
How to Work Like an Engineer

Introduction

In this blended learning unit, students will explore the culture and safety principles of an engineering work environment and apply them to their own work environment in the school and classroom. They will complete a range of tasks that require 21st century skills that are found in industry including critical thinking, reflection, and collaboration. Students will have choice in the work that is completed and the pace of learning. The teacher should serve as a guide rather than a lecturer. The content can be modified for different grade levels, other LMS formats, and ELLs using the resources provided.

Curriculum Alignment

CCSS.ELA-LITERACY.RI.5.3

Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.

CCSS.ELA-LITERACY.RI.5.7

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

CCSS.ELA-LITERACY.RI.5.9

Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

CCSS.ELA-LITERACY.SL.5.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 5 topics and texts*, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.5.2

Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

CCSS.ELA-LITERACY.SL.5.4

Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

CCSS.ELA-LITERACY.SL.5.5

Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

CCSS.ELA-LITERACY.SL.5.6 Adapt speech to a variety of contexts and tasks, using formal English when appropriate to task and situation

CCSS.ELA-LITERACY.W.5.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly;

CCSS.ELA-LITERACY.W.5.6 With some guidance and support from adults, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with

others.

CCSS.ELA-LITERACY.W.5.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

This unit also supports the framework for 21st Century Learning. This framework can be found at <http://www.p21.org/about-us/p21-framework> and is support by NC DPI at <http://www.dpi.state.nc.us/profdev/resources/skills/>.

Objectives

Students will:

- Demonstrate Initiative and Self-Direction by completing all modules and assignments
- Demonstrate Productivity and Accountability by passing all assignments with a score of 80% or higher
- Develop 21st Century Collaboration Skills by reaching a consensus and working together to create a product

Time & Location

This lesson is a blended learning unit. Time and pace are somewhat dictated by student preference. It is intended to take 3-4 weeks with limited teacher guidance. It is originally in the format of an interactive PowerPoint so the location can be any LMS needed. It is currently being formatted for Canvas.

Teacher Materials

In the Course Modules, there are links for all electronic assignments, as well as an appendix of resources. The intention is to make the work digital as much as possible to minimize teacher materials and preparation.

Student Materials

- Device for accessing the internet
- Google Account
- Guided Notes Packet

Teacher Preparations

The teacher will need to make copies of all Google Forms needed for the unit. Then, the PowerPoint will need to be updated with the appropriate hyperlinks to the forms; otherwise, the teacher will not be able to view the students' answers as they will populate in my Google Drive. I also recommend printing the Guided Notes packet to help all students keep track of their learning. The guided notes can be modified to increase or decrease support.

Activities

See Module Outline and Course Blueprint

Assessment

The 3 Principles

Introduction

How can students think like an engineer?

According to the Siemens website, “safety is a business task, a social responsibility, and a factor of success.” The company uses 3 Principles to communicate this (“Zero accidents – it is achievable!” “Health and safety – no compromises!” “We take care of each other.”) In this module, students will learn about the 3 principles as they relate to the school environment, and they will apply these principles when setting personal goals for the upcoming year.

Objectives

- Students will interpret the 3 Principles and apply them personally.
- Students will set and meet personal goals based on the 3 principles with the guidance of peers and teacher.
- Students will monitor, define, prioritize and complete tasks without direct oversight.

Assignment #1A: Notes: What is a principle?

Assignment #1B: Understanding SMART Goals

Students will watch Flocabulary’s video “Goal Setting”. Students will pause the video and record notes on the 5 ways to make a goal SMART (Specific, Measureable, Actionable, Realistic, Time-Based).

- Video Link: <https://www.flocabulary.com/unit/goal-setting/>

Assignment #1C: Setting SMART Goals

Students will use a Google Form to set goals that are SMART and in line with the 3 Principles.

- Form Link (PLEASE MAKE A COPY BEFORE USE):
<https://goo.gl/forms/HTWSnNAPKotaAeUk1>
- Optional: these responses can be imported in Excel and merged to a Word Document to make a printable goal statement. (Examples found in the Appendix)

Responsibility Standards

Introduction

How can students act like an engineer?

At Siemens Charlotte, the responsibility of implementing the 3 Principles falls on ALL EMPLOYEES 100% OF THE TIME. All employees, regardless of position or rank, are tasked with holding themselves and others, regardless of position or rank, accountable for responsible behavior. Feedback or correction are delivered without judgement and received without criticism. In this module, students will analyze the 5 Responsibility Standards, and they will work as a team to relate them to the learning environment.

Objectives

- Students will analyze each of the 5 Responsibility Standards and relate them to the learning environment.
- Students will assume shared responsibility for collaborative work, and value the individual contributions made by each team member
- Students will synthesize and make connections between two or more pieces of information.

Assignment #2A Notes: What is Responsibility?

Assignment #2B: Responsibility Standards at My School

Students will work in pairs to complete the worksheet, “Responsibility Standards at My School”.

- Form Link (PLEASE MAKE A COPY BEFORE USE):
<https://goo.gl/forms/tbFWDZRhCmifJ6lD3>

Assignment #2C: Collaboration Vlog: Responsibility Standards at My School

Students will work in pairs to make a video about how the Responsibility Standards apply at their school.

- Rubric found in Appendix

Human Performance

Introduction

How can students grow like an engineer?

No matter the culture of an environment, to err is human. Top engineering companies, like Siemens and Duke Energy, know this to be true and have implemented a process for preventing, and correcting, as many mistakes as possible. Both companies use the acronym STAR for this process. STAR stands for Stop – Think – Act – Review. In this module, students will reflect on their performance in previous school years and review how that performance compares to the goals they have set for the upcoming year.

Objectives

- Students will utilize the STAR method to reflect on their performance in previous school years and review how that performance compares to the goals they have set for the upcoming year.
- Students will identify and ask significant questions that clarify various points of view and lead to better solutions.
- Students will use technology as a tool to organize and communicate information.

Assignment #3A: Notes: What is Human Performance?

Assignment #3B: Evaluate the Performance

Students will evaluate the error precursors in the videos.

- Form Link (PLEASE COPY BEFORE USING): <https://goo.gl/forms/yLPqGc2bpbJJdAeR2V>

Assignment #3C: My S.T.A.R. Performance

Students will use reflective questioning to evaluate their performance in the past.

- Link for S.T.A.R. REFLECTION WORKSHEET:
https://docs.google.com/document/d/1RNaIb1_ALt0d6GngSPkLcRWSCxL124JDLgcHYKfd5Vs/copy?usp=sharing

Assignment 3D: Individual Choice: Evaluate My Performance

Students will choose a final product for sharing their S.T.A.R. Performance Reflection.

- 1) Students will record a video where they identify a time in the past when they made an error, and they will identify the steps they will take to prevent it in the future. Students may use their goals from the 3 Principles Module in addition to the reflection worksheet. (Rubric for video in Appendix)
- OR -
- 2) Students will create a comic/cartoon where they identify a time in the past when they made an error; they will identify the steps they will take to prevent it in the future. Students may use their goals from the 3 Principles Module in addition to the reflection worksheet. Toony Tool is one option for cartoon creation software. (Rubric for cartoon in Appendix)

GUIDED NOTES: HOW TO WORK LIKE AN ENGINEER

INSTRUCTIONS: Use these guided note to help you understand what you will see, hear, and read in this unit. Your responsibility is to fill in each of the blanks with the appropriate concepts, definitions, and other information.

Students will:

- Demonstrate _____ and _____ by completing all modules and assignments
- Demonstrate _____ and _____ by passing all assignments with a score of 80% or higher
- Develop 21st Century _____ Skills by reaching a consensus and working together to create a product

VIDEO NOTES

MODULE 1: THE 3 PRINCIPLES

How can you ~~THINK~~ like an engineer?



