**Work Like an Engineer Kindergarten Unit Plan**

**Introduction:**

This course is designed to teach kindergarten students how to work purposefully, collaboratively, and creatively like engineers, by practicing the safety principles and school rules to ensure their safety at school and prepare them for real-world jobs. Through my internship at Siemens, I learned that educators can prepare students for the real world by incorporating activities that compel collaboration, teamwork, communication, critical thinking, problem solving, and responding to feedback.

**Curriculum Alignment:**

Social Studies Standard Course of Study:

**K.C&G.1.1** Exemplify positive relationships through fair play and friendship.

**K.C&G.1.2** Explain why citizens obey rules in the classroom, school, home and neighborhood. English Language Arts.

**SL.K.1.A.** Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion). English Language Arts.

**SL.K.6.** Speak audibly and express thoughts, feelings, and ideas clearly. English Language Arts.

**W.K.2** Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

**Objectives:** *(SWBAT: students will be able to)*

* Introduction: SWBAT Identify What an Engineer is & Why we Should Work Like an Engineer
* Module 1: SWBAT Identify the 3 Safety Principles **(may take more than 1 day)**
* Module 2: SWBAT Identify the Responsibilities of an Engineer
* Module 3: SWBAT Identify How to Grow Like an Engineer
* Module 4: SWBAT Identify Causes of Mistakes
* Module 5: SWBAT Identify How to Stay Safe Like an Engineer
* Module 6: SWBAT Identify 5 Reminders

**Time and Location:**

This is a seven-lesson unit, including the introduction. Each lesson will take about 30-45 minutes and should be taught during the social studies block, during the first quarter (nine weeks) of school. *Module 1 may take more than a day to complete.*

**Teacher Materials:**

Work Like an EngineerKindergartenPower Point, projector, whiteboard**,** Flip Grid platform, chart paper, markers, Speaking and Listening checklist, collaboration/teamwork checklist, and writing rubric.

**Student Materials:**

Access toFlip grid platform, Chromebook, choice board sheets, blocks, Play-Doh, paper, pencils, crayons, scissors, construction paper, and any arts-n-crafts materials for props, teacher computer for dance music, prompting activity cards for each learning station to give students ideas on what they can create.

**Safety:**

Ensure that all materials are easily accessible to all students in different stations around the classroom. You may want to limit the number of students at each station.

**Student Prior Knowledge:**

Students should understand the concept of safety, responsibility, and they should know the classroom rules. If using a Chromebook, students should know 1) how to turn on the Chromebook, 2) how to login to their Chromebooks, and 3) know their student numbers, which are necessary for the login process. Students should have had experience logging in to the Flip Grid platform, prior to this lesson.

**Teacher Preparation:**

Teacher should create a Flip Grid discussion board and save the link on each student’s digital device. The teacher will create a teacher account on Flipgrid.com, then create a sample video, modeling the procedure for saving their own Flip Grid.Flip Grid is a website that allows teachers to create a digital class discussion board. Teachers create a video, record their discussion questions, and students answer discussion questions in a 90-second video clip. This video serves as an exit ticket.

**Assessment:**

Students will work collaboratively with different peers in each module to complete one choice board activity. Partners are modeling what the social studies skills look like as they work, such as following class rules and modeling honesty, fairness, and consideration in their interactions with others. The teacher will measure if students apply the social studies grade level skills.

**Activities:** *(TW: Teacher will; SW: Students will)*

Lesson Format: “I do, We do, You do”

1. **Introduction: What is an engineer? Why should we work like an engineer?**

* TW state objective: By the end of this lesson you will be able to identify what an engineer is and why we should work like one
* TW ask, “What is an engineer? What do they do? How do they work?”
* SW turn & talk to discuss with a neighbor
* TW create a K-W-L chart based on student responses
* SW watch YouTube video: What is an engineer? (slide 3)
* TW summarizes what an engineer is
* TW assign partnerships as Partner 1 & Partner 2
* Partner 1 teaches Partner 2 about what an engineer is (slide 4). Partner 2 looks & listens to Partner 1
* TW walk around, listen, & use checklist to mark off correct usage of speaking and listening standards
* SW switch roles
* Partner 2 teaches Partner 1 what an engineer is. Partner 1 looks and listens to Partner 2 (slide 4)
* TW walk around, listen, & use checklist to mark off correct usage of speaking and listening standards
* SW listen to reasons why they should work like an engineer (slide 5)
* TW summarize why they should work like an engineer.
* Partner 1 will teach Partner 2 the reasons why they should work like an engineer, and Partner 2 will look and listen to Partner 1 (slide 6)
* TW coach as needed
* SW switch roles
* Partner 2 will teach Partner 1 the reasons why they should work like an engineer, and Partner 1 will look and listen to Partner 2 (slide 6)
* TW coach as needed
* SW summarize their learning
* TW address misconceptions
* TW document what students learned on the K-W-L chart
* TW provide 30 second commercial on tomorrow’s lesson

