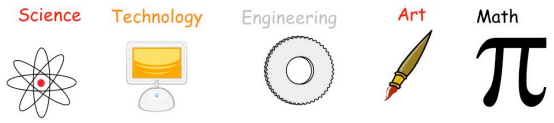
STEaM



Rockburn Elementary School
STEaM Fair
March 5, 2015
7:00-8:00pm

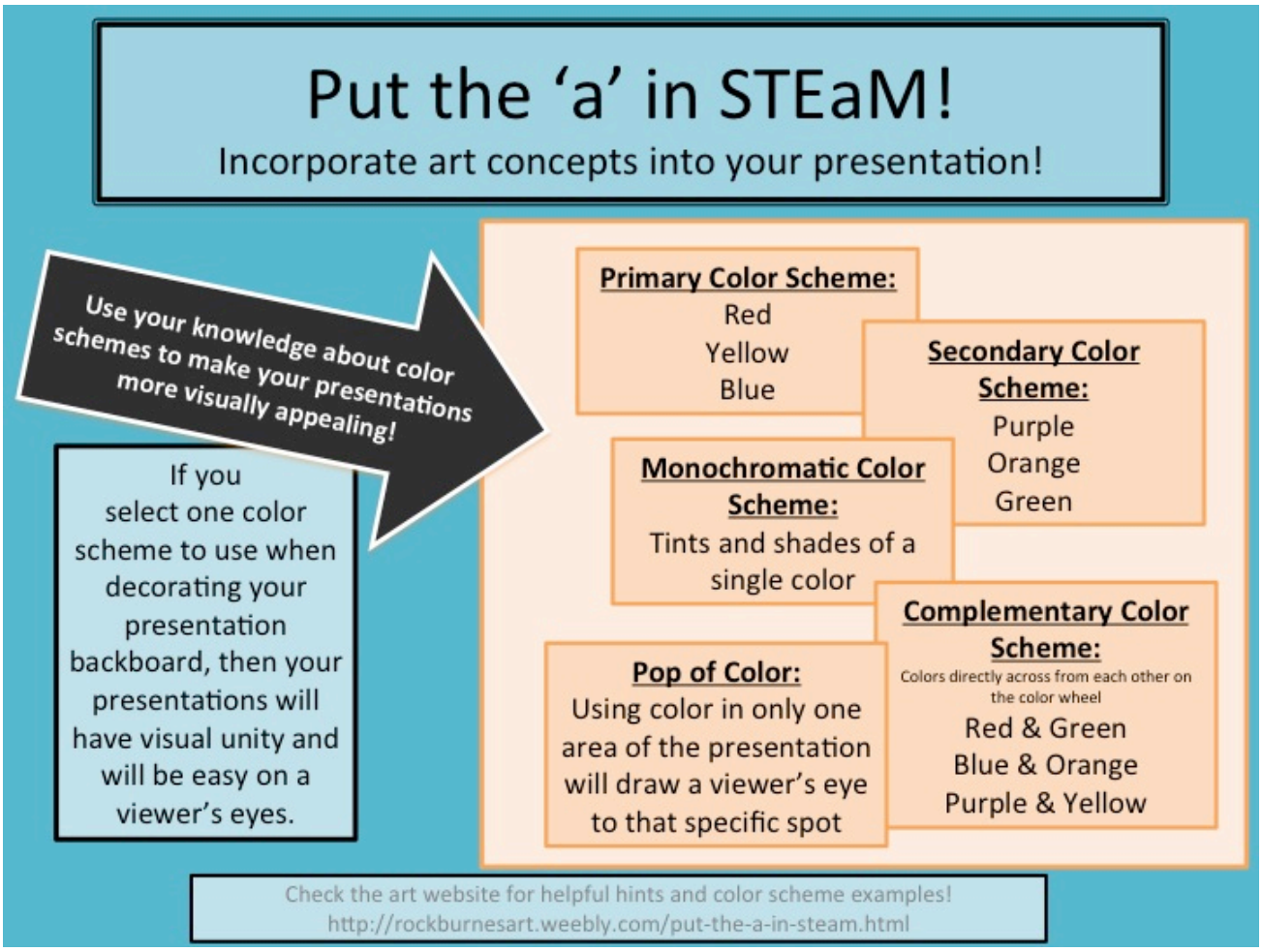
Guidelines

1. The project should begin with either a testable question or a question that includes an engineering challenge.
    - **A testable question**- Example, "Can a person that is blindfolded tell the difference between whole milk and skim milk?"
    - An **Engineering challenge question** should be a real life problem that needs to be solved. For example: "How can I make a structure out of index cards to support my stuffed animal?"
2. You may work alone or with an engineering team of up to four people.
3. The size of your project may not exceed 4 ft. wide by 3 ft. tall.
4. All projects must be durable and safe. Your project must be able to stand by itself. Bring your display board and project to the fair no later than 15 minutes before the Fair starts. (**DO NOT** bring your board in the **morning**!)
5. Posters or papers explaining the project should be neat.
6. No harmful chemicals, live animals, explosives, dangerous substances, disease causing organisms, microbes or fungus (living or dead), expensive items, or drugs may be used.
