PROJECT OVERVIEW

Name of Project:	**To Eat or Not to Eat?**	**Duration: 4 weeks**
Subject/Course: 7th math and science	**Teacher(s): Bush/Huizenga**	**Grade Level:7**
Other subject areas to be included, if any:	**Science and math (basic calculations & Scientific Process)**	

Project Idea Summary of the issue, challenge, investigation, scenario, or problem:	Students will learn the skills of variable, positive and negative number calculations, inductive reasoning and graphing and use them with the scientific method to make a connection to wise food choices.
Driving Question	How can we make wise food choices in our school cafeteria?
Content and Skills Standards to be addressed:	Order of operations, positive and negative numbers 7.NS.1, 7.NS.2, 7.NS.3, **S.IP.07.11** *Generate scientific questions* based on observations, investigations, and research. **S.IP.07.12** *Design and conduct scientific investigations*. **S.IP.07.13** *Use tools and equipment* (spring scales, stop watches, meter sticks and tapes, models, hand lens, thermometer, models, sieves, microscopes, hot plates, pH meters) appropriate to scientific investigations. **S.IP.07.14** Use *metric* measurement devices in an investigation. **S.IP.07.15** *Construct and interpret charts and graphs* from data and observations. **S.IP.07.16** *Identify patterns in data.*

		T+A	E		T+A	E
21st Century Skills to be explicitly *taught and assessed* (T+A) or that will be *encouraged* (E) by project work, but not taught or assessed:	Collaboration		x	Other:		
	Presentation	x				
	Critical Thinking:		x			

Culminating Products and Performances	**Group:**	Group presentation of problem and scientific method used to solve the problem – including calculations (Science Class) (Choice: poster, keynote, video)	**Presentation Audience:**	
			Class:	x
			School:	
			Community:	
	Individual:	Menu quizzes twice during the unit during math(Appetizer, Entrée, Dessert) Printed out Lab Report	Experts:	
			Web:	
			Other:	

PROJECT OVERVIEW

Entry event to launch inquiry, engage students:	**Jamie Oliver Food Revolution trailer. See detailed Science plans below for details of entry event.**				
Assessments	**Formative Assessments (During Project)**	Quizzes/Tests	x	Practice Presentations	**x**
		Journal/Learning Log		Notes	**x**
		Preliminary Plans/Outlines/Prototypes	x	Checklists	**x**
		Rough Drafts	x	Concept Maps	
		Online Tests/Exams	x	Other:	
	Summative Assessments (End of Project)	Written Product(s), with rubric: _____		Other Product(s) or Performance(s), with rubric: _____	x
		Oral Presentation, with rubric	x	Peer Evaluation	
		Multiple Choice/Short Answer Test	x	Self-Evaluation (maybe of presentation)	?
		Essay Test	x	Other:	

Resources Needed	**On-site people, facilities:**	Computer Labs
	Equipment:	Measurement tools, calculators, appropriate software
	Materials:	Depends on individual questions created by groups
	Community resources:	Dietician?, school cafeteria employees, parents

Reflection Methods	**(Individual, Group, and/or Whole Class)**	Journal/Learning Log		Focus Group	
		Whole-Class Discussion	x	Fishbowl Discussion	
		Survey		Other: gallery walk	x

Use inductive reasoning to draw conclusions and analyze data	➔	Give various types of patterns (pictures, numbers, words, etc) look for the pattern and find the next three. Advanced: make up own pattern and have someone else solve it.
Project:		**Course/Semester:**

Knowledge and Skills Needed by Students to successfully complete culminating products and performances, and do well on summative assessments		**Scaffolding / Materials / Lessons to be Provided** by the project teacher, other teachers, experts, mentors, community members
Generate Scientific Questions	➔	Look at pre-written questions and evaluate them. Practice writing good questions about food.
Design and Conduct Scientific Investigations	➔	Become familiar with Independent and Dependent variables by looking at other people's questions, graphs, data tables etc. Evaluate procedures. Write good procedures. Practice using the Scientific Process to answer a question with specific IV & DV
Collect and manipulate numerical data using the order of operations, and positive and negative numbers	➔	PEMDAS – Define, practice given problems, work with partner to make a problem, have the other solve
Use scientific and metric tools and devices to collect data	➔	Practice using the metric tools available (that relate to a group's Scientific question) to make accurate measurements
Construct and interpret charts and graphs	➔	Look at real-world graphs, and interpret. Construct graphs from data collected. Construct graphs from data that is given. Construct graphs from data by hand AND using technology.
Identify patterns in data	➔	Given various problems, students will use problem solving strategies to solve and then report out findings. They will use tables and graphs to make conclusions based on patterns.
Use inductive reasoning to draw conclusions and analyze data	➔	Give various types of patterns (pictures, numbers, words, etc) look for the pattern and find the next three. Advanced: make up own pattern and have someone else solve it.

