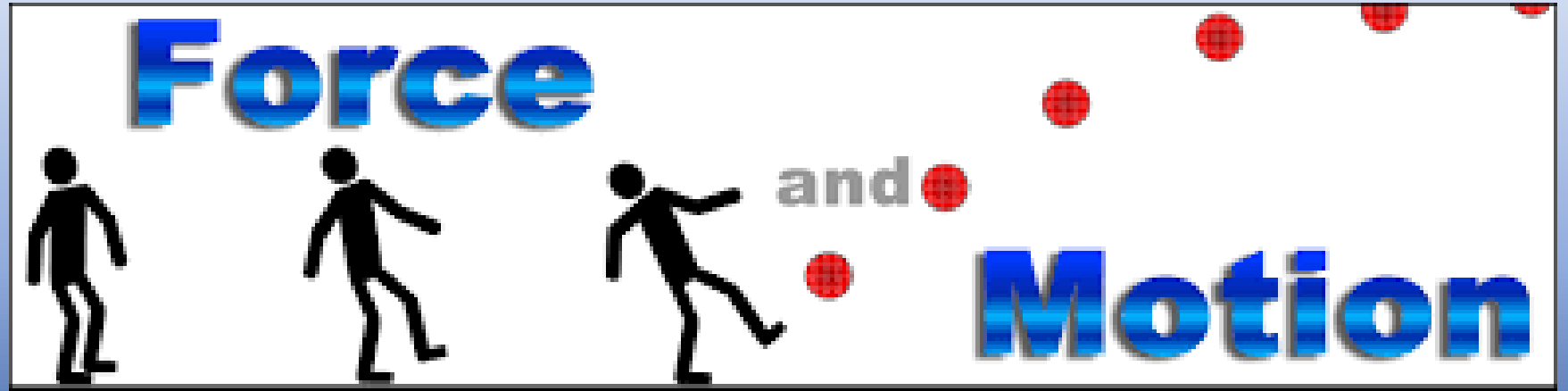


Interdisciplinary Unit

LTEC 632

Designing eLearning Environments

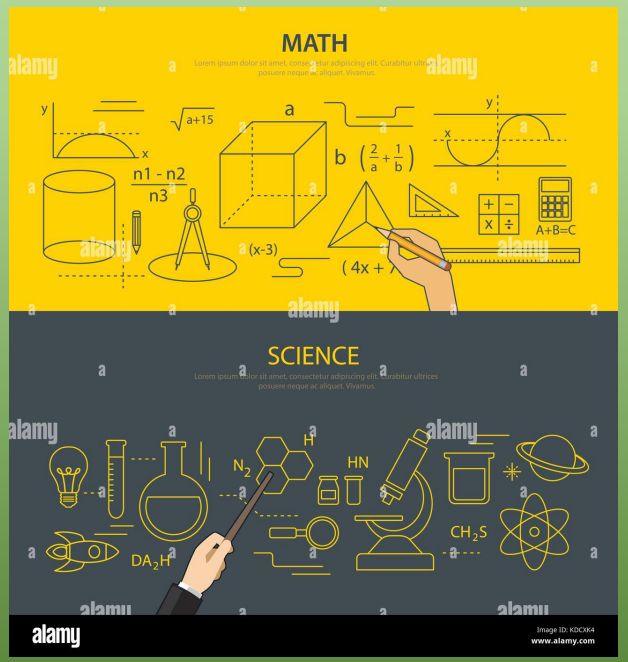
University of Hawai'i at Mānoa

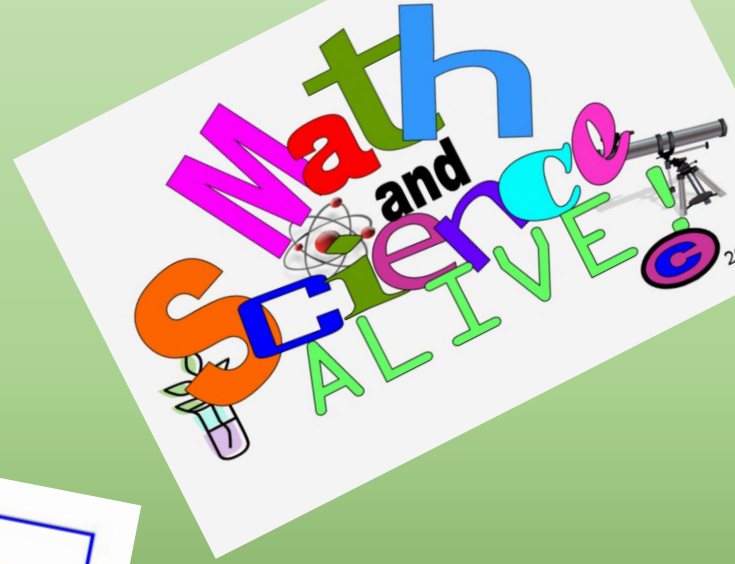
Lee Taylor

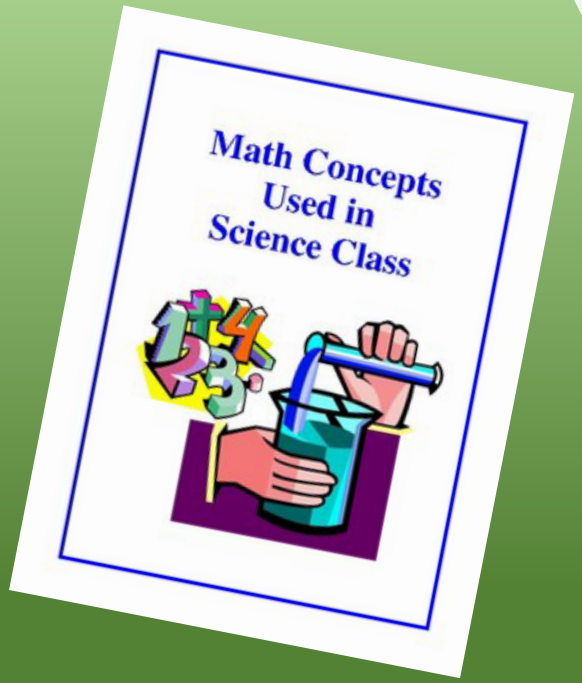
Science + Math

Welcome to Force and Motion an Interdisciplinary Unit

- Science and Math

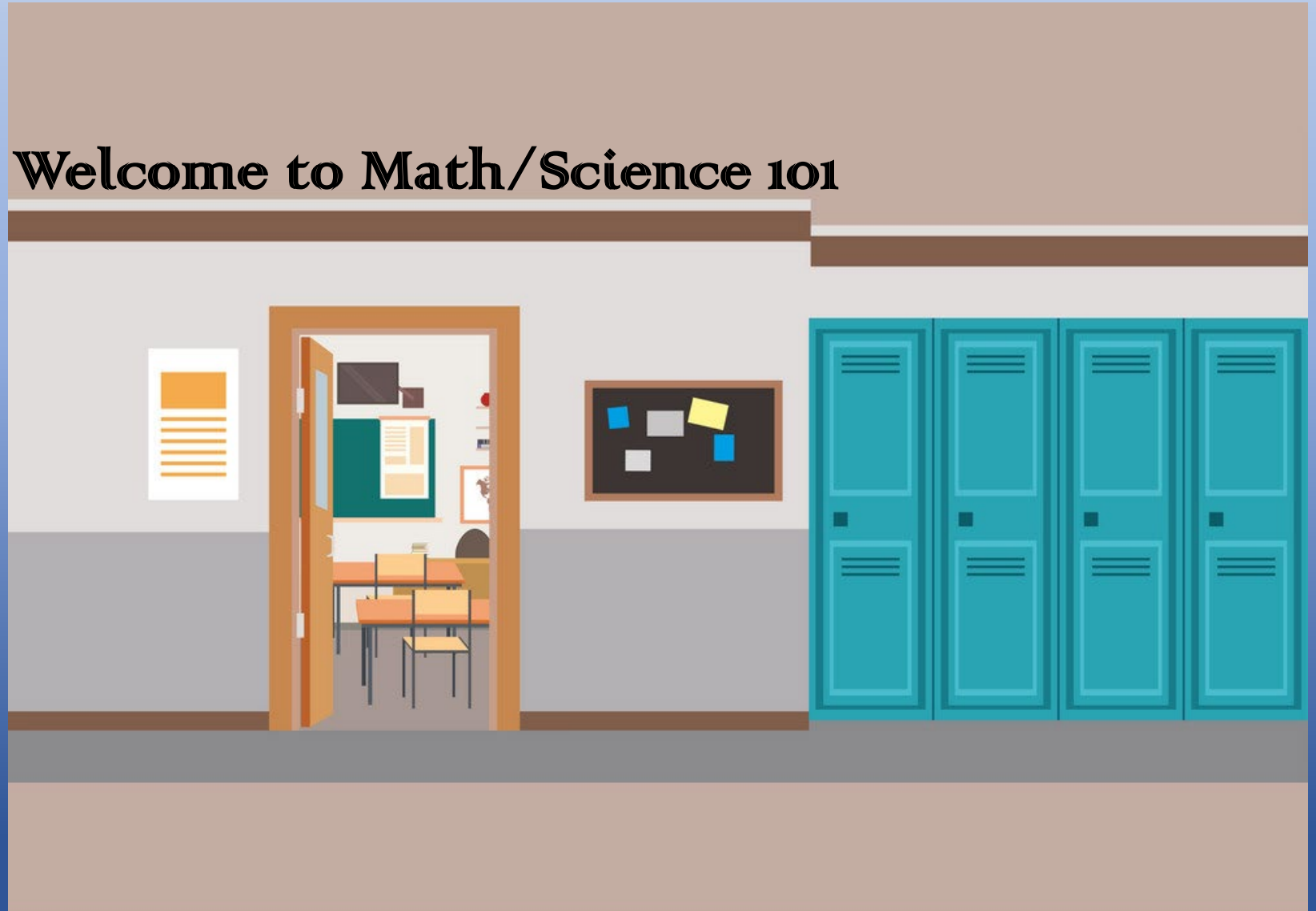






Science + Math

Marriage of Math and Science in the Classroom



