

Component 4 Reflection Lesson Plan

COURSE:

Engineering Design and Development (Honors)

TEACHER:

Jason D. Redd

DURATION:

15 Days

STANDARDS:

This course connects to standards in the following:

- Common Core State Standards for English Language Arts Anchor Standards
- Common Core Standards for Mathematics
- Next Generation Science Standards
- Standards for Technological and Engineering Literacy

PLTW FRAMEWORK:

Provided by Project Lead the Way (PLTW), the PLTW Framework provides an overview of the levels of understanding that each student will build upon throughout the lesson/unit. It includes: Established Goals, Transfer, Understandings, Knowledge and Skills, and Essential Questions. The most fundamental level of learning is defined by course Knowledge and Skills statements. Each Knowledge and Skills statement reflects specifically what students will know and be able to do after they've had the opportunity to learn the course content. Students apply Knowledge and Skills to achieve Learning Objectives, which are skills that directly relate to the workplace or applied academic settings.

Established Goals

It is expected that students will:

- Demonstrate an ability to identify, formulate, and solve engineering problems.
- Demonstrate an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety,

- The engineering design process is both a guide and a series of waypoints for effective problem solving. It is a tool for self-evaluation as an engineer moves through the process.
- There are many stakeholders involved in an open-ended engineering design process.
- The ability to communicate as a professional is a critical skill for engineers.
- Engineering design projects are typically peer reviewed. Stakeholder feedback and design reviews help guide engineers through the design process.
- Presentation of this design process and project findings are critical to the engineering design process.

Knowledge and Skills

Knowledge: Students will:

- Recognize engineering design processes and how key steps in the engineering design process are related to each other.
- Know the best practices and professional skills associated with contacting experts and project stakeholders.
- Recognize the difference between technical writing and persuasive writing.

Skills: Students will:

- Interpret test results.
- Contact stakeholders and experts directly related to this project and problem. Share the testing results and conclusions about the effectiveness of this solution and testing plan?
- Gather feedback from stakeholders and experts related to your conclusion and testing analysis.
- Provide designer feedback on next steps if time permits, or if you were to start over from a different point in the design process.

ESSENTIAL QUESTIONS:

Students will keep considering:

- What do end-users and experts directly relF4 12 Tf1 012BT/F1 12 Tf1 01 10047m0G()JTJETQ EMC /P /MC

Element J Documentation of External Evaluation

- *Element J Documentation of External Evaluation Overview*
- *Element J Documentation of External Evaluation Template*

Element K Reflection on the Design Project

- *Element K Reflection on the Design Project Overview*
- *Personal Evaluation Rubric*
- *Redesign and Refine*
- *Element K Reflection on the Design Project Template*

Element L

- *Overview*
- *Template*

- Provide instructions for *Component 4 Reflection (Element J, K, and L)*.
- Provide instructions for the *Technical Report*.
- Assess student presentations/work.

Guided Practice

The teacher will:

- Review agenda, learning objectives, and essential questions daily.
- Lead students to recall prior knowledge / experience to make connections to new content.
- Introduce content to be learned.
- Clarify and check for understanding by asking open-ended questions (or by some other type of formative assessment) throughout instruction. Reteach material as needed.
- Pace the classroom instruction to clarify misunderstanding and provide opportunities for student feedback.
- Introduce new content to be learned and how it connects to learning objectives and answers some (or all) of the essential questions.
- Demonstrate skill practices students will gain from this lesson.
- Demonstrate assignment(s) outcome expectations.
- Review resources and equipment needed to problem-solve student assignments.
- Share safety instructions to students. *Safety Instructions: Students should only utilize equipment they have been fully trained to use.*
- Provide review material / resources for students to prepare for summative assessments.

Transition

- ☒ Classroom Expectations / Routines
- ☒ Review Questioning
- ☒ Stimulus or Signal (Example: “Pencil Drop”, “Eyes on Me”, etc.)
- ☒ Student Reflection
- ☒ Timer

Independent Practice (Varied Learning)

The students will:

- Participate in teacher-led discussions / presentations

Closure

The following techniques may be utilized:

- The teacher will lead a classroom discussion to check for understanding and clarify misunderstandings.
- The teacher may ask students to reflect on the outcomes from the lesson.
- The teacher may ask students if they met and how they met the learning objectives for the lesson.
- The teacher may ask students to demonstrate what was learned.
- Teacher and students may play Kahoot! (or some other type of game) to check for mastery.
- Student will share why the lesson is important via guided questions.
- Student will complete some sort of exit ticket.

Assignments and Assessments

The students will:

- Practice active listening skills while observing the teacher-led PowerPoint presentations.
- Review the *Component 4 Reflection* documents and PowerPoint presentations.
- Complete *Component 4 Reflection (Element J, K, and L)*.
- Create and continually add to and revise the *Technical Report*