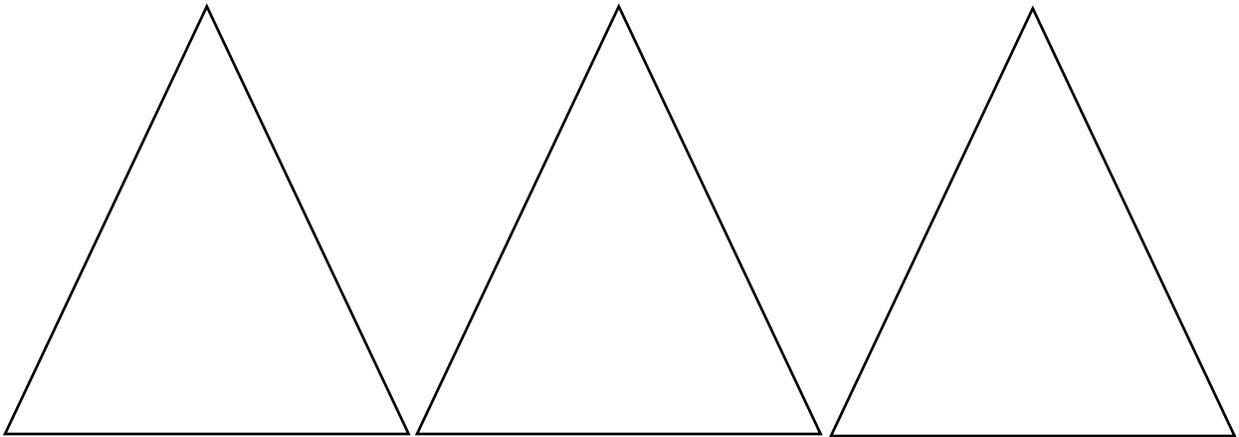
WHAT IS A PRINCIPLE?

A **principle** is a general belief about the way you should _____, which influences your _____.

- Another word for this could be _____.
- Morals, or principles, are often _____.

Assignment 1A NOTES: What principles have you learned from adults in charge?

THE 3 PRINCIPLES @SIEMENS



THE 3 PRINCIPLES @SCHOOL

1. QUALITY OF WORK

We all have different work to do that ultimately impacts

_____. If we are each committed to our best effort,
_____ is achievable.

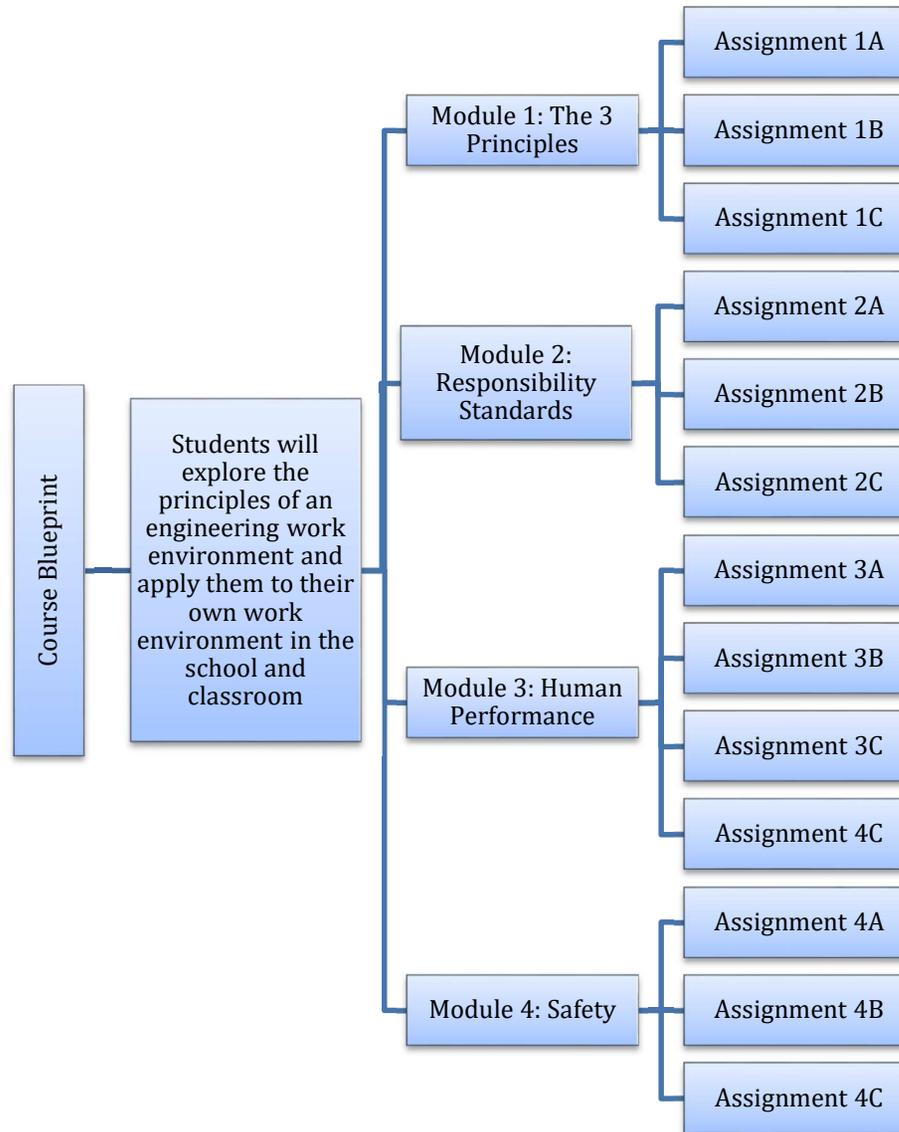
2. ZERO REFERRALS

It can be done! We believe that everyone should have a _____
and _____ classroom environment and return
_____ to family and friends at the end of the day.

3. ONE FAMILY

We take care of each other. We are _____ to the Safety and
Health of ourselves and each other. This means we advise each other and receive
_____ with an _____

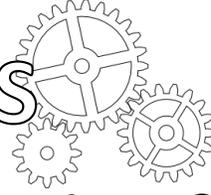
Course Blueprint – How to Work Like an Engineer



This Course Blueprint is part of the [Blended Learning Toolkit](#) prepared by the [University of Central Florida](#) (UCF) and the [American Association of State Colleges and Universities](#) (AASCU) with funding from the [Next Generation Learning Challenges](#) (NGLC). It is provided as an open educational resource under a [Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License](#).



MODULE 2: RESPONSIBILITY STANDARDS



How can you ACT like an engineer?

WHAT IS RESPONSIBILITY?

Responsibility is completing a task or duty without _____
_____.

- A _____ is something assigned to you and only you.
- You are acting responsibly when you do _____
_____.

Assignment 2A: What is something or someone you are responsible for? Do you enjoy this responsibility? Why or why not?

RESPONSIBILITY @SCHOOL

We ALL have a responsibility for ensuring:

- The _____ of our Work
- The Safety & Health of _____ and _____
- The _____ of our School
- The Conservation of _____
- The Need to _____

NOTES: HOW CAN YOU ACT LIKE AN ENGINEER? - Part 1

Use this space to record your partner's name and any ideas you want to share.

NOTES: HOW CAN YOU ACT LIKE AN ENGINEER? - Part 2

Use this space to jot down notes before you and your partner record the video.

I, Ms. Fitz, am committed to living the 3 Principles in the classroom in order to maximize my success as a student. Attending school is my job, and it is preparation for my future, in college or in a career, whichever path I choose.

I understand that the quality of my work directly affects the work of others. I am committed to giving my best effort. I will know I am giving my best effort when planning meaningful and rigorous work for my students. I will maintain and increase my quality of work by achieving a grade level proficiency of 70% or higher. I will be planning lessons that utilize the power standards and 21st century learning, and I will go to my personal and professional resources, including my admin team and facilitators when I need assistance. I am going to review this goal on 9/29/2018.

I understand that safety is the responsibility of everyone, including myself. I will keep in mind the health and safety of my school and my community. I can demonstrate my commitment to safety when I set clear expectations and procedures, as well practice safety routines and review expectations, routines, and procedures with the students and model these in my own behavior. I will measure it by the number of incidents in the first quarter. I will being firm but fair and patient, and I will go to my admin team when I need assistance. I am going to review this goal on 9/29/2018.

