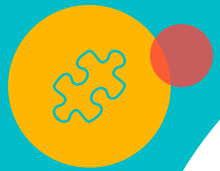

Deeper Learning Experiences
Designing Renewable Energy Solutions
&
Metric Measurement Classroom Transformation

Lisa Depew

Grade 5

Belmont Station Elementary



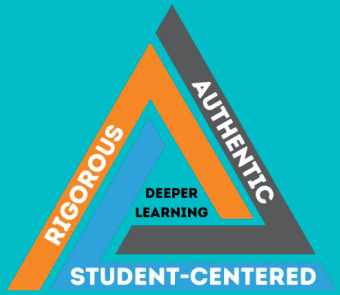
Experience #1
Renewable Energy Solutions

A Deeper Learning Experience
for
5th Graders

Applying Understanding of
Energy Sources and
Transformation
to Solve a
Real World Problem

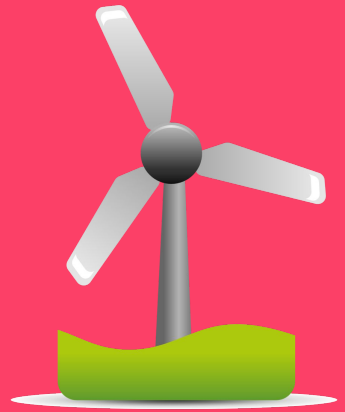
Experience #1 Goal

- Students will investigate and understand that energy can take many forms.
  - energy is the ability to do work or to cause change
  - there are many different forms of energy
  - energy can be transformed; and d) energy is conserved
- Students will work in teams to explore and develop solutions for using renewable energy sources in their community

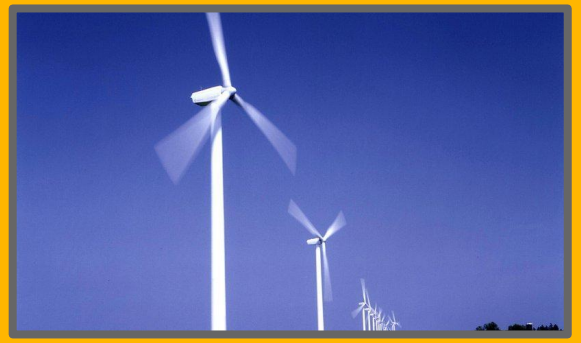


Day 1

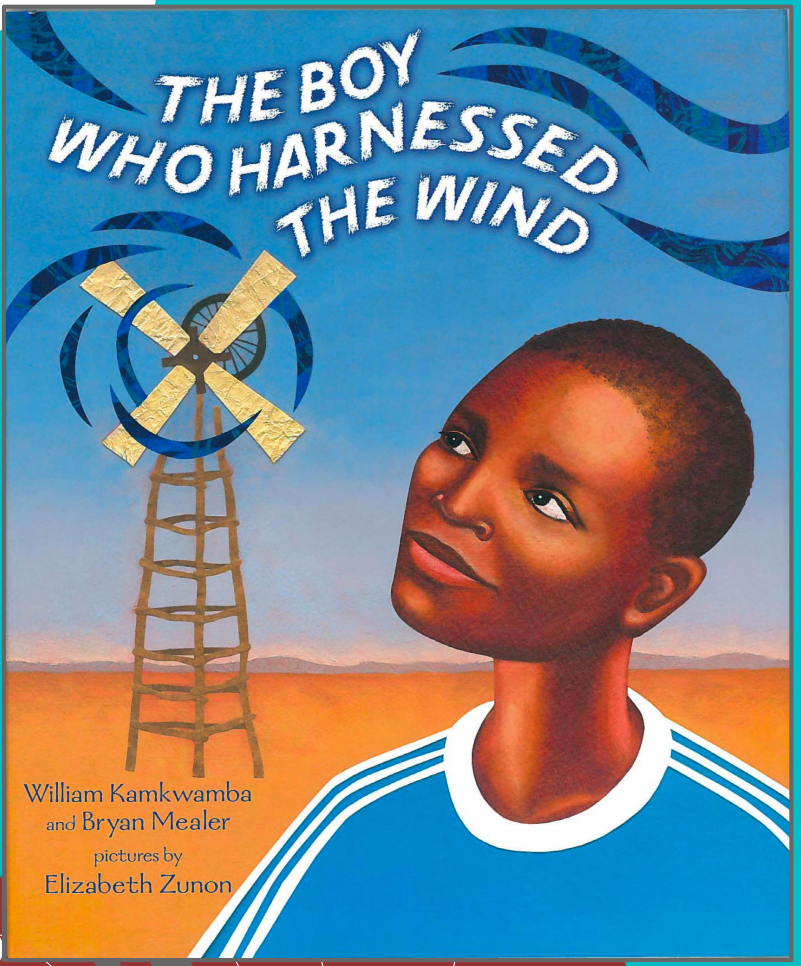
I can learn about alternative energy resources and explain the project.