1. **Module 1: 3 Safety Principles**

* TW state objective: By the end of this lesson you will be able to identify the 3 safety principles of working like an engineer
* TW ask students, “What is a principle? Can you think of one principle we should follow? Why?”
* SW turn & talk share their thoughts
* TW document students’ wonderings on the K-W-L chart
* SW listen to the 3 safety principles (slide 7 & 8)
* TW summarize the 3 safety principles
* Partner 1 will teach Partner 2 the 3 safety principles and Partner 2 will look and listen to Partner 1 (slide 9)
* TW walk around, listen, & use checklist to mark off correct usage of speaking and listening standards
* SW switch roles
* Partner 2 will teach Partner 1 the 3 safety principles and Partner 1 will look and listen to Partner 2
* TW walk around, listen, & mark correct usage of speaking and listening standards
* SW watch the Quality video (slide 10)
* TW summarize the definition of quality
* Partner 1 teaches Partner 2 about quality (slide 11) and Partner 2 will look and listen to Partner 1 (slide 11)
* TW coach as needed
* SW switch roles
* Partner 2 will teach Partner 1 the definition of quality (slide 11) and Partner 1 will look and listen to Partner 2
* TW walk around, listen, and mark off correct usage of speaking and listening standards
* SW watch the Family video (slide 12)
* TW summarize the meaning of family
* Partner 1 will teach Partner 2 the meaning of family (slide 13), and Partner 2 will look and listen to Partner 1
* TW coach as needed
* SW switch roles
* Partner 2 will teach Partner 1 the meaning of family (slide 13) and Partner 1 will look and listen to Partner 2
* TW coach as needed
* SW watch the Safety video (slide 14)
* TW summarize the meaning of safety
* Partner 1 will teach Partner 2 the meaning of safety (slide 15) and Partner 2 will look and listen to Partner 1
* TW coach as needed
* SW switch roles
* Partner 2 will teach Partner 1 the meaning of safety (slide 15) and Partner 1 will look and listen to Partner 2
* TW discuss directions for choice boards: SW pick a partner and complete a choice board activity.
  + **Rules:**
    - Must work together to create 1 product from the choice board activity sheet, modeling how to follow the rules and demonstrating fairness, thoughtfulness, and consideration for their peers as they work together.
    - Students will complete a choice board activity for every module in this unit.
    - No more than 1 group at each station. If you have more than 18 students, add another choice activity to the board.
    - **Activity limit:** no more than two times per activity.
* TW set up learning stations
* SW pick a partner & complete a choice board activity (slide 16)
* TW walk around and use checklist to mark off correct usage of social studies standards as students work in partnerships
* SW clean up, return to the carpet, and summarize their learning
* TW address misconceptions
* TW document what student’s learned on K-W-L chart
* TW provide a 30-second commercial about tomorrow’s lesson

1. **Module 2: The Responsibilities of an Engineer**

* TW state objective: By the end of this lesson you will be able to identify the responsibilities of an engineer
* TW ask students, “What is a responsibility? What do you think are the responsibilities of an Engineer? Why?”
* TW give students examples of her own responsibilities at home & school
* SW turn & talk to share their thoughts with peers
* TW document their wonderings on the K-W-L chart
* SW listen to the responsibility standards (slides 17-19)
* TW summarize the responsibility standards
* Partner 1 will teach Partner 2 the responsibility standards, Partner 2 looks and listens to Partner 1 (slide 20)
* TW walk around, listen, & use checklist to mark off correct usage of speaking and listening standards
* SW switch roles
* Partner 2 teaches Partner 1 the responsibility standards, Partner 1 looks and listens to Partner 2 (slide 20)
* TW walk around, listen, & use checklist to mark off speaking and listening standards
* TW set up learning stations
* SW pick a new partner & complete a different choice board activity (slide 21)
* TW walk around and use checklist to mark off correct usage of social studies standards as students work in partnerships
* SW clean up, return to the carpet, and summarize their learning
* TW address misconceptions
* TW document student discoveries on K-W-L chart
* TW provide 30 second commercial about tomorrow’s lesson

