Amp It Up! Engineering/Technology and Industry Lesson Extension



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School and District:	**Hamilton-Wenham Regional School District**
Course:	**Physics**

Abstract: In 200 words or less, please provide a summary of the goal for the lesson extension and its relationship between industry and academic topic.

The goal of the lesson is to introduce students to different types of careers that were introduced to us at GE as well as many other kinds of engineering careers that exist. Studnets will also learn about and reflect on the kinds of skills that are valued at a STEM company such as GE. Students will think about how they acquire and practice these skills in their courses and elsewhere.

Engineering/Technology Link:

1. How did you *introduce* engineering/ technology concepts or the company/industry focus in your course? Check the appropriate box(es) or choose Other.

   x Defined terms (science, engineering, technology)

   ☐ Described the engineering design process

   ☐ Engineering design challenge related to industry

   x Overview of the company

   ☐ Challenge based on 'industry specific' area of focus (manufacturing process, quality control, measurement, development, teamwork etc.)

   ☐ Other: _____

Level of Inquiry: Which of the following best describes the level of inquiry (adapted from Bell 2005) you used for this lesson/unit? Check the appropriate level.

☐ *Structured inquiry*: Instructor provides question and procedure. Students determine the results based on given procedures.
☒ *Guided inquiry*: Instructor provides question. Students design procedure and determine the results.
☐ *Open inquiry*: Students investigate their own research question. Students design procedures and implement the procedure on their own.

Lesson Extension Plan:

Title/Topic: STEM Career Paths and Valued Skills

Time (minutes): 60-90

Company Name and brief Description: GE Aviation (Lynn, MA). Jet engine designer and manufacturer.

Overview of the Lesson:

- Students will be introduced to different types of high demand STEM careers that were introduced to us at GE and the kinds of skills that are valued at an engineering company such as GE. Students will think about how they acquire and practice these skills in their courses and elsewhere.

Standard(s)/Unit Goal(s) to be addressed in this lesson: Career readiness, discusson of 21st Century Skills

Essential Question(s) addressed in this lesson:

- What does an engineer do?
- What are the key skills that are valued by STEM employers such as GE?

Objectives (academic and/or engineering/technology, career):

- Students will discover many kinds of engineering jobs that exist
- Students will be able to identify the academic and non-academic skills that are valued at STEM employers.
- Students will identify skills they currently possess and skills they need to further develop or acquire that are valued by companies such as GE

Link to Industry (how the lesson connects to the industry visited):

- Through our conversations with GE enegineers, we learned about different career paths at GE and the kinds of skills that are highly valued

What students should know and be able to do before starting this lesson

- No prerequisites

Instructional Materials/Resources/Tools

- Instructor needs an Internet enabled laptop and projector. Students should have a device with Interent access.

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Lesson Delivery
Lesson Opening • Ask students "What does an engineer do?" Students write down any thoughts and discuss with a small group first, then discuss with the whole class. Discuss misconceptions about engineering.
During the Lesson (activities/labs/challenges) • Show TED Talk about a female engineer's path to becoming an engineer: https://www.youtube.com/watch?v=FEeTLopLkEo • Discuss the female engineer we met at GE, her career path, and her current role there. • Have a discussion about misconceptions students may hold about engineers and who can be an engineer • Discuss that the projects we did in class (propulsion cars, building projectile launchers, etc.) are engineering. • Discuss different types of engineers (https://www.engineergirl.org/33/Engineering-Careers) and (http://www.nacme.org/types-of-engineering) • Students do research online on a different types of engineer assigned to their group • Students go around the classroom and teach each other about different types of engineers they researched • Students identify the essential skills necessary for a STEM career • Students reflect on what skills they currently have (see checklist attached) and where they might develop these skills (school, extracurricular, and/or community experiences)
Lesson Closing • Students write a reflection on important takeaways from the lesson and whether any of the engineering careers that were discussed are appealing to them, explaining why or why not.
Assessment
Student Assessment: Thoughtful reflection of the lesson
Delivery Assessment: The quality of students' reflections of how they are now thinking about their careers and skills

Additional resources and assessments: Attachments should include handouts, readings (with references), lab write-ups, rubrics, exams/quizzes, and/or other similar materials.

Skills Checklist

1. How have you developed the following skills?

Skill	Example from Classes	Other Experiences with This Skill
Problem Solving		
Collaboration		
Communication		
Project Management		
Learning from Mistakes		
Learning from Mistakes		
Teamwork		
Creativity		
Attention to Detail		
Data Analysis		
Using Technology		

2. Which skills have you developed through activities or other experiences outside of class?

3. Where do you see these skills being useful in your everyday life? Give two examples.

4. Which three skills do you think are your strengths? Why?

5. Which two skills do you think are your weakest? Why?

6. How might you improve your weaker skills?

7. Look ahead to the courses you expect to take your senior year or to you extracurriucular activities. Which ones will help you develop the skills you might need for a 21st century career?