See
Think
Wonder



The Boy Who Harnessed the Wind Read Aloud

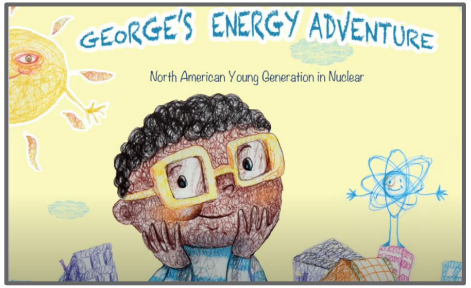


What type of energy source did William use?

How did William help his community?

Steps

1. Explore, Listen and Learn

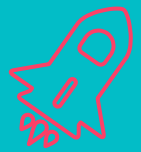


   a. Renewable vs. Nonrenewable Resources (Generation Genius)
   b. What Are Sources of Energy? | Energy Explained
2. Link to Slides- Review of Energy Sources

Other info

1. This is a 3 day project!

2. Your team will design a prototype that transforms one energy form to another form of usable energy.

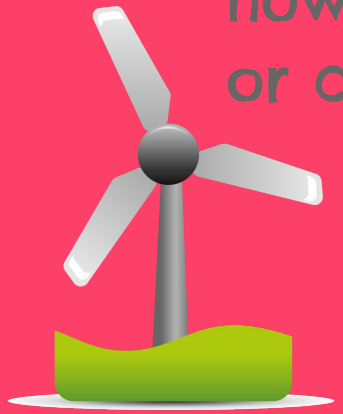


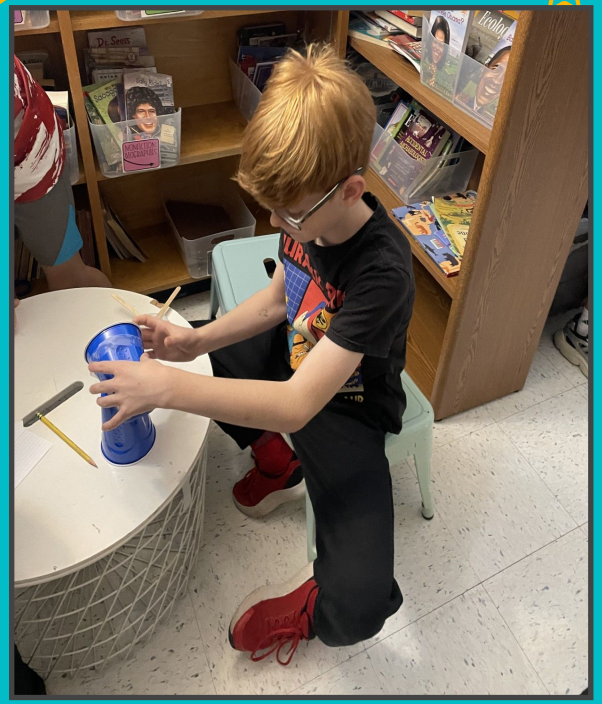
Rubric for Energy Solution Challenge

Planning Student used at least two forms of energy and described the specific details of each.	4	3	2	1
Sketch is detailed and forms of energy are labeled.	4	3	2	1
Prototype Drawing of the solution is colorful and includes details. The forms of energy are labeled.	4	3	2	1
Writing explains the features of the prototype using the forms of energy chosen on the planning page.	4	3	2	1
Writing includes appropriate punctuation, capitalization, and sentence structure.	4	3	2	1

