correct form of the verb in brackets, or with a suitable article or preposition.

1. The results of the study will be published …….. a scientific journal next month.
2. The team of researchers …….. (work) on a new gene-editing technique for the past year.
3. …….. apple a day keeps the doctor away, but what about a genetically modified apple?
4. The debate over GMOs has been going on …….. decades.
5. If the technology …….. (be) safer, it would be more widely accepted.

Questions 16-20: Word Formation

Use the word in capitals to form a word that fits in the gap.

1. The ……. of genetic engineering are far-reaching. (IMPLY)
2. There is a great deal of ……. surrounding the use of CRISPR. (CONTROVERSIAL)
3. The ……. of new diseases is a major concern. (EMERGE)
4. Scientists are looking for more ……. ways to modify genes. (EFFECT)
5. The ……. of the new technology is still being debated. (ETHIC)

LISTENING SCRIPTS

SECTION 1

(Sound of a phone ringing)

Receptionist: Good morning, The Genetics Centre. How can I help you?

Sarah: Oh, hello. I'm calling to inquire about genetic screening.

Receptionist: Of course. Can I take your name, please?

Sarah: Yes, it's Sarah Jones. That's J-O-N-E-S.

Receptionist: Thank you, Ms. Jones. And your date of birth?

Sarah: It's the 15th of March, 1985.

Receptionist: Okay. And what is the reason for your inquiry today?

Sarah: Well, my husband and I are thinking about starting a family, so we're considering genetic screening for **family planning**.

Receptionist: That's a very responsible step to take. Do you have any particular concerns or a family history of any genetic conditions?

Sarah: Yes, my mother has **cystic fibrosis**.

Receptionist: I see. In that case, it would be a good idea to speak with one of our genetic counselors. We have Dr. Evans available for consultations. Would you like to book an appointment?

Sarah: Yes, please. What days is she available?

Receptionist: She's available on Tuesdays and **Thursdays**. Which would you prefer?

Sarah: Thursday would be great.

Receptionist: And can I take a contact number?

Sarah: Yes, it's 07700 900 541.

Receptionist: 541. Got it. And an email address?

Sarah: It's sarah.j@email.com.

Receptionist: Perfect. Now, is there any specific information you'd like me to send you before your appointment?

Sarah: Yes, could you send me some information on the cost of the screening, the **procedure** involved, and how long it takes to get the **results**?

Receptionist: Certainly. I'll send you a **brochure** with all that information right away. I'm also generating a reference number for you. It's GCX55-9. That's G-C-X-five-five-dash-nine.

Sarah: Great. Thank you for your help.

Receptionist: You're welcome, Ms. Jones. We look forward to seeing you on Thursday.

SECTION 2

Good morning, everyone, and welcome to our community meeting. It's wonderful to see so many of you here today. My name is David, and I'm the project manager for the new community garden project. I'm here to give you an update on our progress and to tell you how you can get involved.

As you know, the aim of the project is to transform the derelict land at the end of Green Street into a vibrant and productive community garden. We want to create a space where residents can come together to grow their own food, learn about sustainable gardening, and simply enjoy a bit of nature in the heart of our city. But our primary goal is to **educate people about sustainable farming**.

We've been working hard over the past few months to get the project off the ground. We've secured funding from the local council, and we've cleared the site of all the rubbish and weeds. We've also been busy sourcing our seeds. We've decided to use **heirloom varieties from the local area**. These are traditional, non-hybrid seeds that

have been passed down through generations of local gardeners. They are well-suited to our climate and soil, and they have a much better flavor than the commercial varieties you find in the supermarkets.

We're planning to have a variety of different sections in the garden. There will be raised beds for vegetables, a fruit patch, a herb garden, and a wildflower meadow to attract bees and other pollinators. We're also going to have a dedicated section for **children's activities**, with a mud kitchen and a sensory garden. We want the garden to be a place where people of all ages can learn and have fun.

One of the key principles of our project is sustainability. We'll be using organic gardening methods, and we'll be harvesting rainwater to water the plants. We're going to install a series of large **rainwater barrels** at the corners of the garden, which will be connected to a drip irrigation system. This will help us to conserve water and reduce our reliance on the mains supply.

Of course, a project of this scale requires a lot of help, and we're currently facing a **shortage of volunteers**. We're looking for people to help with everything from digging and planting to fundraising and organizing events. If you're interested in getting involved, please come and have a chat with me after the meeting.

