

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

## **4<sup>th</sup> Grade Science Fair Project**

You have been assigned to complete a science experiment according to the scientific methods and STEM (science, technology, engineering, and math) that we have studied in class (stem.ocps.net).

### **Below are the following due dates:**

- Testable Question Due: **Friday, January 19<sup>th</sup>, 2018.**
- Research Due: **Friday, February 9<sup>th</sup>, 2018.**
- Rough draft Due: **Friday, March 2<sup>nd</sup>, 2018.**
- Final copy (Tri-fold Board) Due: **Monday, April 16<sup>th</sup>, 2018 \*Tentative to change if we are taking the FSA. We will send home notification if this date is changed.**
- **Science Fair: Tuesday, April 24<sup>th</sup>, 2018 at 6:30 pm.**

Your experiment must have the following:

1. A testable question – this means you must be able to have a test variable and complete an experiment in order to answer your question. You **cannot** do an activity or investigations which includes only making models or dioramas. This must be a true experiment with working models.
2. Research or data on the problem- what does the research say about the question or topic? (If you are investigating the effect of different fertilizers, you should research what plants need and how fertilizer effect plants.) Include a bibliography with at least 2 references (see below).
3. A hypothesis- MUST state what you think will happen and WHY. This information should be based off of your research (For example, I believe \_\_\_\_\_ because the research states \_\_\_\_\_ or If \_\_\_\_\_, then based on my research this \_\_\_\_\_).
4. An explanation of the experiment performed including your detailed procedure with materials, controlled variables and your test variable. (controlled variable-the parts of the experiment that don't change; test variable- the **ONE** part of the experiment that changes or is different)
5. Data collected -there MUST be a data chart! Remember that a data chart is not a graph. The data chart should be used to create a graph. Multiple trials should be conducted and averages should be computed. Make sure to complete **at least 3 trials.**
6. Graph of the data - Graph must include titles (graph title, x-axis title and labeled, y-axis title and labeled, key titled and labeled if needed), color and should be based on the data in the data chart. Make sure to include a key for the different trials or use the average for the graph.
7. A conclusion that explains if your hypothesis was supported or not and WHY (what did you learn BASED on your research and don't forget to refer back to your hypothesis)!

## **Procedure**

1. Do not hesitate to ask to use tools from the classroom at any time to begin your experiment early if you would like.
2. You may use the enclosed sheet to record all of your information.
3. The focus of this experiment is the process of doing a science experiment and **not** creating a fun model. Your experiment MUST answer a testable question and include data.
4. **The second part of this project will require you to create a tri-fold board of your experiment. You will want to plan on getting a tri-fold board and maybe taking some photos of you working on your experiment. For example, pictures of the experiment while you are conducting it.**
5. Choose a question that is personal to you but simple to explore. If you need an idea, check out <http://www.sciencebuddies.org>

## **Bibliography**

### **Books:**

Author's Last name, First name. Book Title. City of publication: Publishing company, Publication date.

### **Encyclopedia:**

Author's Last name, First name. "Title of Article." Title of Encyclopedia Volume #  
Date: pages used.

### **Magazines:**

Author's Last name, First name. "Title of Article." Periodical Title Volume #  
Date: pages used.

### **Websites:**

Author's Last name, First name. website address. Date of access.  
(If author is not available, then write the source of the website)

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

## Rough Draft

(This will be typed and placed on your tri-fold board)

Question:

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Research (based on your question):

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Hypothesis (Must reflect research):

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Experiment/Procedure (What did you do in detail? Describe your variables- controlled variable and test variable):