Day 2

Students will rotate through 5 stations (Sample Stations) designed to empower them to research the energy forms and how they are used to transform or conserve energy. (WE DO)



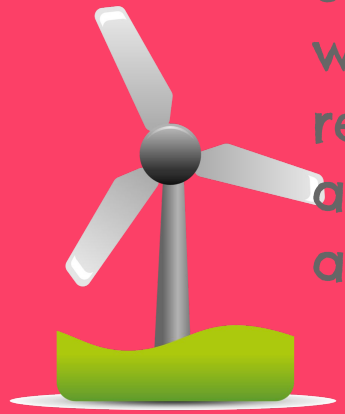


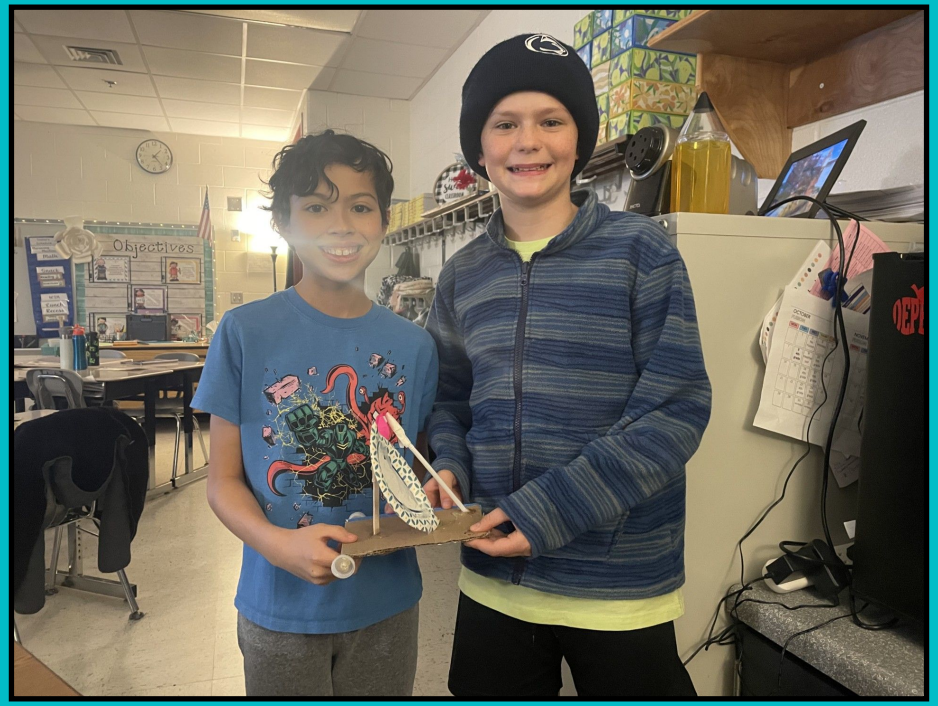
Rubric for Energy Solution Challenge

<u>Planning</u> Student used at least two forms of energy and described the specific details of each.	4	3	2	1
Sketch is detailed and forms of energy are labeled.	4	3	2	1
<u>Prototype</u> Drawing of the solution is colorful and includes details. The forms of energy are labeled.	4	3	2	1
Writing explains the features of the prototype using the forms of energy chosen on the planning page.	4	3	2	1
Writing includes appropriate punctuation, capitalization, and sentence structure.	4	3	2	1

Day 3

Students will work in teams, with specified roles for each member to design a prototype of a way one energy source (ie solar, hydroelectric, etc) can be used to create power within their community. This phase requires students to apply their learning and new understandings in a collaborative effort. (You Do)




Objectives

Rubric for Energy Solution Challenge

<u>Planning</u> Student used at least two forms of energy and described the specific details of each.	4	3	2	1
Sketch is detailed and forms of energy are labeled.	4	3	2	1
<u>Prototype</u> Drawing of the solution is colorful and includes details. The forms of energy are labeled.	4	3	2	1
Writing explains the features of the prototype using the forms of energy chosen on the planning page.	4	3	2	1
Writing includes appropriate punctuation, capitalization, and sentence structure.	4	3	2	1

Experience #2

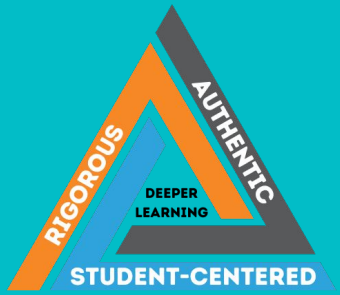
Classroom Transformation

A Culminating Experience
for
5th Graders

Applying Metric Measurement Skills

Experience #2 Goal

- Apply your understanding of the metric measurement system to a real-world scenario.
- Teams will create a classroom layout that maximizes efficiency and promotes student learning.



