

CW Middle School

STEM 8

1. Towers/Bridge/Boomilever (25.00%)

Learning Targets

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

Learning Target	Descriptor	Definition
4	Proficient	I can produce a written justification for each of my designs, using my research.
3	Developing	I can use research to design at least three different structure sketches, including balsa sizes.
2	Basic	I can use research to reduce weight and increase strength of my device.
1	Minimal	I can list constraints for construction of my device.
0	No Evidence	No evidence shown.

1.2 I can assemble at least three towers, bridges, or boomilever s that fits all build parameters, accommodates the load assembly, and changes at least one element

Learning Target	Descriptor	Definition
4	Proficient	I can assemble at least three towers, bridges, or boomilever s that fits all build parameters, accommodates the load assembly, and changes at least one element
3	Developing	I can choose an adhesive and justify my choice using research for each of my devices.
2	Basic	I can cut balsa wood to size and correct angles, using my sketch as a guide.
1	Minimal	I can use my sketches to assemble properly sized materials.
0	No Evidence	No evidence shown.

1.3 I can create a device with minimal mass and maximum strength, submitted with proper data logs, for final testing.

Learning Target	Descriptor	Definition
4	Proficient	I can create a device with minimal mass and maximum strength, submitted with proper data logs, for final testing.
3	Developing	I can use my data to justify my choice for a final design for testing.
2	Basic	I can create a correct graph of my data, using proper axis titles and units.
1	Minimal	I can chart data for each device, including device mass, adhesive used, and weight held.
0	No Evidence	No evidence shown.

2. Engineering Design/Printing (25.00%)

Learning Targets

 1 I can (with teacher assistance) create a design challenge containing scenario and constraints for my engineering project.

Edit page

Learning Target	Descriptor	Definition
4	Proficient	I can (with teacher assistance) create a design challenge containing scenario and constraints for my engineering project.
3	Developing	I can brainstorm various situations in which the engineering loop may be helpful.
2	Basic	I can describe the direction and cyclic nature of the engineering loop.
1	Minimal	I can list the steps of the engineering loop.
0	No Evidence	No evidence shown.

2.2 I can describe how my design is different enough from existing patented products.

Learning Target	Descriptor	Definition
4	Proficient	I can describe how my design is different enough from existing patented products.
3	Developing	I can research real products' patents related to my design.
2	Basic	I can describe possible products related to my design.
1	Minimal	I can define vocabulary associated with patents.
0	No Evidence	No evidence shown.

2.3 I can list three possible environmental issues related to my design challenge.

Learning Target	Descriptor	Definition
4	Proficient	I can list three possible environmental issues related to my design challenge.
3	Developing	I can list three possible safety issues related to my design challenge.
2	Basic	I can list three possible standards related to my design challenge.
1	Minimal	I can list reasons why standards and codes are important.
0	No Evidence	No evidence shown.

2.4 I can sketch a final design using real-life dimensions.

Learning Target	Descriptor	Definition
4	Proficient	I can sketch a final design using real-life dimensions.
3	Developing	I can use my design criteria to rough sketch my design.
2	Basic	I can create design criteria for my challenge (eg: safety, appearance, cost, ease of use, etc).
1	Minimal	I can use user interviews to rank consumer needs.



 Edit page

CW Middle School

STEM 8

Learning Target	Descriptor	Definition
0	No Evidence	No evidence shown.

2.5 I can construct a mostly working prototype of my design, based off of my sketch, consumer needs, and constraints.

Learning Target	Descriptor	Definition
4	Proficient	I can construct a mostly working prototype of my design, based off of my sketch, consumer needs, and constraints.
3	Developing	I can use at least one 3D printed piece to my design.
2	Basic	I can list all materials needed for my prototype.
1	Minimal	I can describe the benefits of creating a prototype.
0	No Evidence	No evidence shown.



CW Middle School

STEM 8

3. Elastic Launched Glider (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 at least two different sketches, including material choices.
2	Basic	I can use research to reduce weight and maximize time in the air (with both material choice and tilt).
1	Minimal	I can list constraints for construction of my glider.
0	No Evidence	No evidence shown.

3.2 I can create at least two gliders that fit all parameters and fits well within the launcher.

Learning Target	Descriptor	Definition
4	Proficient	I can create at least two gliders that fit all parameters and fits well within the launcher.
3	Developing	I can construct a glider that fits within the size parameters.
2	Basic	I can properly use tools to cut my pieces to size.
1	Minimal	I can use my sketches to compile a materials list.
0	No Evidence	No evidence shown.

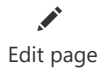
3.3 I can create an elastic launched glider, with proper data logs, that will stay in the air for the longest period of time.

Learning Target	Descriptor	Definition
4	Proficient	I can create an elastic launched glider, with proper data logs, that will stay in the air for the longest period of time.
3	Developing	I can use my data to justify my choice for a final design for testing.
2	Basic	I can create a correct graph of my data, using proper axis titles and units.
1	Minimal	I can chart flight data for each glider, including elevation and angle of launch.
0	No Evidence	No evidence shown.

4. Tinkercad Arduino (25.00%)

Learning Targets

4.1 I can configure pins by writing a code for a blinking LED.



CW Middle School

STEM 8

Learning Target	Descriptor	Definition
4	Proficient	I can configure pins by writing a code for a blinking LED.
3	Developing	I can describe the use for variables in code.
2	Basic	I can describe the function of digital pins.
1	Minimal	I can identify parts of the Arduino microcontroller.
0	No Evidence	No evidence shown.

4.2 I can build an external circuit, use digitalWrite to turn an LED on and off, and create a two LED circuit using loops.

Learning Target	Descriptor	Definition
4	Proficient	I can build an external circuit, use digitalWrite to turn an LED on and off, and create a two LED circuit using loops.
3	Developing	I can use digitalWrite to write a program which blinks an LED.
2	Basic	I can use a schematic to build an external circuit using an LED.
1	Minimal	I can identify power wires, ground wires, anodes, and cathodes in an external circuit.
0	No Evidence	No evidence shown.

4.3 I can use while loops to print to my computer screen and create a program that interacts with the user.

Learning Target	Descriptor	Definition
4	Proficient	I can use while loops to print to my computer screen and create a program that interacts with the user.
3	Developing	I can use strings, floats, and ints in Arduino using for loops.
2	Basic	I can write a program that turns on the serial port with the correct baud.
1	Minimal	I can define baud and describe its purpose.
0	No Evidence	No evidence shown.

4.4 I can read and draw circuit boards and apply Ohm's law to various situations and discuss the relationship among voltage, current, and resistance.

Learning Target	Descriptor	Definition
4	Proficient	I can read and draw circuit boards and apply Ohm's law to various situations and discuss the relationship among voltage, current, and resistance.
3	Developing	I can use Ohm's law to determine whether a light or sensor will tolerate a current.



 Edit page

CW Middle School

STEM 8

Learning Target	Descriptor	Definition
2	Basic	I can write analog voltages to the Arduino board.
1	Minimal	I can read a circuit board and label voltage, current, and resistor.
0	No Evidence	No evidence shown.

4.5 I can use a potentiometer with an Arduino board and read analog voltages to write a program for a dimmable LED.

Learning Target	Descriptor	Definition
4	Proficient	I can use a potentiometer with an Arduino board and read analog voltages to write a program for a dimmable LED.
3	Developing	I can describe how, in my program, analog read and analog write values are converted.
2	Basic	I can write a program which reads voltages from a potentiometer.
1	Minimal	I can follow a schematic to wire a potentiometer to an Arduino microcontroller.
0	No Evidence	No evidence shown.

Submitted on 7/15/2022 by