

Revision Guide: Module 4 - Science and Technology: A Blessing or a Curse?

1. Core Concepts & Definitions

- **Science:** Systematic knowledge of the physical or material world gained through observation and experimentation [cite: 108].
- **Technology:** The branch of knowledge dealing with the creation and use of technical means and their interaction with life, society, and the environment [cite: 108].
- **Invent vs. Discover:** To *invent* is to create something new through ingenuity or experimentation [cite: 108]; to *discover* is to see or find something that previously existed but was unknown [cite: 108].

2. Genetic Engineering & Biotechnology

Key Terms

- **DNA (Deoxyribonucleic acid):** A molecule found within a structure known as a chromosome [cite: 114].
- **Chromosome:** A structure within the nucleus containing DNA [cite: 115].
- **Germline:** The genes a person will pass on to his/her children [cite: 115].
- **Gene Therapy:** The insertion of normal DNA directly into cells to correct a genetic defect [cite: 114].
- **Genetic Testing:** Analysis of human DNA, RNA, chromosomes, and proteins to detect inheritable diseases or predict future health risks [cite: 115].

Debate Perspectives

- **Pro-GE Arguments:** Curing life-threatening diseases, developing vaccines/pharmaceuticals, solving food production problems, and protecting endangered species [cite: 118, 123, 124].
- **Against-GE Arguments:** Severe side effects (e.g., organ damage, death during trials), ethical issues surrounding designer babies, genetic pollution, loss of biodiversity, and unequal access for poorer nations [cite: 121, 122, 124].

3. Essential Grammar: Compound Adjectives & Negative Prefixes

- **Compound Adjectives:** Formed using structures like noun/number + hyphen + adjective/participle (e.g., *long-term threat*, *12-year-old girl*, *life-threatening reaction*, *genetically-modified pea*) [cite: 130].
- **Negative Prefixes:** Used to form opposites (e.g., *il-*, *in-*, *ir-*, *dis-*, *im-*, *mis-* such as **immoral**, **incurable**, **illegal**, **inhuman**, **unacceptable**, **unsuccessful**, **disappear**, **irresponsible**, **misunderstand**) [cite: 123].

4. Media & Technology Issues

- **Mobile Phones & Health:** Major studies indicate handset use does not trigger rare brain tumors, though long-term safety monitoring continues [cite: 126].
- **Medical Breakthroughs:** Hi-tech cameras for early detection of malignant melanoma and non-invasive diabetic patches drawing blood sugar through pores [cite: 126, 127].