Now, let me just show you a plan of the garden. As you can see, we've divided the site into five main areas. Area 1, at the front, is where we'll have the main entrance and a small seating area. This will be a place where people can relax and enjoy the view. Area 2, to the right of the entrance, is where we'll have the raised beds for vegetables. Area 3, at the back of the site, is where we'll be planting our fruit trees. Area 4, to the left of the fruit trees, is where we'll have our tool shed and composting area. And finally, Area 5, in the center of the garden, is where we'll have our greenhouse.

So, that's the plan. We're very excited about this project, and we hope that you'll all get involved and help us to make it a great success.

SECTION 3

Tutor: So, Chloe and Tom, you've been looking at the ethical implications of CRISPR technology. What have you found?

Chloe: Well, it's a fascinating and slightly terrifying topic. The thing that I find most surprising about CRISPR is its **precision**. The ability to go in and edit a single gene with such accuracy is just mind-boggling.

Tom: I agree. It's an incredibly powerful tool. But I'm particularly concerned about the use of CRISPR for **human enhancement**. The idea of creating 'designer babies' with specific traits is something that I find deeply unsettling.

Tutor: That's a very valid concern, Tom. The distinction between therapy and enhancement is a key ethical issue. But let's not forget the potential benefits of CRISPR. For example, it could be used to **eradicate malaria** by modifying mosquitoes so that they can no longer carry the parasite.

Chloe: That's true. The potential for good is enormous. But I'm worried that CRISPR could lead to an increase in **social inequality**. If only the wealthy can afford to have their children's genes edited, it could create a genetic divide in society.

Tom: Exactly. And I don't think the public is well-informed enough about the **potential risks of CRISPR**. There's a lot of hype about the benefits, but not enough discussion about the dangers.

Tutor: That's a good point, Tom. And it raises the question of the role of scientists in this debate. I believe that scientists have a responsibility to **engage in public debate about their work**. They can't just stay in their labs and leave the ethical questions to others.

Chloe: I agree. And I think the most important ethical principle to consider is **non-maleficence**, or 'do no harm'. We need to be absolutely sure that any changes we make to the human genome are safe before we proceed.

Tom: That's why I believe there should be a global moratorium on **germline editing in humans**. We're just not ready for it yet. We need more research and a much broader public discussion.

Tutor: The debate over CRISPR is certainly a complex one, and it's likely to **become more complex over time** as the technology develops. There are no easy answers, but it's a conversation that we all need to be having.

SECTION 4

Good morning. In today's lecture, I'm going to be talking about the future of genetic technologies. The rapid advances in this field are transforming our world in ways that we could only have imagined a few decades ago. These technologies have the potential to address some of our most pressing global challenges, from disease and hunger to climate change and **pollution**.

Let's start with gene editing. The development of CRISPR-Cas9 has been a game-changer. It's a powerful tool that allows us to make precise changes to DNA. In medicine, this has opened up the possibility of treating a wide range of genetic disorders, such as sickle cell anemia and cystic fibrosis. It's also being used to develop new **therapies** for cancer, by engineering a patient's own immune cells to attack tumors.

However, the power of gene editing also raises significant ethical concerns, particularly when it comes to the prospect of 'designer babies' and human enhancement. There is a clear need for a robust **regulatory framework** to ensure that this technology is used responsibly.

Now, let's turn to synthetic biology. This is a field that involves designing and building new biological parts, devices, and systems. For example, scientists are engineering microorganisms to produce biofuels, plastics, and other valuable chemicals. They're also developing new **diagnostics** and materials with novel properties.

But synthetic biology also comes with potential risks. The accidental release of engineered organisms into the environment could have unforeseen consequences. There's also the risk of **misuse** by terrorists or rogue states, who could use the technology to create bioweapons.

This brings me to the role of the public in shaping the future of genetic technologies. Public engagement is crucial for responsible innovation. We need a more informed **public debate** about the risks and benefits of these technologies. And that requires transparency and **honesty** from scientists.

Looking to the future, it's clear that genetic technologies will continue to evolve at a rapid pace. They have the potential for both great good and great harm. The need for **ethical oversight** is paramount. We also need a **global** approach to regulation, to ensure that there are consistent standards across the world.

The ultimate goal is to use these technologies to create a better and more **sustainable** future for all. But to do that, we need to proceed with caution, wisdom, and a deep sense of responsibility.