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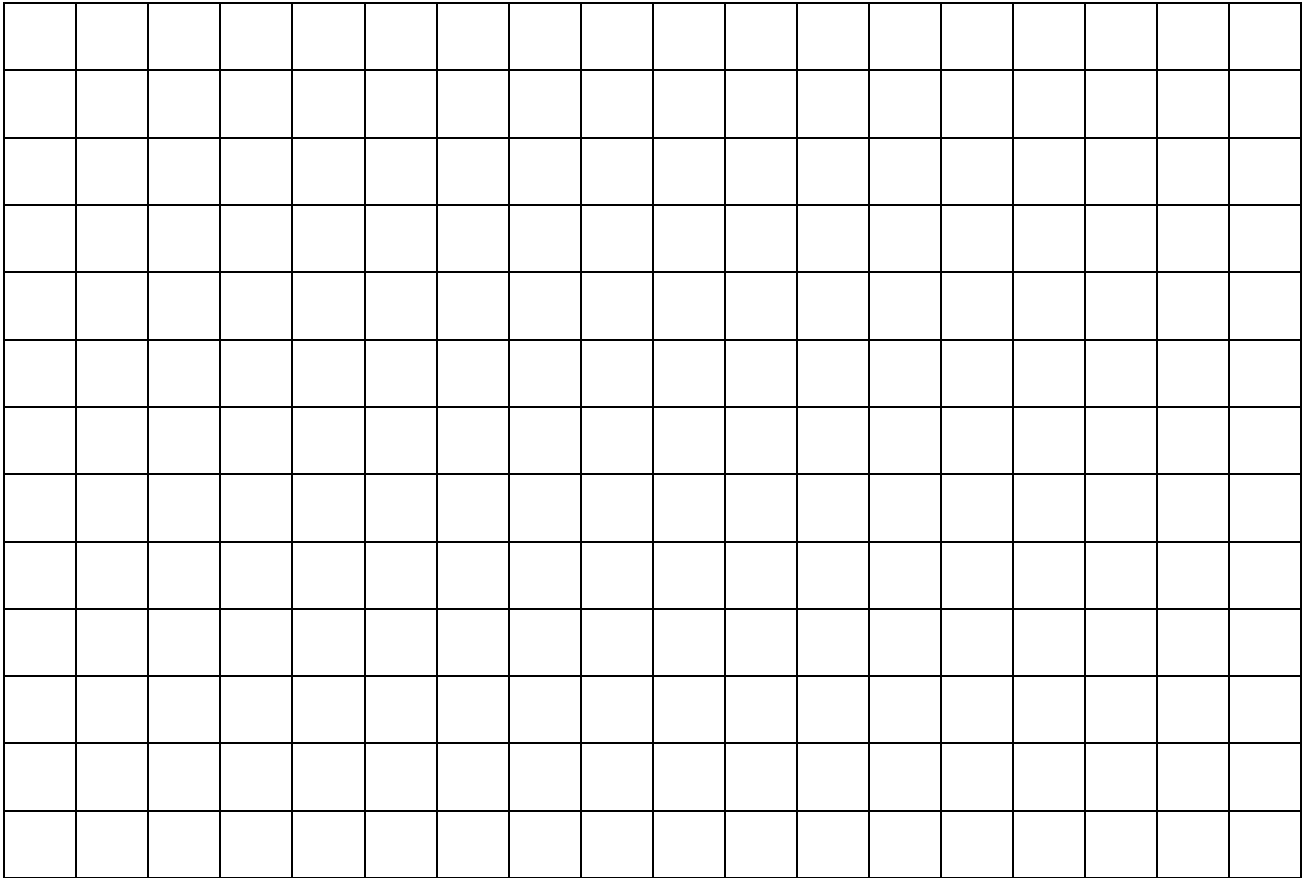
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Data:

(Test Variable)	Trial 1	Trial 2	Trial 3	Average

Graph (Use the numerical data in the chart above to make this graph)



Conclusion (must refer back to your hypothesis):

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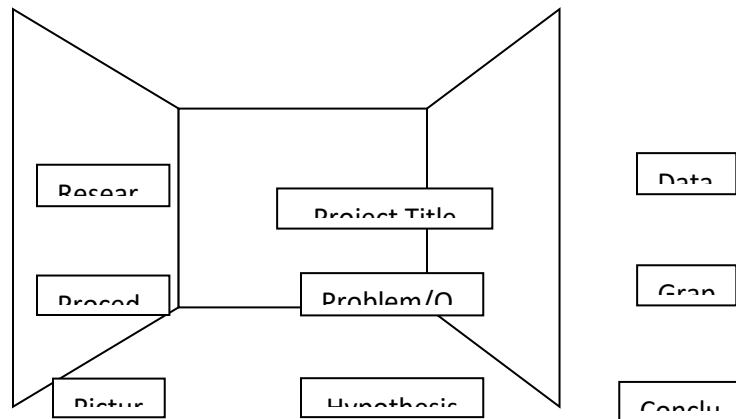
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Please use this display as an outline when completing your tri-fold board. Your board should be neat and colorful. Be creative 😊



Your tri-fold board will be graded as follows:

1. Title and Creativity
2. Testable Question
3. Research based on question and what is going to be changed. Make sure to summarize the research in your own words! **Points will be deducted if we feel that you have copied word for word or if bibliography is not included with at least 2 references.**
4. Hypothesis based on research. **Points will be deducted if research is not provided.**
5. Experiment/Procedure. **Points will be deducted if the procedure is not detailed, materials were not specified and controlled and test variable not stated.**
6. Data chart. **Points will be deducted if 3 trials were not completed.**
7. Graph. **Points will be deducted if the graph is not hand made, graph not titled, x-axis not labeled and titled, y-axis not labeled and titled, and data not represented accurately.**
8. Conclusion. **Points will be deducted if conclusion does not include whether the hypothesis was supported or not, why it was supported or not, and if it was not supported.**

# EXAMPLE

(You CANNOT use this one for the project)

## Question:

What type of chocolate melts faster, dark, milk, or white?

## Research (based on your question):

Different types of chocolate are used in different recipes and types of food. The most common chocolates used in recipes are Milk Chocolate, Semisweet Chocolate, and White Chocolate. All three types have the same ingredients, cocoa, cocoa butter, milk, and sugar, but each have different combinations to create the unique type.

## Bibliography (at least two)

Food Network. <http://www.foodnetwork.com/recipes/articles/just-the-facts-how-to-temper-chocolate.html>. 3/16/15.

Dolentz, Sueanne. <http://facts-about-chocolate.com/types-of-chocolate>. 3/25/15

Hypothesis (Must reflect research):

I believe that semisweet chocolate will melt faster, because my research states that semisweet chocolate is a combination of dark and milk chocolate and there are less ingredients in dark chocolate than milk or white.

Experiment/Procedure (What did you do in **DETAIL**? Describe your variables-controlled variable and test variable):

Test Variable: Type\flavor of Chocolate

Variables That Need To Be Controlled: Type of pan used for melting, brand of chocolate used, materials\temperature

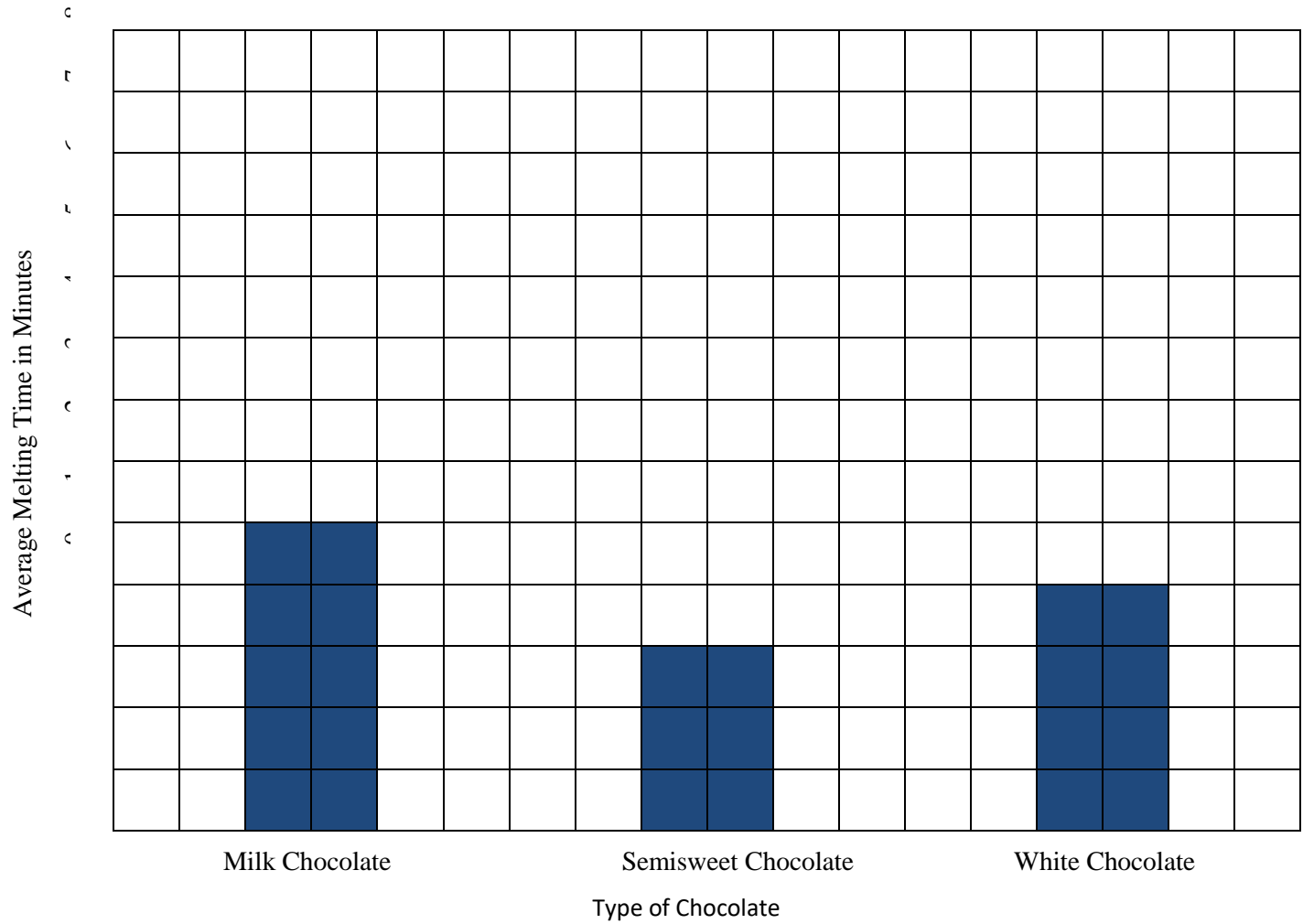
1. Gather all materials
2. Get double boiler ready (saucepan & glass bowl)
3. Prepare chocolate by chopping into small similar sized pieces
4. Weigh chocolate on digital scale – I will melt 4 oz of each type of chocolate
5. Measure 1 1/3 cups water and pour into saucepan and heat over low heat to a simmer
6. Place chopped chocolate in the glass bowl.
7. Remove saucepan from heat when simmer is reached. Take temperature of water.
8. Place glass bowl of chocolate over saucepan
9. Start timer
10. Observe melting chocolate, stir lightly with rubber spatula.
11. Record time when chocolate has changed from its original form or melted.
12. Wash and dry glass bowl and spatula. Empty water from saucepan.
13. Repeat steps 3 thru 12 4 times for each type of chocolate.

