



COURSE 1:

Food Production, Nutrition and Health

FOOD FOR THOUGHT



**food and
nutrition sciences**

PREPARATION FOR TOMORROW





CONTENTS

Project Overview.....	3
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Lessons

Day 1: What role does food play in your everyday life?.....	4
Day 2: (Project Roll-out) Do you understand our project?	6
Days 3-4: What do experts say about how we should eat?	8
Day 5: How do we categorize food?.....	12
Day 6: How do we represent data? How can we show numbers graphically?	14
Day 7: How much is a serving?	16
Day 8: How do diet and lifestyle contribute to energy balance? How do we calculate caloric needs?	18
Days 9-10: How do we track our eating?.....	20
Day 11: How does your eating compare to MyPlate’s recommendations?	24
Day 12: What does a consumer need to know about using a food diary?.....	26
Day 13: How should we present information to a group?	28
Day 14: How do we calculate mean responses? Why do we use mean responses?	30
Days 15-16: How well did your food tracking system work?	32
Days 17-18: Which components of each food tracking system worked well?	36
Days 19-20: How do you write a report on your food diary research?.....	39

Appendices

Appendix 1: Daily Bell-Work Journal	43
Appendix 2: Daily Exit Tickets	44
Appendix 3: Essential Question	45
Appendix 4: Research Notes.....	46
Appendix 5: Project Management Log: Team Tasks.....	47
Appendix 6: MyPlate	48
Appendix 7: Pie Chart Pre-Test	49
Appendix 8: MyPlate Pie Chart.....	52
Appendix 9: Intro to Pie Charts	53
Appendix 10: Calculating Daily Energy Balance	55
Appendix 11: Calculating Energy Balance	59
Appendix 12: Concept Map Rubric	62
Appendix 13: Food Diary Survey	63
Appendix 14: Calculating Means Pre-Test.....	64
Appendix 15: Calculating Means Practice	65
Appendix 16: Means Matching Slips	66
Appendix 17: Project Rubric.....	67
Appendix 18: Collaboration Rubric	68
Appendix 19: Project Presentation Audience Feedback.....	69
Appendix 20: Sample Research Report.....	70
Appendix 21: Research Report Outline.....	72
Appendix 22: Research Paper Rubric	73
Appendix 23: Self-Reflection on Project Work.....	74

Project Overview



CONCEPT/DESCRIPTION

- 1 Students compare personal eating habits to standard American diets. Students explain the impact of historical events on personal eating habits. Students discuss the cultural significance of food.
- 2 Students describe the purpose of the project. Students list the tasks and products related to the project. Students describe the project in one sentence.
- 3-4 Students list the recommendations for healthy diets. Students compare recommendations from different sources. Students examine careers in the field of nutrition. Students determine if sources of information are reliable.
- 5 Students define fruits, grains, dairy, vegetables, and proteins. Students assign foods to the categories used in USDA MyPlate.
- 6 Students create pie or circle charts based on given data. Students compare personal eating habits to those suggested by the USDA.
- 7 Students measure servings of foods from each MyPlate category. Students compare serving sizes of foods commonly served.
- 8 Students calculate calorie requirements for a variety of people in order to maintain energy balance. Students describe how different factors impact energy balance.



CONCEPT/DESCRIPTION

- 9-10 Students compare systems for tracking eating. Students develop a system to track food consumption.
- 11 Students create a pie chart representing eating habits. Students compare pie charts of their eating to the MyPlate pie chart.
- 12 Students identify necessary information for someone to follow their guide. Students develop a one page explanation of the diary and how to classify foods.
- 13 Students explain the structure of a presentation. Students describe the kinds of evidence that sway audiences.
- 14 Students calculate mean. Students explain why one uses mean responses. (Optional day depending on how students perform on pre-test)
- 15-16 Students analyze the results of their food tracking system survey. Students describe the benefits and drawbacks of their food tracking system. Students develop a presentation to the class and nutrition expert that explains their system and how it was received by the participants.
- 17-18 Students compare food tracking systems. Students demonstrate effective presentation skills.
- 19-20 Students write a research report based on survey results and feedback from presentations.



Key Question of the Day:

What role does food play in your everyday life?

(Each day the key question should be prominently displayed and used to open the lesson.)



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Compare personal eating habits to standard American diets.
- Explain the impact of historical events on personal eating habits.
- Discuss the cultural significance of food.



