Engineering report and presentation

Content Area: **Science**
Course(s): **CP Introduction to Engineering**
Time Period: **Marking Period 1**
Length: **1.5 weeks**
Status: **Published**

Course Pacing Guide

Unit	MP/Trimester	Weeks
Engineering Report and presentation	1	1.5

Unit Overview

In this unit students research one of many different fields within engineering and create a report and presentation for the rest of the class. Each specialty within engineering requires a different skillset, knowledge, and education. The many different fields in engineering appeal to the various fields in science and are widely varied. The point of this assignment is to educate the students in class on what the different fields are in engineering, opening the door for further pursuit into a field that a student is drawn to. There are too many high school students with a high aptitude in science, with a lack of understanding of the careers available to them in engineering that utilize their interests and abilities.

Enduring Understandings

Students will gain a through understanding of the field of engineering they choose to research as well an a better understanding of the many other fields within engineering.

Essential Questions

What are the different fields within engineering and what background and experience is needed for this field?

New Jersey Student Learning Standards (No CCS)

9-12.HS-ETS1-1.1.1	Analyze complex real-world problems by specifying criteria and constraints for successful solutions.
9-12.HS-ETS1-3.6	Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles and theories.
9-12.HS-ETS1-1.ETS1.A	Defining and Delimiting Engineering Problems
9-12.HS-ETS1-1.ETS1.A.2	Humanity faces major global challenges today, such as the need for supplies of clean water and food or for energy sources that minimize pollution, which can be addressed through engineering. These global challenges also may have manifestations in local communities.

Amistad Integration

Holocaust/Genocide Education

Interdisciplinary Connections

CAEP.9.2.12.C	Career Preparation
CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.
CAEP.9.2.12.C.4	Analyze how economic conditions and societal changes influence employment trends and future education.

Technology Standards

TECH.8.1.12	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.12.A.CS1	Understand and use technology systems.
TECH.8.1.12.A.CS2	Select and use applications effectively and productively.
TECH.8.1.12.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.

21st Century Themes/Careers

CAEP.9.2.12.C	Career Preparation
CAEP.9.2.12.C.1	Review career goals and determine steps necessary for attainment.
CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.

Financial Literacy Integration

1. The State Board of Education shall require that a school district incorporate in each of the grades [1][kindergarten] six[1] through eight financial literacy instruction to pupils enrolled in those grades. The purpose of the instruction shall be to provide [1][elementary and][1]middle school students with the basic financial literacy necessary for sound financial decision-making.

This course is for 11th and 12st grade therefore this does not apply.

Instructional Strategies & Learning Activities

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Differentiated Instruction

- Curriculum Map
- Inquiry/Problem-Based Learning
- Learning preferences integration (visual, auditory, kinesthetic)
- Meaningful Student Voice & Choice
- Self-Directed Learning
- LMS use
- Mastery Learning (feedback toward goal)
- Goal-Setting & Learning Contracts
- Rubrics
- Concept Attainment
- Flipped Classroom

- Student Interest & Inventory Data

Formative Assessments

Over the sholder, informal observations and conferences with each student as she or he works on the project.

Alternate Assessments

Assignment grade based on quality of the information that was collected and presented.

Resources & Technology

BOE Approved Texts

Closure

- Students answer the following prompts: "What takeaways from the lesson will be important to know three years from now? Why?
- Ask a question. Give students ten seconds to confer with peers before you call on a random student to answer. Repeat.
- Have kids create a cheat sheet of information that would be useful for a quiz on the day's topic.

ELL

- Alternate Responses
- Extended Time
- Teacher Modeling
- Simplified Written and Verbal Instructions

- Google Translate

Special Education

- Shorten assignments to focus on mastery of key concepts.
- Specify and list exactly what the student will need to learn to pass.
- Evaluate the classroom structure against the student's needs (flexible structure, firm limits, etc.).
- Keep workspaces clear of unrelated materials.
- Provide a computer for written work.
- Seat the student close to the teacher or a positive role model.
- Provide an unobstructed view of the chalkboard, teacher, movie screen, etc.
- Keep extra supplies of classroom materials (pencils, books) on hand.
- Maintain adequate space between desks.
- Give directions in small steps and in as few words as possible.
- Have student repeat the directions for a task.
- Provide visual aids.
- Go over directions orally.
- Grade spelling separately from content.
- Show a model of the end product of directions (e.g., a completed math problem or finished quiz).
- Stand near the student when giving directions or presenting a lesson.

504

- preferential seating
- verbal, visual, or technology aids
- behavior management support
- excused lateness, absence, or missed classwork

At Risk

- Have student restate information
- Concrete examples
- Assistance in maintaining uncluttered space
- No penalty for spelling errors or sloppy handwriting
- Follow a routine/schedule
- Teach time management skills

- Verbal and visual cues regarding directions and staying on task
- Adjusted assignment timelines
- Visual daily schedule
- Immediate feedback
- Work-in-progress check
- Pace long-term projects
- Cue/model expected behavior
- Use de-escalating strategie

Gifted and Talented

Focus on effort and practice

Offer the Most Difficult First

Offer choice

Speak to Student Interests

Encourage risk taking