PROJECT CALENDAR

Project:	**Start Date:**

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
PROJECT WEEK ONE				
See detailed plans below				
PROJECT WEEK TWO				
PROJECT WEEK THREE				

Lesson Design: Careful construction of lessons to remove barriers and provide assess for all students.	**Checkpoints:** Includes
Within our classrooms, a structure already exists for making learning universally accessible. We both regularly use strategies such as guided notes for students who have trouble with writing, note-taking, and organization, grouping by ability or diverse grouping, using simplified or more challenging problems, activities, and examples, based on student's understanding, manipulative, and creatively re-teaching during class time as necessary.	✓ Multiple ways to represent information ✓ Alternatives to text ✓ Support provided for text comprehension ✓ Flexible technology-based materials, strategies and tools ✓ Multiple ways for students show what they know ✓ Conspicuous supports for learning new strategies ✓ Mechanism for rapid feedback to learners ✓ Active student-centered methods ✓ Choice, Challenge, Novelty ✓ Connected, relevant learning
We would like to put more effort this year into providing students with more choices, letting students give input on their desire to help others or be helped by peers, having students describe their own learning styles and take it into consideration when teaching and grouping. These things will help our content to be more accessible to all learners.	

math

DAY ONE

intro: How can we use math calculations to help make healthy lunch choices?

Opening: Jamie Oliver food Revolution - show intro clip to catch students interest

Give students a list of food and calories served at lunch.

Discussion on what foods would be wise choices vs unwise? Why? What criteria are you using? Is there a way to prove that something is a healthier choice?

Have students calculate the amount of calories in various lunch choices including food, drinks and any snacks. It may be what they had for lunch or what they saw someone else eating or any combination they could put together for a meal. Allow students to work in groups and then report out. How were the calculations made. When did you use multiplication when did you use addition?

Transition into variable discussion. What variables are we dealing with in school lunch? (calories, cost, amount bought etc) How could you write an expression for 3 breadsticks? 8 breadsticks? an unknown amount of breadsticks?

Homework: Make a list of variables that determine what you eat, when you eat? Write an expression for the amount of calories in an unknown amount of pizza slices.

Day 2:

Report out on homework from the night before. Discuss how variables relate to math and how it is important to look for key words to determine their mathematical meaning for example plus means add, less means

subtract (etc)

Have students work in groups of 3-4 to fill out the sheet on words that have meaning for ADD,SUBTRACT, MULTIPLY, DIVIDE. Groups can report share their words and we will make a class list to hang in the classroom.

Discuss how to write expressions by identifying key words and using variables for unknown. This is similar to what we did yesterday when we wrote expressions for the amount of an unknown amount of breadsticks or the calories in an unknown amount of pizza slices.

Give various examples for students to work on. Have each group come up with one example of a word expression to share with the rest of the class. The class will write an expression for the other groups examples.

Day 3:

BEGIN ORDER OF OPERATIONS:

Opening activity for Order of Operations: Have two students get “dressed” using a different order of instructions provided.

Do the two individuals look the same? Why or Why not? Did the order matter? Is there a specific way we get dressed every day so that we don’t look ridiculous and have our underwear over our pants? Are there some things that we can do in any order and it doesn’t matter? (Example right leg then left in pants vs. left then right)

The same is true with order of operations. Give all students a problem to solve on their own. Compare the answers that students got. Why are the answers different? Shouldn’t we all get the same answer if we are solving the same problem? Why would it be important to have rules for how to solve a problem.

When we figure out healthy choices to eat why would order matter?

LECTURE:

Define order of opertations - Parentheses, Exponents, Multiplication/Division, Addition/Subtraction (PEMDAS)

Give various examples of various difficulty for students to practice with.

Why would it be important for our project to solve things in the same order?

Day 4:

WRITING and EVALUATING EXPRESSIONS:

Discussion/introduction: What is 8 more than 15? How did you get your answer?

How old would someone be if they were twice as old as you? How did you get your answer?

How old would someone be if they were twice as old as I am? (Students don't know my age so they would have to use a variable 2 x my age = 2 x a) Have students share how they wrote an expression for this.

Refer to the word list we made together and discuss what important words were in the above examples and what mathematical symbol we put in their place. With a partner have students write expressions for examples that I give them and share their answers with other partner groups.