Required Materials

- Weekly Bell-Work journal – [Appendix 1](#) – One per student
- Daily Exit Slip – [Appendix 2](#) – One per student
- Research journals (blank notebooks or binders with lined paper. Binders work well so handouts can be added easily)
- Internet
- Flip chart
- Markers
- Computers (iPads will work too, or any device with access to the Internet)



Bell-Work

(Each day the Bell-Work question should be prominently displayed and used to open the lesson)

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- **“What role does food play in your everyday life?”**

OPENING

*(Designed to **prepare** students for learning. Students are prepared for learning by activating an **overview** of the **upcoming** learning experience, their **prior knowledge**, and the **necessary vocabulary**.)*

- Read the Bell-Work question and solicit responses from the students.
- Possible answers may include:
 - › Provide energy
 - › Sustain life
 - › Celebrations (e.g., birthdays, holidays, etc.)
 - › Social events
- Write the responses on a flipchart or somewhere visible in the room.
- Ask the class, **“How do these different roles affect the choices you make about the foods you eat?”** and briefly discuss their responses.
- Explain that even though food has a cultural and social significance, we ultimately need food to survive. But, it’s the foods that we eat and the choices we make that have more serious impacts, such as impacts on our health.

MIDDLE

*(Designed to provide a **structure** for learning that actively promotes the **comprehension and retention** of knowledge through the use of **engaging strategies** that acknowledge the brain’s limitations of **capacity and processing**.)*

- Distribute students’ research journals. Explain that they will use these for the remainder of the course to keep track of the research that they do and write reflections. Provide students with a format for research journal entries.

- ✓ **TEACHER TIP!** If there is a specific format you or your school uses for taking notes, feel free to use that with the research journal. Use a format that works best for you.
- Ask the class if they have ever seen an infographic. Explain that infographics are a fun, visual way to present information.
 - ✓ **TEACHER TIP!** Have an example of an infographic ready to show in case the response for having seen one is low.
- Explain that to create their infographics, each team will have to do a bit of research to compile supporting facts for the questions they are responding to.
- Ask the class, **“How do you know if a resource is reliable?”**
 - › Have a discussion about reliable sources and explain:
 - » *When it comes to websites, .edu and .gov are the best because they are sources that come from schools/universities and the government. Some .org websites are trustworthy, but not all.*
 - » *The first few websites listed at the top of the Google search are usually the most reliable.*
 - » *Consider the author. Is it a blogger? Is it a college professor? Is it a doctor? What is their background and purpose for writing the article?*
- Remind students that whenever they conduct research they must cite their sources. There are many formats for citing sources but for this course, we will use the APA (American Psychological Association) Format.
 - ✓ **TEACHER TIP!** As students work through all of the projects, they can refer to the Purdue Online Writing Lab (<http://owl.english.purdue.edu/owl/resource/560/05/>) for appropriate formats for different sources.
 - » *The following format should be used for web resources:*
 Author, A. A., & Author, B. B. (Date of publication). Title of document. Retrieved from <http://Web address>
- Divide the class into four teams. Each team will be assigned one of the following questions:
 - › What did you eat today (or this week/last week)?
 - › What impacts how you eat?
 - › How do most Americans eat?
 - › How have the eating habits of Americans changed over time?
- Give each team a flip chart (or allow them to have as many sheets of paper as they will need) and markers.
- Students will be responsible for answering the question posed to the team by creating an infographic. The infographic can include a combination of numbers, words, and/or images.
- Citations for references should be documented at the bottom of the page.
- When they are finished, each team should hang their papers somewhere in the room.
- Have a gallery walk giving each team one minute to visit and review each infographic.

CLOSING

(Designed to promote the **retention of knowledge** through the use of engaging strategies designed to **rehearse and practice skills** for the purpose of **moving knowledge into long-term memory**.)

- Provide each student with the weekly Exit Slip handout ([Appendix 2](#)).
- Students will turn in their Exit Slip for that day. They will respond to the following prompt: **“What similarities or differences did you notice between what we ate today and Americas eating habits?”**
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

(Project Roll-out)
Do you understand our project?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Describe the purpose of the project.
- List the tasks and products related to the project.
- Describe the project in one sentence.



Required Materials

- Project Scenario and Essential Question – [Appendix 3](#) – One per student
- All rubrics – [Appendix 17](#), [18](#), [19](#), [22](#), [23](#) – One per student



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- **“Based upon what you learned yesterday, what do you think is wrong with the American diet?”**

OPENING

10 minutes

- Read the Bell-Work question and solicit responses from the students.
- Debrief the infographic activity by revisiting each question and summarizing the key information about each. Lead into a discussion about the Bell-Work responses and the connection to what they learned the previous day.
- Explain that, **“Today, we will develop an understanding of the project.”**
- Using their notes from the previous class, each student will create a concept map (in research journals) that represents what he or she already knows about the American diet and eating habits, causes and consequences of poor eating habits, and the tools an individual can use to improve his or her eating habits.
 - ✓ **TEACHER TIP!** A concept map is a graphic organizer or diagram that shows the relationship between different ideas or concepts. This can take on any form. If there are specific concept maps you are encouraged to use within your school, this would be a great opportunity to integrate them.
- Students will swap concept maps with a classmate and each student will write a 3-4 sentence summary of what he or she knows about the poor eating habits from viewing his/her classmate’s concept map. Students should write these summaries on the back of the page that holds the map.

