Name: _____ Class: _____ Date: _____

"THE SCIENTIFIC METHOD" MULTIMEDIA PROJECT

During the month of January, you and two lab partners will design a **science experiment** based on a "mystery" item that your group will select in class. Your lab group will be responsible for the following:

- coming up with a **scientific question** related to your item;
- doing **background research** on your topic;
- proposing a feasible, step-by-step **experimental design**;
- developing one or more correctly phrased ("If…then…") **hypothes(e)s**;
- designing one or more **data tables**;
- gathering all necessary **materials**;
- carrying out multiple "**practice runs**" of your experiment;
- carrying out multiple **experimental trials** (including data collection)
- averaging experimental results and graphing your data;
- stating **observations** and **inferences/conclusions** based on your graphs;
- discussing **sources of error** and **changes you would make** for future experiments.

Early parts of the project (scientific question, experimental design, hypotheses, data tables) will require both **individual** and **lab group written work** that will be turned in for credit. The final graded product, however, will be an **iMovie** made from **Flip Video** taken by your group throughout the various stages of your experiment that clearly shows the steps of the scientific method. Students also will evaluate one another's work within their lab group on a weekly basis.

Students will be trained in the correct use of the Flip camcorder, as well as techniques for uploading multiple video segments to iMovie, editing within iMovie, saving work, and exporting the finished movie. *Students will be expected to perform each of many different roles throughout the project: filming, presenting information, carrying out the experiment, and editing the movie on the mobile laptops*.

An approximate timeline for the project appears on the backside of this page ➔

Experimental Design Criteria

- Materials should be CHEAP and EASY TO GET
- No chemicals, no fire, no living organisms, no sharp objects
- Must be able to run experiment within a **limited space** in the classroom
- Must be able to run multiple practice "**pre-trials**" within **one class period**
- Must be able to run multiple "**experimental trials**" within **1 ½ class periods**

Available Classroom Materials

I can provide the following materials (or, if you need something specific, ask me!):

Lamps	Hot plates
Thermometers	Microscopes (standard light; stereoscope)
Glassware (beakers/test tubes)	Pipettes (eyedroppers)
Digital weigh scales	Rulers/metersticks
Hooked weights	Aluminum foil
Ring stands/clamps	Stepstool

Approximate Project Timeline

JANUARY 2011				
Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
3 **Project Assigned**	**4** **3 Experimental Questions**	**5** **Your Project Idea (include steps!) + Group Filming**	**6** **2 Hypotheses + Group Filming**	**7** **Materials; Film Exp. Q + Procedure**
10 **Individual Data Table Draft; Film Hypotheses**	**11** **Group Data Table Draft + Filming**	**12** **Experimental Pre-Trials + Filming**	**13** **Experimental Pre-Trials + Filming**	**14** **Experimental Trials + Filming**
17 **Experimental Trials + Filming**	**18** **Graph Data (graph posters) + Filming**	**19** **Observations & Inferences + Filming**	**20** **Film Final Graphs + Observations & Inferences**	**21** **Scientific Method Recap Worksheet + Filming**
24 **Film "Scientific Method Journey"**	**25** **Film Sources of Error; What You'd Change**	**26** **Editing Flip Video in iMovie**	**27** **Editing Flip Video in iMovie**	**28** **Editing Flip Video in iMovie**
31 **Editing Flip Video in iMovie (PROJECT DUE!)**				

Sample "Lab Partner Evaluation Rubric" (to be completed weekly)

Using this scale, evaluate the members of your group on the criteria listed.
1 (never) 2 (rarely) 3 (sometimes) 4 (usually) 5 (always)

Lab Partner Name:	_____Was their work of high quality? _____Was their work completed on time? _____Did they contribute ideas during group discussion? _____Did they offer assistance to other group members? _____Did they maintain a positive attitude during groupwork? _____Total
Comments:	

Lab Partner Name:	_____Was their work of high quality? _____Was their work completed on time? _____Did they contribute ideas during group discussion? _____Did they offer assistance to other group members? _____Did they maintain a positive attitude during groupwork? _____Total
Comments:	

Name: _____ Class: _____ Date: _____

MY Project Design Ideas

My group members: _____

My group's item: _____

3 possible Experimental Questions:

1).

2).

3).

Group's Chosen Experimental Question:

_____

_____

Group's Back-Up Experimental Question:

_____

_____

My Idea for an Experiment: *(write a short paragraph describing **your** experiment idea)*

My Idea for an Experimental Procedure (steps): *Be specific; start each step with a VERB!*

1).

2).

3).

4).

5).

6).

7).

8).

9).

10).

11).

12).

Group's Chosen Experimental Procedure: *Be specific; start each step with a VERB!*
1).

2).

3).

4).

5).

6).

7).

8).

9).

10).

11).

12).

Materials: *(that **I am responsible** for bringing to class)*

My Hypothes(e)s: *("If…..then….." format)*

1).

2).

Name: _____ Class: _____ Date: _____

GROUP Project Design

Group Members:

_____

Group's item: _____

Main Experimental Question:

_____

_____

Back-Up Experimental Question:

_____

_____

Overview of Our Experiment: *(short paragraph describing your group's experiment)*

Our Chosen Experimental Procedure (steps): *Be specific; start each step with a VERB!*

1).

2).

3).

4).

5).

6).

7).

8).

9).

10).

11).

Materials	Who Will Provide (student name, or "Teacher")
Flashdrive	

Our Hypothes(e)s: *("If…..then….." format)*

1).

2).

Observation	***Inference(s)***

Observation	***Inference(s)***

Observation	***Inference(s)***

Observation	***Inference(s)***

Name: _____ Class: _____ Date: _____

Individual Worksheet: Scientific Method Recap

1). Look at your "Scientific Method" diagram in your "My Project Design" handout. **Think about your group's journey through these steps.**

Q: *What steps of the scientific method proceeded "in order," or as expected, for your group?*

-
-
-
-
-

Q: *What steps of your scientific process DID NOT proceed "as expected"? EXPLAIN and BE SPECIFIC! (for example, did your group have to redo a step, such as go back and change your procedure? Did you have to run your experimental trials again for some reason?), etc.*

-
-
-
-
-
-

2). Describe any **sources of error** that your group experienced during your scientific method journey. Which of these were **human errors**? Which were **equipment errors**?

Human Errors	Equipment Errors

3). What would you do **differently** next time? Would you explore another aspect of your item? Would you change the variable? Would you change the procedure? Would you revise your hypothesis? EXPLAIN!

Group Members: _____

Group Worksheet: Scientific Method Recap

1). Look at your individual "Scientific Method" diagrams in your "My Project Design" handouts. **Think about your group's journey through these steps.**

Q: *What steps of the scientific method proceeded "in order," or as expected, for your group?*

-
-
-
-
-

Q: *What steps of your scientific process DID NOT proceed "as expected"? EXPLAIN and BE SPECIFIC! (for example, did you have to redo a step, such as go back and change your procedure? Did you have to run your experimental trials again for some reason?), etc.*

-
-
-
-
-
-

2). Describe any **sources of error** that your group experienced during your scientific method journey. Which of these were **human errors**? Which were **equipment errors**?

Human Errors	Equipment Errors

3). What would you do **differently** next time? Would you explore another aspect of your item? Would you change the variable? Would you change the procedure? Would you revise your hypothesis? EXPLAIN!