As groups catch on have them move on to writing their own word problems and having their partner write the expression. Have groups report on things they noticed, things that were easily identifiable, and things that were confusing.

In your groups write word problems relating to calories and the school lunch and then report them to the class. Example How many calories would there be in 3 breadsticks, 2 pizza slices and a gatorade.

Day 5:

MORE ORDER OF OPERATIONS AND FORMULAS:

Show a clip from "The Biggest Loser" Introduce the idea of Basic Metabolic Rate, Body Mass Index, Resting Metabolic Rate, how many calories a person should take in based on there numbers.

NOTE: STUDENTS SHOULD NOT DEAL WITH THEIR OWN WEIGHT OR BMI TO AVOID AGE AND BODY ISSUES.

BMR:

Men: 66+ (6.23 x wt lbs)+(12.7 v ht in) - (6.8 x age yrs)

Women: 655 + (4.35 x wt lbs) + (4.7 x ht in) - (4.7 x age yrs)

Calorie intake:

Sedentary:	BMR x 1.2
Lt. Active (1-3 days exercise) :	BMR x 1.375
Mod Active(3-5 day exercise):	BMR x 1.55
Very Active (6-7 day exercise):	BMR x 1.725
Extremely active (training for race):	BMR x 1.9

Resting Metabolic Rate:

9.99 x wt in KG + 6.25 ht cm -4.92 x age yr + 166 x gender -161

GENDER: Male = 1 Female = 0

BMI = wt lbs x 703 / ht in

18.5 underweight
18.5-24.9 normal
25-29.9 overweight
30 or more obese

Practice in groups or with partner using formulas for various fictitious people.

DAY 6:

Continue with formulas and how they can use them in their group for our project.

Students goal for today is to decide how they will go about convincing people what would be healthy choices for lunch and why. They must come up with concrete examples and at the end of the class period be ready to report out what they have decided as far as what they think is healthy and how they are going to prove it using mathematics.

DAY 7:

+/- integers

Now that you have worked on your project why would it be important to have negative numbers as well as positive numbers. When would you use negative numbers? (Losing weight, burning calories)

What are other situations when you would use negative numbers. Have students brainstorm in their group and share their answers using post-it notes on the chalkboard. (Temperature, money, sea level...)

LECTURE:

Absolute Value: Definition, show it on a numberline, how do you represent it, absolute value symbols.

DAY 8-9:

ADDING/SUBTRACTING +/- numbers:

Use numberlines, flip chips, rules and examples to show how to add and subtract integers.

Practice using all manipulatives we have learned. PRACTICE, PRACTICE, PRACTICE!!

DAY 10-11
MULTIPLYING AND DIVIDING +/- numbers
Give rules, and examples.

Day 12-13:

Inductive reasoning and patterns:

Define “conjecture” and relate it to science and hypothesis. Give examples of patterns and have students extend the patterns.

Examples should use pictures, words, numbers. As students progress with finding patterns have them make their own pattern and try to stump the rest of the class

Are their patterns that you think you will be able to identify when doing your project? Discuss in your groups what kind of patterns you think you will find and how you will organize your data to find them.

Give students time to work on projects. Calculating BMI and calories and looking for patterns using their calculations and tables.

Day 14:

Coordinate graphing:

Lecture: Review graphing, quadrants, coordinates, axes (etc)

Have students work on projects to include their graph and find variables to graph to prove their pattern or support their project conclusion.

Day 15:

Students will share their projects with classmates using a gallery walk/presentation style format. Project results will be shared with their health teacher and principal.

Day 1:
Entry Event – Watch the trailer for Jamie Olliver's *Food Revolution* - http://www.youtube.com/watch?v=f8CF15HJJ-0. Students write down as many things as they notice in the trailer that pose a threat to people's health. We will share these health issues in a think/pair/share format. Students pair with another student at their table, share all ideas, and pick one as a team of two to share with the class. As groups share, I will write on white board. Then we will brainstorm other food-realted health concerns in a class-wide format. As students come up with ideas, they will add them to the White board. Students should write down the 4-5 most interesting things on the white board in their project journal (skinny column, "Food-related health issues" Fat column, the ideas from the white board.).
Introduce Driving Question – "Unveil" question, which will be located, covered up, somewhere prominent in the room. Identify (maybe by circling them on the white board) which of these food-related health problems can be connected to choices students make in our school cafeteria.
Groups – Put students into groups. This time it will be fairly random since it will be the beginning of the year. This is how I will learn about students and begin adding to their intro cards, which they will have created on the first day of school. The only NON random thing about this grouping is that I will attempt not to put more than one student with an IEP in each group. Groups will sit together at tables.
Team Building – Human letters. Outdoors in a field, I will call out a letter. Each group will have to form the shape of that letter with their bodies (4 people make 1 letter). They will have a specific amount of time to do it. If they make it before I say "freeze," they "pass." If not, they will "fail." Do this for 5 or 6 letters. Debrief: what were some of the skills you needed to use as a group to complete this activity well? How did it feel to fail? How did it feel to pass? Could you pass on your own, without your other group members? Highlight 21st century skills (refer to them if students are stumped during debrief).
Introduce contracts –