MIDDLE

35 minutes

- ✓ **TEACHER TIP!** Students will create a portfolio at the end of the project (on the last day) where they will compile the bodies of evidence they have created throughout the project. Remind students to save important artifacts as they complete different tasks throughout the project. Feel free to determine the best way

for students to create their portfolios based upon your particular situation (e.g., if your school/district has any specific requirements, etc.).

- Provide students with copies of the essential question and project scenario ([Appendix 3](#)).
- Provide students with copies of all rubrics.
- Instruct each student to use an INSERT strategy as they read the scenario. Place an “!” behind each sentence that surprises you; a “?” behind each sentence that you have questions about; an “*” behind each sentence you disagree with; and a line under each word you do not understand. (Add to or delete INSERTS as desired.)
- Next, have students pair together and share their INSERT marks. Provide time for discussion.
- Lead a discussion of the project as each group shares its questions, surprises, disagreements and needed definitions.
- Key discussion points should be summarized on the board or projected.
- Assign teams that the students will work in for the duration of the project.
- Have each team design a logo/graphic that represents the project as they understand it. Segments of the graphic/logo should include – tasks (which they believe should be accomplished), products, learning activities needed, etc., and any other segments the group might use.
- Teams should determine a name to go with their logo.
- Teams should share their logo and post them in the room. (This could be a gallery walk.)
 - ✓ **TEACHER TIP!** An option is to have teams initiate a **management log** at this time. They simply predict (anticipate) all of the activities and research they believe should occur in order to complete the project. This is reviewed and discussed as a class. The log provides the teacher with insight to the students’ understanding of the project and can help the teacher make adjustments to the instruction. This log should be maintained in conjunction with the research notebook and updated from time to time. At some point early in the project, the teacher should actually provide the students with a calendar of activities so the teams can “check off” completed tasks and plan for up-coming events. At the same time, teams should maintain and adjust original management log. Students should make adjustments without erasing their original plan so that they can track how their ideas about the project have changed.

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt: **“Write one sentence that could be used to describe the project to a friend.”**
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

What do experts say about how we should eat?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- List recommendations for healthy diets.
- Compare recommendations from different sources.
- Examine careers in the field of nutrition.
- Determine if sources of information are reliable.



Required Materials

- Computers
- Projector
- Journal articles about nutrition
- Internet access
- Nutrition texts (books, magazines, etc.)
- Research Notes – [Appendix 4](#) (make additional copies as needed) – One per student
- Project Management Log – [Appendix 5](#) – One per student
- Flip chart
- Markers



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- *“Based upon what you learned over the past few days, what do you think is wrong with the American diet?”*

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- As students share their thoughts, compile a master list on a sheet of flip chart paper.
- Have a brief discussion about their responses and ask why they felt the things they listed are a problem with the American diet.
- Explain that, *“Many people have opinions about what and how we should eat. We’re going to learn more about that today.”*

MIDDLE

40 minutes

- Pose the questions for the class, *“Who are the nutrition experts? What do the experts say about what and how you should eat?”*
- Students will work with their teams to research the advice they can find from nutrition experts.
 - › Have a brief discussion about nutrition careers and explain why students should pay attention to this information when researching recommendations from experts. Careers include nutritionist, registered dietician, doctor, etc.
 - ✓ **TEACHER TIP!** It’s important to highlight that a nutrition blogger may not be a reliable person to make nutrition recommendations if they are just a person with a blog. A nutrition blogger who is an actual registered dietician would have more credibility. So, the source of the information is key because anyone can make a recommendation, and we have to be able to determine what information is valid and credible versus what isn’t.
 - » *Each team will delegate members to conduct research in different ways (e.g., Internet, articles/books in your school library, textbooks in classroom, etc.).*

- » *Students should note these assignments on the Project Management Log Team Tasks (Appendix 5).*
- Each student will complete a Research Notes (Appendix 4) page for each source to be included in the team's research journal. They should also fill out each section of the Research Notes form.
 - Each team will brainstorm a list of search terms that they can use. Remind them that they can use these terms to for the index of a book, the library catalog, and an internet search engine. Circulate among the teams and allow each to begin their search when they have a good list of search terms.
 - Give students about 10 minutes to do an initial search.
 - When time is up, have a brief discussion, "**What is a trustworthy source? How do we decide?**" Talk about the agenda of the publishing agency, explain the peer review publication process (a group of scientists in a field read/review research before it can be published in a peer reviewed journal and decide if the research was done properly, adds to the field, and has merit), then have students re-evaluate their sources.
 - Teams should go through their Research Notes and highlight the sources they believe are trustworthy.

