*Unit 6 Documentation

Content Area: **Technology**
Course(s): **Capstone in Technology, Design & Engineering**
Time Period: **March**
Length: **10 blocks**
Status: **Published**

Transfer Skills

A technical report that documents the design of a product should communicate the chronological timeline of events that led to the overall design history of the finished product.

Enduring Understandings

An engineering documentation portfolio is a collection of work on a long term project that shows progress from start to finish.

An engineering portfolio can take the form of a physical booklet or can be published digitally.

Documentation portfolios should be written as technical reports.

Technical reports are simply a statement of the facts and do not require artistic writing abilities.

Technical reports are a more formalized way of documenting the engineering design process.

Images play a large role in the effective communication in a documentation portfolio.

Essential Questions

What is the purpose of an engineering documentation portfolio?

How would an engineering portfolio change from physical form to digital form?

What are the advantages to publishing a digital engineering portfolio?

What is the purpose of a technical report?

How should a technical report be written?

How are diagrams, charts, and pictures integrated into a technical report?

Why are technical reports important in the field of engineering?

Content

Design brief, Scientific method, Iteration, Mockup, Analysis, Technology, Design process, Proof of concept, Science, Engineering, Hypothesis, Innovation, Project map, Brainstorming, Experiment, Specifications, Possible solution, Prototype, Evaluation, Invention, Rapid Prototyping, 3D printer, Laser cutter, Technical report

Skills

Create rough drafts of technical reports for various parts of the engineering design process.

Incorporate the use of digital photography techniques to effectively communicate a product.

Interpret instructor and peer feedback to create final drafts of technical reports.

Create a digital engineering documentation portfolio.

Publish an engineering documentation portfolio.

Resources

Desktop computers

Research database access

2D & 3D CAD systems

3D printer

Laser cutter

Color laser printers

Large format printer

Prototyping equipment (hand-held and power tools)

Prototyping materials

Prototyping furniture

Presentation device

Standards

TECH.8.1.12.A.3	Collaborate in online courses, learning communities, social networks or virtual worlds to discuss a resolution to a problem or issue.
TECH.8.1.12.B.CS1	Apply existing knowledge to generate new ideas, products, or processes.
TECH.8.1.12.C.1	Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.
TECH.8.1.12.C.CS2	Communicate information and ideas to multiple audiences using a variety of media and formats.
TECH.8.1.12.C.CS4	Contribute to project teams to produce original works or solve problems.
TECH.8.1.12.F.CS1	Identify and define authentic problems and significant questions for investigation.
TECH.8.1.12.F.CS2	Plan and manage activities to develop a solution or complete a project.
TECH.8.1.12.F.CS3	Collect and analyze data to identify solutions and/or make informed decisions.
TECH.8.1.12.F.CS4	Use multiple processes and diverse perspectives to explore alternative solutions.
TECH.8.2.12.A.1	Propose an innovation to meet future demands supported by an analysis of the potential full costs, benefits, trade-offs and risks, related to the use of the innovation.
TECH.8.2.12.B.1	Research and analyze the impact of the design constraints (specifications and limits) for a product or technology driven by a cultural, social, economic or political need and publish for review.
TECH.8.2.12.B.2	Evaluate ethical considerations regarding the sustainability of environmental resources that are used for the design, creation and maintenance of a chosen product.
TECH.8.2.12.C.3	Analyze a product or system for factors such as safety, reliability, economic considerations, quality control, environmental concerns, manufacturability, maintenance and repair, and human factors engineering (ergonomics).
TECH.8.2.12.C.5	Create scaled engineering drawings of products both manually and digitally with materials and measurements labeled.
TECH.8.2.12.C.7	Use a design process to devise a technological product or system that addresses a global problem, provide research, identify trade-offs and constraints, and document the process through drawings that include data and materials.
TECH.8.2.12.C.CS2	The application of engineering design.
TECH.8.2.12.D.1	Design and create a prototype to solve a real world problem using a design process, identify constraints addressed during the creation of the prototype, identify trade-offs made, and present the solution for peer review.
TECH.8.2.12.D.2	Write a feasibility study of a product to include: economic, market, technical, financial, and management factors, and provide recommendations for implementation.
TECH.8.2.12.D.3	Determine and use the appropriate resources (e.g., CNC (Computer Numerical Control) equipment, 3D printers, CAD software) in the design, development and creation of a technological product or system.
TECH.8.2.12.D.CS1	Apply the design process.
TECH.8.2.12.D.CS2	Use and maintain technological products and systems.