As a part of my commitment to the health and safety of everyone around me, I have set a goal of zero incidents this year. While accidents happen, the number of incidents can be greatly reduced by my effort. I promise to commit to no major referrals or incident occurrences in the first quarter. I will measure my progress towards this goal by maintaining organized paperwork and behavior trackers. I will be utilizing restorative practices in all corrective situations, and I will refer to the Restorative Justice handbook and behavior matrix when I need help meeting this goal. I am going to review this goal on 9/29/2018.

COMMON ERROR PRECURSORS

What are some actions that happen **before** an error or accident occurs? Those are called _____.

- Making _____
- _____ Distractions/Disruptions
- Attempting Too Many _____
- Being _____
- _____
- _____ Pressure
- Time _____

Notes from Brain Tricks Video

Notes from Speed Reaction Test Video

S.T.A.R. PERFORMANCE

Watch the Pixar video and use the S.T.A.R. method to evaluate the video. Make notes of when the birds started to formulate a plan, what they were thinking, how they acted, and the review of the situation.

STOP:	THINK:	ACT:	REVIEW:
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MODULE 3: HUMAN PERFORMANCE

How can you GROW like an engineer?

WHAT IS HUMAN PERFORMANCE?

In the business world, **human performance** means “the _____ of a task along agreed upon standards of _____, _____, and _____.”

- Did you do it _____?
- Did you do it _____?
- Did you do it _____?

Assignment 3A: Think of a piece of work, a project, or a test that you did well on. What was it? Now think of one you didn't do well on. What was it? What was the difference in how you performed and why weren't you successful at both?

MODULE 4: SAFETY

How can you STAY SAFE like an engineer?

What Is Safety?

Safety means being free from _____, _____,
and _____.

Safety Is Universal

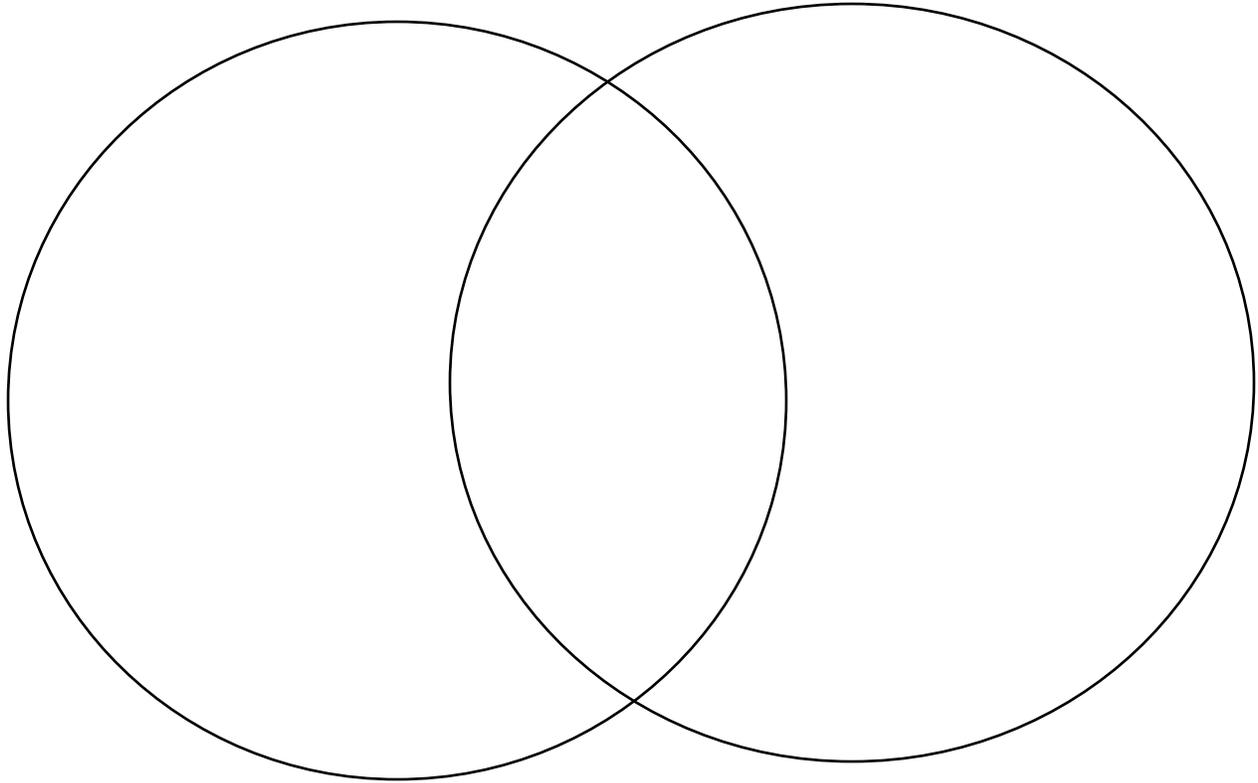
Slide #1

Slide #2

Slide #3

THINK: How Is Safety Universal?

Assignment 4A: Compare and contrast safety in a STEM industry like Siemens to safety in a school



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ALWAYS REPORT

- _____
- DAMAGES TO THE _____
- _____ ELECTRONICS
- _____
- UNSAFE _____

ALWAYS REMEMBER

- NO _____ ELECTRONICS
- NO EATING _____
- ONLY _____ IN THE
CLASSROOM

Safety

Introduction

How can students stay safe like an engineer?

Safety is an obvious priority in all working environments but particularly in schools. Siemens philosophy is “safe behavior is governed not only by complying with laws, regulations and procedures, but also by the personal values and mindsets of managers and employees.” In this module, students will understand how the safety guidelines in industry mirror those in the learning environment. Students will also evaluate the need for safety guidelines and the importance of adhering to them.

Objectives

- Students will understand how the safety guidelines in industry mirror those in the learning environment.
- Students will evaluate the need for safety guidelines and the importance of adhering to them.
- Students will articulate thoughts and ideas effectively using written communication.

Assignment #4A: Notes: How is Safety Universal?

Assignment #4B: Evaluate the Scenario: Snitching or Reporting?

Students will read each scenario and decide if it is “snitching” or reporting.

3) Form Link (PLEASE MAKE A COPY BEFORE USE)

<https://goo.gl/forms/sVtvqXno6GVURRQ02>

Assignment #4C: Safety Essay

Students will choose a writing prompt to demonstrate personal understanding of safety.

1) What does safety look like for you? (Think: what makes you feel safe at home? What makes you feel safe at school? How are they different? The same? Which place makes you feel safest? Why?)

- OR -

2) At our school, we love student feedback. What are 3 specific ways in which we can improve student safety at our school? (Make sure you include details about what the improvement would be and why it would be important.)

Sample Goal Statement Text for Merge

I, «STUDENT_NAME», am committed to living the 3 Principles of an Engineer in the classroom in order to maximize my success as a student. Attending school is my job, and it is preparation for my future, in college or in a career, whichever path I choose.

I understand that the quality of my work directly affects the work of others. I am committed to giving my best effort. I will know I am giving my best effort when «EFFORT_HOW». I will maintain and increase my quality of work by «EFFORT_MEASURE». I will «EFFORT_ACTION», and I will go to «EFFORT_RESOURCES» when I need assistance. I am going to review this goal on «EFFORT_DATE».

I understand that safety is the responsibility of everyone, including myself. I will keep in mind the health and safety of my school and my community. I can demonstrate my commitment to safety when «SAFETY_HOW» and «SAFETY_HOW_2». I will measure it by «SAFETY_MEASURE». I will «SAFETY_ACTION», and I will go to «SAFETY_RESOURCES» when I need assistance. I am going to review this goal on «SAFETY_DATE».

As a part of my commitment to the health and safety of everyone around me, I have set a goal of zero incidents this year. While accidents happen, the number of incidents can be greatly reduced by my effort. I promise to «INCIDENTS_HOW». I will measure my progress towards this goal by «INCIDENTS_MEASURE». I will «INCIDENTS_ACTION», and I will go to «INCIDENTS_RESOURCES» when I need help meeting this goal. I am going to review this goal on «INCIDENTS_DATE».

