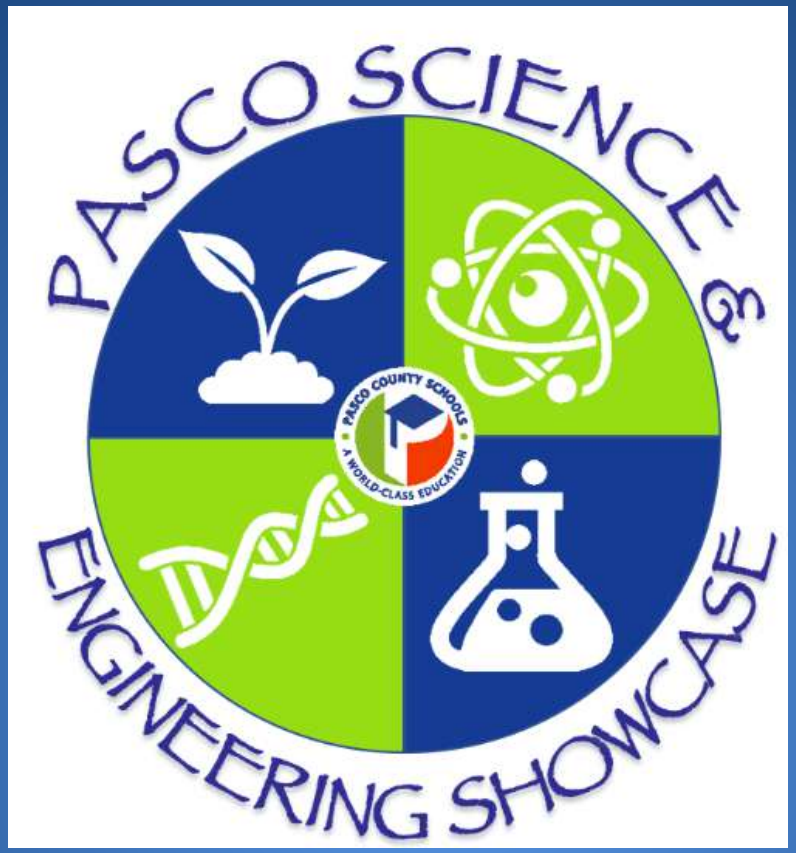


2019-20 Project Information

Chasco Elementary School

Projects Due

Monday, December 9, 2019

Each classroom teacher will choose one participant who will compete in the school showcase during the week of December 16th.

Pasco County Showcase

Saturday, February 1, 2020

The top 8 participants will compete in the district showcase.

What is STEM?

- Science
- Technology
- Engineering
- Mathematics

Why a STEM Fair?

- Providing students opportunities to make meaningful connections to the real world is critical as we develop the skills, behaviors, and dispositions necessary for college, career, and life readiness.

- Developing a S.T.E.M. (Science, Technology, Engineering, and Mathematics) Fair investigation will provide students the opportunity to use science knowledge and skills just as scientists do in the real world.

Skills used in STEM Fair include:

- Writing clearly
- Communicating information effectively
- Collecting and interpreting data
- Using evidence to justify your thinking
- Managing time
- Providing opportunities to ask “why” leading to the development of an experiment or designing of a solution/innovation

Supporting your child with STEM Fair

- Parents play a critical role in supporting their child throughout the STEM Fair process.
- Be interested, encouraging and positive
- Try to ask questions instead of giving answers!
- Supervise and use resources that ensure the SAFETY of both your child and tested organisms.

Sample Guiding Questions:

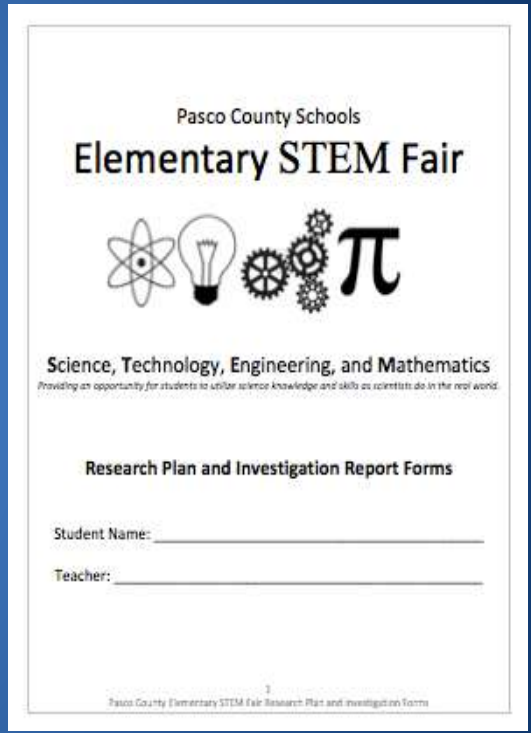
- Why?
- How do you know that?
- What do you want to happen?
- What would happen if…?
- What other things could you try?

