Southern Lehigh School District

UbD Curriculum Template

Course: **4th Grade STEM** Unit: **Robotics and Coding** Grades: **4**

Teacher Team: **Bennett** Date: **June, 2016**

Stage 1 – Desired Results

Established Goals

1. What 21st Century Essentials included in the mission statement will this unit address?
   Effective Communication Skills
   Problem-solving
   Career Planning and Life-Long Learning
   Adaptation and flexibility

2. What content standards will this unit address?

Please access the appropriate standards and copy/paste in the gray region

- ELA PA Core State Standards

  CC.1.2.4.A: Determine the main idea of a text and explain how it is supported by key details; summarize the text.
  CC.1.2.4.F: Determine the meaning of words and phrases as they are used in grade level text, including figurative language.
  CC.3.5.6-8.B: Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

Enduring Understandings/Transfer

Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.

3. List the Enduring Understanding(s):
   * *Robotics technology enhances design, construction, industry, and manufacturing.*
   * *Debugging is a methodical process of finding and reducing the number of defects in coding.*
   * *Communication and collaboration are essential to efficient and effective problem solving.*

4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer?
   * *Students will understand how robots are used in different fields.*
   * *Students will understand how to use program software to write code.*
   * *Students will interact and communicate appropriately and effectively.*

Essential Questions

What thought-provoking questions will foster inquiry, meaning-making, and transfer?

5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit:
   * *What does it look like to work as a team to solve a problem?*
   * *What is robotics and how can it have positive or negative impacts on our world?*
   * *What is STEM and what are some jobs related to each area of STEM?*

Acquisition

Students will know...

6. What facts should students know and be able to use to gain further knowledge?
   Students will know how to code a robot that combines actions to continuously move the robot to

Students will be skilled at... (be able to do)

9. What discrete skill and processes should students be able to demonstrate?

   EO4.B-K.1.1.1 - Refer to details and examples in a

- Math PA Core State Standards
  CC.2.4.4.A.1
  Solve problems involving measurement and conversions from a larger unit to a smaller unit.

- PA Content Standards

  3.4.4.A1 Understand that tools, materials, and skills are used to make things and carry out tasks.
  3.4.4.A3: Describe how various relationships exist between technology and other fields.
  3.4.4.B1: Describe how technology affects humans in various ways.
  3.4.4.B3: Explain why new technologies are developed and old ones are improved in terms of needs and wants.
  3.4.4.B4: Describe how the history of civilization is linked closely to technological development.
  3.4.4.C3: Explain how asking questions and making observations help a person understand how things work and can be repaired.
  3.4.4.D2: Recognize and use everyday symbols (e.g. icons, simple electrical symbols measurement) to communicate key ideas. Identify and use simple hand tools (e.g., hammer, scale) correctly and safely.

  Careers:
  13.1.3.D: Identify the range of jobs available in the community.
  13.1.3.G: Explain why education and training plans are important to careers.

complete a series of assignments.
Students will learn the proper handling (lift with two hands and keep on the floor at all times) of robots to prevent breakage and loss of parts.
Students will know how robots are being used in everyday situations.
Students will know that robots can be programmed to do bad things.
Students will know that STEM stands for Science , Technology, Engineering and Math.

7. What vocabulary should students know and be able to recall?
   Computer Science, Coding, Algorithm, Input, Output, Operator, Procedure, Variable, Debugging, Sensors, Control System, Pre-Programmed, Motor, Central Processing Unit (CPU), Space, Exploration, National Aeronautics and Space Administration (NASA), Impacts, Seconds, Degrees, Rotations, Icon, Gears, Display, Movement

8. What basic concepts should students know and be able to recall and apply?
   Basic Robot Movements: Forward, Backward, Right Turn, Left Turn
   Understanding the Robotics Program on the computer
   Understanding that STEM stands for Science, Technology, Engineering, and Math.
   Understand how robots can be used in different fields.