7. The student may keep a diary, journal, or record book in which observations are recorded.
8. Pictures or drawings may be taken or made during all stages of the challenge and should be placed on the display board with captions.
9. The student should complete projects with parent assistance, not vice versa.

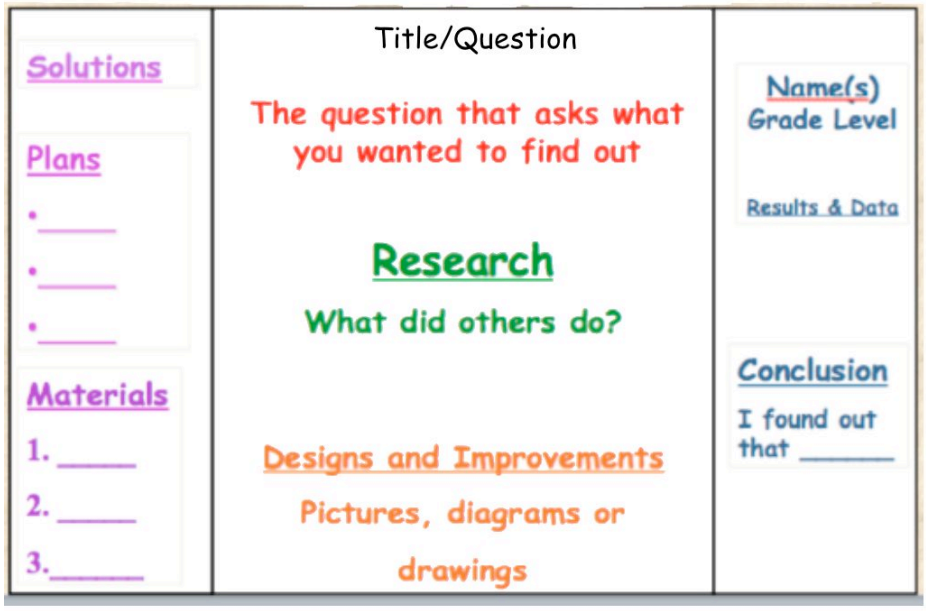
Timeline for STEaM Challenge

	1/22/15 or earlier	1/23/15 or earlier	2/5/15 or earlier	3/4/15 or earlier
Testable Question	Choose topic, form a question, investigate your topic and make a prediction.	**Submit Permission form to Miss Pfenninger**	Develop procedures, gather materials, conduct investigation, collect data, analyze and display data (graphs and pictures) draw conclusions.	Complete display board (using color, neat pictures) BE CREATIVE
Engineering Challenge Question	ASK your STEM question and IMAGINE how you'll engineer a solution.	**Submit Permission form to Miss Pfenninger**	PLAN your steps to solve the challenge. Gather materials. CREATE your engineering design. Test and record results. IMPROVE your design, retest, and record new results. Draw conclusions.	Complete display board (using color, neat pictures) BE CREATIVE