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Welcome to Force and Motion an Interdisciplinary Unit The Journey begins

- First day back on campus

Science + Math

Welcome to Force and Motion an Interdisciplinary Unit Journey

- Science and Math Teachers brainstorm

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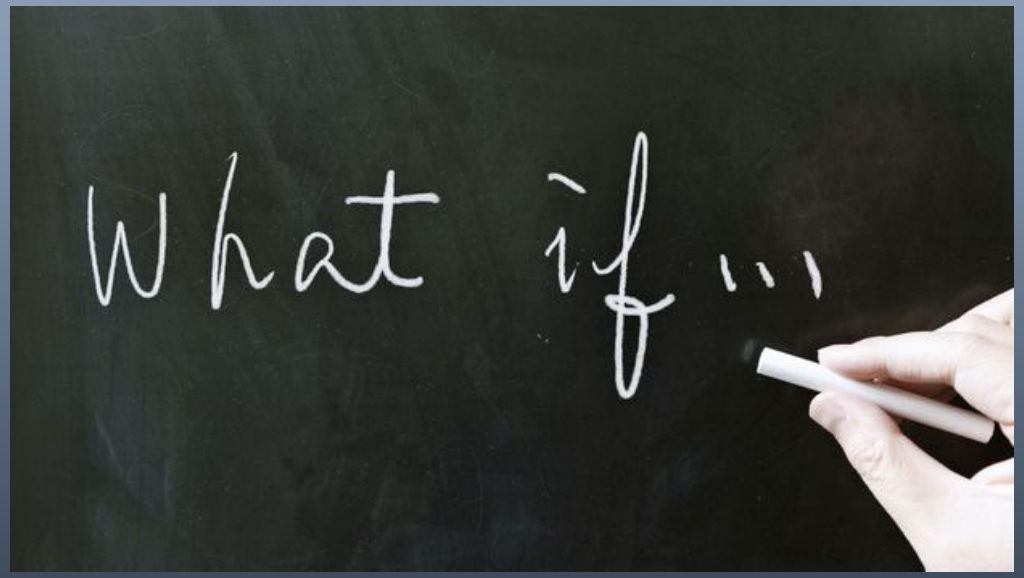
Welcome to Force and Motion an Interdisciplinary Unit Embarking

- Science and Math Interdisciplinary Project? ! ? ! ? ! ? !



