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CW Middle School

STEM 7

1. **Simple Machines and Engineering (25.00%)**

Learning Targets

1.1 **I can propose mechanical options to reduce the amount of force to complete the same amount of work.**

Learning Target	Descriptor	Definition
4	Proficient	I can propose mechanical options to reduce the amount of force to complete the same amount of work.
3	Developing	I can use the work formula to calculate work, force, or distance given a scenario.
2	Basic	I can use the work formula to calculate work given force and distance.
1	Minimal	I can define work, force, and distance.
0	No Evidence	No evidence shown.

1.2 **I can evaluate the mechanical advantage of simple machines in various scenarios.**

Learning Target	Descriptor	Definition
4	Proficient	I can evaluate the mechanical advantage of simple machines in various scenarios.
3	Developing	I can define and discuss the significance of mechanical advantage given a formula.
2	Basic	I can define mechanical advantage
1	Minimal	I can list the simple machines
0	No Evidence	No evidence shown.

1.3 **I can design a device using simple machines and the engineering process to solve a problem.**

Learning Target	Descriptor	Definition
4	Proficient	I can design a device using simple machines and the engineering process to solve a problem.
3	Developing	I can use the engineering process to write a solution to a problem involving simple machines.
2	Basic	I can draw a plan consisting of simple machines to solve a problem.
1	Minimal	I can list a simple machine that will solve a given problem.
0	No Evidence	No evidence shown.

1.4 **I can build working compound machines based on my knowledge of simple machines and calculate their mechanical advantage.**

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Learning Target	Descriptor	Definition
4	Proficient	I can build working compound machines based on my knowledge of simple machines and calculate their mechanical advantage.
3	Developing	I can build a working compound machine.
2	Basic	I can calculate mechanical advantage of the pieces of a compound machine.
1	Minimal	I can distinguish between a simple and compound machine.
0	No Evidence	No evidence shown.

1.5 I can engineer a working device using various simple and compound machines to solve a simple task using minimal effort to achieve maximum results.

Learning Target	Descriptor	Definition
4	Proficient	I can engineer a working device using various simple and compound machines to solve a simple task using minimal effort to achieve maximum results.
3	Developing	I can engineer a device that works after several official trials using various simple and compound machines to solve a simple task using minimal effort to achieve maximum results.
2	Basic	I can engineer a device using few simple machines and works with outside assistance.
1	Minimal	I can draw a plan using simple and compound machines to solve a task.
0	No Evidence	No evidence shown.

2. Scratch (25.00%)

Learning Targets

2.1 I can debug five basic programs and remix them to create working programs.

Learning Target	Descriptor	Definition
4	Proficient	I can debug five basic programs and remix them to create working programs.
3	Developing	I can create a program about me that is interactive, creates a sprite, and repeats.
2	Basic	I can create a working program using only 10 given blocks.
1	Minimal	I can add one of my own blocks to one of the Scratch tutorials.
0	No Evidence	No evidence shown.

2.2 I can debug five programs regarding sound, music, and aminations to make workable programs and document my solutions.

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Learning Target	Descriptor	Definition
4	Proficient	I can debug five programs regarding sound, music, and aminations to make workable programs and document my solutions.
3	Developing	I can create a program using sounds, music, and sprite costumes to make an interactive music video program.
2	Basic	I can create a program that moves sprites around and a program that uses a sprite's different costumes.
1	Minimal	I can use music and sound blocks to create a program that builds a musical band.
0	No Evidence	No evidence shown.

2.3 I can replicate a given starter game (pong, scrolling, or a maze) that keeps score.

Learning Target	Descriptor	Definition
4	Proficient	I can replicate a given starter game (pong, scrolling, or a maze) that keeps score.
3	Developing	I can create at least five mini programs in which sprites interact with each other or their environment.
2	Basic	I can create, define, and use my own block.
1	Minimal	I can describe a situation in which a programmer would need to create their own block.
0	No Evidence	No evidence shown.

2.4 I can create a functional, original game with multiple levels, score keeping, timer, specific blocks, multiple sprites, sounds, and can keep track of at least two players.