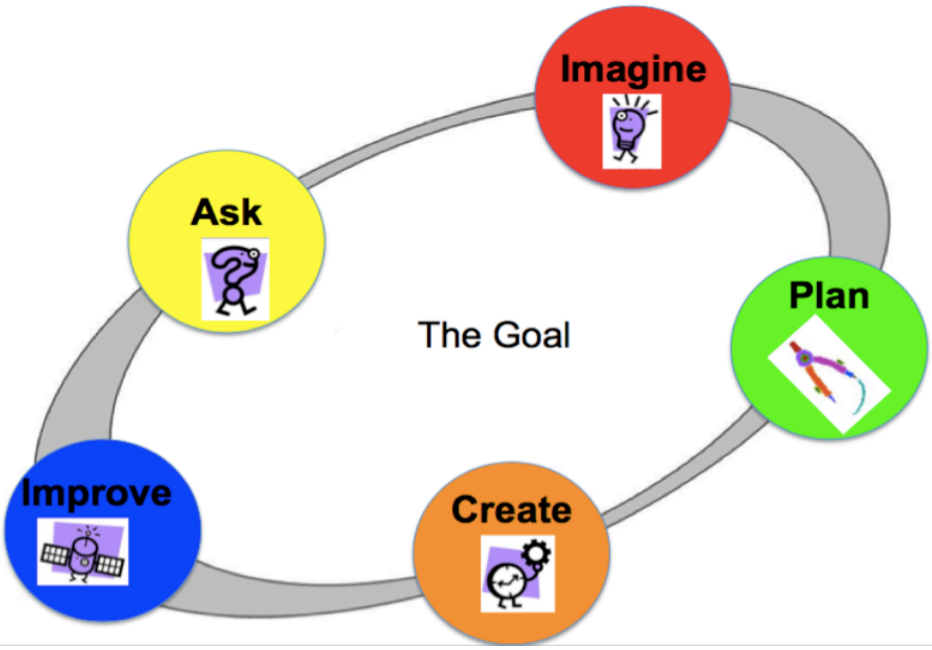
March 5th: Project Due! Please bring your display board to the cafeteria 15 minutes before the fair starts (see #4 in Guidelines.)



Example Project Board Layout



Engineering Design Process



Examples of engineering Challenge questions:

- What materials work best in creating a marble maze?
- Can you invent a cereal dispenser that closes automatically?
- Can you come up with a Bubble-Blowing Machine that automatically turns the straw and blows the bubbles?
- What do you think cities of the future will be like? What do you think they should be like? Use your imagination and build your very own model city of the future.
- Can you design a bungee jump that will protect an egg when dropped from five feet and stop within two inches of hitting the floor?
- Choose a material such as aluminum foil or duct tape and design a boat to hold pennies. Modify your designs until you find out which holds the most pennies.
- Can you design a grabber to pick up trash in your community so you don't have to touch it with your bare hands?
- What is the tallest spaghetti structure you can build to hold a marshmallow peep?
- Old MacDonald has a farm with many animals so he needs a fence to keep the animals from wandering. Design fences for Old MacDonald and build models to demonstrate them.
- Mr. Squirrel needs to sort mixed nuts. Design and build a machine to sort at least two kinds of nuts (you can substitute two different size wooden beads).
- Design and build a homemade toy that two to four children can play together. Use as many recycled and reusable materials as possible to help the Earth.

Examples of testable questions:

- Can a blindfolded person tell the difference between Pepsi and Coke?
- Which chewing gum holds its flavor better?
- How does the temperature of a tennis ball affect the height of its bounce?
- How does the air pressure of a soccer ball affect how far it travels when kicked?
- Which type of bread turns moldy first: store bough or bakery bread?
- Which grows faster: fingernails or toenails?
- Do new tennis balls bounce higher than older ones?
- Will a frozen seed sprout?
- Which type of cheese grows mold the fastest?
- Is there a relationship between the size and strength of a magnet?
- Which brand of cat litter absorbs the most?
- Which cooks faster, brown rice or white rice?
- What type of cleaner removes ink stains best?
- Which brand of trash bag is the strongest?
- Does the thickness of a rubber band affect how far it can be stretched?
- Does the height a ball is dropped from affect how high it bounces?

STEaM Permission slip

Name: _____Teacher: _____Grade: _____

Parent Signature:

_____

Circle One: Individual Project Group Project

Group Members (optional)

*If working in a group, please only turn in **one form** per group

Name	Teacher	Grade	Parent Signature

Question:

_____

_____

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_____

Approved Needs Improvement

Reason:_____

Turn in to Ms. Pfenninger no later than Friday, Jan. 23, 2015