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Welcome to Force and Motion
an Interdisciplinary Unit
More Brainstorm

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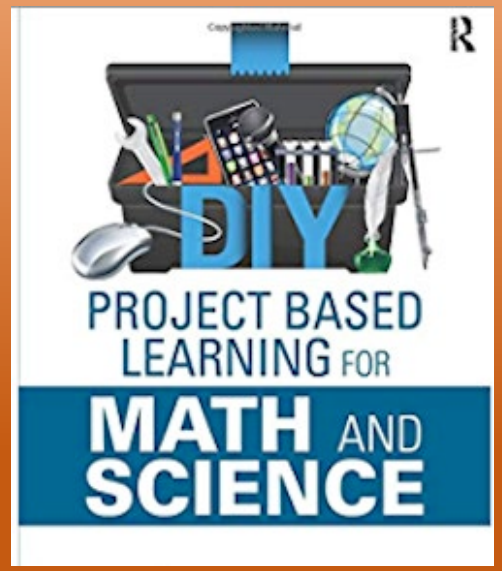
Welcome to Force and Motion an Interdisciplinary Unit

- Hawaii Dept of Education

HAWAII DEPARTMENT of EDUCATION

HawaiiPublicSchools.org

- Project Based Learning



PBLworks
BUCK INSTITUTE FOR EDUCATION

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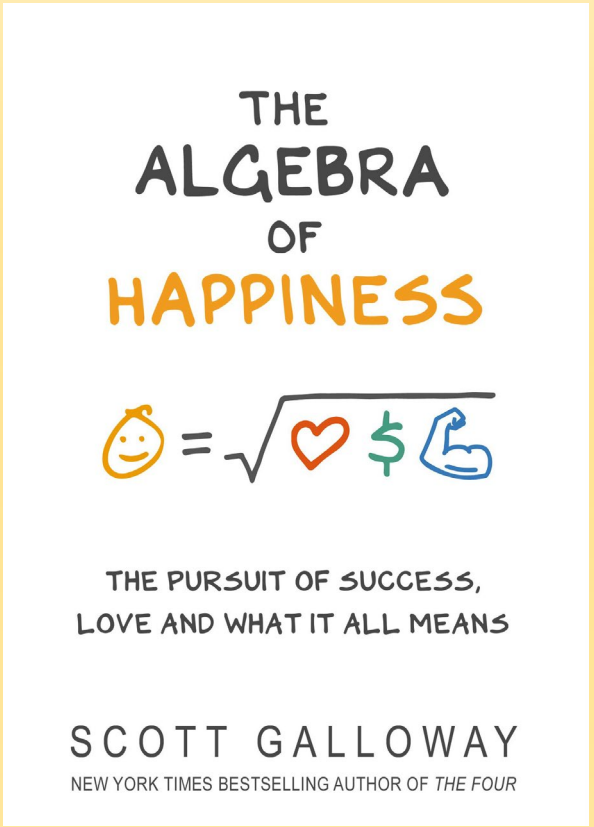
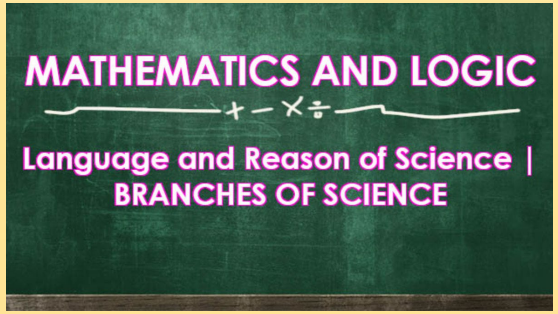
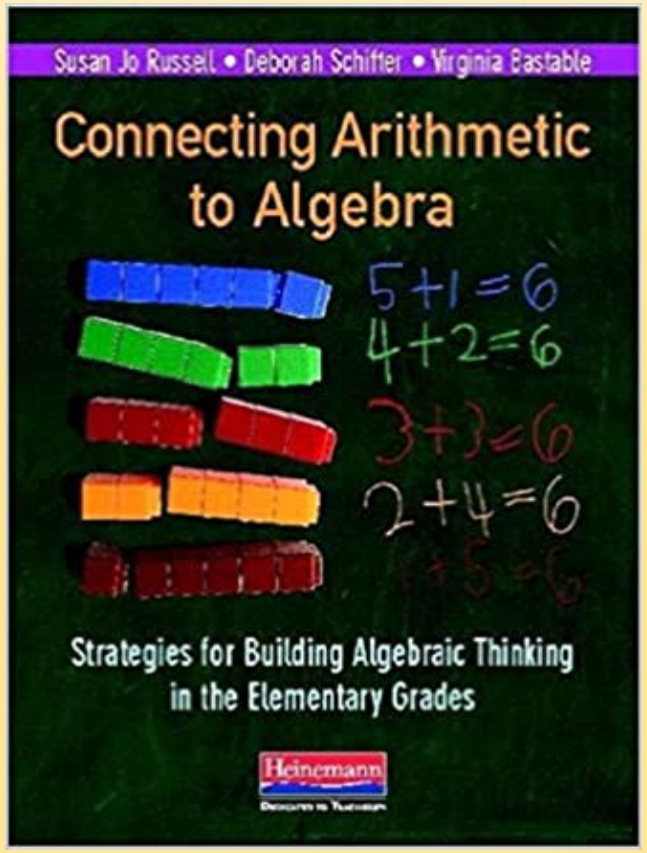
Welcome to Force and Motion an Interdisciplinary Unit