Day 1

I can explain the project and create a plan.

Thinking Routine

Think

See

Wonder

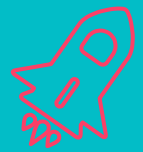
Steps

1. Figure out the measurements in the classroom of the ‘must keep’ items.
2. Decide how you want the room to be laid out.
3. With extra time you can shop for classroom materials within the budget.

Other info

1. This is a 3 day project!

2. The design that earns the most votes will be the room layout we try out for Q4.



Mandatory items

- ❑ 27 desks
- ❑ Teacher table(s)
- ❑ Promethean board
- ❑ Carpet
- ❑ Wardrobe
- ❑ Bookshelf
- ❑ Craft cart

Rubric for Metric Design Challenge

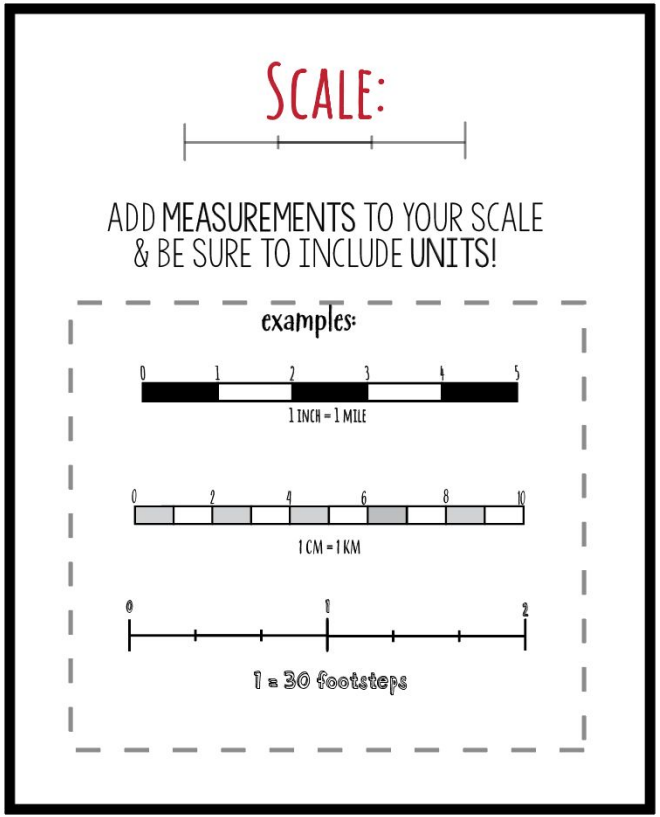
Design includes accurate measurements	4	3	2	1
Design promotes efficiency	4	3	2	1
Design fosters productive learning environment	4	3	2	1
Team demonstrated positive collaboration throughout project	4	3	2	1
Presentation included all team members and presenters made eye contact with their audience and spoke clearly.	4	3	2	1

Day 2

I can sketch my scale model. I can budget.

Experience #2 Goal

- Apply your understanding of the metric measurement system to a real-world scenario.
- Teams will create a classroom layout that maximizes efficiency and promotes student learning.



Example of basic scale model (it's basically like a key)


See
Scale
City
Greetings
from
Miniature Land
0:00
/ 5:36
1x
CC

Scale models are used in various fields to represent objects in a smaller, manageable size while maintaining accurate proportions.

Real world examples:

1. Architectural Models
   - Used by architects and designers to visualize buildings and structures before construction.

2. Model Railroads
   - Hobbyists create detailed miniature railroads, including trains, tracks, and landscapes.

3. Dollhouse Modes
   - Miniature representations of houses and furniture for collectors and hobbyists.
   -
4. Aircraft Models
   - Purpose: Used by aviation enthusiasts and manufacturers to represent airplanes.