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt: "**List two characteristics of a good source of information.**"
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

(Continuation of Day 3)

What do experts say about how we should eat?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- List recommendations for healthy diets.
- Compare recommendations from different sources.
- Examine careers in the field of nutrition.
- Determine if sources of information are reliable.



Required Materials

- Computers
- Projector
- Journal articles about nutrition
- Internet access
- Nutrition texts (books, magazines, etc.)
- Research Notes – [Appendix 4](#) (make additional copies as needed) – One per student
- Project Management Log – [Appendix 5](#) – One per student
- Flip chart
- Markers



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- “*What questions do you have about the work we started yesterday?*”

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- This is meant as an opportunity to check progress and answer any questions the students might still have.
- Then, have students share questions within the team and develop a list of search terms for today’s work.
- Make research assignments for the day and have students record them in the Project Management Log Team Tasks ([Appendix 5](#)).

MIDDLE

40 minutes

- Create a class list on the board of sources that the teams have decided are trustworthy.
- Students will continue to work on their research.
- As part of their research, students should include a summary about the expert whose advice they are noting. Information about the expert should include a career summary with the following information:
 - › Job title
 - › Brief job description
 - › Educational background
 - › Any other career related information they can find about the person
- Once they seem to have enough information, students should develop a summary about the experts who provide the recommendations they gathered.
 - ✓ **TEACHER TIP!** Students can determine the best way to create the summary (e.g., written, bulleted list, etc.)

- Then, they should create a bulleted list of the eating recommendations they have found. Each bullet point should include the citation for where the information was found.
- This list will be used as a guide for the class for the remainder of the project. Students will refer to this list when they begin to develop their food diary.
- Once students are finished building their summaries and lists, have each team select one expert and one recommendation to share with the class. Be sure they share the career background for the expert.
- Have a discussion about the recommendations and whether or not they came from people who should be giving nutrition advice.
 - › Highlight the point that not all recommendations are credible. It depends upon the source and whether or not the person is qualified to be giving such advice.

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt:
“What is one eating recommendation you will try to follow this week?”
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

How do we categorize food?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Define fruits, grains, dairy, vegetables, and proteins.
- Assign foods to the categories used in USDA MyPlate.



Required Materials

- Samples of foods or their packaging from each category (e.g., protein, fruit, vegetable, grain, dairy – and foods that aren't in the categories – oils & fats, sugars)
- Internet access or printouts of the MyPlate graphic – [Appendix 6](#) – One per student
- Pie Chart Pre-Test – [Appendix 7](#) – One per student



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- **“What are the main categories of food?”**

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- Guide the direction of the discussion towards the main food groups.
- Distribute samples of food items around the room. Ask students to share a brief description of the food item that's handed to them on a scrap piece of paper.
- Students should share their descriptions of the food item with the class, along with the food group they think the food item belongs to.
- Explain that, **“Now that we know the recommendations for eating different categories of foods, we need to know which foods belong in each category and how much a serving is.”**

MIDDLE

40 minutes

- Ask the class, **“So, how can we classify these foods?”**
- Use a flip chart to create a poster of the MyPlate categories without labeling what the categories are.
 - ✓ **TEACHER TIP!** If you have a larger class, make two flip chart posters and divide the class into two teams. The teams can compete to see who can categorize the foods the fastest with the most correct.
- Organize the food packages/samples on tables around the room.
- Have students work together as a whole class to organize the foods/samples into the MyPlate categories where they think they belong.
 - › Students would be categorizing the foods at this point based upon their prior knowledge of food groups and the size of the MyPlate categories.