- Passionate about students learning Algebra







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Welcome to Force and Motion an Interdisciplinary Unit

- Students ≠ Math

-

$$x^2 - 7x - 3 = 0$$

Quadratic Equation

$a = 1 \quad b = -7 \quad c = -3$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{7 \pm \sqrt{-7^2 - 4 \cdot 1 \cdot -3}}{2 \cdot 1}$$

$$x = \frac{7 \pm \sqrt{49 + 12}}{2}$$

$$x = \frac{7 \pm \sqrt{61}}{2}$$

$$x = \frac{7}{2} \pm \frac{\sqrt{61}}{2}$$

$x = 7.4051248$

and $x = -0.4051248$

$x + 2 \overline{)2x^3 - 3x^2 + 4x + 5}$	Set up the division problem.
$2x^2$	
$x + 2 \overline{)2x^3 - 3x^2 + 4x + 5}$	$2x^3$ divided by x is $2x^2$.
$2x^2$	
$x + 2 \overline{)2x^3 - 3x^2 + 4x + 5}$	Multiply $x + 2$ by $2x^2$.
$\underline{-(2x^3 + 4x^2)}$	Subtract.
$-7x^2 + 4x$	
$2x^2 - 7x$	Bring down the next term.
$x + 2 \overline{)2x^3 - 3x^2 + 4x + 5}$	$-7x^2$ divided by x is $-7x$.
$\underline{-(2x^3 + 4x^2)}$	
$-7x^2 + 4x$	
$\underline{-(-7x^2 + 14x)}$	Multiply $x + 2$ by $-7x$.
$18x + 5$	Subtract. Bring down the next term.
$2x^2 - 7x + 18$	
$x + 2 \overline{)2x^3 - 3x^2 + 4x + 5}$	$18x$ divided by x is 18.
$\underline{-(2x^3 + 4x^2)}$	
$-7x^2 + 4x$	
$\underline{-(-7x^2 + 14x)}$	
$18x + 5$	
$\underline{-18x + 36}$	Multiply $x + 2$ by 18.
-31	Subtract.

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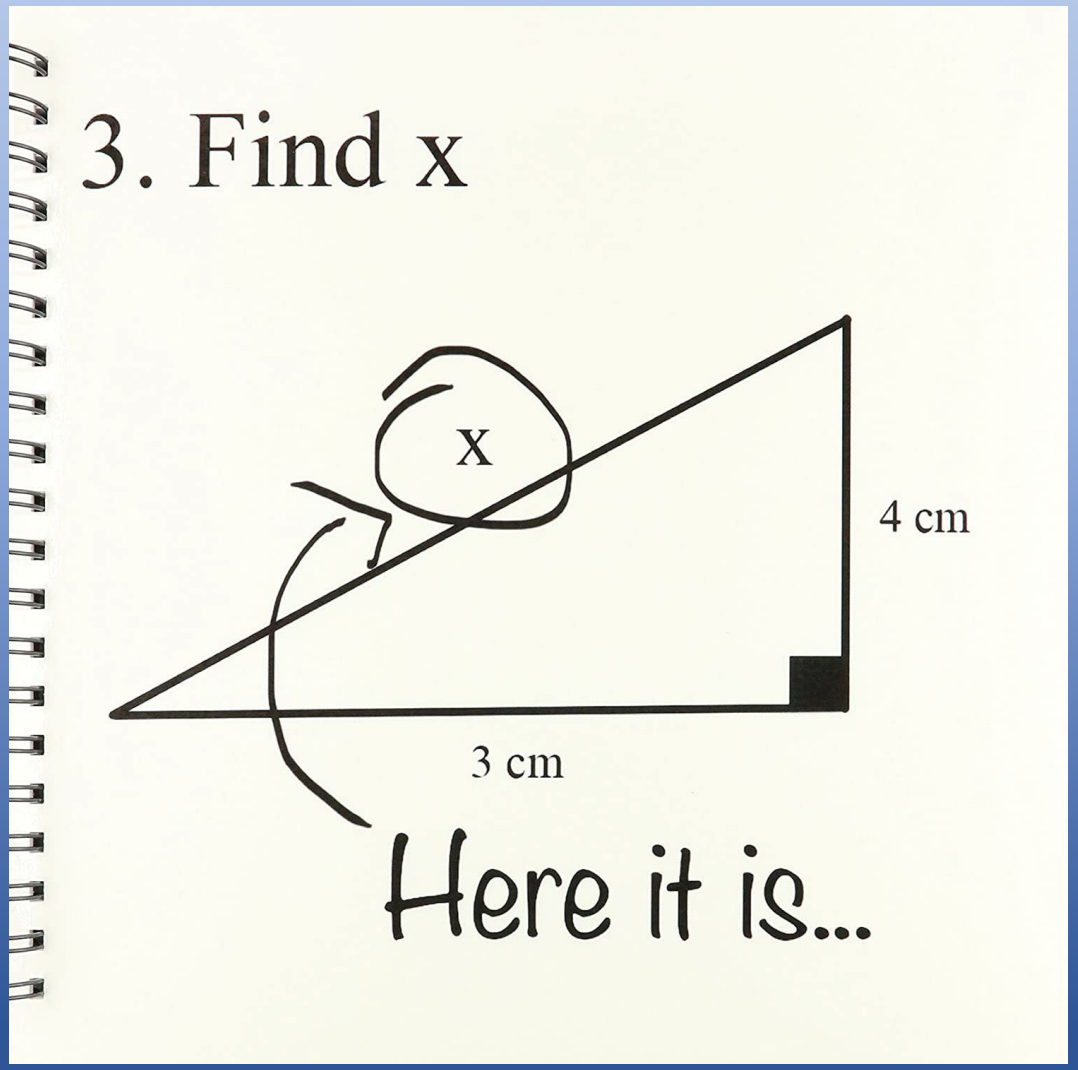
Welcome to Force and Motion an Interdisciplinary Unit