Sample Goal Statement

I, Ms. Fitz, am committed to living the 3 Principles of an Engineer in the classroom in order to maximize my success as a student. Attending school is my job, and it is preparation for my future, in college or in a career, whichever path I choose.

I understand that the quality of my work directly affects the work of others. I am committed to giving my best effort. I will know I am giving my best effort when planning meaningful and rigorous work for my students. I will maintain and increase my quality of work by achieving a grade level proficiency of 70% or higher. I will be planning lessons that utilize the power standards and 21st century learning, and I will go to my personal and professional resources, including my admin team and facilitators when I need assistance. I am going to review this goal on 9/29/2018.

I understand that safety is the responsibility of everyone, including myself. I will keep in mind the health and safety of my school and my community. I can demonstrate my commitment to safety when I set clear expectations and procedures, as well practice safety routines and review expectations, routines, and procedures with the students and model these in my own behavior. I will measure it by the number of incidents in the first quarter. I will be firm but fair and patient, and I will go to my admin team when I need assistance. I am going to review this goal on 9/29/2018.

As a part of my commitment to the health and safety of everyone around me, I have set a goal of zero incidents this year. While accidents happen, the number of incidents can be greatly reduced by my effort. I promise to commit to no major referrals or incident occurrences in the first quarter. I will measure my progress towards this goal by maintaining organized paperwork and behavior trackers. I will be utilizing restorative practices in all corrective situations, and I will refer to the Restorative Justice handbook and behavior matrix when I need help meeting this goal. I am going to review this goal on 9/29/2018.

Collaboration Vlog Rubric

TASK	EXCELLENT (4 points)	GOOD (3 points)	FAIR (2 points)	POOR (1 point)
COMMUNICATION	Excellent communication skills. Students speak clearly, contribute equally and are pleasant to listen to and watch.	Good communication skills. Students both contribute and are mostly clear in speech.	Fair communication skills are used. Students aren't intelligible and/or there is not equitable contribution.	Communication prevents the video from being effective. One or both students does not contribute at all.
VISUAL ELEMENTS	Footage is consistently of high quality with camera focused on the team and minimizing background distractions.	Footage is mostly high quality with some background distractions that do not take away from the content.	Footage is of fair quality. Background distractions, volume, and other factors take away from the content.	Footage is poor. The video is distracting or students are not visible in the recording.
CONTENT	All objectives from the module are met. The content exceeds the scope of the assignment.	Most objectives from the module are met. The content meets the scope of the assignment.	Only one objective from the module was met. The content does not adequately address the scope of the assignment.	Objectives from the module are not addressed. The content is not related to the scope of the assignment.

Individual Vlog Rubric

TASK	EXCELLENT (4 points)	GOOD (3 points)	FAIR (2 points)	POOR (1 point)
COMMUNICATION	Excellent communication skills. Student speaks clearly and is pleasant to listen to and watch.	Good communication skills. Student speaks clearly and is generally pleasing to listen to and watch.	Fair communication skills are used. Student isn't intelligible and comprehension of viewer is impeded by communication.	Communication prevents the video from being effective OR no video was submitted.
VISUAL ELEMENTS	Footage is consistently of high quality with camera focused on the student and minimizing background distractions.	Footage is mostly high quality with some background distractions that do not take away from the content.	Footage is of fair quality. Background distractions, volume, and other factors take away from the content.	Footage is poor. The video is distracting or student is not visible in the recording OR no video was submitted.
CONTENT	All objectives from the module are met. The content exceeds the scope of the assignment.	Most objectives from the module are met. The content meets the scope of the assignment.	Only one objective from the module was met. The content does not adequately address the scope of the assignment.	Objectives from the module are not addressed. The content is not related to the scope of the assignment.

Cartoon Rubric

TASK	EXCELLENT (4 points)	GOOD (3 points)	FAIR (2 points)	POOR (1 point)
CLEAR CONCEPT	The S.T.A.R. process is reflected in the cartoon, and the reader can easily understand the process from beginning to end. A lesson is clear in the final panel.	The S.T.A.R. process is reflected in the cartoon. The reader understands the process.	The S.T.A.R. process is not completely reflected in the cartoon. It is difficult to understand the process from beginning to end.	The S.T.A.R. process was not used at all in creation of the concept.
VISUAL ELEMENTS	Each panel has a clear focus and is visually appealing with images, text, and color.	Each panel has a clear focus and is mostly visually appealing with images, text, and color.	Some panels have a clear focus. Some visual elements are pleasing.	No panels have a clear focus or relation to the concept. Visual elements are missing.
CONTENT	All objectives from the module are met. The content exceeds the scope of the assignment.	Most objectives from the module are met. The content meets the scope of the assignment.	Only one objective from the module was met. The content does not adequately address the scope of the assignment.	Objectives from the module are not addressed. The content is not related to the scope of the assignment.

Safety Essay Rubric

TASK	Good (5 points)	Fair (3 Points)	Poor (1 Point)
<p><u>Safety Details</u> Student should outline their personal safety beliefs by giving specific details and address the demands of the question.</p>	<p>Details are specific and clear. The student has clearly given personal thought to the answer.</p>	<p>Details are specific and clear, but the student uses generic examples that are not personal.</p>	<p>The answer is not related to the prompt. OR No answer was given.</p>
<p><u>Completeness</u> Student should compose at least 3 paragraphs.</p>	<p>3 Paragraphs</p>	<p>2 Paragraphs</p>	<p>1 or fewer Paragraphs</p>
<p><u>Editing</u> Student should make sure essay is free from mistakes in grammar, punctuation, and spelling.</p>	<p>The answer has no errors in grammar, punctuation, and spelling.</p>	<p>The answer has few errors in grammar, punctuation, and spelling, but these do not affect the reader's understanding.</p>	<p>The answer has severe errors in grammar, punctuation, and spelling which prevent the reader from fully understanding.</p>

Resources Used:

<https://blended.online.ucf.edu/blendkit-course-diy-project-tasks/>

<http://www.p21.org/about-us/p21-framework/261>

<https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/>

<https://www.siemens.com/global/en/home/company/sustainability/safety.html>

<http://www.corestandards.org/ELA-Literacy/SL/5/>

<https://www.flocabulary.com/lesson/setting-goals/>

<https://www.rcampus.com/rubricshowc.cfm?sp=true&code=GX7C962&>

<http://www.businessdictionary.com/definition/human-performance.html>

<http://www.wordcentral.com>

See Module Outline and Course Blueprint

Critical Vocabulary

<https://quizlet.com/305824580/how-to-work-like-an-engineer-flash-cards/>

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HOW TO WORK LIKE AN ENGINEER

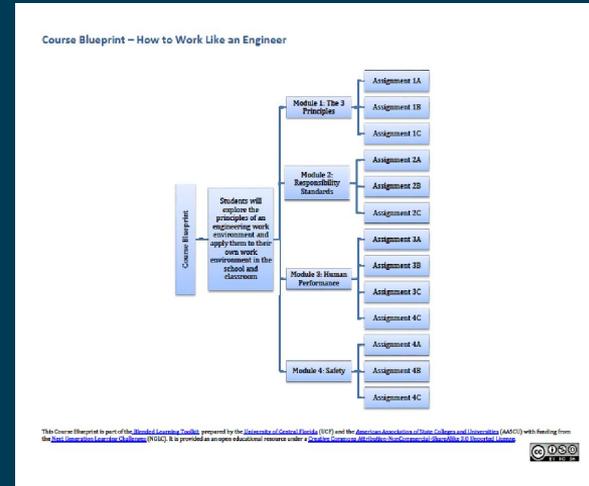
adapted from Siemens Safety Training



COURSE OVERVIEW

Students will:

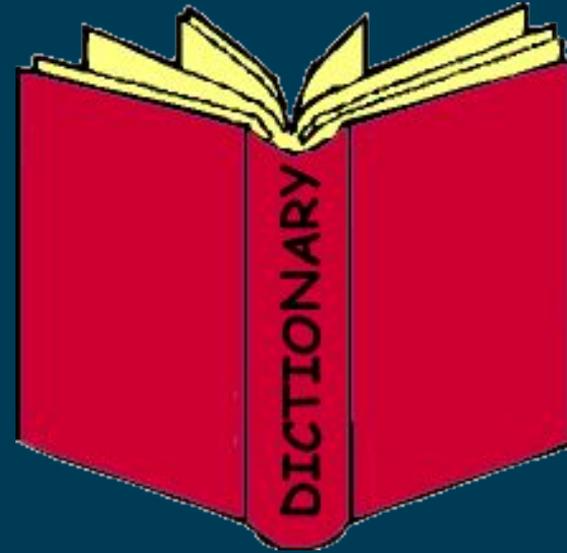
- Demonstrate Initiative and Self-Direction by completing all modules and assignments
- Demonstrate Productivity and Accountability by passing all assignments with a score of 80% or higher
- Develop 21st Century Collaboration Skills by reaching a consensus and working together to create a product



COURSE BASICS



Watch this video to learn about the basics of engineering.