text when explaining what the text says explicitly and when drawing inferences from the text.
E04.B-K.1.1.2 Determine the main idea of a text and explain how it is supported by key details; summarize the text.
E04.B-K.1.1.3 Explain events, procedures, ideas, steps, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.
E04.B-V.4.1.1 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase. b. Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., telegraph, photograph, autograph). c. Determine the meaning of general academic and domain-specific words or phrases used in a text.
E04.C.1.2.1 Introduce a topic for the intended audience and group related information in paragraphs and/or sections to support the writer's purpose.
E04.D.1.1.6 Produce complete sentences, recognizing and correcting inappropriate fragments and run-on sentences.
E04.D.1.2.1 Use correct capitalization.
E04.E.1.1.1 Introduce text(s) for the intended audience state an opinion and/or topic, establish a situation, and create an organizational structure in which related ideas are logically grouped to support the writer's purpose.
E04.E.1.1.2 Develop the analysis using a variety of evidence from text(s) to support claims, opinions, ideas, and inferences.

M04.D-M.1.1.1 Know relative sizes of measurement units within one system of units including standard

		units (in., ft, yd, mi; oz., lb; and c, pt, qt, gal), metric units (cm, m, km; g, kg; and mL, L), and time (sec, min, hr, day, wk, mo, and yr). Within a single system of measurement, express measurements in a larger unit in terms ofa smaller unit. A table of equivalencies will be provided. Example 1: Know that 1 kg is 1,000 times as heavy as 1 g. Example 2: Express the length of a 4-foot snake as 48 in. *M04.D-M.1.1.2 Use the four operations to solve word problems involving distances, intervals of time (such as elapsed time), liquid volumes, masses of objects; money, including problems involving simple fractions or decimals; and problems that require expressing measurements given in a larger unit in terms of a smaller unit.* *S4.A.1.1.2 Identify and describe examples of common technological changes past to present in the community (e.g., energy production, transportation, communications, agriculture, packaging materials) that have either positive or negative impacts on society or the environment.* *S4.A.1.3.2 Describe relative size, distance, or motion.* *S4.A.2.1.4 State a conclusion that is consistent with the information/data.* *S4.A.2.2.1 Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length - ruler, mass - balance scale, volume - beaker, temperature - thermometer; making observations: hand lens, binoculars, telescope).* *S4.A.3.1.1 Categorize systems as either natural or human-made (e.g., ballpoint pens, simple electrical circuits, plant anatomy, water cycle).* *Students will use concrete objects to demonstrate an understanding of measurement quantities (e.g., length, weight, temperature).*

		Students will be skilled at learning to determine what programming block to use in the computer program to make a robot move forward, backward, left, and right. *Students will be skilled at coding a robot to combine movements to continuously move to complete a series of assignments.* *Students will be skilled at troubleshooting to solve any problems they encounter.* *Students will be skilled at safe handling of robotic equipment.* *Students will be skilled at pulling current events from an article to provide evidence on how robots are being used today.*

Stage 2 – Evidence	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Communication and Collaboration* *Critical Thinking* *Technology Operations*	*Examples include but are not limited to:* *Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *Read and respond to a current events article about Robots. (Transfer: Robots are used in everyday life, not only for programming)* *Complete activities that teach the robots to move forward, backward, turn left, turn right, and combine movements together.(Transfer: Students will use these movements in higher grades and will be combining them together to make more complex programs.)* *Complete an activity that allows students to explore what the robot can do, on their own terms. (Transfer: Robots have many functions that are learned easily by trial and error.)* *Read and respond to a current events article about Careers in Robotics. (Transfer: Students will understand how robots are used in different fields.)*
	OTHER SUMMATIVE ASSESSMENTS—can include factual recall
	Examples include but are not limited to final projects, research papers, quizzes and tests. List the assessments: *Completing a "foldable" on the current events article about robots.*

	Six assignments to move the robots that are graded based upon completion of the code, written code on a worksheet, and teamwork.

<table>
<tr><th colspan="4">Stage 3 – Learning Plan</th></tr>
<tr><th>NETS for Students</th><th colspan="2">Learning Activities</th><th>Progress Monitoring/Formative Assessment</th></tr>
<tr><td rowspan="2">NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world.

