# Math & Science in the Elementary Classroom

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## Agenda

I. Standards & Inquiry Overview

II. 3<sup>rd</sup> Grade Activity

III. 4th Grade Activity

IV. 5<sup>th</sup> Grade Activity



### **How to Read the Standards**



#### Math

#### **Science**

**M1:** Make sense of problems and persevere in solving them

**M2:** Reason abstractly & quantitatively

M6: Attend to precision

**M7:** Look for & make use of structure

M8: Look for & make use of regularity in repeated reasoning

d persevere in solving them Reason abstractly &

E6: Use technology & digital media strategically & capably

**M5:** Use appropriate tools strategically

with mathematics **52:** Develop & use models

M4. Models

**S5:** Use mathematics & computational thinking

**E2:** Build a strong base of knowledge through content rich texts

**E5:** Read, write, and speak grounded in evidence

M3 & E4: Construct viable arguments and critique reasoning of others

**S7:** Engage in argument from evidence

**S1:** Ask questions and define problems

**S3**: Plan & carry out investigations

**S4:** Analyze & interpret data

**S6:** Construct explanations & design solutions

s8: Obtain, evaluate, & communicate information

E3: Obtain, synthesize, and report findings clearly and effectively in response to task and purpose

Commonalities
Among the Practices
in Science, Mathematics
and English Language Arts

Based on work by Tina Chuek ell.stanford.edu

**E1:** Demonstrate independence in reading complex texts, and writing and speaking about them

**E7:** Come to understand other perspectives and cultures through reading, listening, and collaborations

**ELA** 



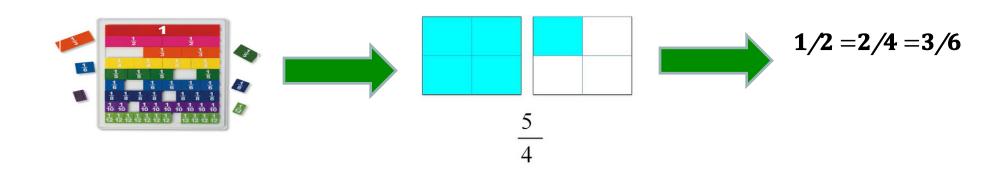
## **INQUIRY: The 5-e Model**

ngagement Exploration **E** xplanation **E** laboration **E** valuation

#### **CPA Model**

#### **Concrete – Pictorial - Abstract**

http://www.mathsnoproblem.co.uk/concrete-pictorial-abstract



## How does CPA Model apply to teaching kids subtraction?

232 - 156?

How does it apply to teaching fraction division?

$$\frac{2}{3} \div \frac{1}{6}$$

## 3<sup>rd</sup> Grade Activity



## **Standards Addressed**

#### 3-PS2-2

Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

#### 3.MD.B.4

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.

© Can you incorporate this engineering standard:

#### 3-5-ETS1-3

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

How about this math standard?

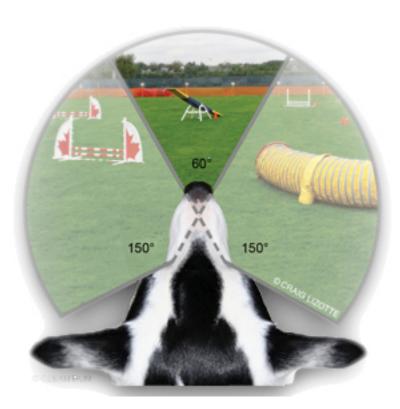
3.OA.D.9

Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

How can you make this activity more inquiry-based?

## 4<sup>th</sup> Grade Activity





## Simulating Animal Eyes

#### Students use:

- Paper Towel rolls to simulate chameleon
- Maleidoscope to simulate fly
- Magnifying glass to simulate spider
- Plastic mirror to simulate frog









## Making a Clinometer

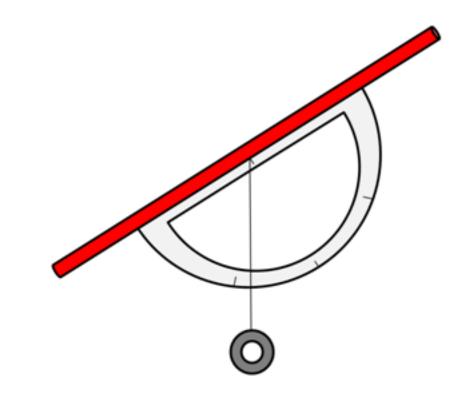
#### **Materials**

Protractor

Washer

String

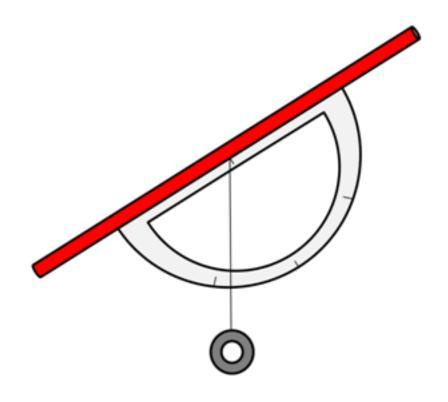
Straw (optional)



## Making a Clinometer

Stop when the height of the object you're estimating is registering 45° on protractor.

Height of object is equal to your distance away from it + distance from ground to your eyes



## **Standards Addressed**

#### 4-LS1-2

Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

#### 4.MD.B.5 & 6

Recognize angles as geometric shapes; understand concepts of angle measurement; use protractor

## 5<sup>th</sup> Grade Activity



## **Standards Addressed**

#### 5-PS1-3

Make observations and measurements to identify materials based on their properties.

#### 5-PS1-4

Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

#### 5.G.A.2

Represent real world and mathematical problems by graphing points in the first quadrant...; interpret coordinate values of points

## **Inquiry Extensions**

#### #3

What is one additional question you would like to research using these supplies?

© Can you incorporate these math standards?

#### 5.MD.C.3

Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

#### 5.MD.C.4

Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.