Steps

Your design must include:

- A scale or key
  - Ex: 1 meter= 1 centimeter
- All mandatory items

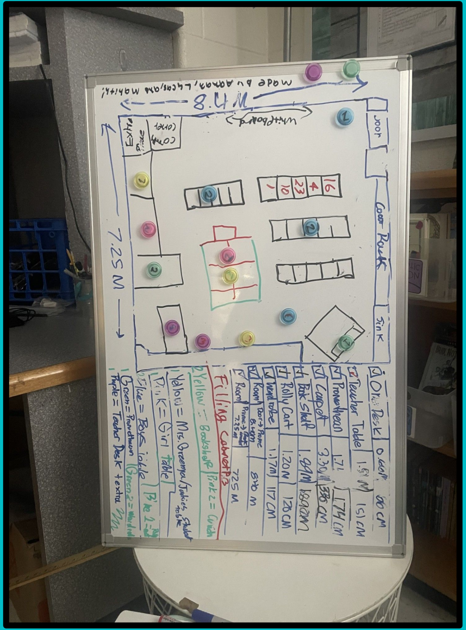
Resources to help during the process:

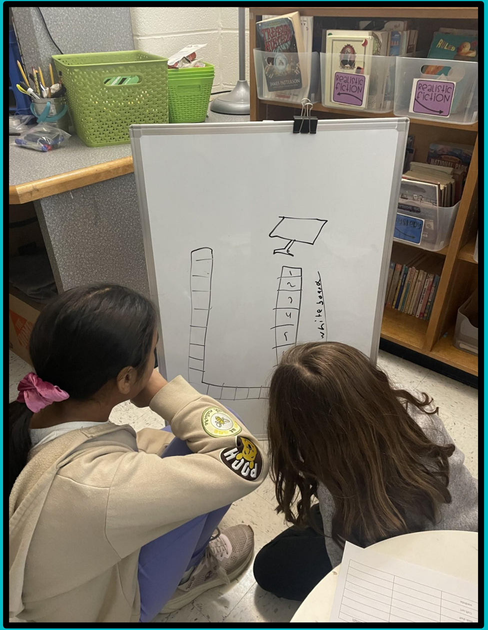
Digital Ruler Practice (The Ruler Game)

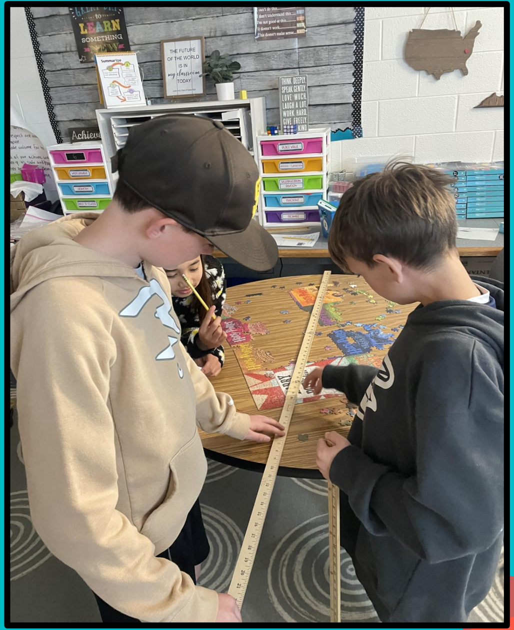
A great interactive ruler!

Measurement Workshop (Mr. Nussbaum)

- This is an interactive “workshop” where students will practice using measuring tools!


