Understanding By Design 1-Page Template

Title: Engineering Communication
Standards:

Standard #3: Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.

- **Technological progress promotes the advancement of science and mathematics.**

Standard #4: Students will develop an understanding of the cultural, social, economic, and political effects of technology.

- **Changes caused by the use of technology can range from gradual to rapid and from subtle to obvious.**
- **Making decisions about the use of technology involves weighing the trade-offs between the positive and negative effects.**
- **Ethical considerations are important in the development, selection, and use of technologies.**

Standard #5: Students will develop an understanding of the effects of technology on the environment.

- **When new technologies are developed to reduce the use of resources, considerations of trade-offs are important.**
- **Humans devise technologies to reduce the negative consequences of other technologies.**
- **Decisions regarding the implementation of technologies involve the weighing of trade-offs between predicted positive and negative effects on the environment.**

Standard #7: Students will develop an understanding of the influence of technology on history.

- **Throughout history, technology has been a powerful force in reshaping the social, cultural, political, and economic landscape.**
- **Early in the history of technology, the development of many tools and machines was based not on scientific knowledge but on technological know-how.**

Stage 1: Desired Results

Understandings

Students will understand…

- The ethics involved in engineering a product
- How engineering impacts and changes society
- The differences and similarities between engineering and science

Essential Questions	Knowledge & Skill
♦ What is the connection between ethics and inventions? ♦ Should Engineers be concerned about things like efficiency? ♦ Is someone technologically literate because they have an engineering degree?	♦ Define ethics ♦ Define ethics in engineering ♦ Define ethics in science ♦ Compare and contrast science & engineering ♦ Define society impact ♦

Stage 2: Assessment Evidence

Performance Task Summary	Rubric Titles
♦ Engineering & Society Project	♦ Engineering & Society

Self-Assessments	Other Evidence, Summarized
♦ Check each section of project against rubric	♦ Technology Debates ♦ Discussion responses

Stage 3: Learning Activities

- Where: Introduce essential questions & discuss pre-established knowledge
- Hook: Review "Life in Glass" video and identify the innovation involved
- Explore & Equip: Discuss ethics and complete Technology Debates
- Rethink & Revise: Compare & contrast Science and Engineering using skills from technology debates
- Evaluate Understandings: Engineering & Society Project
- Tailor: Allow students to select an engineering product not on the list
- Organize & Sequence:
  Day 1: Ethics & Life in Glass discussion
  Day 2-3: Technology Debates research
  Day 4: Technology Debate Presentations
  Day 5: Science vs. Engineering Discussion
  Day 6-9: Engineering & Society Project
  Day 10 – 11: Present Projects in class