Data:

(Test Variable)	Trial 1 Minutes it took to melt	Trial 2 Minutes it took to melt	Trial 3 Minutes it took to melt	Average (add each trial then divide by 3- round to the nearest whole number)
White Chocolate	5	4	3	4
Semisweet Chocolate	3	3	4	3
Milk Chocolate	6	4	5	5

Graph (Use the numerical data in the chart above to make this graph)

Melting Chocolate



Conclusion (must refer back to your hypothesis-rewrite hypothesis):

My hypothesis that semisweet chocolate would melt the fastest was correct. In my experiment, 4 oz of semisweet chocolate melted in 3 minutes, while it took 4 oz of milk chocolate 5 minutes to melt and 4 minutes for 4 oz of white chocolate to melt.

# Science Fair Grading Rubric

Please attach this rubric to the BACK of your final trifold display.

Title and Creativity.....\_\_\_\_\_/5 points

Testable Question.....\_\_\_\_\_/5 points

Hypothesis.....\_\_\_\_\_/5 points

Research based on question.....\_\_\_\_\_/10 points

Experiment/Procedure.....\_\_\_\_\_/20 points

(You must do at least 3 trials, points will be deducted if there are less than 3.)

Data chart .....\_\_\_\_\_/ 20 points

Graph.....\_\_\_\_\_/20 points

Conclusion.....\_\_\_\_\_/15 points

**FINAL GRADE:** \_\_\_\_\_/100 points

\*Points will be deducted from each component of the project for misspellings, incorrect grammar, and if the project is turned in late. **(5 points deducted each day it is late)**



# Testable Question Due: Friday, January 6<sup>th</sup>, 2017.

This is a GRADE. Do NOT start your project until your testable question has been approved by your teacher.

Name \_\_\_\_\_

Testable Question:

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X \_\_\_\_\_

Parent Signature

\_\_\_\_\_ GREAT! Start working on your project!

\_\_\_\_\_ Please Try again

X \_\_\_\_\_

Teacher Signature

Testable Question (*If needed to redo*):

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X \_\_\_\_\_

Parent Signature

\_\_\_\_\_ GREAT! Start working on your project!

\_\_\_\_\_ Please Try again

X

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**Teacher Signature**