8.4 M
7.25 M


Realistic Fiction
Realistic Fiction


LEARN
SOMETHING

Day 3

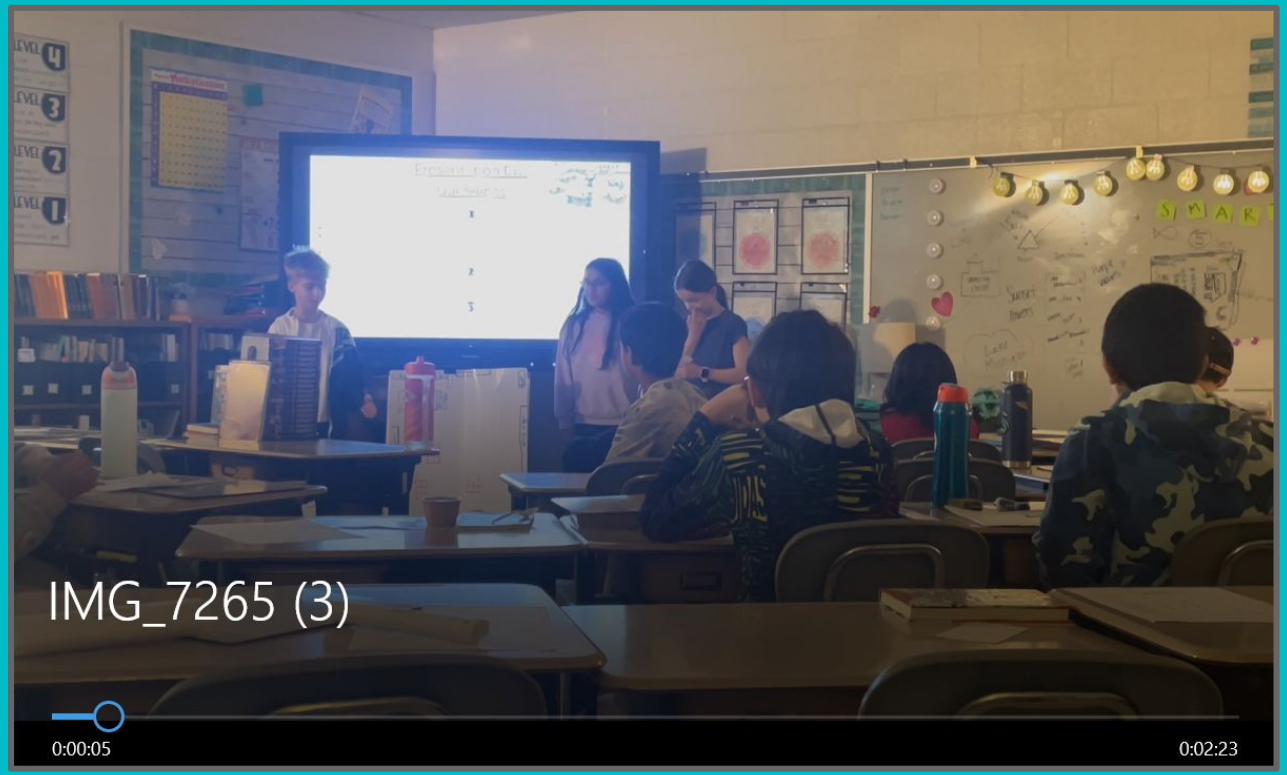
I can present my model and explain how it aligns to the rubric.

Rubric for Metric Design Challenge

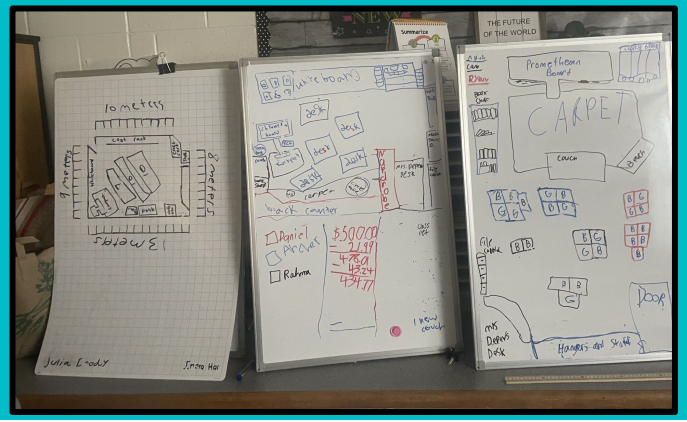
Design includes accurate measurements	4	3	2	1
Design promotes efficiency	4	3	2	1
Design fosters productive learning environment	4	3	2	1
Team demonstrated positive collaboration throughout project	4	3	2	1
Presentation included all team members and presenters made eye contact with their audience and spoke clearly.	4	3	2	1