Learning Target	Descriptor	Definition
4	Proficient	I can create a functional, original game with multiple levels, score keeping, timer, specific blocks, multiple sprites, sounds, and can keep track of at least two players.
3	Developing	I can create a game with at least two different modes or levels in which the sprites interact with each other and their environments.
2	Basic	I can create a game that keeps score, uses animations and uses a list of given blocks.
1	Minimal	I can design an original menu screen for my game that has two different modes or levels.
0	No Evidence	No evidence shown.

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3. **Ping Pong Parachute (25.00%)**

Learning Targets

3.1 I can produce a written justification for each of my designs, using research.

Learning Target	Descriptor	Definition
4	Proficient	I can produce a written justification for each of my designs, using research.
3	Developing	I can use research to design and sketch nose cone and parachute designs.
2	Basic	I can use research to design and sketch at least three different bottle/fin designs for construction.
1	Minimal	I can list constraints for construction of my device.
0	No Evidence	No evidence shown.

3.2 I can build at least two ping pong parachutes that are able to successfully launch at a given pressure, without the use of water or other gases.

Learning Target	Descriptor	Definition
4	Proficient	I can build at least two ping pong parachutes that are able to successfully launch at a given pressure, without the use of water or other gases.
3	Developing	I can assemble all pieces to build a ping pong parachute that fits snugly on the launcher.
2	Basic	I can assemble a ping pong parachute that uses only tape to hold fins and nose cone.
1	Minimal	I can safely and properly use tools to cut materials in the proper dimensions per my sketches.
0	No Evidence	No evidence shown.

3.3 I can use my launch data to justify my choice for the final launch.

Learning Target	Descriptor	Definition
4	Proficient	I can use my launch data to justify my choice for the final launch.
3	Developing	I can graph launch data for each rocket and each of the five parameters with proper axis titles and units.
2	Basic	I can chart launch data for each rocket with at least five different parameters.
1	Minimal	I can chart launch data for each parachute at different pressures.
0	No Evidence	No evidence shown.

4. **SketchUp and Printing (25.00%)**

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4.1 I can create basic three dimensional shapes (stacked and windowed) using the push/pull, move, x-ray, rectangle, and circle tools in SketchUp.

Learning Target	Descriptor	Definition
4	Proficient	I can create basic three dimensional shapes (stacked and windowed) using the push/pull, move, x-ray, rectangle, and circle tools in SketchUp.
3	Developing	I can use the previous tools as well as the move tool to stack rectangles and cylinders.
2	Basic	I can use dimensions, push/pull, circle and rectangle tools to create a 3D rectangle and cylinder of proper dimensions.
1	Minimal	I can identify the push/pull, move, x-ray, rectangle, and circle tools in SketchUp.
0	No Evidence	No evidence shown.

4.2 I can use the divide, scale, and rotate tools to build columns for a Greek temple.

Learning Target	Descriptor	Definition
4	Proficient	I can use the divide, scale, and rotate tools to build columns for a Greek temple.
3	Developing	I can create irregular objects, such as vases, pyramids, and spires in SketchUp using the scale, divide, rotate, and arc tools.
2	Basic	I can use the scale tool to build a spire and a vase to specific dimensions.
1	Minimal	I can use the rotate, push/pull, and move tools to create a stack of pipes.
0	No Evidence	No evidence shown.

4.3 I can apply 3D design technique to replicate an item in 3D with proper scale dimensions.

Learning Target	Descriptor	Definition
4	Proficient	I can apply 3D design technique to replicate an item in 3D with proper scale dimensions.
3	Developing	I can create a 3D image of an observed object that represents most aspects of the original with mostly correct dimensions.
2	Basic	I can make a 3D design that does not represent all aspects of the original with some correct dimensions.
1	Minimal	I can make a sketch of the original object with scaled dimensions.
0	No Evidence	No evidence shown.

4.4 I can master the use of a 3D printer (including loading/unloading filament, leveling, and loading flash drive) to print a simple object.

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Learning Target	Descriptor	Definition
4	Proficient	I can master the use of a 3D printer (including loading/unloading filament, leveling, and loading flash drive) to print a simple object.
3	Developing	I can load and unload filament and level the build plate.
2	Basic	I can unload and load filament.
1	Minimal	I can turn on the printer and unload filament.
0	No Evidence	No evidence shown.

Submitted on 7/15/2022 by