Day 2:
Complete Contracts – each group does this on their own. Get each other's info. Hand in to teacher. I will make copies. I will keep one copy and each group will have a copy for their group folder.
Introduce Project and concept of the class – discuss group roles, contracts, checkpoints, firing procedures, end product.
I Can Statements – Students read, mark one of the first 3 columns for each, put in personal folder.
Rubric 1 - Pass out rubric for checkpoint one (Scientific Question, IV & DV, hypothesis) – allow students to ask questions.
Need to know – chart paper – post in room when done.
Develop a Scientific Question - Brainstorm questions we can investigate with measurements or data collection regarding food in our cafeteria. Students can refer to topics written in their Project Journals yesterday if they wish to. Each student comes up with one question, decide as a group which one to share. Reveal that none of these questions are scientific and none would receive

points on the rubric. Pass out a worksheet with several questions. Some scientific, some not. Let students decide which ones they think are which aren't scientific. Share opinions as a class Reveal which are. Have students figure out what all of the scientific questions have in common (write these criteria in the Project journal). Now, they can rewrite their own individual questions to make them scientific. Check each others' be sure they are Scientific. *Extension activity* (if students are still struggling) – IV/DV Question template puzzles. Students who get it create the puzzle pieces using a topic that I give. Students who are struggling put the puzzles together.
IF TIME – DECIDE ON A QUESTION THE GROUP WOULD LIKE TO INVESTIGATE.

Day 3:
Question – Make a final decision as a group – Identify IV & DV within question– (give hints if necessary – IV, *I* change it, I decide the values, measurements and numbers. DV, the thing that is getting measured…the thing that changes BECAUSE of the IV, I do NOT decide the numbers, I have to figure out what they are.)
Rubric – Refer to rubric one (on screen), decide what still needs to be done (hypothesis).
Groups define hypothesis – 3-4 minutes as a group to discuss it (writer, timer, kindness police, researcher (only one allowed to look at anything) . Call on people with sticks to give their group's definition.
Good question and hypothesis on screen – students identify anything that is word for word in the hypothesis and the question.
Write Hypothesis – as a group - Gallery walk (sticky note, walk as group, rotate writers, I noticed (good thing), I wonder (thing to look at or change))
ReWrite Hypothesis each team member writes it in their own project journal.
Review "Need to Know" – as a class (or have individuals write down on a sticky note what they still need to know)

Day 4:
Try on your own as a group to get IV, DV, and CV in your individual Project Journals. Ask teacher individually if you have questions.
Catch up day if necessary – work with students in groups on their "need to knows" if there are any. Have high students help lower students. Puzzles available for questions. Lots of variables available (students can group them according to IV, DV or CV depending on the question they are given). Hypothesis puzzles available?
Students revisit their main "I can" sheet and fill in proof of knowing for 1-3.

Day 5: (Computer Lab)

Checkpoint 1! – Groups type up everything involved in checkpoint 1 in word, save and post to wiki? (wiki expert (2)– mess with wiki, figure out how to post things; typer – types up stuff that has been put together so far; reader – has info in Project journal to read to typer) Template on screen as they work. Teacher checks to be sure each group is done before passing out…
Rubric 2 – go over individually – as a group, come up with need to knows – put on sticky note?
Need to know as a class (poster paper)

Day 6:
Write procedures – for a simple task (sharpen pencil). Teacher follows them.
Hand back – rewrite as a group.
Try again – teacher
Give students procedures with something wrong (one per group). Have groups figure out what was missing or made it hard to follow. Write as a list on the board. (all instructions for same activity). Students copy list into project journal (skinny column - good procedures, fat column – list)
Make list – as a class of things that are necessary for a good procedure. (things to measure, set up, daily management, calculations, clean up, finishing, etc) Write categories in Project Journal. Try to have each group come up with 4 categories for THEIR OWN EXPERIMENT. Assign a category to each group member (groups can do this themselves – go over what to do if there is disagreement – poster on wall with this info?). This will be an INDIVIDUAL GRADE.
Begin writing – procedures for your part of the experiment on blank paper. (5-10 minutes alone)
Communicate – your part with the group. Decide on the order of the categories in your procedures. Trade with someone in your group and add to and adjust their procedures as necessary. Trade with someone else in group. Rewrite all your own steps if necessary after all additions.
Tape – all procedures together in order – store in someone's folder