- Find X



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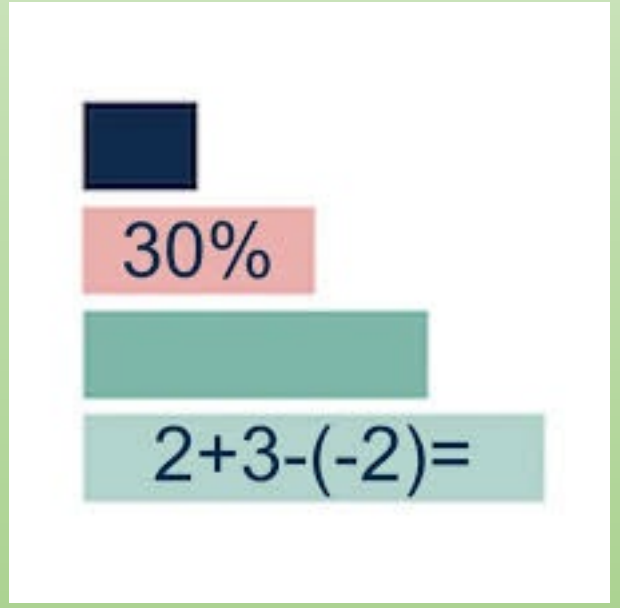
Welcome to Force and Motion an Interdisciplinary Unit

- Passionate about students learning Algebra

- Break problems into small steps



Success

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Welcome to Middle School
Land of Hormones

- Target audience

8th graders

- Inclusion Classes

Title 1 School

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Empathy Activities
Know your target audience

- Regular activities
  - "Do Now" that ask about their experience
    - With instruction
    - Software
    - Homework
    - Challenges
    - Successes
    - What changes they would like to make

- Restorative Circles
  - Share out about school wide issues
    - COVID-19
    - Vaccines
    - Bullying
    - Class dance
    - Ukraine
    - Going to high school

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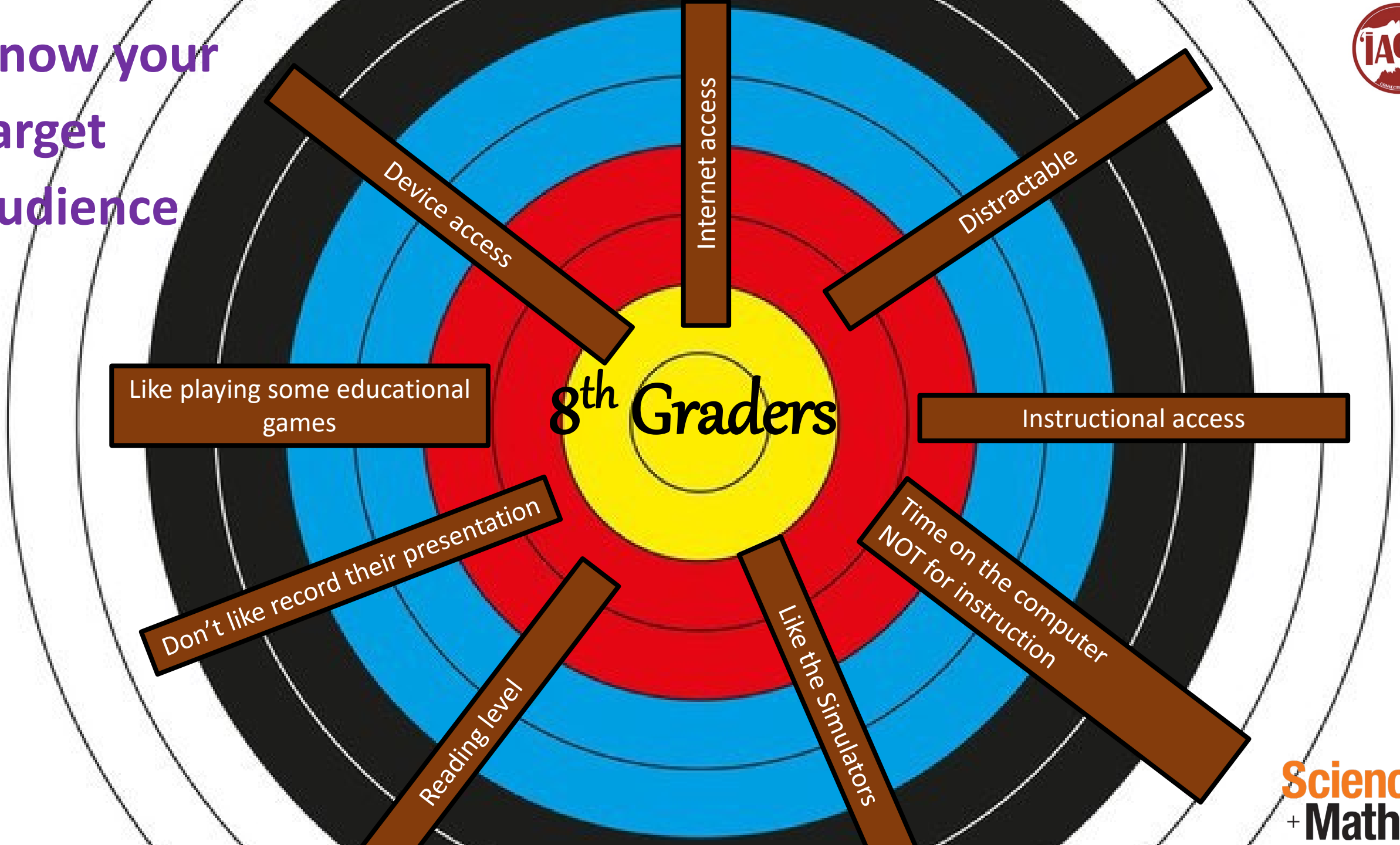
Know your target audience

