

Edison Elementary School

Science/STEM Fair

**Friday, November 17, 2017**

**S**cience, **T**echnology, **E**ngineering, and **M**athematics

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

*Either through scientific investigation or an engineering design project.*

**Research Plan and Investigation Report Forms**

Student Name/s: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Teacher: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Grade\_\_\_\_\_\_ Room\_\_\_\_\_\_\_

**Science/STEM Fair Contacts:**

**Jan Slama [jan\_slama@dpsk12.org](mailto:jan_slama@dpsk12.org)**

**Sydney Lambert [sydney\_thomas@dpsk12.org](mailto:sydney_thomas@dpsk12.org)**



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**Edison’s Science Fair Schedule**

**Friday, November 17, 2017**

7:45-8:30am Participants set up in gym

8:45-12:00 noon Judges view projects and talk with participants by grade level

12:30-3:15pm Classrooms visit the fair, some participants will discuss projects

3:30-5:30pm Edison Families and Community may visit the fair. All children must be accompanied by an adult during this time.

Grade levels will be called from class as judges are ready. Participants may be asked to stay with their projects for a small part of the afternoon to talk with visiting classrooms.

All projects must be taken home Friday at 5:30pm.



**Information and Important Dates…**

**\*\*Students may create an individual project or work in teams of 2-4 on a group project.**

As you research and design your project, be sure to complete each step of the packet you have downloaded or printed.

**October 23-November 3**- Sign-up for Science/STEM Fair open!

**Friday, November 3**-Sign-up deadline for participating in the fair!

**Monday, November 13**—Completed Science/STEM Fair packet is due.

\*The packet may be submitted electronically to Mr. Jan or paper packets may be turned into the office.

**Wednesday, November 15**—Last day to withdraw your intent to participate in the fair. Please withdraw your intent on Edison’s Enrichment site if you must withdraw.

**Friday, November 17**—Bring your project to the gym between 7:45-8:30 in order to set up. Your space will be at the tables designated by grade level. Look for your name placard and project packet. This will be your set up spot!

**Awards and Judging!**

* All projects receive a certificate and ribbon for participation!
* Judges are community members, parents, and students from Colorado School of Mines who are so excited to hear what you have learned from your research and investigation! Show pride in the work you’ve done!
* Three projects per grade level will be chosen to go on to Denver Public Schools’ District Fair**.** We will notify you if your project is chosen to go on to the district fair and will provide more information at that time!
* Edison’s Green Team will award one project from each grade level that focuses on energy or health related topics!
* Have fun!

We look so forward to seeing your hard work!

**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Teacher \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Grade level \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Room number \_\_\_\_\_\_\_\_**

**Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Science/STEM Fair Topics**

**What types of things do you enjoy in science? There are three different science categories your idea may fit into:**

**Physical Science:** Do you find yourself wondering why or how things work? If so then you might want to choose Physical Science for your category. Topic examples may include things about matter, electricity, magnetism, sound, light, or energy.

**Earth and Space Science**: Do you find yourself curious about our Earth or outer space? If so then this may be the category for you. Topic examples may include things about weather, geology (things that make up the Earth such as rocks, fossils or volcanoes), or our Sun, stars and planets. Just a reminder, a model is not an experiment, so be careful when thinking about your investigation.

**Life Science:** Do you like plants, animals or are curious about why humans behave certain ways? If so then Life Science may be the category your investigation could fall under. (There are special rules anytime you work with animals. Please talk to your teacher to ensure you are following any rules).

**Which category have you chosen to investigate? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Is this a Scientific Method Project? \_\_\_\_\_\_\_ Problem Based Engineering Project? \_\_\_\_\_\_\_**

**Research to Help Support Your Investigation**

After choosing your investigation category it is important to complete some research to better understand what your investigation is about. How do you complete research? You need to read! The information you gather while completing your research will assist in developing your hypothesis, designing your experiment or prototype (if applicable), collecting data, drawing conclusions, and communicating like a real scientist. Make sure to include at least the title, author, and date published or accessed.

Books or Articles about my topic:

Internet Websites about my topic:

People I talked to about my topic:



**Statement of Question I am Answering or Problem I am Trying to Solve**

**Once a category has been chosen and research has been conducted, begin to think about what type of question you are going to answer OR type of problem you are going to solve.**

Example(s):

* *Question I am going to answer:* “Which brand of diaper is the most absorbent?” This is a good question which would allow students to go through the scientific process manipulating only one variable; the type of diaper.
* *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 problem would allow the student to design a solution and test its effectiveness.

