# *Unit 2 Conducting and Presenting Research

Content Area: **Technology**
Course(s): **Capstone in Technology, Design & Engineering**
Time Period: **October**
Length: **6 blocks**
Status: **Published**

## Transfer Skills

Presenting research in engineering requires the careful and thorough vetting of sources and the summarization of information organized in such a way that someone without any background knowledge can understand.

## Enduring Understandings

Research on a topic must be compiled from multiple primary and secondary sources.

Sources used in research should be properly vetted to ensure their appropriateness.

Research reports require the use of formal writing techniques.

Defending one's research is just as important as collecting and presenting research.

Presenting a topic requires a different set of skills than writing about a topic.

Sources used within a presentation must be cited properly.

Visual aides are an effective way to further enhance a presentation.

Questions from the audience after a presentation should be answered in a specific and professional manner.

## Essential Questions

How should research be organized?

What characteristics make up a source's appropriateness?

What is the danger in using an inappropriate source?

Why is using formal writing techniques important in research reports?

What techniques can be used to defend research?

How to visual aids help present information?

What makes a presentation effective?

How do you decide what info to include in a presentation and what information to leave out?

What is the value in citing sources within a presentation?

Why is it important to properly answer questions during/after a presentation?

## Content

Accuracy, Baseline, Bias, Deviation, Distribution, Empirical research, Field study, Inductive, Methodology, Peer review

## Skills

Compile research on a topic from multiple primary and secondary sources.

Decide on the appropriateness of a source using the CARS (Credibility, Accuracy, Reasonableness, Support) checklist.

Create a research report on a topic using formal writing techniques.

Present and defend research within a group of peers.

Create a visual aid for a presentation.

Present a research topic to a group of peers.

Field questions from peers about a presentation and its content.

Properly cite sources within a presentation.

## 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.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.CS2 | The application of engineering design. |
| 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. |