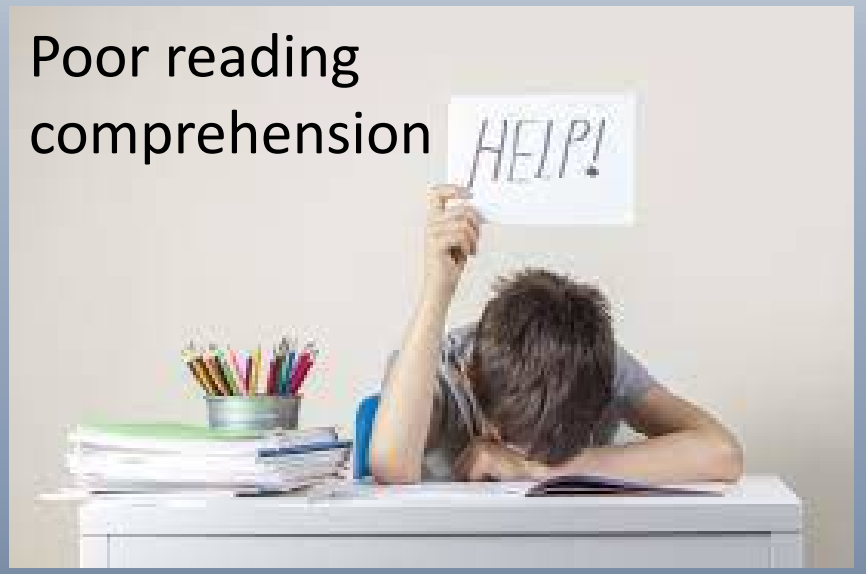


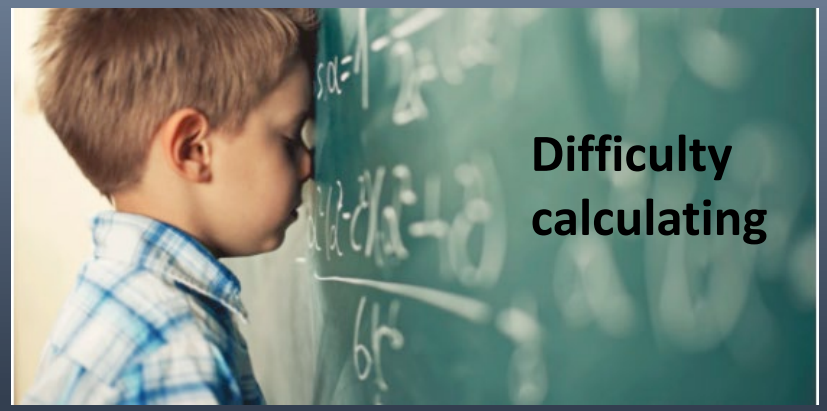
Use what you've learned

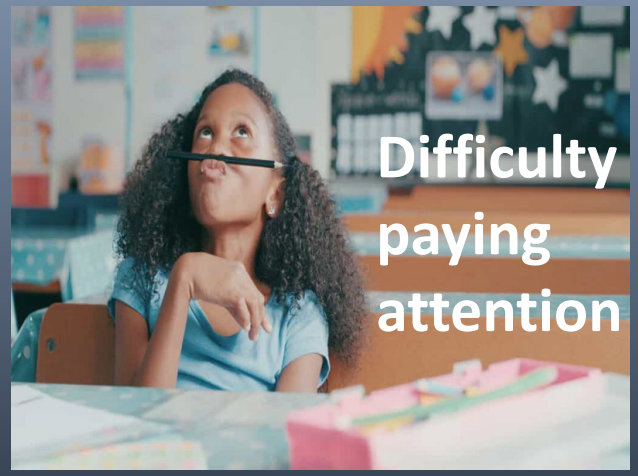
No Internet Connection

Geographic location – limited access to internet

Poor reading comprehension







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Technology part of STEM

Google Classroom

Easy Screen Recording:

Screencastify

STEMscopes™
THE LEADER IN STEM EDUCATION

padlet

Teach Assess Connect

nearpod

Unity WebGL Responsive Build!

G Suite PRODUCTS

Mail Calendar Drive Contacts
Docs Sheets Slides Groups

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- You push a skateboard on a flat surface. According to Newton's 1st Law of Motion what should happen?
- Does this happen?
- Why?

Welcome to Force and Motion Roll Out week 1

- Week 1
  - Introduction –
    - Took the entire week
    - Initially planned for one day
    - Students asked a lot of questions
    - Needed extra time for clarification
    - Activities took longer to complete

- Week 1
  - Re-group –
    - Adjust plan
    - Review Course
    - Adjust timeline based on week 1 experience
    - Students clarified needs

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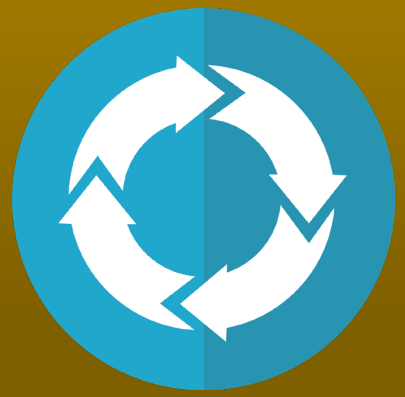
Welcome to Force and Motion Roll Out Week 2

- Week 2
  - Explore 1 –
    - Students were rushed to complete the experiment – additional clarification
    - Initially planned for one day
    - Students asked a lot of questions
    - Needed extra time for clarification

- Week 2
  - Re-group –
    - Adjust plan
    - Review Course
    - Adjust timeline based on week 1 experience
    - Students clarified needs
    - Adjusted expectations to continue with planned pace