**My question I am going to answer or problem I am going to solve:**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**



**Hypothesis**

The purpose of creating your hypothesis is to identify what you think will happen based on research that was collected. The hypothesis needs to be worded as an “If… then…because” statement explaining the cause and effect relationship that is being investigated. Evidence from your research needs to be used to support and justify your thinking.

Example(s):

* *Question I am going to answer:* **If** I put 30mL of water in the Huggies diaper, **then** it will absorb the most water **because** Huggies diapers have an extra layer of polyfiber material.
* *Problem I am trying to solve:* **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.

If \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



**Testing My Hypothesis**

Now that you used some research to develop your hypothesis it is time to begin your investigation to help answer your question or solve your problem. The next few pages will help guide you in setting up and conducting your investigation.

**Materials:** What types of materials will be used to conduct your investigation? Make a list of them here using either words or pictures.

***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: This is the variable that will be changed in your investigation.*
* *Dependent: This is the variable that will show an effect in your investigation.*
* *Constants: These are all the things that will be kept the same throughout your investigation to make sure it is valid.*

***Example(s):***

*Question I am going to answer:* ***If*** *I put 30mL of water in the Huggies diaper,* ***then*** *it will absorb the most water* ***because*** *Huggies diapers have an extra layer of polyfiber material.*

* + *Independent variable: The different brands of diapers that are being tested (Huggies, Pampers, Luvs)*
  + *Dependent variable: The amount of water absorbed (measured using mL) by each brand of diaper.*
  + *Constants: temperature of the water, location in the diaper in which water is poured*

*Problem I am trying to solve:* ***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.*

* + - *Independent variable: The different types of materials tested to create the pocket casing.*
    - *Dependent variable: The number of shakes the pant pocket can withstand before losing its contents.*
    - *Constants: same pair of pants and sized pocket, same items placed in the pocket casing*

The **Independent Variable** that I will change in my investigation will be:

The **Dependent Variable** that will show an effect on my investigation will be:

The **Constants** in my investigation are:



**Procedure (Designing of My Investigation):** What steps will I use to carry out my investigation? It is very important that the steps in developing/designing your investigation are recorded precisely so another student can replicate the investigation.

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If I am *answering a question* do I need to draw a picture of how I will set up my experiment? **If I am *solving a problem,*  a labeled diagram of the proposed solution needs to be sketched here.**



**Data and Results**

When conducting your investigation it is important to collect some data (information) to help either prove or disprove your hypothesis. When you are collecting data please make sure to be as precise as possible in using labels, dates, and even pictures. Once you finish collecting your data it is important to record your data/results into a table and then organize it into a chart or graph to easily communicate your findings. Please use additional pages or a journal to record your data and organize it into charts, tables, and graphs.

**Data and Results collected over time:**

**Organizing my Data and Results into Charts, Tables, and Graphs:**



**Conclusion**

During your investigation you have learned many new things including whether or not you were able to prove or disprove your hypothesis. Your conclusion should be a summary of your results and state whether or not your investigation supported your hypothesis. Use the questions below to help guide you in sharing what you learned.

* Did your results support your hypothesis? Identify and explain the types of data you used to prove or disprove your hypothesis.
* What did you learn from the trials you conducted in your investigation?
* What types of problems did you encounter throughout your investigation?
* If you conducted this investigation again, what would you do differently?
* How does your investigation make connections to real life?

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**Abstract/Summary**

**The abstract is the part in your project log in which you summarize the entire investigation.** Remember to include things such as the questions you were trying to answer or problem you were trying to solve, hypothesis, procedure, data/results, and conclusions based on evidence collected.

Student Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Project Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

School: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Acknowledgements:**

Who helped you with your project?

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**Backboard Suggestion**

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.

|  |  |  |
| --- | --- | --- |
| Problem/Need  Hypothesis  Materials/Equipment    Abstract | **Title**    Procedure  Labeled Diagrams or  Pictures of Investigation or data as  it’s being collected | Data and Results      Tables and Graphs    Conclusion |

**Final Project Checklist!**

* page 5-Problem or Question is written.
* page 5-6-Hypothesis is written and variables are known.
* page 7-Procedure or Problem is thought out, performed and written.
* page 8-Charts, graphs, tables are created to show data. Use copies of these for your Project Board.
* page 9-Conclusion is written-addressing some or all ideas mentioned in bullet points.
* page 10-Abstract paragraph is written and explains your project.
* **If you need to withdraw your intent to participate, please withdraw by Wednesday, November 15, on Edison’s Enrichment site.**
* Monday, November 13-Packet is complete and turned in to office(paper form), or sent electronically to: [jan\_slama@dpsk12.org](mailto:cindy_stroschein-lucas@dpsk12.org)