- Once they are done organizing all of the foods, students should develop a definition and description for each category.
- Post the MyPlate graphic and ask students, “How do your categories fit with the USDA’s?” Don’t provide definitions yet, just provide titles.
- Distribute copies of MyPlate ([Appendix 6](#))
 - › Students can write category definitions on this sheet.
- Share the USDA definitions of the categories and see if any adjustments need to be made to the ones the students created.
 - › Fruit: Any fruit or 100% fruit juice (e.g., fresh, canned, frozen, or dried)
 - › Vegetable: Any vegetable or 100% vegetable juice; sub-groups include dark green, beans and peas, starchy, red and orange, and other (e.g., fresh, canned, frozen, or dried)
 - › Grains: Any food made from wheat, rice, oats, cornmeal, barley, or other cereal grain; sub-groups include whole and refined
 - › Proteins: All foods made from meat, poultry, seafood, beans and peas, eggs, processed soy products, nuts, and seeds
 - › Dairy: All fluid milk products and many foods made from milk; calcium content is the key to being part of this group
 - › Oils: Fats that are liquid at room temperature (e.g., from plants and fish)
- Next, students should reorganize the foods as needed into the MyPlate categories.
- Ask the class, “**What foods are left?**” and discuss why some of the foods do not fit in the categories and what that means for their eating habits.
- After the discussion, distribute the Pie Chart pre-tests ([Appendix 7](#)).
 - ✓ **TEACHER TIP!** Do not “grade” these. Read them for correct concepts, procedures, and answers. These should not be returned to students; they will fixate on getting the right answer instead of developing understanding.
- Use the pre-tests to create homogenous pairs of students for tomorrow’s activities based on shared misconceptions.

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt: **“Refer to the MyPlate graphic and explain what it suggests about how we should eat?”**
- Collect the Exit Slip for the day as students leave the classroom.



Key Questions of the Day:

How do we represent data?

How can we show numbers graphically?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Create pie or circle charts based on given data.
- Compare personal eating habits to those suggested by the USDA.



Required Materials

- Copies of MyPlate – [Appendix 6](#) – One per student
- Internet access
- Pie chart pre-test – [Appendix 7](#) – One per student
- MyPlate Pie Chart Exercise – [Appendix 8](#) – One per student
- Pie Chart Traditional Math – [Appendix 9](#) – One per student



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- “*What is a pie chart?*”

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- After students share their responses, review the definition of a pie chart and explain what they are used for. “*What do we know about creating pie charts? How are they made? What decides how big each piece of the pie is?*”

MIDDLE

40 minutes

- Ask students to sit with the partners assigned the previous day.
- Give each pair a fresh copy of the pie chart pre-test ([Appendix 7](#)) to work through together.
- Circulate to monitor groups’ progress.
- When you feel that most of the misconceptions have been addressed, bring the class back together as a whole group.
- Have students work through Pie Chart Traditional Math ([Appendix 9](#)) individually.
- Review the problems when everyone is finished.
- Next, students will create a pie chart based on MyPlate.
- Distribute MyPlate Pie Chart Exercise ([Appendix 8](#)) and allow students to work with a partner to check their work. Boys and girls will have different pie charts.

CLOSING*5 minutes*

- Students will turn in their Exit Slip for that day. They will respond to the following prompt:
“Summarize what you learned about using pie charts for organizing data.”
- Collect the Exit Slip for the day as students leave the classroom.
- For Homework: For the next three days, students will keep a food diary on the chart “Food Diary.” They will record each meal using the chart and measuring foods by cups. Tomorrow they will work with their team to develop simple visuals to represent the correct amounts of foods.



Key Question of the Day:

How much is a serving?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Measure servings of foods from each MyPlate category.
- Compare serving sizes to the sizes of foods commonly served.



Required Materials

- Food serving containers from a variety of restaurants or food products (e.g., cups, bowls, plates, chip bags, etc)
- Measuring cups and spoons
- Water
- Rice (or other dry food product such as cereal)
- Scales
- Post-It notes



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- ***“How do you decide how much of something you should eat?”***

OPENING

10 minutes

- Read the Bell-Work question and solicit responses from the students.
- Put out serving containers from a variety of restaurants or packaged foods.
- Have students measure how much liquid or dry food fits in the cup or package.
- Give each team a few serving containers and have them measure how much the containers hold.
- Students should write the amount the container will hold on a post-it, attach the post-it to the container, and put it back in front of the room.
- Ask students to share their reactions to the test they conducted.

MIDDLE

35 minutes

- Each team will take a few of the containers and determine which category of food each container holds.
 - › For example, cups at fast food restaurants usually hold soda which is considered sugar, french fries are a starchy vegetable and oils, etc.
- Compare the amount of food the containers hold to the amount of food suggested by MyPlate.
- Each team will present their containers to the class and explain how many servings they contain and of what category.
 - › For example, if it contains three cups of grains, how many meals worth of grains is that according to MyPlate?