Communication and Collaboration
Critical Thinking
Technology Operations</td><td colspan="2">Questions to consider while planning:
• Are transfer and acquisition addressed in the learning plan?
• Does the learning plan reflect principles of learning and best practices?
• Is there tight alignment with Stages 1 and 2?
• Is the plan likely to be engaging and effective for all students?</td><td>• How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?
Observation
Discussion
Review of robots code
• What are potential rough spots and student misunderstandings?
Confusion of the difference between seconds and rotations in the robot's code.
What to do if the robot stops working.

• How will students get the feedback they need?
After each activity I check each groups robot to make sure it is moving correctly, before they can proceed to the next activity.</td></tr>
<tr><td>List planned activities
(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games):

Read a current events article abouts robots.
Read current events articles about potential jobs in robotics.
Fill in a STEM foldable that has students fill in: vocabulary, STEM topics covered, explanation of STEM</td><td>List resources required
(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction text, lab equipment, maps, translator, calculators)
Programmable robot
Programmable robot software
Computers
Newsela
Current events article on robots
STEM foldable</td><td>FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.

Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb

Check-in after each assignment.</td></tr>
</table>

	topics covered, article highlights, drawing a picture about something they read, any questions that they have. Learn how to use the Robot program Work with a partner to complete the coding/programming activity		

Southern Lehigh School District

UbD Curriculum Template

Course: **4th Grade STEM** Unit: **Animation** Grades: **4**

Teacher Team: **Bennett** Date: **June, 2016**

Stage 1 – Desired Results

Established Goals

1. What 21st Century Essentials included in the mission statement will this unit address?
   Problem-solving
   Adaptation and flexibility
   Career Planning and Life-Long Learning

2. What content standards will this unit address?

   - ELA PA Core State Standards
     CC.1.2.4.C
     Explain events, procedures, ideas, or concepts in a text, including what happened and why, based on specific information in the text.

   - Math PA Core State Standards
     CC.2.4.4.A.1
     Solve problems involving measurement and conversions from a larger unit to a smaller unit.
   - PA Content Standards
     3.4.4.A1
     Understand that tools, materials, and skills are used to make things and carry out tasks.

Enduring Understandings/Transfer

Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.

3. List the Enduring Understanding(s):
   ** students move toward adulthood, they will likely find that play will continue to have a place in their life for entertainment, learning and practicing skills.*
   ** There are different game genres and career opportunities in the growing field of animation.*
   Animation technology has benefits and drawbacks.
   ** A well-planned and designed program is easier to code, demonstrates fewer bugs, and require less maintenance in the future.*

4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer?
   ** Students will know some applications of Scratch (or newer programs) and understand how it can be used in the real world.*
   ** Students will understand the impact that animation software has had on our lives in the 21st century.*
   ** Students will know that the animation field has grown significantly and know the career options available.*

Essential Questions

What thought-provoking questions will foster inquiry, meaning making, and transfer?

5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit:
   ** How can programming software be used to code different animation?*
   ** How do the different phases of game development differ?*
   ** How can Animation help students become better prepared for careers in the game industry?*
   ** What are some the Scratch's (or other) unique game applications?*

3.4.4.A2 *Understand that systems have parts and components that work together.* *3.4.4.A3* *Describe how various relationships exist between technology and other fields.* *3.4.4.B3* *Explain why new technologies are developed and old ones are improved in terms of needs and wants.* *3.4.4.C3* *Explain how asking questions and making observations help a person understand how things work and can be repaired.* *Careers:* *13.1.3.D* *Identify the range of jobs available in the community.* *13.1.3.G* *Explain why education and training plans are important to careers.* *13.1.3.H* *Explain how workers in their careers use what is learned in the classroom.* *13.1.5.C* *Relate the impact of change to both traditional and nontraditional careers.*	**Acquisition**	
	Students will know...	**Students will be skilled at... (be able to do)**
	6. What facts should students know and be able to use to gain further knowledge? *Students will know how to use Scratch to code sprites to become animated.* *Discuss and understand three motivational factors and games that are examples of these factors.* 7. What vocabulary should students know and be able to recall? *Code Block, Costumes, Integrated Development Environment, Logical Error, Looks Blocks, Motion Blocks, Nest, Paint Editor, Project, Rotation Center, Script, Sound Blocks, Sprite, Stack Blocks, Stacks, Stage, Troubleshooting* 8. What basic concepts should students know and be able to recall and apply? *Getting Familiar with Menu Bar Commands.* *Working with Blocks and Stacks.* *Working with Motion and Code Blocks.* *Coding the Scratch Software to Play Sound Effects.* *Changing Sprite Costumes and Backgrounds.* *Using wait blocks to time animation correctly.*	9. What discrete skill and processes should students be able to demonstrate? *E04.B-K.1.1.3 Explain events, procedures, ideas, steps, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.* *S4.A.2.2.1 Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length - ruler, mass - balance scale, volume - beaker, temperature - thermometer; making observations: hand lens, binoculars, telescope).* *S4.A.1.1.2 Identify and describe examples of common technological changes past to present in the community (e.g., energy production, transportation, communications, agriculture, packaging materials) that have either positive or negative impacts on society or the environment.* *S4.A.2.1.1 Generate questions about objects, organisms, or events that can be answered through scientific investigations.* *Students will be skilled at working with the menu and toolbar buttons.* *Students will be skilled at adding, removing, and modifying the sprites that make up the Scratch application.* *Students will be skilled at coding the sprites to control their placements on the program stage.* *Students will be skilled at editing and modifying scripts, costumes, and sounds.*