Click the dictionary above to find the meaning of common words in this unit.

MODULE 1: THE 3 PRINCIPLES

How can you THINK like an engineer?

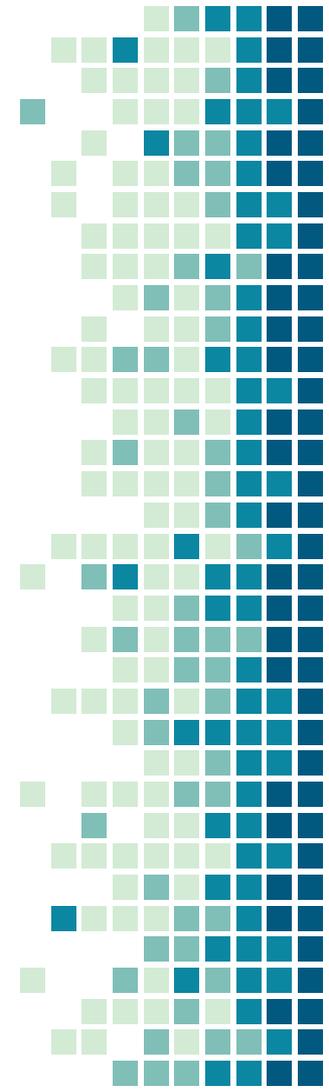


MODULE 1 OVERVIEW

According to the Siemens website, “safety is a business task, a social responsibility, and a factor of success.” The company uses 3 Principles to communicate this (“Zero accidents – it is achievable!” “Health and safety – no compromises!” “We take care of each other.”) In this module, you will learn about the 3 principles as they relate to the school environment, and you will apply these principles when setting personal goals for the upcoming year.

Objectives

- I will interpret the 3 Principles and apply them personally.
- I will set and meet personal goals based on the 3 principles with the guidance of peers and my teacher.
- I will monitor, prioritize and complete tasks without direct oversight.

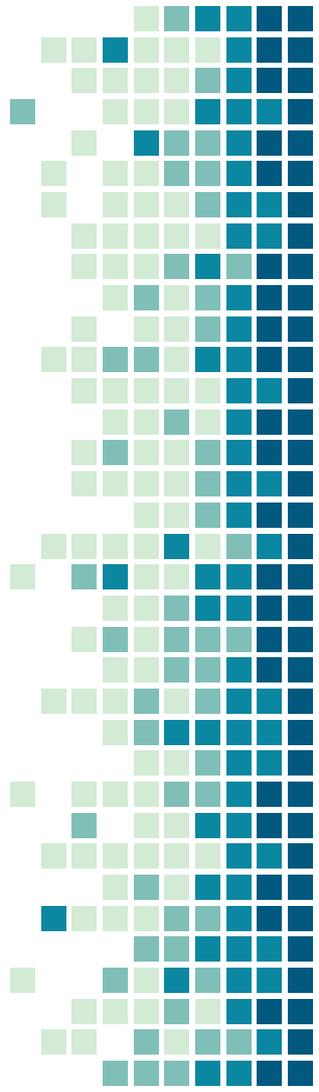


WHAT IS A PRINCIPLE?

A principle is a general belief about the way you should behave, which influences your behavior.

- Another word for this could be moral.
- Morals, or principles, are often taught or passed down from parents to children.

Assignment 1A: What principles have you learned from adults in charge? Record them in your notes.



THE 3 PRINCIPLES @SIEMENS

THEY LIVE THEIR PRINCIPLES

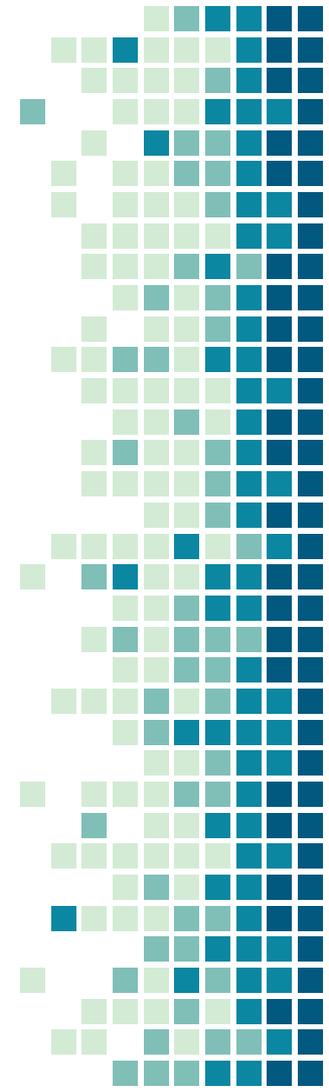
QUALITY = 100%
ERROR FREE



SAFETY = ZERO
INCIDENTS



OWNERSHIP CULTURE
= ONE SIEMENS



THE 3 PRINCIPLES @SCHOOL

WE LIVE OUR PRINCIPLES

QUALITY OF WORK

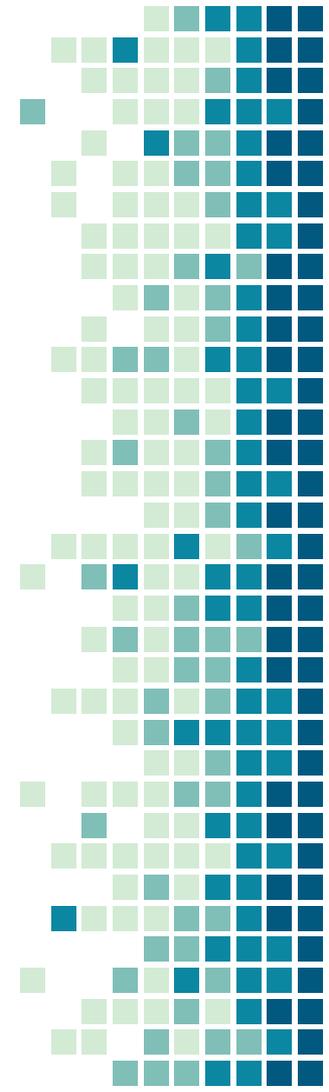
We all have different work to do that ultimately impacts the performance of the entire school. If we are each committed to our best effort, growth is achievable.

ZERO REFERRALS

It can be done! We believe that everyone should have a safe and secure classroom environment and return healthy and safe to family and friends at the end of the day.

ONE FAMILY

We take care of each other. We are committed to the Safety and Health of ourselves and each other. This means we advise each other and receive advice given with an open mind.



HOW CAN YOU SET GOALS LIKE AN ENGINEER?

Engineers think about what they want to accomplish, and they set SMART goals. What does that mean? Click the video link below to find out!

Assignment 1B Record notes as you watch.



YOUR TURN!