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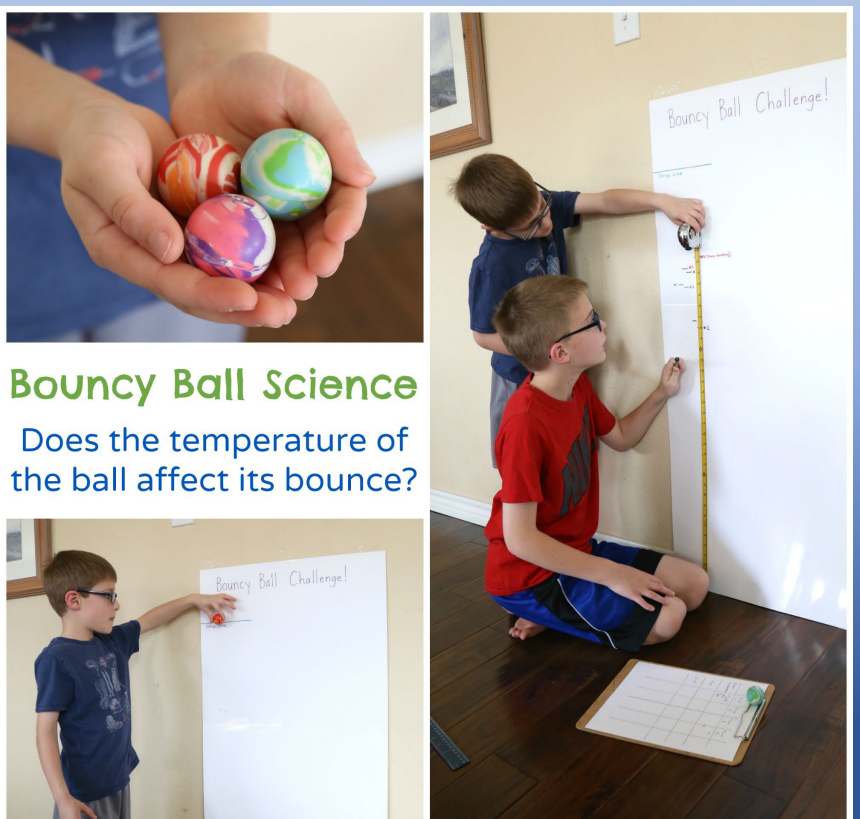
Welcome to Force and Motion
On a roll Week 3

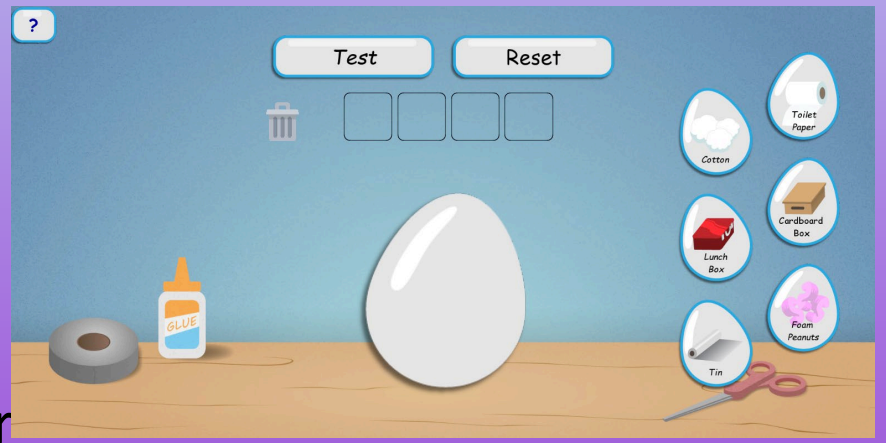


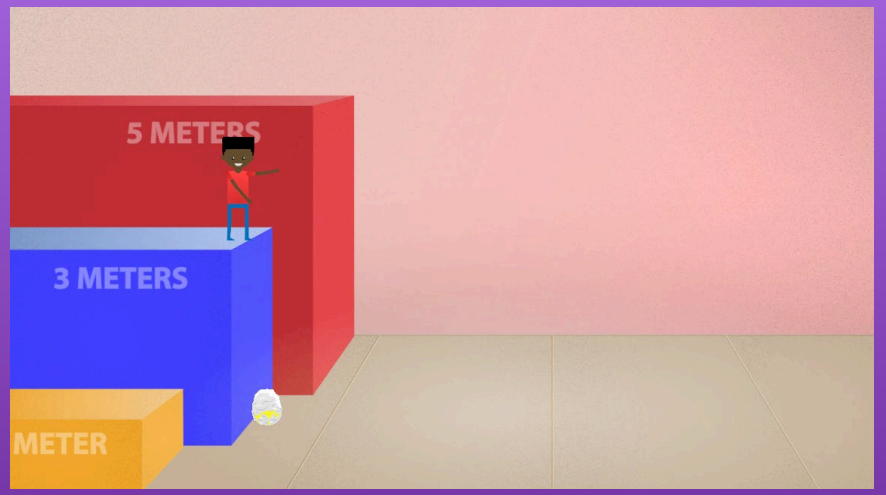
- Week 3
  - Explore 2 –
  - Ball bounce experiment
  - Students were able to accomplish more in the time allotted time
  - Simple experiment

- Week 3
  - Small adjustments

Welcome to Force and Motion
Continue rolling Week 4

- Week 4
  - Explore 3 –
  - Egg drop simulation
  - Instructions seemed clear
    - Less questions
  - Students designed multiple scenarios





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Force and Motion Successes

- Engagement
  - Presentations
    - Embedded activities
  - Experiments
    - Hands on
    - Simulated
- Group work

- Knowing target audienc
  - Challenges
  - Needs
  - Motivation
  - Proud
  - Avoid