ANSWER KEY

READING

1. FALSE
2. FALSE
3. FALSE
4. FALSE
5. TRUE
6. FALSE
7. B
8. C
9. D
10. B
11. genetic disorders
12. controversy
13. unforeseen consequences
14. i
15. vi
16. iv
17. viii
18. iii
19. ii
20. B
21. C
22. A
23. B
24. labor costs
25. biodiversity

26. consumers
27. NO
28. NO
29. NOT GIVEN
30. NO
31. NO
32. YES
33. C
34. B
35. B
36. C
37. heritable
38. subsequent generations
39. genetic inequality
40. reproductive purposes

LISTENING

1. Jones
2. 15th March
3. family planning
4. cystic fibrosis
5. Thursday
6. 541
7. procedure
8. results
9. brochure
10. GCX55-9
11. B
12. C

13. C
14. B
15. B
16. B
17. E
18. A
19. D
20. G
21. B
22. B
23. A
24. B
25. B
26. B
27. B
28. C
29. B
30. B
31. pollution
32. therapies
33. regulatory framework
34. diagnostics
35. misuse
36. public debate
37. honesty
38. ethical oversight
39. global
40. sustainable

GRAMMAR

1. were -> was
2. have -> has
3. who’s -> whose
4. would have known -> had known
5. is -> are
6. should be regulated more strictly
7. claimed to have made
8. could potentially
9. most impressive scientific discovery
10. have been working on
11. in
12. has been working
13. An
14. for
15. were
16. implications
17. controversy
18. emergence
19. effective
20. ethics

TUTOR GUIDE

Model Answer for Writing Task 1

The bar chart illustrates public sentiment regarding the application of genetic engineering in food production within a specific European nation during 2023. Overall, the chart indicates a significant division of opinion, with a substantial proportion of

the population expressing opposition, while a slightly smaller group is in support. A notable percentage of people remain neutral on the matter.

The most prominent group is those who oppose the use of genetic engineering in food, with 35% of respondents falling into this category. When combined with the 15% who are 'strongly opposed', it is clear that half of the population has a negative view of GM foods. The 'strongly oppose' group, while not the largest, represents a significant minority with strong convictions.

On the other hand, those who support the technology make up a combined total of 40%. The largest single group in this category is those who 'support' GM foods, at 25%, while a smaller 15% 'strongly support' it. The remaining 10% of the population are neutral, indicating that they have not formed a definite opinion on the issue.

In summary, public opinion in this European country is polarized on the topic of genetically engineered food. The opposition is slightly larger than the support, and a small but significant portion of the population remains undecided.

Model Essay for Writing Task 2 (Band 9 level)

The dawn of the genetic engineering age has ushered in an era of unprecedented scientific advancement, offering the potential to reshape the very fabric of life. While proponents of this technology foresee a future free from disease and want, a significant cohort of society remains deeply concerned about the unforeseen and potentially devastating consequences. This essay will explore both perspectives before arguing that a cautious and ethically-grounded approach is essential if we are to harness the benefits of genetic engineering without succumbing to its perils.

On the one hand, the potential for genetic engineering to alleviate human suffering is undeniable. The ability to correct genetic mutations at their source could eradicate a plethora of hereditary diseases, such as Huntington's chorea and cystic fibrosis, which have plagued humanity for millennia. In agriculture, genetically modified crops offer the promise of enhanced yields, improved nutritional content, and resistance to pests and diseases, thereby addressing the pressing global challenges of food security and malnutrition. The development of 'Golden Rice', for instance, a variety of rice engineered to produce vitamin A, stands as a testament to the life-saving potential of this technology. Furthermore, the application of genetic engineering in medicine has already yielded significant breakthroughs, from the mass production of insulin to the development of novel gene therapies for cancer.

Conversely, the unbridled pursuit of genetic modification is fraught with ethical and practical dangers. The prospect of 'designer babies', where parents can select for desirable traits in their offspring, raises the specter of a new eugenics, one that could exacerbate social inequalities and create a genetic schism in society. The long-term consequences of altering the human germline are unknown, and there is a tangible risk of introducing unintended mutations with unforeseen and potentially catastrophic effects. The case of the first genetically edited babies in China, which was met with global condemnation, serves as a stark reminder of the perils of proceeding without a robust ethical framework and a broad societal consensus. Moreover, the release of genetically modified organisms into the environment could have irreversible ecological consequences, from the creation of 'superweeds' to the disruption of delicate ecosystems.

