
DP PLAN YOUR LESSON: IB FRAMEWORK ALIGNMENT

EXAMPLE: “Editing Nature”

Introduction

►► The questions and activities in this guide directly relate to the IB Mapping Companion. The Companion classifies the lessons by Achieve3000 Literacy Article Summary, Subject Group, and TOK Links, helping students to move beyond in-depth reading to conceptual and reflective inquiry.

Article Title

“Editing Nature”

Text summary

Gene editing tools are making it possible to help feed billions of people amid a changing climate, but the gene editing process raises many questions.

Subject group

Sciences

Lesson Objective

By the end of this lesson, students will be able to:

- Examine the role of evidence, uncertainty and values in debates about gene editing.
- Consider how combinations of Ways of Knowing (reason, emotion, ethics) affect views.
- Assess the relationship between the human drive to meet needs and respect for natural processes.
- Reflect on how ethical acceptability is determined.

The TOK Links below are provided to help students and teachers create Knowledge Questions, facilitate exploration, perspectives, and encourage reflection and action.

TOK links:

- How do we determine whether scientific innovation is ethically acceptable?
- To what extent should science be driven by human needs versus respect for natural processes?
- How do different Ways of Knowing (reason, emotion, ethics) influence our stance on gene editing?

Step 1: Engaging with Knowledge Questions

▶▶ How will I frame the A3K Article Summary to spark curiosity and connect to a TOK Knowledge Question within the subject group?

To provoke discussion, display a picture of a cow without horns (gene editing) and a packet of crisps labelled 'non-GMO'. Ask: "Which one do you instinctively trust more? Why?"

Inform students they will be investigating how we determine what is ethically acceptable when it comes to new scientific developments, like gene editing. Pose the following questions for them to consider:

- Do we base our decisions on human needs, like food security?
- Do we privilege the importance of respecting nature?
- Is decision-making a matter of reason, emotion, or ethics?

Step 2. Exploring and Investigating

▶▶ How will students explore the topic through disciplinary inquiry, gathering evidence, and multiple perspectives?

Model how different Ways of Knowing (reason, emotion, ethics) provide contrasting insights. Discuss how scientific uncertainty affects public perception.

Students read the article independently. As they read, they make annotations under three TOK lenses:

- **Reason:** Factual claims and testing that is reported (hornless cows, healthier soybeans).
- **Ethics:** Risks or ethical issues that are raised (accidental DNA alterations, safety regulation).
- **Emotion:** Reactions by people or consumers (consumer fears about modified foods, labeling that will reassure).

Students progress as open-minded learners by examining different viewpoints.

Step 3: Analyzing and Evaluating

▶▶ How will students critically analyze the ideas and evidence from the Achieve3000 Literacy Summary using TOK thinking?

Whole-Class Discussion

Explain that scientific issues with a direct bearing on our lives, such as the use of gene-edited foods, show an important overlap between environmental science and environmental ethics. They raise questions about the acceptable limits of scientific change, the role of caution in scientific practice, the proper balance of needs and respect in both innovation and science communication.

Knowledge Question 1:

- How can we know whether scientific innovation is ethical?
- Who should decide: scientists, governments, or consumers?
- What role does caution play in science; is it a virtue or a weakness?

Knowledge Question 2:

- How much should science be about human needs vs. respect for natural processes?
- Is feeding billions enough reason to alter nature?
- Are some 'natural processes' worth protecting even if they are less efficient?

Knowledge Question 3:

- How do different Ways of Knowing (reason, emotion, ethics) shape our approach to gene editing?
- Reason: How does evidence about gene editing move us?
- Emotion: Why does consumer fear matter, even if evidence shows no risk?
- Ethics: What's more important—helping people survive or protecting nature?

Step 4: Synthesizing and Applying

▶▶ How will students connect new understanding to real-world contexts or ethical dimensions within and beyond the subject?

Activity: Ethics in Action

Students will put their knowledge of gene editing into practice by thinking through how scientific innovation can (and should) consider ethics, human needs, and the world's challenges. Students will use the guiding questions below to synthesize ideas from the article and class discussion with authentic examples of how gene editing might be applied in the real world, whether CRISPR crops, genetic therapies, or conservation technologies.

In small groups or pairs, students will:

- Identify a recent, real-world example of gene editing or related biotechnology.
- Apply the guiding questions to their chosen example.
- Share their analysis in a short discussion, infographic, or visual summary.
- Discuss how different vantage points (scientific, ethical, emotional) can affect the process of decision-making.

Guiding Questions:

- How can science both address human needs and respect for nature?
- In what ways can ethical considerations impact scientific innovation?
- What are the responsibilities that come with using technology to address the world's challenges?

- In what ways does the gene-editing debate reflect other global ethical debates (AI, climate engineering, medical cloning, etc.)?

Step 5: Communicating and Presenting

▶▶ How will students express their insights clearly, using academic communication or creative modes to share perspectives?

Activity: Mini-Debate

“Scientific progress should prioritize human needs over preserving nature.”

Students defend, challenge, and evaluate claims using evidence from the article.

- Scaffold opportunities for students to articulate their arguments in multiple formats (discussion, essay, or debate).
- Model the use of TOK and subject terminology: Ways of Knowing, ethics, reason, evidence, perspective.
- Emphasize balanced justification and the respectful exchange of viewpoints.

Step 6: Reflection and Evaluation

▶▶ How will revisiting the Achieve3000 Literacy Article Summary help students recognize shifts in their understanding and deepen their thinking?

TOK Journal Entry

Prompt: Which Way of Knowing do you find most influential in shaping your own views about gene editing: reason, emotion, or ethics? Why? Support your answer with evidence from the article.

Students write 250–300 words, making use of at least one TOK concept (e.g., Ways of Knowing, perspectives, evidence).

Research Task

Research two different disputed advances in science (such as cloning, nuclear power, etc.). In what ways are the issues of ethical acceptability and public trust discussed in both cases?