Day 7: (computer lab)
Type up procedures - groups of 2 – two categories per pair. One typer, one reader. post to wiki. On your group's experiment page.
Materials List – still in groups of 2, go over the parts you typed, and start writing a list of all the things you will need to do each step in your procedure. *Include how many or how much of each thing.*
Get together – with other 2 people in group. Compile materials list. Type and post to wiki.

Day 8: Team Building Day/Data Tables

All Aboard – using bandanas. Each group receives a bandana. The whole team must stand on the bandana long enough to sing "row, row, row your boat." Teams then fold the bandana in half and try again. They will do this over and over again until they can no longer stand on the bandana. The group with the largest number of folds wins. Debrief using questions about communication.
Data tables - Have students look through magazines to find data tables. As groups find them, put them under the document camera. Individuals try to identify SCIENTIFIC question that led to the data in the table. (I will do the first one as an example). Then, identify the IV & DV. Now create a data table using your groups IV & DV.

Days 9-11:
work on experiment (independently within groups) – teacher is available to help with materials, research, and observing and giving feedback on communication, data collection, etc. Check out computer labs for each of these days and try to have more than one adult in the room. (maybe use breakout rooms between other classrooms?) On these days, the data table and data collected should be added to the wiki, so students will have everything they need for checkpoint 2.

Day 12:
Rubric 3 (analysis and conclusion)
Look over I can Statements
Need to know (new one) as class
Graph Hunt – Individual students find different types of graphs in magazines. Each group then chooses one graph that they have found (most interesting one). For that graph, one person identifies and writes the SCIENTIFIC question used in the experiment that led to the creation of the graph, another identifies the independent and dependent variables, another creates the data table that may have been used, and the last attempts to identify the type of graph used and other situations in which that type of graph may be useful.
Each group presents to either the whole class or at least one other group depending on time. It may be helpful for the teacher to take specific students and create a new group with them, using this time to show a teacher's choice example instead of asking students to come up with this on their own.

Day 13: (computer lab)
Making graphs – Students will receive a packet with instructions for creating a graph/chart in excel. I will give students various sets of data in tables and they will attempt to use the packet to create an appropriate graph. Each student should save each graph that they make for evaluation with the rubric. There will be a range of data sets, some making graph creation simple, others with more challenging data. They will be distributed according to student need.

As students finish, they can assist and explain to other students who are confused or struggling.
Evaluation of Graphs – peer evaluation using the rubric during the last 15 minutes of class. Students can have the last 10 minutes to make changes that align their graphs with the rubric according the evaluation of their peer. Students will evaluate the graphs of other students who are NOT in their own group. Turn in graph to my hand-in box at the end of the hour (filename = firstlastgraph.xls)

Day 14: (computer lab)
more graphing – finish up from day before – more interesting graphing challenges for successful students, more one-on-one help for struggling students.
make YOUR graph – students sit surrounded by members of different groups. They must use the packet to create a graph from their own group's data table. When finished, compare with other members of their own group. Identify what is missing from each person's graph, go around to each computer. Other group members give that student feedback on HOW to fix the graph, but no one may touch a student's computer except the student who created the graph.
Group chooses which graph is most conducive to experiment and adds it to the wiki from that student's computer.

Day 15: Conclusions
Someone else's experiment - Give your graph (printed from wiki), question, and hypothesis to another group. Develop a conclusion, using the rubric, to that other group's Scientific Process. As you go, write a list of questions that you have about parts of the conclusion that you cannot write. (scribe for questions, rubric keeper/reader, info keeper/reader, scribe for conclusion)
Groups ask questions of teacher or other groups –
Finish conclusions
Trade back – make any adjustments you need to on what the other group wrote for you.
Give to one group member to type and add to wiki before class tomorrow.

Day 16: (computer lab)
Checkpoint 3 - all parts of rubric three must be on the wiki document by the beginning of class today.
Rubric 4 –
Choose presentation format (as a group) – give a list of options, requirements are on rubric 4.
Individual Lab reports – individually copy from wiki, save to word document. Finish on own, hand in to hand-in box (file name firstlastreport1.doc)
Evaluate communication skills, peers, self

Day 17: (computer lab)
Create and practice presentation (groups divide up responsibilities on their own this time)
Day 19:
present – as a group (Look for a more applicable audience – parents? Food service staff? Administrators?)