		Students will be skilled at creating new sprites using Scratch's built-in Paint editor. *Students will be skilled at troubleshooting to solve any problems they encounter.*

Stage 2 – Evidence	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Communication and Collaboration* *Creative and Innovation* *Technology Operations*	*Examples include but are not limited to:* *Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *Running Scratch Applications on Stage, Working with the Sprite List, Generating New Sprites, Working with the Toolbar and Options Area, Working with Button Controls, Working with Stack and Hat Blocks, Changing Costumes (Transfer: Students will use these skills to create a video game in other grades.)* *Creating a New Scratch Project (Students need to know this skill to start the project in this grade and other grades)* *Saving and Executing Student New Application (Students need to know this skill to start the project in this grade and other grades)* *Video Game Designer Research (search the job, salary, the demand and schooling required for this job. Transfer: (Students will know that the animation field has grown significantly and know the career options available.)*
	OTHER SUMMATIVE ASSESSMENTS—can include factual recall
	Examples include but are not limited to final projects, research papers, quizzes and tests. List the assessments: *Create a simple comic strip on a topic of their choosing, including movement, conversation, and a background.* *Code the comic on Scratch and present to the class.*

Stage 3 – Learning Plan		
NETS for Students	**Learning Activities**	**Progress Monitoring/Formative Assessment**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world.	Questions to consider while planning: • Are transfer and acquisition addressed in the learning plan? • Does the learning plan reflect principles of learning and best practices? • Is there tight alignment with Stages 1 and 2? • Is the plan likely to be engaging and effective for all	• **How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?** Observation Discussion Review of codes in class • **What are potential rough spots and student**

<table>
<tr><td rowspan="2">Communication and Collaboration
Critical Thinking
Technology Operations</td><td colspan="2">students?</td><td>misunderstandings?
Confusion on how to add wait times to make it look like the Sprites are actually having a conversation.
How to fix codes that aren't working the way they would like them to.
• How will students get the feedback they need?
Students work independently with a check list to ensure they have all the necessary parts of the projects.
I go over the check list with each student to make sure they have everything they need and understand.</td></tr>
<tr><td>List planned activities
(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games):

Running Scratch Applications on Stage, Working with the Sprite List, Generating New Sprites, Working with the Toolbar and Options Area, Working with Button Controls, Working with Stack and Hat Blocks, Changing Costumes, Creating a New Scratch Project, Saving and Executing Student New Application, Scratch Tutorial, Comic Strip Worksheet, Scratch Coding Checklist, Scratch Coding Rubric
Video Game Designer
Research Worksheet</td><td>List resources required
(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction text, lab equipment, maps, translator, calculators)
Scratch Tutorial
Comic Strip Worksheet
Scratch Coding Checklist
Scratch Coding Rubric
Computer
Scratch Program</td><td>FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.

Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb

Scratch tutorial (pre assignment)
Assignment checklist</td></tr>
</table>

Southern Lehigh School District

UbD Curriculum Template

Course: **4th Grade STEM** Unit: **Product Design** Grades: **4**

Teacher Team: **Bennett** Date: **June, 2016**

Stage 1 – Desired Results	
Established Goals	**Enduring Understandings/Transfer**
1. What 21st Century Essentials included in the mission statement will this unit address? *Effective Communication Skills* *Problem-solving* *Adaptation and flexibility* 2. What content standards will this unit address? • ELA PA Core State Standards CC.1.4.4.E Use precise language and domain-specific vocabulary to inform about or explain the topic. CC.1.4.4.V Conduct short research projects that build knowledge through investigation of different aspects of a topic. CC.1.4.4.W Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. CC.1.4.4.X Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a	**Written as a declarative statement, an enduring understanding is a "big idea" that focuses on larger concepts, principles, and processes that go beyond discrete facts or skills. Enduring Understandings are applicable to new situations across content areas and TRANSFERABLE (the ability to learn in one context and apply to a new situation, particularly outside of the classroom) to the real world.** 3. List the Enduring Understanding(s): *No design is perfect and changes can always be made to improve a design.* *Engineering Design Process and the Technological Design Loop are how creative ideas are turned into inventions and innovations.* *Manufacturing encompasses many processes to complete a desired product.* *Manufactured products have advantages and disadvantages.* *Communication and collaboration are essential to efficient and effective problem solving.* 4. What do you want students to do with this knowledge or skill beyond this course? What is Transfer? ** Students will understand the steps of The Technological Design Loop in order to create a product.* ** Students will understand how to safely handle tools.* ** Students will understand how to use a ruler to take measurements.* **Essential Questions** **What thought-provoking questions will foster inquiry, meaning-making, and transfer?** 5. List the Essential Question(s) that students should ponder, wonder about or explain by the end of this unit: *What is The Technological Design Loop?* *How does The Technological Design Loop help design a product?* *What does it look like to work as a team to solve a problem?* *In the creative problem solving process, why is it important to acknowledge our successes, celebrate our failures and modify our ideas or products?*

	Acquisition	
single sitting or a day or two) for a range of discipline-specific tasks, purposes and audiences. • Math PA Core State Standards CC.2.4.4.A.1 Solve problems involving measurement and conversions from a larger unit to a smaller unit. • PA Content Standards *3.4.4.A1* *Understand that tools, materials, and skills are used to make things and carry out tasks.* *3.4.4.C1* *Understand that there is no perfect design.* *3.4.4.C2* *Describe the engineering design process: Define a problem. Generate ideas. Select a solution and test it. Make the item. Evaluate the item. Communicate the solution with others. Present the results* *3.4.4.C3* *Explain how asking questions and making observations help a person understand how things work and can be repaired.* *3.4.4.D1* *Investigate how things are made and how they can be improved.* *3.4.4.D2* *Recognize and use everyday symbols (e.g. icons, simple electrical symbols measurement) to communicate key ideas.* *Identify and use simple hand tools (e.g., hammer, scale) correctly and safely.* *3.4.4.E6*	**Students will know...** 6. What facts should students know and be able to use to gain further knowledge? *Students will know how to build a model of a product that they designed.* *Students will know how to use a straw rocket launcher to test their model.* 7. What vocabulary should students know and be able to recall? *Drag, Force, Friction, Gravity, Mass, Speed, Newton's First Law, Technological Design Process, Manufacturing, Fin, Nosecone* 8. What basic concepts should students know and be able to recall and apply? *Follow the steps of The Technological Design Loop to create a product.* *Safe handling of tools.* *Make predictions about a product's functionality.*	**Students will be skilled at... (be able to do)** 9. What discrete skill and processes should students be able to demonstrate? *E04.C.1.2.4 Use precise language and domain-specific vocabulary to inform about or explain the topic.* *S4.A.2.2.1 Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length - ruler, mass - balance scale, volume - beaker, temperature - thermometer; making observations: hand lens, binoculars, telescope).* *S4.A.2.1.2 Design and describe an investigation (a fair test) to test one variable.* *S4.A.2.1.4 State a conclusion that is consistent with the information/data.* *S4.A.1.3.2 Describe relative size, distance, or motion.* *Students will be skilled assembling their project to work in the desired way.* *Students will be skilled at troubleshooting to solve any problems they encounter.* *Students will be skilled at sketching a design of an idea for their product.* *Students will be skilled at measuring to the nearest 1/4"*