In my view, while the potential benefits of genetic engineering are too significant to ignore, the risks are equally profound. Therefore, a precautionary approach is not only prudent but essential. The path forward lies not in a blanket ban on this transformative technology, but in the establishment of a stringent and transparent regulatory framework, guided by a robust public discourse. We must draw a clear distinction between therapeutic applications, which aim to cure disease, and enhancement technologies, which seek to alter the very nature of what it means to be human. By proceeding with caution, wisdom, and a deep sense of responsibility, we can ensure that genetic engineering serves humanity as a whole, rather than becoming a tool for the privileged few.

Speaking Part 2 Sample Response

One film that immediately springs to mind when I think about genetic engineering is 'Gattaca'. It's a science fiction film from the late 90s, but its themes are more relevant today than ever. The film is set in a future society where eugenics is commonplace and people are defined by their DNA. Society is divided into two classes: the 'valids', who are conceived through genetic selection, and the 'in-valids', who are conceived naturally.

The protagonist, Vincent, is an 'in-valid' who dreams of becoming an astronaut, a profession reserved for the genetic elite. In order to achieve his dream, he assumes the identity of a 'valid' named Jerome, who has been paralyzed in an accident. Vincent uses Jerome's DNA samples – his blood, urine, and hair – to fool the authorities at the

Gattaca Aerospace Corporation. The film follows his journey as he tries to maintain his deception while pursuing his lifelong ambition.

The central message of the film is a powerful critique of genetic determinism. It argues that a person's worth should not be determined by their genes, but by their spirit, their determination, and their dreams. The film champions the human spirit and its ability to overcome adversity, even in the face of a society that is obsessed with genetic perfection. It's a very moving and thought-provoking film that raises some profound questions about the ethics of genetic engineering.

I think the issues raised in 'Gattaca' are incredibly important. The film serves as a cautionary tale about the dangers of a society that values genetic purity above all else. It makes you think about the potential for genetic engineering to create a new form of discrimination and to devalue what it means to be human. While I believe that genetic engineering has the potential to do a lot of good, 'Gattaca' is a powerful reminder that we need to be very careful about how we use this technology.

Key Vocabulary List

1. **Genetic Engineering:** The deliberate modification of the characteristics of an organism by manipulating its genetic material.
2. **Recombinant DNA:** DNA that has been formed artificially by combining constituents from different organisms.
3. **Genome:** The complete set of genetic material present in a cell or organism.
4. **Vector:** A DNA molecule used as a vehicle to artificially carry foreign genetic material into another cell, where it can be replicated and/or expressed.
5. **Plasmid:** A small, circular, double-stranded DNA molecule that is distinct from a cell's chromosomal DNA.
6. **Gene Therapy:** The transplantation of normal genes into cells in place of missing or defective ones in order to correct genetic disorders.
7. **Genetically Modified (GM):** An organism whose genetic material has been altered using genetic engineering techniques.
8. **Herbicide:** A substance that is toxic to plants, used to destroy unwanted vegetation.
9. **Pesticide:** A substance used for destroying insects or other organisms harmful to cultivated plants or to animals.

10. **Beta-carotene:** A red-orange pigment found in plants and fruits, especially carrots and colorful vegetables, which the body converts to vitamin A.
11. **Biodiversity:** The variety of plant and animal life in the world or in a particular habitat, a high level of which is usually considered to be important and desirable.
12. **CRISPR-Cas9:** A unique technology that enables geneticists and medical researchers to edit parts of the genome by removing, adding or altering sections of the DNA sequence.
13. **Somatic Cells:** Any cell of a living organism other than the reproductive cells.
14. **Germline:** The sex cells (eggs and sperm) that are used by sexually reproducing organisms to pass on genes to their offspring.
15. **Eugenics:** The science of improving a human population by controlled breeding to increase the occurrence of desirable heritable characteristics.
16. **Hereditary:** Determined by genetic factors and therefore able to be passed on from parents to their offspring or descendants.
17. **Mutation:** The changing of the structure of a gene, resulting in a variant form that may be transmitted to subsequent generations, caused by the alteration of single base units in DNA, or the deletion, insertion, or rearrangement of larger sections of genes or chromosomes.
18. **Moratorium:** A temporary prohibition of an activity.
19. **Sustainable:** Able to be maintained at a certain rate or level.
20. **Bioethics:** The ethics of medical and biological research.