1. **Module 3: How to Grow Like an Engineer**

* TW state objective: By the end of this lesson you will be able to identify how to grow like an engineer by understanding what S.T.A.R. means
* TW ask, “What do you think S.T.A.R. stands for? What ideas do you have? Example: K.I.S.S. means Keep It Simple, Stupid
* SW turn & talk share their thoughts
* TW document their wonderings on the K-W-L chart
* SW watch How to Grow Like an Engineer by applying S.T.A.R. (slide 23)
* TW summarize what S.T.A.R. means
* Partner 1 will teach Partner 2 How to Grow Like an Engineer by applying S.T.A.R. (slide 24) and Partner 2 will look and listen to Partner 1
* TW walk around, listen, & use checklist to mark off correct usage of speaking and listening standards
* SW switch
* Partner 2 will teach Partner 1 How to Grow Like an Engineer by applying S.T.A.R. and Partner 1 will look and listen to Partner 2
* TW walk around, listen, & use the checklist to mark off correct usage of speaking and listening standards
* TW set up learning stations
* SW pick a new partner & complete a different choice board activity (slide 25)
* TW walk around and use checklist to mark off correct usage of social studies standards as students work in partnerships
* SW clean up, return to the carpet, and summarize their learning
* TW address misconceptions
* TW document student discoveries on the K-W-L chart
* TW provide 30 second commercial for tomorrow’s lesson

1. **Module 4: Causes of Mistakes**

* TW state objective: By the end of this lesson you will be able to identify causes of mistakes
* TW ask students, “Why do you think mistakes happen? What types of things cause mistakes to happen?”
* SW turn & talk share their thoughts
* TW document their wonderings on the K-W-L chart
* SW listen & learn the causes of mistakes (slides 26- 27)
* TW summarize the causes of mistakes
* Partner 1 will teach Partner 2 about the causes of mistakes (slide 28). Partner 2 will look and listen to Partner 1
* TW walk around, listen, & use checklist to mark off correct usage of speaking and listening standards
* SW switch roles
* Partner 2 will teach Partner 1 about the causes of mistakes (slide 28) and Partner 1 will look and listen to Partner 2
* TW walk around, listen, & use checklist to mark off correct usage of speaking and listening standards
* TW set up learning stations
* SW pick a new partner, complete a different choice board activity (slide 29)
* TW walk around and use checklist to mark off correct usage of social studies standards as students work in partnerships
* SW clean up, return to the carpet, and summarize their learning
* TW address misconceptions
* TW document what students learned on the K-W-L chart
* TW provide a 30 commercial for tomorrow’s lesson

1. **Module 5: How to Stay Safe Like an Engineer**

* TW state objective: By the end of this lesson you will be able to identify How to Stay Safe Like an Engineer
* TW ask students, “How do engineers stay safe? What kinds of things do you think they do to prevent themselves from getting hurt? What kinds of things do you think they don’t do?”
* SW turn & talk share their thoughts
* TW document their wonderings on the K-W-L chart
* SW listen & learn about How to Stay Safe Like an Engineer (slides 30-31)
* TW summarize How to Stay Safe Like an Engineer.
* Partner 1 will teach Partner 2 about How to Stay Safe Like an Engineer (slide 32) and Partner 2 will look and listen to Partner 1
* TW walk around, listen, & use checklist to mark off correct usage of speaking and listening standards
* SW switch roles
* Partner 2 teaches Partner 1 about How to Stay Safe Like an Engineer (slide 32) and Partner 1 looks and listens to Partner 2
* TW walk around, listen, & use checklist to mark off correct usage of speaking and listening standards
* TW set up learning stations
* SW pick a new partner & complete a different choice activity (slide 33)
* TW walk around and use checklist to mark off correct usage of social studies standards as students work in partnerships
* SW clean up, return to the carpet, and summarize their learning
* TW address misconceptions
* TW document what students’ learned on K-W-L chart
* TW provide a 30 second commercial for tomorrow’s lesson

1. **Module 6: Reminders**

* TW state objective: By the end of this lesson you will be able to identify 5 things engineers should remember
* TW ask students, “What are some reminders engineers should remember? What advice do you have for them and everyone else?”
* SW turn & talk share their thoughts
* TW document their wonderings on the K-W-L chart
* SW listen & learn about things to remember (slides 34-35)
* TW summarize 5 reminders they should remember
* Partner 1 will teach Partner 2 about the 5 reminders (slide 36) and Partner 2 looks and listens to Partner 1
* TW walk around, listen, & use checklist to mark off correct usage of speaking and listening standards
* SW switch roles
* Partner 2 will teach Partner 1 about the 5 reminders (slide 36) and Partner 1 will look and listen to Partner 2
* TW walk around, listen, & use checklist to mark off correct usage of speaking and listening standards
* TW set up learning stations
* SW pick a new partner, complete a different choice board activity (slide 37)
* TW walk around and use checklist to mark off correct usage of social studies standards as students work in partnerships
* SW clean up, return to the carpet, and summarize their learning
* TW address misconceptions
* TW document what students’ learned on the K-W-L chart

1. **End of Unit Assessment:**

Students will watch Flip Grid videos created by their peers and reflect out loud about what they learned from their friends’ videos. After learning about engineers and how they stay safe, students will write a narrative about how they stay safe every day at school and at home. At the beginning of the year, kindergarteners will draw pictures and perhaps write random letters. Teachers will scribe for students, one-on-one. Questions for prompting: What are some things you do to stay safe? What are some things you don’t do in order to stay safe? What does safety look like?