Identify key aspects of manufacturing processes (designing products, gathering resources and using tools to separate, form and combine materials in order to produce products). *Careers:* *13.1.5.B* *Describe the impact of personal interest and abilities on career choices.* *13.1.5.C* *Relate the impact of change to both traditional and nontraditional careers.* *13.3.3.B* *Identify how to cooperate at both home and school.*		

Stage 2 – Evidence	
NETS for Students	**PERFORMANCE TASK(S)—can include transfer tasks and Project-Based Learning**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Communication and Collaboration* *Critical Thinking* *Creative and Innovation*	*Examples include but are not limited to:* *Labs, open-ended essays, voice recordings, videos, presentations, discussion boards, graphic organizers, songs, skits, dioramas, visual projects (posters, dioramas)* List the task(s), then explain how the student will demonstrate the transfer of knowledge or skill involved in the task(s) (reference Stage 1, Item #4): *Work together to find the definitions of important key vocabulary they will be working with during the project.* *Go over the Technologcial Design Process and design packet explaining their design challenge.* *(Transfer: Students will follow the Technological Design Process to create other products in higher grades.)* *Complete the design challenge with a group to create a straw rockect to see what number of fins makes the rocket fly the farthest. (Transfer: Students will complete a challenge in higher grades that follow the same format, they will also be using*

Select *Select* *Select*	*measurement to help them build their other projects that will be used in 5th grade.)* *Explore the NASA jobs website and discuss potential jobs in the building and designing field.* *http://nasajobs.nasa.gov/work/employeesay.htm*
	OTHER SUMMATIVE ASSESSMENTS—can include factual recall
	Examples include but are not limited to final projects, research papers, quizzes and tests. List the assessments: *Complete the vocabulary search with a partner.* *Observation of groups collaborating to design and build a rocket.* *Completing a working model to successfully test with the class.* *Completion of the design challenge packet.*

Stage 3 – Learning Plan		
NETS for Students	**Learning Activities**	**Progress Monitoring/Formative Assessment**
NETS—National Educational Technology Standards; i.e., the standards for evaluating the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world. *Communication and Collaboration* *Critical Thinking* *Creative and Innovation* *Select* *Select* *Select*	Questions to consider while planning: • Are transfer and acquisition addressed in the learning plan? • Does the learning plan reflect principles of learning and best practices? • Is there tight alignment with Stages 1 and 2? • Is the plan likely to be engaging and effective for all students?	• **How will you monitor students' progress toward acquisition, meaning, and transfer during learning activities?** Observation Discussion Review of design challenge packets • **What are potential rough spots and student misunderstandings?** How to spread the fins out equally around the bottom. How to successfully attach the fins without wasting material. How can the straw rocket be fixed if it does not fly as expected. • **How will students get the feedback they need?** While the straw rockets are being built I observe the students to see how the rockets are going. We test the rockets as a class so we are all able to see what works and what doesn't work. I give them feedback in their design challenge packet.

	List planned activities *(examples include but are not limited to: experiments, guided reading, worksheets, discussions, note-taking, research, games)*:	**List resources required** *(examples include but are not limited to: laptops, iPads, websites, digital cameras, magazines, Blackboard, textbooks, novels, primary source documents, other non-fiction text, lab equipment, maps, translator, calculators)*	**FORMATIVE ASSESSMENTS—any non-graded, diagnostic assessment administered prior to or during a unit that reflects prior knowledge, skill levels, and potential misconceptions.** *Examples include but are not limited to: Pre-tests, clickers (CPS), mini whiteboards, entrance and exit tickets, CDTs, DIBELS, Aimsweb*
	Straw rocket models, Straw rocket design challenge, straw rocket vocabulary, straw rocket testing.	Straws, Paper, Scissors, Rulers, Model Magic, Masking Tape, Straw Rocket Launcher, Straw Rocket Vocabulary Sheet, Number of Fins Recording Sheet, Designing the Straw Rocket Worksheet, Number of Fins Analysis and Conclusion Worksheet, Computers	Observation of group work. Measuring the distance the rocket flies.