- Explain or assist in finding resources to explain concepts that are difficult to understand.

STEM Fair Packet

Your child's teacher provided this packet.

- Provides clarification and guidance throughout your child's investigations.
- Helps your child stay organized
- Your child WILL need to keep an ADDITIONAL project log or journal. This includes dates and notes of everything that is done and read that pertains to the project.


Pasco County Schools

Elementary STEM Fair

Science, Technology, Engineering, and Mathematics

Providing an opportunity for students to utilize science knowledge and skills as scientists do in the real world.

Research Plan and Investigation Report Forms

Student Name: _____

Teacher: _____

1

Pasco County Elementary STEM Fair Research Plan and Investigation Forms

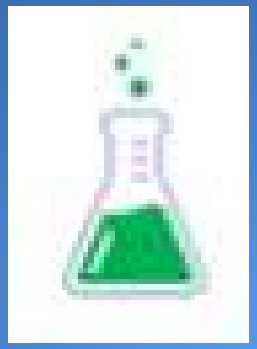
Getting Started: Choosing an Investigation

Your child can choose to investigate **ONE** of the following:

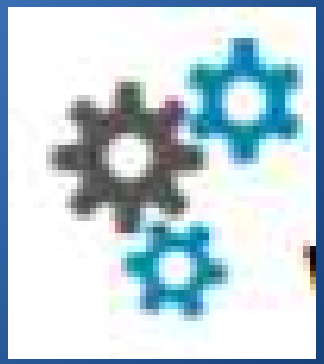
1. ***Question I am going to answer***: "Which brand of diaper is the most absorbent?" (This will be an experiment)

2. ***Problem I am going to solve***: "I am constantly losing things out of my pant pockets. How can I create a pant pocket that keeps items inside?"
   - This investigation has the student design/engineer something and then test it to help them solve their problem. (This will be an Invention or Innovation)

- If your child chooses to find the answer to a QUESTION, they will follow this sign in the packet.



- If your child chooses to solve a PROBLEM, they will follow this sign in the packet.



Step 1: Research

- One of the most important parts of the project!
- Should be done by creating a list of questions the student wants to learn more about in regards to their investigation topic.
- The student can use websites, books, or even talk to professionals
- Your child should take notes about their learnings in their lab notebook.

Step 2: Identify Variables

A variable is a fancy word for things that you will be changing or keeping the same throughout your investigation. There are 3 types of variables:

- **Independent**: The one variable that will be changed
- **Dependent:** This variable is what is being measured
- **Constants**: All the things that will be kept the same throughout the investigation to make sure it's valid

Example Variables

Diaper Question

- Independent: different brand of diapers that are being tested (Huggies, Pampers, Luvs) This is what you change, and you can only change 1 thing.
- Dependent: the amount of water absorbed (measuring using mL) by each brand of diaper
  - It must be measureable
- Constants: temperature of the water, location in the diaper in which water is poured

Pant Pocket Problem

- Independent: different types of materials tested to create the pocket seal This is what you change, and you can only change 1 thing.
- Dependent: the number of shakes the pant pocket can withstand before losing its contents
  - It must be measureable
- Constants: same pair of pants and sized pocket, same items placed in the pocket

Step 3: Write a hypothesis

A hypothesis is a guess based on what you learn from research.

Example Hypotheses

- *Question:* **If** I continue to add water to each of the different diapers, **then** Huggies will absorb the most water **because** Huggies diapers have an extra layer of polyfiber material.

- *Problem:* **If** I create a magnetic pocket casing, **then** I will lose fewer items out of my pockets **because** magnets provide a tight seal due to their characteristics.

Step 4: Materials & Procedure

- The purpose of the procedure is so other scientists and engineers can replicate your investigation. DETAIL, DETAIL, DETAIL.