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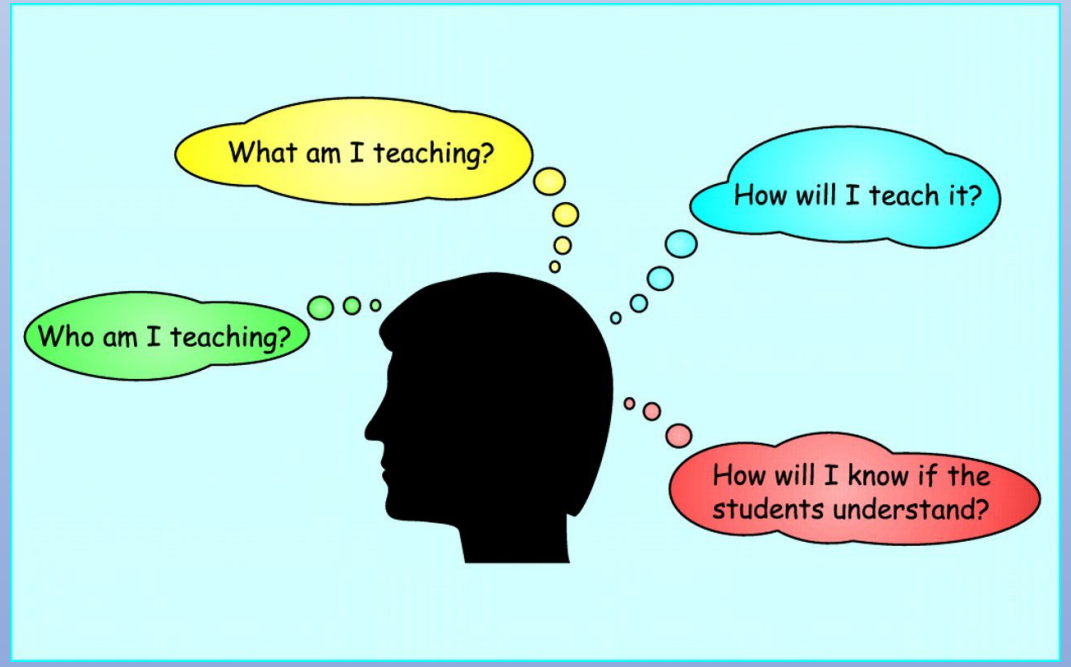
Force and Motion
Lessons learned

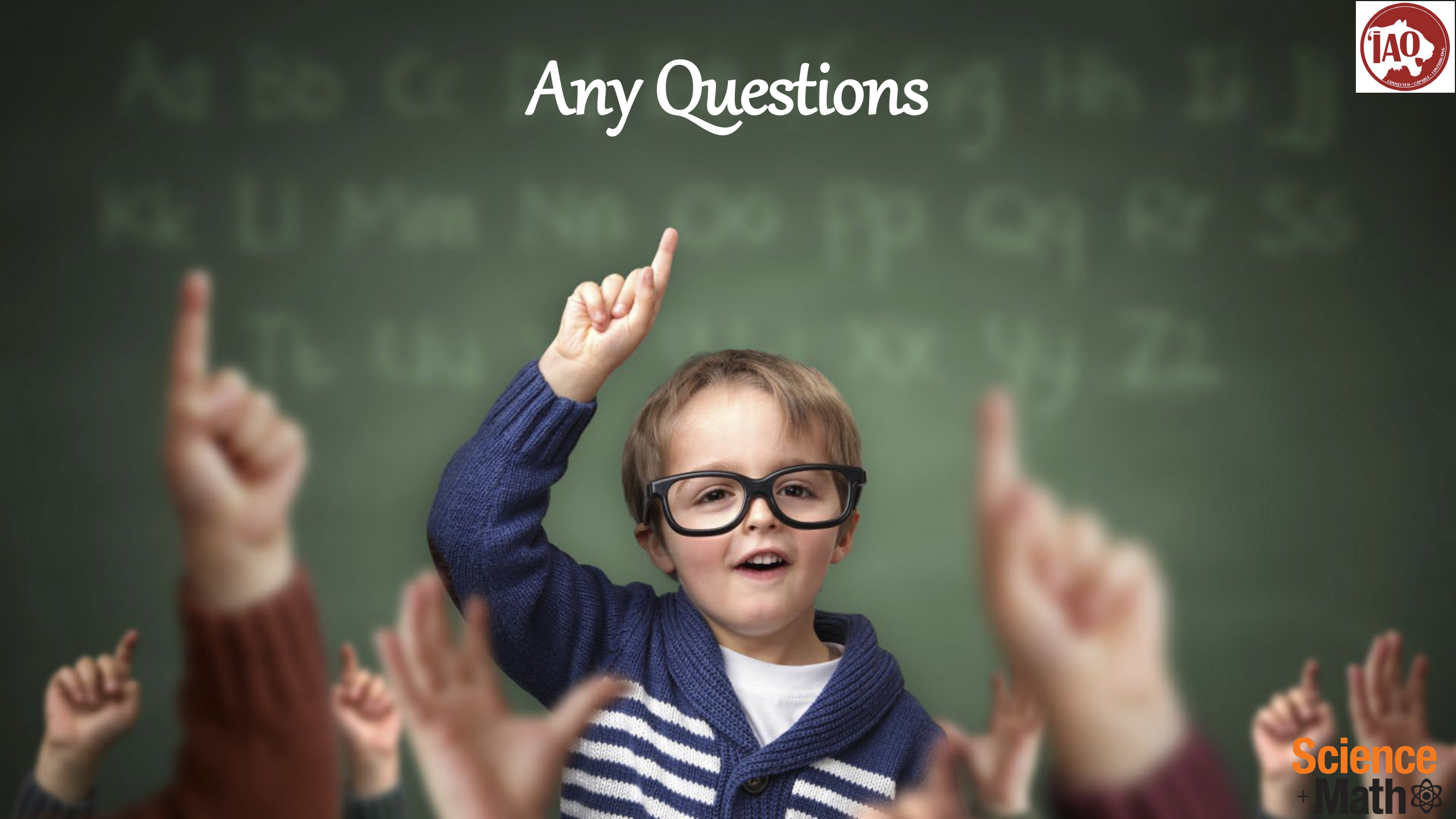
- Simulate entire Course
  - Quickly discussed
- Ambitious
  - Amount of content



Force and Motion
Lessons learned

- Be your Target Audience
  - Become your students

Any Questions



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+Math
Mahalo
ʻIAQ
CONNECTED • CAPABLE • CONTRIBUTING