

# Teacher's Notes – Designer Babies

**Aim:** to develop the students' ability to listen to a complicated scientific lecture, read a document and then discuss the key points in a seminar. **Lesson Time:** Approximately 3 hours

## Seminar Lesson Plan

### 1. Lead in

- Put the students in small groups (3/4). Ask them to discuss the term 'designer baby' and write down any associated words. Feedback – write vocabulary on the board.

### 2. Lecture

- Explain you are going to listen to a short animated scientific lecture on '*Designer babies: the science and the ethics of genetic engineering*' by Dr Joanna Webb.

Pre lecture:

- Give out **Vocabulary Sheet #1**. Ask students to check unknown vocabulary.
- Give out **Listening Sheet #1**. Ask students to look through the sheet at the main ideas that they will take notes on. State that all terms will be explained in the lecture.

Lecture Listening:

- Play lecture and students take notes on **listening sheet #1** [play 2/3 times – stop & start if needed]
- There are two lecture versions: Link 1 (higher levels) / Link 2 (lower levels)
- **Link 1:** (normal speed) <https://www.youtube.com/watch?v=Gbxk4cGnMTk> [5.01]
- **Link 2:** (slower version) <https://www.youtube.com/watch?v=wF80QqvztYw&t=2s> [8.22]

Post Lecture:

- Feedback: go through answers as a whole group or give out **Answer sheet** to check.

### 3. Reading

- Two text articles to read. (lower levels – use only Text 2)
- **Text 1** is based on a recent announcement about modifying genes in babies.
- **Text 2** is based on the pros and cons of designer babies.
- Students read the articles, take notes and evaluate the key content to their own opinions.

### 4. Discussion

- Put the students in small groups (4-6). Students discuss the lecture and text(s) for 20 minutes. Teacher: how to run a seminar <https://www.academic-englishuk.com/seminars>.
- **Seminar Discussion Sheet #1:** Explain to students they **must** refer to lecture and text(s). They have three minutes' preparation and then discuss for 20 minutes.

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## Vocabulary Sheet #1

Topic: Medical Science

### Designer babies: the science and the ethics of genetic engineering

Check these words before listening:

#### **Key vocabulary**

1. Genetic make up
2. Gene traits
3. Gene therapy
4. Genome / genotypes
5. Nucleus
6. Gene pool
7. Gene editing
8. Gender
9. Manipulating fertilized eggs
10. Screening
11. Diagnosis
12. DNA
13. DNA Strands
14. DNA Snippets
15. Replicated
16. Enzymes
17. Bacteria
18. Virus
19. Mitochondria
20. Muscular dystrophy
21. Fertilization
22. Life span
23. Vulnerabilities
- 24. A downfall**

#### **Video Links:**

Video: <https://www.youtube.com/watch?v=Gbxk4cGnMTk>

Video: (slower version) <https://www.youtube.com/watch?v=wF80OqvztYw&t=2s>

## Listening Sheet #1

### Designer babies: the science and the ethics of genetic engineering

By Dr Joanna Webb (2018) from The Friendly Brain.com

Link 1: Video: <https://www.youtube.com/watch?v=Gbxk4cGnMTk> [5.01]

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#### 1. Designer Baby Definition

#### 2. Three types of technology:

##### i. Preimplantation Genetic Diagnosis

##### ii. TALENs (Transcription Activator-like Effective Nucleases)

##### iii. CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats)

**3. Use on humans: Preimplantation Genetic Diagnosis**

**4. Three Person Babies**

**5. Future [redacted] of TALENs and CRISPR**

**6. How will this [redacted] ?**

Benefits	Negatives

**7. The final summary**

## Designer babies: the science and the ethics of genetic engineering

### Listening **ANSWER Sheet**

#### 1. Designer Baby Definition

Genetic makeup has been altered or chosen to provide the desired genome.

#### 2. Three types of technology:

##### i. Preimplantation Genetic Diagnosis

Most simplistic of 3 technologies / NO gene editing / choose between variable eggs – best satisfies parents' wants. Used for diseases and gender (Male & Female).