- Make sure to share all steps completed during the investigation and/or design of the invention.

- It is okay if you begin your procedure and realize you may need to change something. This happens to scientists and engineers all the time.

Step 5: Decide how you will Collect Data

- As you investigate your problem, be sure to collect data using a chart or table in your lab notebook.

- This will help you draw conclusions when you are finished with your experiment

Sample Data Tables:

How much water do diapers absorb?			
TRIAL	Huggies	Luvs	Pampers
1			
2			
3			
4			
5			

How many items came out of the pants pocket after _____ shakes?			
TRIAL	Magnet	Velcrow	elastic
1			
2			
3			
4			
5			

Step 6: Carry out the investigation

- 5 trials
- Take notes
- Record date and time
- Be sure to collect data (measurements) and record in data table.

Steph 7: Graphing Results: Communicating Data

(Graph can be hand drawn or computer generated.)

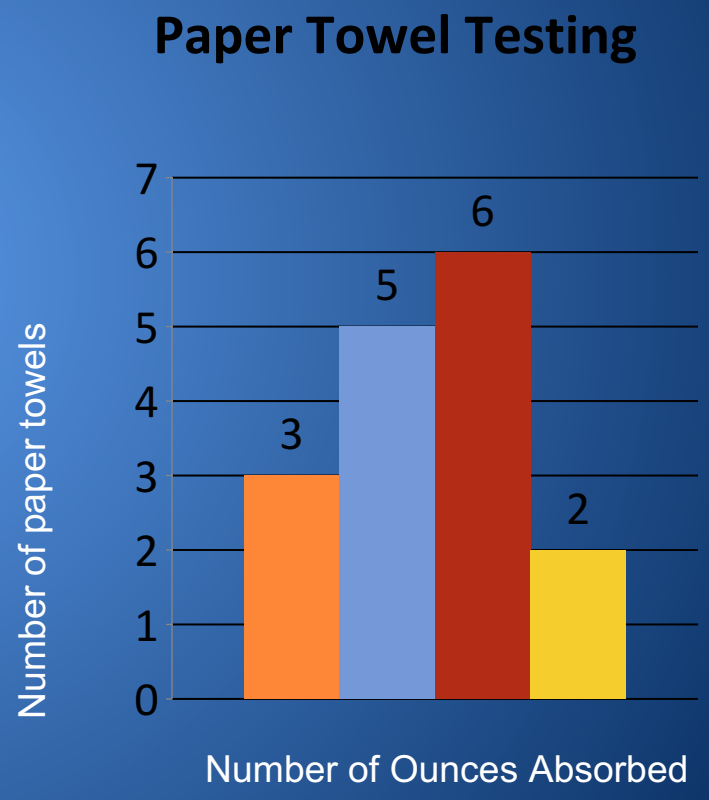
Types of Graphs:

Bar- Compares different things

Line- Shows progress over time

Circle- Parts of a Whole

Make sure title and subtitles are labeled.



Step 8: Conclusion and Abstract: Putting It All Together

What did you learn from the experiment?

Did you prove your hypothesis?

- Why-why not?

What problems did you have?

How is it applicable to real life?

What can the results be used for?

How can I use the knowledge I have gained from the experiment?

What would you do differently next time?

Final Step: Create a Backboard Display

- **This step is optional only if a student does not want to compete in the school fair. If the student would like a chance to compete at the school level and possibly the district level, a backboard display is required.**
- **The backboard should include all the components of the science and engineering project.**
- **See next slide for a sample backboard.**

Sample Backboard

The following is a suggested layout for your backboard. You need to make sure that the abstract is in the lower left hand side of the board.

QUESTION or PROBLEM

HYPOTHESIS

ABSTRACT

The abstract is the part in your project log in which you summarize the entire investigation.

RESOURCES CITED

TITLE and AUTHORS

The title should describe the work to the reader. Include the variables that are manipulated.

TESTING and PLANNING

PROCEDURES, VARIABLES, MATERIALS

This section should include three sections in sufficient detail so that others can repeat your research.

DATA and RESULTS

Describe the results clearly. Use graphs, tables, charts, and pictures to prove or disprove your hypothesis to help clarify the results. Include a discussion on the statistics you use to describe or test your data. Save any conclusions for the discussion.

CONCLUSION

A summary of your results. State whether or not your investigation supported your hypothesis or if any modifications need to be made to improve your prototype.

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