Scientific Process Presentation Rubric – How can we make good food choices in our school cafeteria?

Score Levels	Content	Conventions	Organization	Presentation
4	▪ Project is well thought out and directly related to the scientific question ▪ IV & DV are apparent in EVERY section.	▪ No spelling, grammatical, or punctuation errors ▪ High-level use of vocabulary and word choice ▪ Checklist is complete	▪ Presentation is clearly focused in an organized and thoughtful manner that leads the audience the scientific process.	▪ Multimedia is used to clarify and illustrate the main points. ▪ Presentation captures audience attention. ▪ Presentation includes a live demonstration of what was done during the experiment
3	▪ Project is well thought out and mostly related to the scientific question. ▪ IV & DV are present, but not obvious.	▪ Few (1 to 3) spelling, grammatical, or punctuation errors ▪ Good use of vocabulary and word choice ▪ Checklist is complete with the exception of 1-2 items	▪ Presentation is mostly focused and organized in a logical manner	▪ Multimedia is used to illustrate the main points. ▪ Presentation captures audience attention. ▪ Presentation includes photographs, artifacts, or video footage of the experiment taking place
2	▪ Project is loosely related to the scientific question. ▪ IV & DV are missing from 1-2 sections ▪ Has some factual errors or inconsistencies	▪ Minimal (3 to 5) spelling, grammatical, or punctuation errors ▪ Low-level use of vocabulary and word choice ▪ Checklist is complete with the exception of 3-4 items	▪ Presentation has a focus but might stray from it at times. ▪ Presentation may confuse some audiences trying to understand the scientific process	▪ Multimedia loosely illustrates the main points. ▪ Presentation does not capture audience attention. ▪ Presentation includes a verbal description of what happened during the experiment or items similar to those used in the experiment.
1	▪ Project is not related to answering the scientific question or the question is not scientific. ▪ IV & DV are missing from 3 or more sections or are extremely unclear. ▪ Has significant factual errors, misconceptions, or misinterpretations	▪ More than 5 spelling, grammatical, or punctuation errors ▪ Poor use of vocabulary and word choice ▪ 5 or more items from the checklist are missing.	▪ Presentation is unfocused and haphazard. ▪ Presentation has no apparent pattern.	▪ Presentation appears sloppy, unrehearsed, and/or unfinished ▪ Multimedia is overused or underused. ▪ Does not capture audience attention. ▪ Presentation includes nothing related to the experiment.

Scientific Process Checklist 1

1. **Question** – (the problem you are investigating)
    a. ___Testable by YOU (you have access to the information and tools you will need)
    b. ___Correct format – How does (IV) affect (DV)?
2. **Hypothesis** – (a possible answer to the question)
    a. ___If/then statement that answers the question above
    b. ___Statement gives a specific prediction, a stand is taken
    c. ___A rationale is given for the hypothesis (If…Then…Because…)
3. **Experiment** – (what you **do** to see if your hypothesis is right)
    a. Variables
        i. ___ONE Independent Variable is correctly identified
        ii. ___ONE Dependent Variable is correctly identified
        iii. ___At least 5 Controlled Variables are listed

Scientific Process Checklist 2

1. **Experiment** – (what you **do** to see if your hypothesis is right)
    b. Materials
        i. ___All materials used are listed
        ii. ___Measurements are included where necessary (how many or how much of each material)
    c. Procedure
        i. ___Procedure is written as a numbered list of steps
        ii. ___Logical sequence
        iii. ___Enough information is included so another person could repeat your experiment EXACTLY (include how to construct items, how to set up the experiment, how to run the experiment, how to take any measurements, how to record and use the measurements, what to observe, etc)
        iv. ___Diagrams included if necessary
    d. Observations
        i. ___All observations are recorded in a data table
        ii. ___**Data table** is correctly labeled (one column should be the IV and the other the DV)
        iii. ___All data include units

Scientific Process Checklist 4

1. **Analysis** – (what does your data tell you about your hypothesis?)
    Includes a **graph**
    a. ___Appropriate type of graph is used
    b. ___Graph has a clear and thorough title which includes the DV & IV
    c. ___All data have units
    d. ___Both Axes are correctly labeled (one axis is DV & other axis is IV)
    e. ___The most important information from your data table is shown
2. **Conclusion** – (tells weather your hypothesis was right or wrong)
    a. ___My hypothesis was…
    b. ___Restate Hypothesis
    c. ___Refer to data to explain why hypothesis was right or wrong
    d. ___Reason(s) for error
    e. ___Next time I would…

