

# Tactivities for Active Learning in the Classroom

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# Purpose of Today's Workshop

- Introduce some tactile activities in different STEM subject areas (examples from math, engineering, chemistry, biology).
- Encourage adaptation to your classroom/subject.
- Activities can be used as review, or introduction to new material.
- **MAIN PURPOSE: reinforce content and encourage subject matter discussion.**

# Activity 1: Sequencing--Dominos

- Dominos – matching cards
  - Create a unique chain of matching cards – only one way to fit together.

**MATH EXAMPLE – make a chain of matching derivatives.**

START	$\frac{d}{dx} \sin(x)$
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$\cos(x)$	$\frac{d}{dx} e^{2x}$
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$-\cos(x)$	$\frac{d}{dx} xe^x$
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# Dominos: ENGINEERING EXAMPLE

- Create an ordering of the Design Process to create a product.

Check out the specifications

Update the prototype

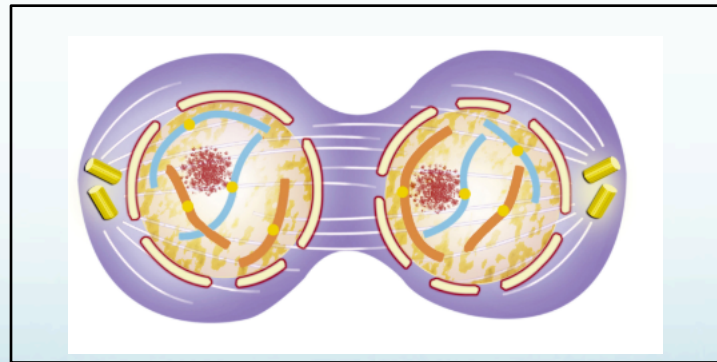
Field test the detail design

# Dominos: BIOLOGY- Phases of Mitosis

- Order the phases of mitosis by picture, description, and name

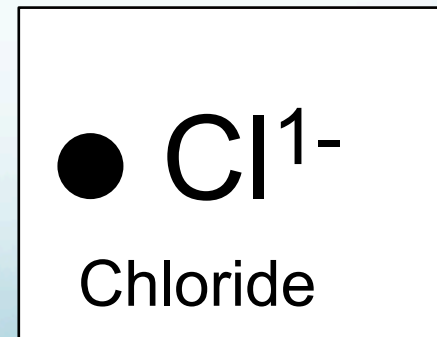
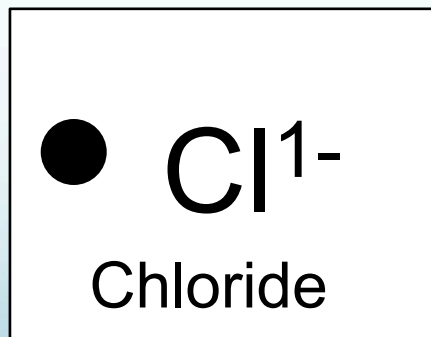
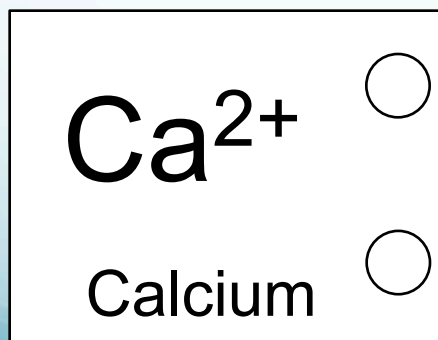
Metaphase

The nuclear membrane disappears



# Dominos: CHEMISTRY - Create Compounds

- Lay out ALL the cards. Create as many DIFFERENT compounds, using as many of the cards as you can.
- Write down the chemical formula and the chemical name.
- Your score is the number value of the remaining unused cards. A score of 0 is a perfect score.



## Activity 2: CATEGORIES

- Categorize content based on some similarity.
- **MATH**
  - a. Sequences: convergent & divergent
  - b. Systems of equations: 0, 1,  $\infty$  solutions

# CATEGORIZATION: Chemistry

- Categories: Chemical Reactions
  - Decomposition
  - Synthesis
  - Single Replacement
  - Double Replacement
  - Combustion
- Words, Chemical Reactions, etc.



# CATEGORIZATION: Engineering

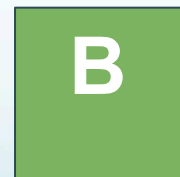
- Different engineering disciplines and who/what they serve.
- Could be used as a starting off point for exploring different engineering disciplines.

# CATEGORIZATION: Biology

- Classification Kingdom
  - Animals
  - Fungi
  - Bacteria
  - Protists
  - Plants
- Pictures and descriptions

# ABCD Cards

- A way for the instructor to get immediate feedback from students about their level of understanding.
- Simultaneous voting: on the count of VOTE, everyone holds up their cards.
- Cards are held in front of your chest so only the instructor sees your vote.
- Choices for voting:



= I don't know

**Question: What is the most commonly fractured bone in the human body?**

A) clavicle  
(collarbone)

B) hip

C) ankle

D) scaphoid (wrist  
bone)

**Answer: What is the most commonly fractured bone in the human body?**

**A) clavicle  
(collarbone)**

# Question: What causes night and day?

A) The Earth moves into and out of the Moon's shadow.

B) The Earth spins on its axis.

C) The Sun goes around the Earth.

D) Clouds block the Sun's light.

**Answer: What causes night and day?**

**B) The Earth spins on its axis.**

**Question: Which of the following is not a typical side effect of aspirin?**

A) dry cough

B) tinnitus

C) stomach ulcers

D) spontaneous bruising



**Answer: Which of the following is not a typical side effect of aspirin?**

A) dry cough

**Question: The regulatory mechanism of the market system is...**

A) specialization.

B) private property.

C) self-interest.

D) competition.

**Answer: The regulatory  
mechanism of the market system  
is...**

**D) competition.**

# Whole Class Movement

**Go to the appropriate CORNER and SHARE out if you do something special...**

**Corner 1)** on your first day of class.

**Corner 2)** to encourage group work.

**Corner 3)** to encourage a growth mindset.

**Corner 4)** outside of class to stay in/or encourage communication.