- After each team has presented, allow each team to create a meal from the food options given. The meal does not have to come from the same establishment (if using containers from local restaurants).
- Teams should research the calories in their meal and drink. Some restaurants print the calorie counts and nutritional information on the packaging while others have it available online.
- Each team will create a display for their meal that shows the packaging, a pie chart of the meals categories (as done yesterday), and a calorie count.
 - › To determine the calorie count, simply add the calories for each item together to find the total.
- Once each team is done, have students rotate so that they are working with a new food display. They will respond to the question, ***“Is this a good meal? Why or why not?”***
- Bring the class back together and discuss their findings. Take a poll to determine how many of the meals were good (healthy) options and how many were not good options.
- Allow the discussion about the meals options that aren’t healthy lead to the question, ***“What is a calorie?”***
- Explain that, ***“We’re going to learn how to measure calories scientifically. We know that food labels list calories per serving and we hear people talking about calories but what are they and why do they matter?”***
- In their research journals, students should take the last few minutes of class to write a reflection on the following prompt, ***“What do we overeat? What do we under-eat? Why do we overeat some foods and under-eat others?”***

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt: ***“What does fast food do to our diet?”***
- Collect the Exit Slip for the day as students leave the classroom.



Key Questions of the Day:

*How do diet and lifestyle contribute to energy balance?
How do we calculate caloric needs?*



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Calculate calorie requirements for a variety of people in order to maintain energy balance.
- Describe how different factors impact energy balance.



Required Materials

- Flip chart
- Markers
- Energy Balance Lab – [Appendix 10](#) – One per student
- Calculators
- Scales (students to weigh selves)
- Energy Balance Scenarios – [Appendix 11](#) – One per student
- Concept Map Rubric – [Appendix 12](#) – One per team



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- “What is a calorie? Make a list of everything you know about calories.”

OPENING

5 minutes

- Read the Bell-Work question and ask students to swap with a neighbor and add to each other’s list (1 minute).
- Swap back and discuss the findings as a class (1 minute).
- Share the definition of calorie: A calorie is the amount of food having an energy-producing value of the amount of heat required to raise the temperature of one kilogram of water one degree Celsius. In other words, it’s a measure of the energy in a food item.

MIDDLE

40 minutes

- Transition to the “Building a calorie balance equation” activity:
 - › Post the definition of calorie balance on a flip chart somewhere in the room
 - » *Calorie Balance = The mathematical summation of your caloric intake and energy expenditures*
 - › Working with a partner, students should list all of the ways that they expend calories in a normal day.
 - › Have students share their responses with the class and create a master list.
 - › Ask the class, “How can we account for all of these?”
 - › Write the following words on the board. Students will use these terms to create an equation:
 - » *Calorie balance*
 - » *Food ingestion*
 - » *Basal (or resting) metabolic rate*
 - » *Work or exercise metabolism*
 - › Have students work in their project teams to create an equation on a sheet of flip chart paper.
 - » *Remind them that equations can include addition, subtraction, multiplication, and division.*
 - › Each team will post their equation on the wall somewhere in the room.

- › Take a few minutes for students to look at them for similarities and differences.
 - › Ask students to think of their calorie balance as a bucket of calories. What pieces of the equation would add calories to the bucket and what pieces would subtract? Revisit and revise the equation to arrive at a class equation:
 - » *Calorie Balance = Calories Ingested – Basal (resting) Metabolic Rate – Working or Exercise Metabolic Rate (cardiorespiratory endurance ratings)*
 - › Students remain with their partners while you distribute Appendix 10 and give students a few minutes to weigh themselves.
 - › Walk through the first calculation – converting pounds to kilograms – with students. Students work with their partner to complete the rest of Part I.
 - › What does a resting metabolic rate mean to us? Watch: <http://www.youtube.com/watch?v=OJOIXjrV4qo>. Discuss:
 - » *Why are we using a calculation instead of a test? Is an approximation ok?*
 - » *What is a resting (or basal) metabolic rate? What does it include?*
 - » *What isn't included in a BMR (or RMR)? Evoke a list of things that students do that are not considered in a basal metabolic rate.*
 - » *What happens if we only eat enough calories to meet our needs for a basal metabolic rate?*
 - › Students will complete Part II on their own over the next few days. They should keep it in their research journals.
 - › Review the directions for completing it with the students and ask them to keep track of their levels of activity the next few days.
- Next, students will create a concept map on a sheet of flip chart paper to summarize what they learned about calorie balance. It should include the concepts discussed in the equation.
 - › Students may work with a partner for this activity.
 - ✓ **TEACHER TIP!** Use the concept map rubric ([Appendix 12](#)) to evaluate the concept maps.

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt: ***“How do basal metabolic rate and working metabolic rate relate to a person’s calorie balance?”***
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

How do we track our eating?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Compare systems for tracking eating.
- Develop a system to track food consumption.



Required Materials

- Computers
- Internet



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- “How do people know how much they have eaten in a day?”

OPENING

5 minutes

- Read the Bell-Work question and ask students to swap with a neighbor and add to each other’s list (1 minute).
- Swap back and discuss the findings as a class (1 minute).
- Share the definition of calorie: A calorie is the amount of food having an energy-producing value of the amount of heat required to raise the temperature of one kilogram of water one degree Celsius. In other words, it’s a measure of the energy in a food item.