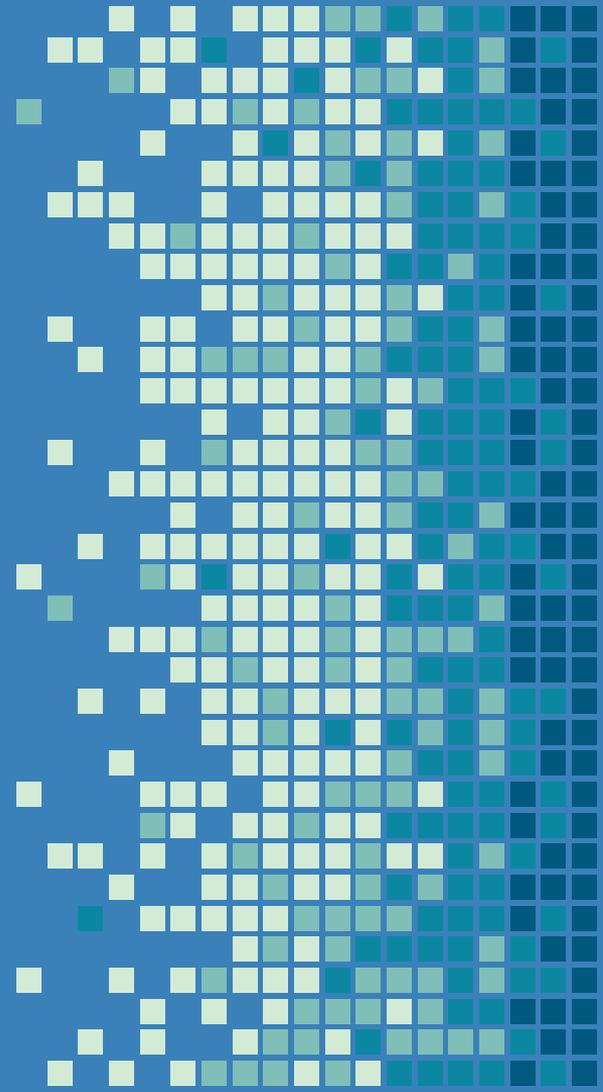
Complete this Google Form to make your own SMART Goals that utilize The 3 Principles

Assignment 1C:

[SMART Goals Google Form](#)

MODULE 2: RESPONSIBILITY STANDARDS

How can you ACT like an engineer?



MODULE 2 OVERVIEW

At Siemens Charlotte, the responsibility of implementing the 3 Principles falls on ALL EMPLOYEES 100% OF THE TIME. All employees, regardless of position or rank, are tasked with holding themselves and others, regardless of position or rank, accountable for responsible behavior. Feedback or correction are delivered without judgement and received without criticism. In this module, you will analyze the 5 Responsibility Standards and work as a team to relate them to the learning environment.

Objectives

- I will analyze each of the 5 Responsibility Standards and relate them to the learning environment.
- I will assume shared responsibility for collaborative work, and value the individual contributions made by each team member.
- I will synthesize and make connections between two or more pieces of information.

WHAT IS RESPONSIBILITY?

Responsibility is completing a task or duty without direct supervision.

- A responsibility is something assigned to you and only you.
- You are acting responsibly when you do something on your own.



Assignment 2A: What is something or someone you are responsible for? Do you enjoy this responsibility? Why or why not? Record it in your notes.

RESPONSIBILITY @SIEMENS

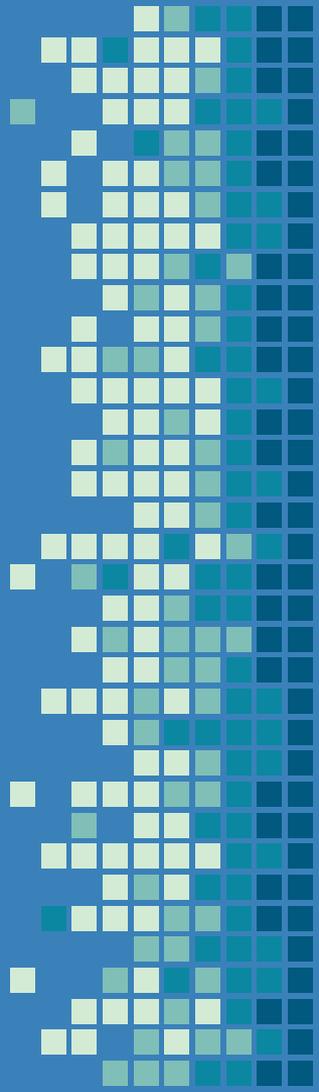
We ALL have a responsibility for ensuring:

- The Quality of our Product
- The Safety & Health of ourselves and each other
- The Protection of the Environment
- The Conservation of Resources
- The Need to Continually Improve

RESPONSIBILITY @SCHOOL

We ALL have a responsibility for ensuring:

- The Quality of our Work
- The Safety & Health of ourselves and each other
- The Protection of our School
- The Conservation of Resources
- The Need to Continually Improve



HOW CAN YOU ACT LIKE AN ENGINEER? – Part 1

Engineers meet with peers and leaders to evaluate their working environment because they value safety and productivity.

Teamwork Assignment 2B: [EVALUATION: Responsibility @My School](#)

Instructions:

- Choose a partner who is on the same step or ahead of you.
- Work together to complete the evaluation of your school on 1 Chromebook.
- Leave your answers open and don't submit! You'll need it for your next assignment!

HOW CAN YOU ACT LIKE AN ENGINEER? – Part 2

SPEAK UP! You have a voice!

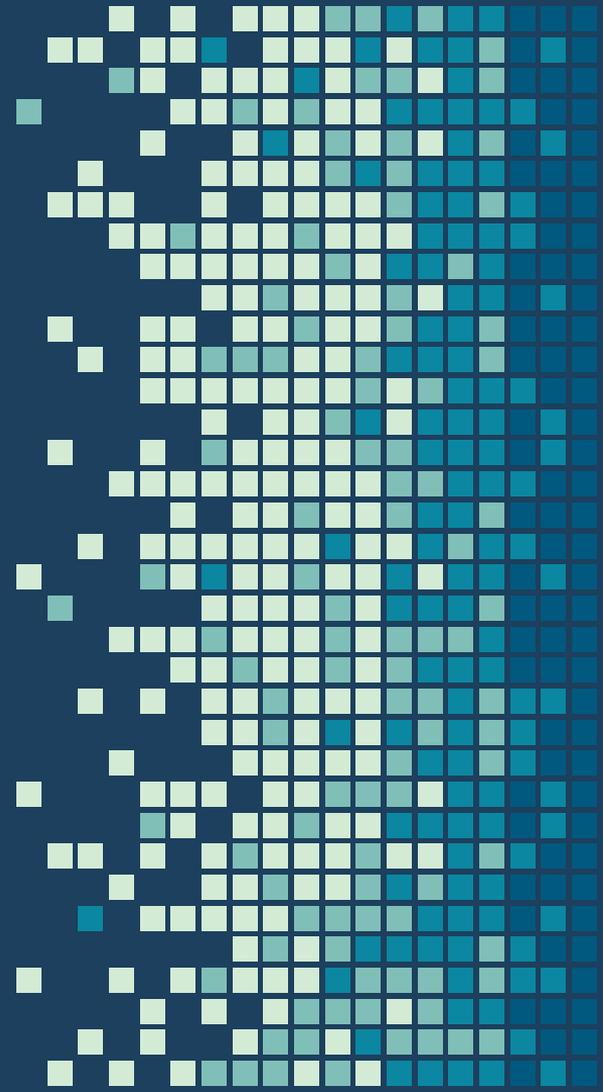
Teamwork Assignment 2C: Video Blog

Instructions:

- Review the rubric for creating a video blog. [Vlog Rubric](#)
- Using your Chromebook camera, record and submit a video where you and your partner discuss how your school is doing with responsibility standards.
 - You may use your evaluation answers.
 - You can take turns asking and answering questions.
 - You can create your video however works best for you.

MODULE 3: HUMAN PERFORMANCE

How can you GROW like an engineer?