Scientific Process Checklist 4

1. **Question** – (the problem you are investigating)
    a. ___ Testable by YOU (you have access to the information and tools you will need)– – 2
    b. ___Correct format – How does (IV) affect (DV)? –8
2. **Hypothesis** – (a possible answer to the question)
    a. ___If/then statement that answers the question above – 4
    b. ___Statement gives a specific prediction, a stand is taken –2
    c. ___A rationale is given for the hypothesis (if…then…because…) –4
3. **Experiment** – (what you **do** to see if your hypothesis is right)
    a. Variables
        i. ___ONE Independent Variable is correctly identified – 2
        ii. ___ONE Dependent Variable is correctly identified – 2
        iii. ___At least 5 Controlled Variables are listed - 2
    b. Materials
        i. ___All materials used are listed – 5
        ii. ___Measurements are included where necessary –2 (how many or how much of each material)
    c. Procedure
        i. ___Procedure is written as a numbered list of steps –2
        ii. ___Logical sequence –2
        iii. ___Enough information is included so another person could repeat your experiment EXACTLY (include how to construct items, how to set up the experiment, how to run the experiment, how to take any measurements, how to record and use the measurements, what to observe, etc) – 8
        iv. ___Diagrams included if necessary
    d. Observations
        i. ___All observations are recorded in a data table – 6
        ii. ___**Data table** is correctly labeled (one column should be the IV and the other the DV) – 6
        iii. ___All data include units – 3
4. **Analysis** – (what does your data tell you about your hypothesis?)
    Includes a **graph**
    a. ___Appropriate type of graph is used –2
    b. ___Graph has a clear and thorough title which includes the DV & IV –2
    c. ___All data have units –2
    d. ___Both Axes are correctly labeled –4 (one axis is DV & other axis is IV)
    e. ___The most important information from your data table is shown - 5
5. **Conclusion** – (tells weather your hypothesis was right or wrong)
    a. ___My hypothesis was… – 2
    b. ___Restate Hypothesis – 2
    c. ___Refer to data to explain why hypothesis was right or wrong – 2
    d. ___Reason(s) for error – 2
    e. ___Next time I would… - 2

___All **BOLD** steps above are numbered, labeled, and in order – 5
___Neatness – 5
___ Spelling & Grammar - 5
TOTAL = 100 points

GROUP CONTRACT
To Eat or Not To Eat

Members _____

Leader:

Task List

Everyone will be responsible for her own individual work, but group members should also provide help to any member in need.

Group Constitution

Forward: This contract is a binding legal document and governs the group until the assigned project deadline.

Article I: Absence Policy

a. If a group member will be absent on a day in which work is due, they must tell another group member a day in advance and have all work that they are responsible for turned in. All group members must stick to the provided agenda to have the assignments completed on time. If there will be an unexpected absence, the group member is to complete the work from home and email another group member (or contact them in another way) to let them know they will be gone for the day.

b. Group members will contact one another if they are absent for any amount of period during the time allotted for working on the projects.

c. If a group member is absent, it is the responsibility of the other group members to complete the tasks in class without the absent member. It is also the responsibility of the group to contact the absent member that day and let them know what new responsibilities or information they have acquired.

Article II: Work Policy

a. Group members may assist one anther with tasks and assignments. However, it is the responsibility of each group member to complete his or her individual work individually. Any group member who is found copying the work of another student, group, or any other source, or giving their work to another student or group to be copied will be subject to dismissal from the group and other consequences as deemed appropriate by the school handbook's policy on academic dishonesty.

b. If a group member is physically or mentally unable to complete their portion of the group's collective work, they may seek help from members of their own group. Group members are expected to help each other complete tasks in any way that does not fall under article II a.

b. Each group member will work to the best of their ability, making sure to complete all work up to standards, and by the appropriate deadlines.

c. If a group member commits plagiarism, they are solely responsible and incur the punishment on their own. The group will not be punished for one member's plagiarism unless they are deemed complicit in the plagiarism.

Article III: Leadership

a. At the beginning of the project, a leader will be voted upon democratically. If a group member is absent at the time of voting, they waive their right to participate in voting. The person who wins the most votes becomes the leader. If there is an unclear outcome (same number of votes for different people), the group will have no leader until one can be chosen by a revote.

b. By being elected leader, the person must perform the following duties:

1. Organize group meetings.
2. Create and enforce a group agenda to govern group progress.
3. Organize any out of school project efforts.
4. Provide communication between group members in order to help individuals work towards the project goal.