MIDDLE

40 minutes

- Transition to the “Building a calorie balance equation” activity:
 - › Post the definition of calorie balance on a flip chart somewhere in the room
 - » *Calorie Balance = The mathematical summation of your caloric intake and energy expenditures*
 - › Working with a partner, students should list all of the ways that they expend calories in a normal day.
 - › Have students share their responses with the class and create a master list.
 - › Ask the class, “How can we account for all of these?”
 - › Write the following words on the board. Students will use these terms to create an equation:
 - » *Calorie balance*
 - » *Food ingestion*
 - » *Basal (or resting) metabolic rate*
 - » *Work or exercise metabolism*
 - › Have students work in their project teams to create an equation on a sheet of flip chart paper.
 - › Remind them that equations can include addition, subtraction, multiplication, and division.
 - › Each team will post their equation on the wall somewhere in the room.

- › Take a few minutes for students to look at them for similarities and differences.
- › Ask students to think of their calorie balance as a bucket of calories. What pieces of the equation would add calories to the bucket and what pieces would subtract? Revisit and revise the equation to arrive at a class equation:
 - » *Calorie Balance = Calories Ingested – Basal (resting) Metabolic Rate – Working or Exercise Metabolic Rate (cardiorespiratory endurance ratings)*
- › Students remain with their partners while you distribute Appendix 10 and give students a few minutes to weigh themselves.
- › Walk through the first calculation – converting pounds to kilograms – with students. Students work with their partner to complete the rest of Part I.
- › What does a resting metabolic rate mean to us? Watch: <http://www.youtube.com/watch?v=OJOIXjrV4qo>. Discuss:
 - » *Why are we using a calculation instead of a test? Is an approximation ok?*
 - » *What is a resting (or basal) metabolic rate? What does it include?*
 - » *What isn't included in a BMR (or RMR)? Evoke a list of things that students do that are not considered in a basal metabolic rate.*
 - » *What happens if we only eat enough calories to meet our needs for a basal metabolic rate?*
- › Students will complete Part II on their own over the next few days. They should keep it in their research journals.
- › Review the directions for completing it with the students and ask them to keep track of their levels of activity the next few days.
- Next, students will create a concept map on a sheet of flip chart paper to summarize what they learned about calorie balance. It should include the concepts discussed in the equation.
 - › Students may work with a partner for this activity.
 - ✓ **TEACHER TIP!** Use the concept map rubric ([Appendix 12](#)) to evaluate the concept maps.

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt: “Based upon the research you conducted today, list the components of a good food diary?”
- Collect the Exit Slip for the day as students leave the classroom



Key Question of the Day:

(Continuation of Day 9)
How do we track our eating?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Compare systems for tracking eating.
- Develop a system to track food consumption.



Required Materials

- Computers
- Internet



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- **“What can you conclude so far about the food tracking systems that are available for consumers?”**

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- Have a brief discussion about the different systems that are available and the pros and cons of the different resources.
- Explain that, **“Today, you will continue your research and begin to develop a system for tracking eating that aligns with our master list of guidelines. As you develop your food diary, the system can be completely original or it can be a compilation of pieces your team likes from existing systems. The goal is to create a system that will be the most effective tool for the consumer.”**

MIDDLE

40 minutes

- Teams will continue their research on the food tracking systems.
- Students should compare each system to the class recommendations list to determine if/how the system is meeting those guidelines.
- Students should be creative about how they develop a system that can easily be used throughout the day to monitor their eating habits.
 - › The tracking system should include a way to track calories in order to determine if their calorie intake hypothesis were accurate.
- By the end of the class period, each team should have a prototype of their food tracking system and should be able to provide an example to show how the system is used to track food.
 - › Explain that a prototype is a preliminary model of something that can help to test a concept.
 - › Students should plug in an example of food consumption for a day in order to demonstrate how their tracking method works.

- Visit each team to check progress and review their examples. Once they have teacher approval on the prototype, bring the class together and have each team share a brief summary of the prototype and why they created it the way they did.
 - › Students should ask questions and share any input for each team that might be helpful as they move forward with creating the final version.
- After the presentations, students can proceed with implementing any edits and planning for the final version.

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt: ***“How do you think your food tracking system will help consumers in comparison to the resources that already exist?”***
- Collect the Exit Slip for the day as students leave the classroom.
- Homework: Students will use the food diary to track their consumption for the next 24 hours. Students should bring this with them to class the next day, as this data will be used to help them evaluate the validity and accuracy of their food diary before giving it to participants to use.



Key Question of the Day:

How does your eating compare to MyPlate's recommendations?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Create a pie chart representing personal eating habits.
- Compare pie charts of personal eating habits to the MyPlate pie chart.



