#### Rockburn Elementary School's Science/STEM Fair March 16, 2017



# Thank you, Rockburn PTA, for all of your support!

#### What does STEM stand for?

- S- science
- T-technology
- E-engineering
- M-mathematics









### **Traditional Science Fair**

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#### Scientific Method:

In the scientific method students focus on creating a science fair testable question, constructing a hypothesis or prediction, designing, executing, and then evaluating their experiment.



#### Rockburn's STEM Fair uses NASA's Engineering Process



http://www.nasa.gov/audience/foreducators/best/index.html



#### Before you begin...

- Read through the STEM Fair booklet with your parents.
- Decide if you will work alone or part of an engineering team (up to 4 members)
- What's right for <u>YOU</u>?





- What is the challenge?
- What are my limitations?
- What have others done?

#### This is the foundation!



#### Find a problem!

- My pet hamster is getting too fat.
- My juice gets warm in my lunchbox.
- I have to wait too long for the bus. I'd rather wait inside where it's more comfortable.
- I make sandwiches for my lunch on Sunday. By the end of the week, they go stale.
- My younger brother & sister are too small to reach the light switches. I always have to go turn on the light for them.
- I sometimes forget to put my homework in my backpack.
- I caught my brother in my room, but he says he never goes in there.





#### http://pbskids.org/zoom/ activities/sci/



#### What are my limitations?

• How much time do I have?



• What are my resources?

#### What have others done?

- Collect information.
- Look at a variety of sources.
- <u>KEY GOAL</u>: Obtain enough information to make a prediction of what will happen in your design.



## •Imagine

- What are some solutions?
- Brainstorm ideas
- Choose the best one



#### How do I brainstorm?



- Don't worry about whether they are right or not. Everything is OK when you are brainstorming. One idea often leads to another.
- Be sure to include everyone's ideas if you are working in a group.
- Talk with friends and parents to spark more ideas.
- Look in science books and read to get ideas!

## •Plan

- Draw a diagram
- Make lists of materials you will need.



#### Make a diagram

- Does not have to be a work of art!
- Think about a side view, top view, bottom view!
- Save your sketches or diagrams.



### •Create

- Follow your plan and create it.
- Test it out!
- Collect some data.



•Improve!

Don't settle for your 1<sup>st</sup> Ideal



#### How can I improve my design?

- Talk about what works, what doesn't, and what could work better.
- Choose one part of your design and modify it to make it better.
- Test it out.
- Collect more data.





- After you improve your design once, you may want to begin the Engineering Design Process over again to refine your technology.
- Or you may want to focus on one step.



## The Engineering Design process can be used again and again!

.... and again!

#### **Engineering Design Process**



## and again!

## $\underline{K} eep \ \underline{I}t \ \underline{S} afe, \ \underline{S} imple$



Display Boards

## Think of the Display board as a commercial for your project







#### What is the challenge?

- What materials work best in creating a marble maze?
- Can you come up with a Bubble-Blowing Machine that automatically turns the straw and blows the bubbles?
- Can you invent a cereal dispenser that closes automatically?
- 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.