If they fail to perform these duties, or another person is also carrying them out, a revote may be taken to determine whether to obtain a new leader.

c. If a leader fulfills his or her duties, they will receive the 20 extra credit leadership points at the end of the project. At the deadline, the current group leader will receive these points, regardless of how long they lead the group for. If no leader has been assigned, a majority vote will decide who receives the leadership points.

Leader _____

Group contact info:

Member Name	Contact 1	Contact 2	Contact 3

Article IV: Work Ethics

a. If a group member does not complete work they were assigned, the punishment for the infringement will be of detriment solely to the group member at fault. No negative grading shall be given to any other group members.

b. At the end of the project, ‘hard workers’ will be designated by means of a democratic vote. The people voted as the top two will each receive the ten bonus points. If one candidate is voted as hard worker by a margin of 75%, they will receive 20 points. If there is a tie, the group will discuss and come to resolution or else no points will be granted to the disputed individuals.

Article V: Member Dismissal

a. The following conducts will result in a group member being able to be dismissed;

i. Incomplete or missing group work.
ii. Plagiarism or any form of cheating.
iii. If group member decides to leave under his or her own will.
iv. Poor, uncooperative attitude that hinders the working ability of the group

b. Any group member leaving under their own will be able to submit all their own work, while the other group members may not. Any group member fired for breaking any of the conducts under Article V-a (i-iii). will have their work taken from their possession to be used at the discretion of the original group, but not for the individual being fired. In addition, any fired member may not use any work completed by other group members, subject to punishment under Article 2-c.

c. If a group member leaves under the stipulation of Article V-a (iv), they retain all the work they have already provided for the group. The original group cannot use this work or it is subject to punishment under Article 2-c.

d. In order to properly dismiss a group member, the following procedures must be completed in order:
    1. One concerned group member must present their concerns to the group member up for dismissal. This must be documented by the concerned group member as “intervention 1.” The documentation should include the date, the name and signature of the concerned, the name and signature of the member up for dismissal, the nature of the concern, a plan made by both members to address the concerns, and a date on which the concern will be revisited. If, by the date agreed upon in the intervention, the concerned member deems the intervention ineffective, there will be a second intervention documented as “intervention 2.” It will contain the same information as intervention 1, but with a new plan.
    2. If, after two documented interventions, there is no change, then the third intervention will include the entire group and must also be documented. It can be documented as “intervention 3” and must contain all above information, but with a new plan.
    3. At this stage, a fourth intervention will take place, this time including the teacher as well as the entire group. The group leader will document this intervention as “intervention 4.” It must include all of the above information, a new plan, and the teacher’s signature.
    4. After an unsuccessful fourth intervention, the rest of the group will vote on the dismissal of the member. If a majority of the group votes to dismiss the member, that member is then “fired.” That member must start at the beginning of the project and work alone. All of the work they have previously done will be the property of the group (except in that case that a member is dismissed under Article V-a (iv)). Any work that the dismissed member would have done, will now have to be completed by the remaining group members. If a majority of the group votes NOT to dismiss the member, then the member will remain in the group. Any further concerns with that group member will need to begin back at step one of Article V-d.

Article VI: Signature

By signing this contract the following group members abide to the articles above. If any member fails to abide by the articles of this contract, they may be fired from the group using the procedures listed in Article V-d.

<u>Signatures:</u>

I Can Statements for Scientific Process

	BEFORE UNIT			AFTER UNIT			
	Don't Know	Unsure	Know	Don't Know	Unsure	Know	Proof of Knowing
1. I can identify and write a scientific question							
2. I can identify and write good independent, dependent, and controlled variables							
3. I can write a hypothesis using the If, Then, Because method.							
4. I can write a detailed list of materials, including measurements.							
5. I can write detailed procedures that would allow someone else to duplicate my experiment EXACTLY.							
6. I can create an accurate, labeled, titled data table and fill it with quantitative observations from my experiment, using the metric system whenever possible.							
7. I can write, in words, qualitative observations about my experiment.							
8. I can take the data from my table and show it using the appropriate type of graph that is appropriately labeled and titled.							
9. I can write a conclusion that restates my hypothesis, describes its accuracy using data, acknowledges reasons for error, and identifies opportunities for further research.							
10. I can present my project in a way that other students understand and show them something tangible that I used in my experiment.							
11. I can communicate effectively and kindly with my teacher and group members.							