

Heating Project Planning Guide REVISION 11/27/17

Exam Review Today 11/29

See Handout for Quiz Topics, covered today and questions on Friday.

Exam: Monday 12/4

Heating topics

Risk Management: Strategies, Reason's Swiss Cheese Model

Data Analysis: Principles, Analysis of experimental data from Lab work

Engineering Design Cycle: 6 Steps

Data into Information

Report Due: Friday 12/8(5th period); Early +5%early, Late -5% 12/11

Individual Report

After completion of the lab work, each team member should have the 3 items listed in the table (Salt selection, calculations, experimental data sheet.) After that is completed, all report work is individual. Details in the table below.

(Rev 11/13/17)

Lab Trials: As soon as you are ready. Next week if ready . Last Date :11/29

Quiz 11/22 (Data Analysis, Risk Management, Foundation Concepts, Heat Calculations (see Review sheets),

Report Due: Wednesday December 12/6

Exam: Monday 12/4

Calculations Required for Heating Trial: (Pages 119-123)

1. Complete salt selection spreadsheet (express in J/g)
2. Complete heat requirement calculations (water, medicine, equipment, heat losses)
Use the worksheets on Pg 120,122,123 as a guide (Heat transfer data on Pg 122)
3. Calculate the amount of salt required for your first trial

Heat Calculation Review Worksheets:

Heat Calculations: Pg 103 #1,2,4

Conversions from moles to grams: Pg 109

Examples: Conduction: Pg 114, Convection Pg 116

Class Worksheet Handout "Heat Transfer Problems". Answers will be posted on web

Responsibility for Report Sections

Individual	Group
Introduction	Salt Selection Tables/Short Rationale/References
Concept Map	
Principles	Heat Loss Calculations/Data
Narrative of Salt Selection Process (more detail than rationale)	Dimensioned Drawings/Photographs
Narrative of Heat Loss Estimate	Calculation of Salt used for both trials
Revisions to Design /Construction Narratives	
Narrative of Tests	Experimental Results
Analysis of Results (see best practices)	
Project Evaluation	

Guidance for Individual Reports

The real question to keep in mind is can the reader understand what you thought, decided, and did so that they are in a position to concur or object.

Concept Maps:

Remember that concept maps are useful to help think about and visualize the project.

Individual Concept maps are required. These comments are based on the evaluation of the individual concept maps submitted for the rocket project. Most teams made good revisions for the joint report.

Show a clear and logical relationship for all of the technical parts of the project

Show relevant relationships with connecting words. Check for level of detail by thinking about the project

Emphasize the important relationships. Do not clutter your mind or the diagram with minor connections because two topics have a minor relationship. An excessive number of weak connections the diagram difficult to interpret.

Salt Selection Narratives:

The narrative should emphasize how the decision was made. The narrative should refer directly to the data in the table as weighed against the criteria used for the selection.

List your sources, especially note the sources that you used for the final decision.

Heat Loss Narrative:

Determination of the estimate for the heat loss was a process. Tell the story briefly of the thought processes and the effect on the design.

Analysis: Best Practices for Report

The Project Report Rubric outlines the specific sections required for the report. The details of the report may be below, meet or exceed requirements. **The evaluation weights of the rubric will be modified to put more emphasis on the analysis section.**

In Engineering, best practices are developed as a consequence of learning from experience and incorporating those lessons into future projects. In this case, students in previous classes have identified some best practices based on observations and analysis and took the initiative to go further. You are encouraged to be guided by this experience and add your own best practices to your report. Examples are shown below.

Examples of Best Practices for Precision Heating Project Reports

Effects of agitation on heating curve

Concept Map: Technical and Project Components

Graphs of Heating Curve

Comparison of Data in single plot or table to extract more information, differences noted

Insulators/Conductors described on molecular level

Comparison of efficiency for both trials

Quantitative data for salt selection

Relate agitation to heating curve

Literature basis for Quantitative estimate of heat lost prior to trials

Dissolution theory discussed in terms of polarity and bond formation

Recognition of the importance of the size of the outer container

Calculated estimate of heat absorbed by containers during temperature rise

Steps taken to improve group interaction

Consideration of Safety in salt selection

SI Units exclusive/Reasonable Significant Figures/Full Spell check

Pictures of Apparatus

Safety Considerations Recognized

Formats for data tables appropriate

Precision Heating Trial Slots F/17

Period #

Team #

Members:

Access the Labs is more limited this year. With the team, pick the slots that work best for the group. **Everyone may not be available. That is fine, as long as all observations are communicated to the other members.** If no slot works, I will arrange to have the trial done for your team and communicate the result. (Contingency plan must be submitted in advance)

Both trials will be done during the same slot.

Available Laboratory Periods: 30-40 minutes for first trial; 20 for second trial

Mon November 20

Team Members Available

6th				
7th				
8th				

Wed November 22

5th				
6th				
7th				

Monday November 27

6th				
7th				
8th				

Wed November 29

5th				
6th				
7th				
8th				