**Choice Board Partner Activities**

**Timeline:**

Brainstorming: 2 minutes

Product Development: 5 minutes. If they don’t pick an idea, TW pick for them

Clean up: 2 minutes

**Partners:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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|  |  | play doh |
| Write 1or more sentence (s) with your partner. | flipgrid | act it out |
|  | puzzle | dance |

**North Carolina Social Studies Standard Course of Study**

**K.C&G.1.1** Exemplify positive relationships through fair play and friendship.

**K.C&G.1.2** Explain why citizens obey rules in the classroom, school, home and neighborhood.

**Collaboration/Teamwork Checklist**

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| **Student Name** | **Module 1 KCG1.1** | **Module 1**  **KCG1.2** | **Module 2**  **KCG1.1** | **Module 2**  **KCG1.2** | **Module 3**  **KCG1.1** | **Module 3**  **KCG1.2** | **Module 4**  **KCG1.1** | **Module 4**  **KCG1.2** | **Module 5**  **KCG1.1** | **Module 5**  **KCG1.2** | **Module 6**  **KCG1.1** | **Module 6**  **KCG1.2** |
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**Kindergarten Speaking & Listening Teach Checklist** (Use 1 for each module)

**English Language Arts**

**SL.K.1.A.** Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).

**SL.K.6.** Speak audibly and express thoughts, feelings, and ideas clearly. English Language Arts.

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| **Partners** | **Partner 1**  **I can speak loud and clear.** | **Partner 1**  **I can make eye contact.** | **Partner 1**  **I can answer questions.** | **Partner 2**  **I can listen quietly.** | **Partner 2**  **I can add to what my partner said** | **Partner 2**  **I can ask questions,** | **Both: We take turns and speak one at a time.** |
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**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Writing Rubric:**

**W.K.2** Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

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| **Not Yet** | **Starting To** | **Yes** |
| I cannot identify a specific and clear topic.  1 pt. | I can somewhat identify a topic.  2 pts. | I can identify a specific and clear topic.  3 pts. |
| I cannot identify any details about the topic.    1 pt. | I can identify 1-2 details about the topic.    2pts. | I can identify 3-4 details about the topic.  3pts. |

**Prompting Activity Cards:**

**Art**

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**Music**

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| **Row, Row, Row Your Boat** |  | **The Muffin Man** |

**Play Doh**

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| **Pizza** | **Hamburger** | **Cupcake** |

**Writing**

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| **Favorite Fruit** | **Favorite Flavor** | **Favorite Color** |

**Flip Grid**

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| **Favorite Book** | **Favorite Game** | **Favorite Movie** |

**Act It Out**

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**Blocks**

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**Create Your Own Puzzle**

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**Dance**

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| Get the wiggles out with How Long and other free activities on GoNoodle, the most engaging and energizing teacher resource online. GoNoodle.com | Get the wiggles out with Fight Song and other free activities on GoNoodle, the most engaging and energizing teacher resource online. GoNoodle.com | **Get the wiggles out with Best Day Of My Life and other free activities on GoNoodle, the most engaging and energizing teacher resource online. GoNoodle.com** |

**Critical Vocabulary:**

* Engineer: people who create things that solve problems
* Principles: rules
* Quality: how good or bad something is; our focus is doing our best
* Responsibilities: jobs
* Standards: rules
* Mistakes: something you didn’t mean to do
* Stressed: feeling worried and uncomfortable
* Overconfident: too much confidence; a belief you can do something too well
* Distractions/disruptions: prevents you from concentrating on task
* Reminders: things you should not forget
* Specific: clear
* Consistent: all the time
* Consideration: thoughtful
* Honesty: tell the truth
* Fair: equal, just

**Author Information:**

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**Mentor:** Dawn Braswell. Dawn Braswell is the Head of Siemens Apprenticeship for North America. She is responsible for providing guidance to the current apprenticeship programs in the US and Canada, in addition to providing professional development to all of the employees at Siemens Charlotte. Her position is split (50/50) between Siemens Charlotte and Siemens Corporate in Orlando, Florida. She has partnerships with the Charlotte Chamber of Commerce, Central Piedmont Community College, and other community groups on behalf of Siemens.

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