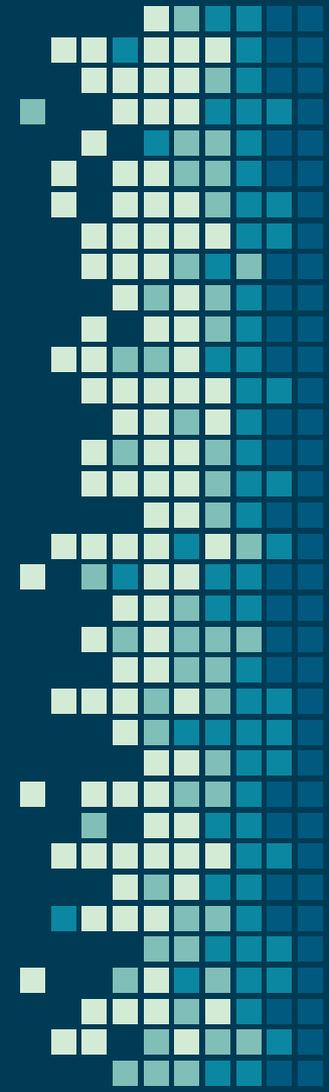


MODULE 3 OVERVIEW

No matter the culture of an environment, to err is human. Top engineering companies, like Siemens and Duke Energy, know this to be true and have implemented a process for preventing, and correcting, as many mistakes as possible. Both companies use the acronym STAR for this process. STAR stands for Stop – Think – Act – Review. In this module, you will reflect on your performance in previous school years and review how that performance compares to the goals you have set for the upcoming year.

Objectives

- I will utilize the STAR method to reflect on my performance in previous school years and review how that performance compares to the goals I have set for the upcoming year.
- I will identify and ask significant questions that clarify various points of view and lead to better solutions.
- I will use technology as a tool to organize and communicate information.



WHAT IS HUMAN PERFORMANCE?

In the business world, human performance means “the accomplishment of a task along agreed upon standards of accuracy, completeness, and efficiency.”

- Did you do it correctly?
- Did you do it completely?
- Did you do it efficiently?

Assignment 3A: Think of a piece of work, a project, or a test that you did well on. What was it? Now think of one you didn't do well on. What was it? What was the difference in how you performed and why weren't you successful at both? Record it in your notes.



COMMON ERROR PRECURSORS

What are some actions that happen before an error or accident occurs? Those are called precursors.

- Making Assumptions
- Mental Stress
- Distractions/Disruptions
- Attempting Too Many Tasks
- Being Overconfident
- Unclear Instructions
- Peer Pressure
- Time Pressure



ERROR PRECURSORS

Assignment 3B: Evaluate the Performance

[Evaluate the Precursors](#)

Instructions:

- Review the common error precursors on the previous slide.
- Watch each video closely and evaluate the scenarios for common precursors.



S.T.A.R. PERFORMANCE @SIEMENS

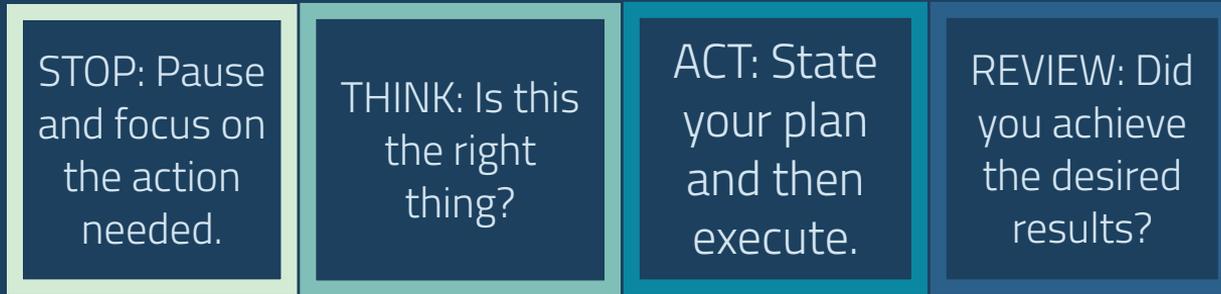
Humans are never error-free.

We make mistakes in work and in behavior.



S.T.A.R. PERFORMANCE

How have you performed in previous school years? Even the best students make mistakes in work and behavior. Pick a time that you made an error and follow the S.T.A.R. model to evaluate the situation. Think of how you would do this differently in the future.



Assignment 3C: My S.T.A.R. Performance [S.T.A.R. Reflection Worksheet](#)

Instructions:

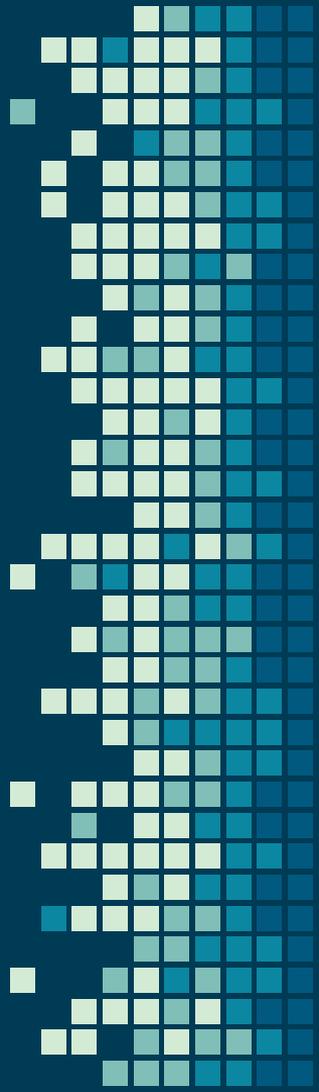
- Click the worksheet link.
- Select "Make A Copy"
- Answer each question honestly.

HOW CAN YOU GROW LIKE AN ENGINEER?

Assignment 3D: Evaluate My Performance

It's time to share how you've grown! Choose the product that works best for you.

1. VLOG: Create a video blog. Talk about the error you made and how you corrected it or how you will avoid it in the future. Use your goals and your reflection worksheet. Open the rubric to see the guidelines. [Individual Vlog Rubric](#)
 - OR -
2. COMIC: Create a cartoon. Use images to tell the story of your mistake and how you have grown because of it. Use your goals and your reflection worksheet. Open the rubric to see the guidelines. [Cartoon Rubric](#)
 - [Toony Tool Cartoon Maker](#)



MODULE 4: SAFETY

How can you STAY SAFE like an engineer?

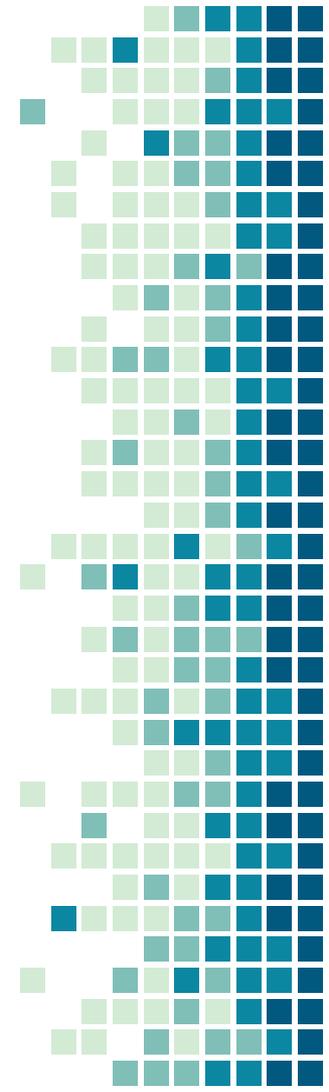


MODULE 4 OVERVIEW

Safety is an obvious priority in all working environments but particularly in schools. Siemens' philosophy is "safe behavior is governed not only by complying with laws, regulations and procedures, but also by the personal values and mindsets of managers and employees." In this module, you will understand how the safety guidelines in industry mirror those in the learning environment. You will also evaluate the need for safety guidelines and the importance of sticking to them.

Objectives

- I will understand how the safety guidelines in industry mirror those in the learning environment.
- I will evaluate the need for safety guidelines and the importance of adhering to them.
- I will articulate thoughts and ideas effectively using written communication.



What Is Safety?