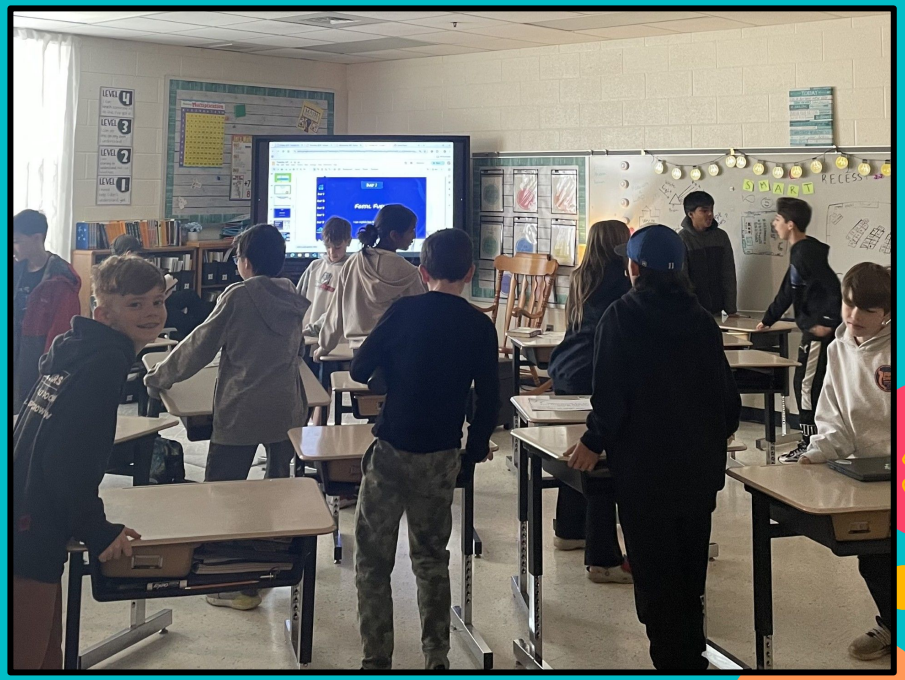
Experience #2 Goal

- Apply your understanding of the metric measurement system to a real-world scenario.
- Teams will create a classroom layout that maximizes efficiency and promotes student learning.


IMG_7265 (3)
0:00:05
0:02:23

Time to move the furniture!





Presentation Day Guidelines

1

- Present your classroom layout design to the class using your white board.
- Explain your measurements, layout decisions, and how your design maximizes efficiency for learning.
- Participate in the class discussion, asking questions and providing feedback.

2

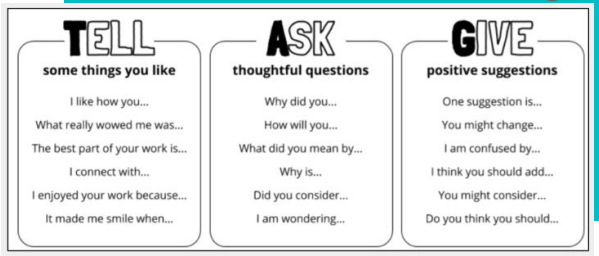
- Vote on the best classroom layout design based on accuracy of work, creativity, and efficiency.

3

- Reflect on your learning experience and discuss what you learned about
- metric measurement and classroom design.

What did you learn?

- Developing rigorous and authentic deeper learning experience is doable and does not have to be complicated.
- Clarity! It's critical to provide clear, curriculum based learning objectives that are communicated and repeated in consistent, student friendly language throughout the experience.
- Facilitate opportunities for students to connect learning to their interests, backgrounds, prior learning, and facilitate relevant applications to increase motivation and engagement.
- Communicate to students the characteristics of high-quality work and success criteria from the beginning and throughout the learning experience.



TAG Feedback

How did your learning show up in your designs?

- **Student-Centered:** Students took on roles such as Project Manager, Presentation Manager, and Materials Manager within teams, making meaningful decisions regarding their project's direction.
- **Authentic:** Students worked on real-world scenarios—providing relevance and motivation.
- **Rigor:** Students applied their understanding of concepts to think critically and design solutions collaboratively.

What will you transfer beyond this cohort?

- I will be mindful of creating opportunities for students to make real world connections.
- Meaningful solutions to problems can be motivating in themselves and facilitate organic experiences that seamlessly incorporate the 5Cs.
- I am intentional about questions, discussion, and collaboration to engage students in higher level thinking and increasing their level of understanding.

Thank you!