##### ii. TALENs (Transcription Activator-like Effective Nucleases)

**ALL Answers available with paid version...**

## Text 1: The Engineered Baby

Written by Arianna Watson (2018)

On November 28 2018 in Hong Kong a Chinese scientist (He Jiankui) declared to the world that he had just created the first ever gene-edited babies using a method known as CRISPR/Cas 9.

gene-editing is banned in countries like US, UK and Europe on the grounds that hereditary XXXXXXXXXXXX to future generations.

More importantly is that the announcement was highly unconventional. According to the New Scientist (2018) It raised deep questions for scientists about whether traditional oversight channels were followed, as well as what to believe about the experiment and the results.

A new genome “editing” technique called CRISPR-Cas9 makes it possible for scientists to insert, remove and as cancers, obesity and dementia (Harris, 2018). It also means that unhealthy genes can be eliminated creating a healthier baby and there are claims that it can improve life expectancy by 30 years. However, UNESCO ( the complexities of DNA and changing genes could have catastrophic mutations; i.e: even unhealthy genes are

At the moment the news media seem to be focusing on ‘the designer baby’ concept. The fact is that soon From being able to choose the colour of its eyes to its intelligence. It is suggested that society will become a race for perfection and as a result will create another area of inequality between the rich and the poor. Of course, there is also the moral ethical question of whether we should be playing God and by manipulating our genes could we be creating the beginning of our very own-self destruction?

### References:

UNESCO (2018). *UNESCO panel of experts calls for ban on “editing” of human DNA to avoid unethical tampering with hereditary traits*. [online] UNESCO. Available at: <https://en.unesco.org/news/unesco-panel-experts-calls-ban-editing-human-dna-avoid-unethical-tampering-hereditary-traits> [Accessed 6 Dec. 2018].

Harris, J. (2018). *Pro and Con: Should Gene Editing Be Performed on* [Accessed 6 Dec. 2018].

New Scientist (2018). *New techniques may soon make designer babies a reality – are we ready?* [online] New Scientist. Available at: <https://www.newscientist.com/article/mg24032041-800-new-techniques-may-soon-make-designer-babies-a-reality-are-we-ready/> [Accessed 6 Dec. 2018].

## Text 2: The Designer Baby

New genome “editing” techniques called TALENs and [REDACTED]

[REDACTED] It holds the prospect of preventing heredity diseases and increasing survival rates of babies.

However [REDACTED]  
[REDACTED] amount of controversy surrounding this type of science.



### Possible pros of designer babies

- Installing a better scientific understanding and increasing funding in genetics for biologists ([Princeton University, 2018](#)).
- There are claims that [REDACTED] ([Centre for Genetics, 2017](#)).
- It might help prevent genetic diseases such as Alzheimer’s, Down’s syndrome, obesity, diabetes and HIV ([The New Scientist, 2018](#)).
- [REDACTED] in babies ([Genetic Association, 2017](#)).
- It will allow parents to manipulate traits governed by a small number of genes, such as muscularity, eye colour, height, and memory ([Harvard Medical School, 2017](#)).

### Possible cons of designer babies

- Genetic engineering is a complex science. [REDACTED] permanently ([National Geographic Society, 2018](#))
- If the process is not done carefully, the embryo could be accidentally terminated ([The Genetic Society, 2017](#)).
- A baby cannot [REDACTED] children and have the rights to make changes ([Harvard Medical School, 2018](#)).
- Gap creation in society. “Designer” babies would most likely be better looking, smarter, etc. This would create “classes” between designer and non-designer babies ([National Geographic Society, 2018](#)).
- Ethics and morality. [REDACTED] are good and bad traits ([Stanford University, 2017](#)).

## The Seminar Discussion #1

You are going to have a seminar discussion for **20 minutes**. In the seminar discussion you **must** refer to your notes on the lecture (Dr Webb, 2018) and the texts (Text 1: Watson, 2018) and (Text 2: Princeton University, 2018 / Harvard Medical School, 2017...).

Read the question and you have three minutes to prepare what you will say.

### **Question:**

- *In the future, it is likely that designer babies will become more common. What do you think? What might be the [REDACTED] as a whole?*

**You can make notes here:**