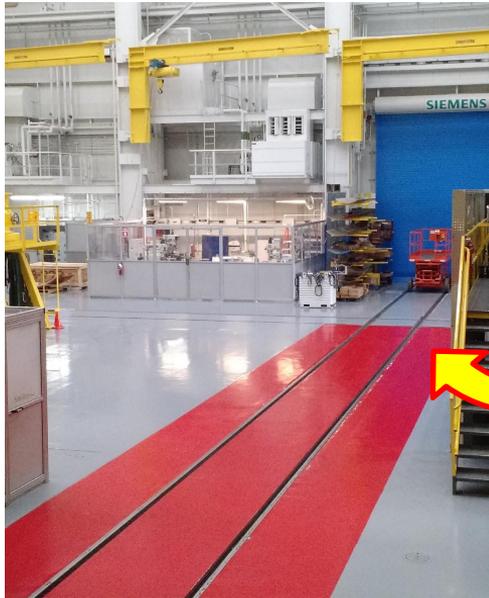


Safety means being free from hurt, injury, and loss. Check out these state and local sites about staying safe.

- [CMS Safety Department](#)
- [Charlotte Fire Safety](#)
- [Ready NC](#)

Safety Is Universal

SIEMENS



How are these alike?

SCHOOL



Safety Is Universal

SIEMENS



How are these alike?

SCHOOL



Safety Is Universal

SIEMENS



How are these alike?

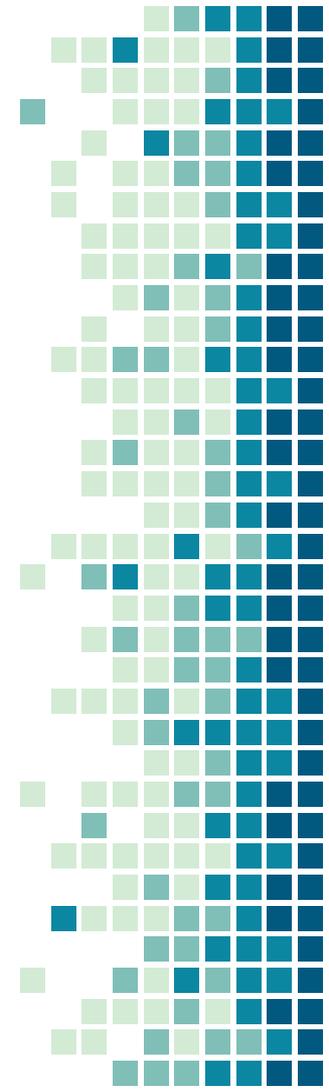
SCHOOL



THINK: How Is Safety Universal?

The previous slides show actual photos from Siemens Energy Hub in Charlotte. Engineers *STAY SAFE* by following the same expectations as students.

Assignment 4A: In your notes, draw a Venn diagram to compare and contrast safety in a STEM industry like Siemens to safety in a school. Then answer the following questions: 1) What do you think an engineer would do if they saw a co-worker being unsafe? 2) What would you do if you saw a peer being unsafe?



WHEN SHOULD YOU REPORT?

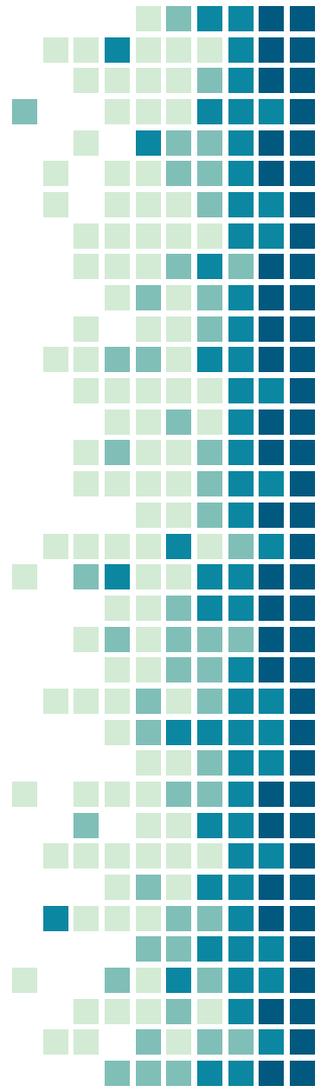
Nobody likes a tattle-tale, but when is it important enough to report the behavior? Safety is everyone's job – at school, at work, at home, and in public. It's not snitching or tattling if it involves safety.

SNITCHING/TATTLING	REPORT
Purpose is to get someone in trouble	Purpose is to prevent/stop dangerous situations
Looking for attention	Looking out for the safety of you and your peers
You can handle it.	You, or someone you know, is being bullied.

Assignment 4B: Snitching or Reporting?

- It is important to report safety concerns. Evaluate each situation and decide if it is snitching or reporting.

[Snitching or Reporting?](#)

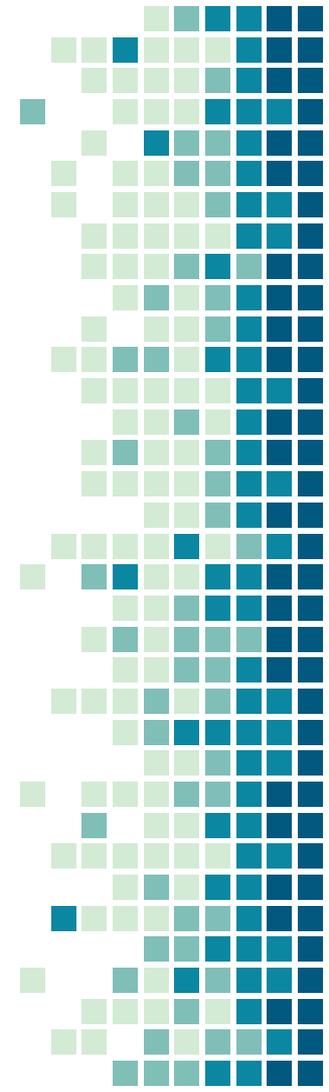


ALWAYS REPORT

- INJURIES
- DAMAGES TO THE PHYSICAL ENVIRONMENT
- DAMAGED ELECTRONICS
- SPILLS
- UNSAFE BEHAVIORS

PERSONAL RULES TO REMEMBER

- NO PERSONAL ELECTRONICS
- NO EATING OUTSIDE OF THE CAFETERIA
- ONLY DRINKS WITH A LID IN THE CLASSROOM



HOW CAN YOU STAY SAFE LIKE AN ENGINEER?

You are a valuable resource at our school! You have the power to view things and understand them as a student, a truly unique perspective. Your voice is important to all of us.

Assignment 4C: Safety Essay

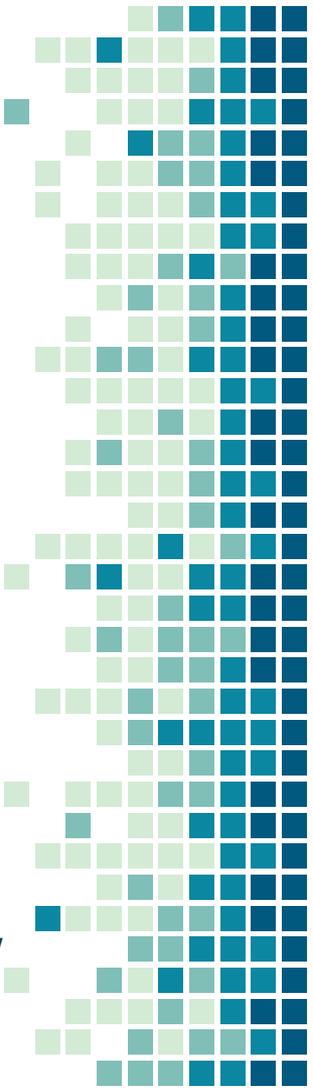
Instructions: Choose a writing prompt. Use the rubric to help you complete the work.

Choice 1:

What does safety look like for you? (Think: what makes you feel safe at home? What makes you feel safe at school? How are they different? The same? Which place makes you feel safest? Why?) [RUBRIC](#)

Choice 2:

At our school, we love student feedback. What are 3 specific ways in which we can improve student safety at our school? (Make sure you include details about what the improvement would be and why it would be important.) [RUBRIC](#)



FINAL CHECK...

Did you complete each assignment?

- 13 in total?
- Snap pics of your notes?
- Check all rubrics for completeness?