Unit 3 — Science and Ethics — Teacher copy

Track E · Klasse 12 · Niveau E (Basisfach / Leistungsfach)

Niveau E

1. Vocabulary

Match each item to its meaning or use it in a sentence.

Term	Your note
precautionary principle	
dual-use research	
informed consent	
moratorium	
governance	
irreversibility	
externality	
stakeholder engagement	
transparency	
peer review	
replication	
bioethics committee	
IRB	

2. Reading

Read the text and use it for the activities below.

Reading — *Three Ethics Frames* (paraphrased)

Consequentialism asks *what produces the best outcomes?* — including risks, who bears them, and across what time horizon. *Deontology* asks *what are we required to do regardless of consequences?* — informed consent, dignity, irreversible-harm thresholds. *Virtue ethics* asks *what kind of researcher / institution do we want to be?*. Real-world ethics-of-science debates almost always combine all three; pretending the debate is purely consequentialist is itself a philosophical position.

Vocabulary — science ethics

precautionary principle, dual-use research, informed consent, moratorium, governance, irreversibility, externality, stakeholder engagement, transparency, peer review, replication, bioethics committee, IRB.

3. Practise

Niveau E — controlled

1. Match: precautionary principle → caution under uncertainty; dual use → research with both civilian and military potential; moratorium → temporary halt.
2. T or F: consequentialism rules out informed consent; deontology rules out cost-benefit thinking.

Niveau E — productive

3. Build 4 sentences applying consequentialist + deontological + virtue-ethics moves to the CRISPR case.

4. Your turn

Science-ethics essay, 350 words. Pick one case (CRISPR / LLMs / climate intervention). Build a structured argument with one consequentialist move + one deontological move + one virtue-ethics move + one disagreement / acknowledgement. Use 4 academic discourse markers + 1 cleft.

Sample

The CRISPR-Cas9 germline editing debate is instructive precisely because all three major ethics frames push in slightly different directions, and the resulting policy must be assembled from their overlap. The consequentialist case for some forms of germline editing is, on its own terms, strong: if a single safe intervention can prevent Huntington's disease in a future child, the expected welfare gain is large and the risk profile, with current CRISPR-Cas9 v3 protocols, is modest. By contrast, the deontological objection is also strong: the future child cannot consent, and the principle of informed consent has, since the Belmont Report (1979), been a non-negotiable in human-subject research. Accordingly, the most useful frame here is the precautionary principle — not the strong version (any risk, no action) but the weak version (irreversible-harm thresholds plus stakeholder engagement). The virtue-ethics question — what kind of researcher community do we want? — tilts toward a moratorium-with-review, partly because the researcher community after the He Jiankui case (2018) has, on reflection, agreed that the breach of governance norms was itself the primary harm. It is precisely this institutional self-correction that makes the moratorium-with-review frame defensible. In this regard, the case is not *for or against germline editing* but *for or against doing it inside a peer-reviewed, consent-respecting governance structure*. The honest answer is conditional. Some applications, with strong governance, may be permissible; others, without it, are not. The frame is what travels.

5. Further reading / listening

- Henry T. Greely, *CRISPR People* (accessible chapters).
- The Atlantic — *Tech Ethics* essays.

6. Teacher answer key

Controlled. 1. all true.

2. F (consequentialism includes consent under expected-value), F (deontology accepts cost-benefit as a secondary tool, not primary).

Productive. 3. Open.