Required Materials

- Team food diary



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- ***“What conclusions can you make about your food diary entries for the past 24 hours?”***

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- Next, ask the class to share any surprises about their food tracking experience from the past 24 hours.
- Ask students to take a look at their food diaries to confirm that they know which MyPlate categories their tracked food items belong to.
- Explain that, ***“Now that you’ve had an opportunity to test out the usability of your food tracking system, let’s see where the food items you tracked fall in accordance with the MyPlate guidelines. From there, we’ll focus on finalizing the design of your tracking systems.”***

MIDDLE

40 minutes

- Students refer to their food diary entries from the past 24 hours.
- Average the amount of each food category you’ve eaten at each meal. Choose one meal and use its averages to create a pie chart.
- Using the steps used earlier to create pie charts, create a pie chart that reflects the average for each food category.
- Discussion:
 - › What is the problem with using a pie chart here?
 - » *Pie charts always show categories as parts of a whole, it doesn’t matter how big the “whole” is as long as all of the pieces add up to 100%*
 - › What if you eat all of the categories in the correct proportions but eat much more than you should?
 - » *The pie chart will look good but you will have eaten too much*

- › What will happen?
 - » *You will not have energy balance even though you have eaten the correct proportions*
 - › So what should we do?
 - » *Monitor calorie balance and MyPlate to eat the right amount of food and the foods that are good for us*
 - › Which tool is easier for you to use? Why?
- Give students about five minutes to meet with their teams to discuss how their food diary worked. They should document notes about any changes they would like to make in their research journals.
 - Ask students to take a look back at the number of calories they hypothesized they would consume in the 24 hour timeframe.
 - › In their research journals, each student should write a reflection about what they learned about their perceptions of what they ate in comparison to what they actually ate in a day.

✓ **TEACHER TIP!** Since this can be a sensitive topic, don't ask students to share their answers. If having a class discussion about this, focus on the lessons learned about the importance of being aware of food consumption.

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt:
“Are you eating a balanced diet? Why or why not? How can you tell?”
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

What does a consumer need to know about using a food diary?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Identify necessary information for someone to follow their guide.
- Develop a one page explanation of the diary and how to classify foods.



Required Materials

- Team's Food Diaries – 20 copies per team
- Food Diary Survey – [Appendix 13](#) – 20 copies per team
- Computers with access to Word or other word processing program



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- ***“What message do you want consumers to know about why they should use your food diary system?”***

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- After hearing the responses from the students, ask the class, ***“Why do we need to provide clear instructions and background information about using your food diary system?”***
- Explain that, ***“The last step in finalizing your food diary system is to create instructions for how to use the system. Clear instructions are critical so that the consumer understands the purpose of the tool and its intended use.”***

MIDDLE

40 minutes

- Students should meet with their project teams and develop instructions for using their diary. Be sure to clarify amounts and classifications of foods.
- The instructions should be no more than one page.
- This should also be the final opportunity to make any changes necessary to the diary, since the next step is to distribute it for people to use.
- Next, each team should develop a plan for distributing their diary to at least 20 people who will use it track consumption for 2 days.
 - › Each participant will need a copy of the diary, the instructions, and a copy of the Food Diary Survey ([Appendix 13](#)).
 - ✓ **TEACHER TIP!** The easiest way to do this would be to find as many health classes as you have groups of students and have each class do one group's diary for 2 days. The teacher will have to make copies of the food diaries for each team in time to distribute before class tomorrow. They will collect them again before class on Day Fifteen. Be sure to tell the participants when the surveys will be collected.

CLOSING*5 minutes*

- Students will turn in their Exit Slip for that day. They will respond to the following prompt:
“What are your hopes and expectations for sharing your food diary with the participants?”
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

How should we present information to a group?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Explain the structure of a presentation.
- Describe the kinds of evidence that sway audiences.



Required Materials

- Mean Pre-Test – [Appendix 14](#) – One per student



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- **“What are the qualities of a good presentation?”**

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- Capture the student’s responses and have a brief discussion about why it’s important to understand how to deliver a proper presentation.
- Explain that, **“Today we are going to explore the qualities of a good presentation so that you have the tools needed to prepare for your presentations about your food diaries.”**

MIDDLE

40 minutes

- Explain the steps of preparing for a good presentation:
 - › Develop an outline
 - » *Ensures good flow and completeness*
 - › Develop a good hook
 - » *Spark audience interest*
 - » *Give a reason to listen*
 - › Focus on one key point at a time
 - › Maximize slide impact
 - » *Keep minimum amount of text, maximum size*
 - » *Use other visuals with words*
 - » *Avoid clutter*
 - › Involve the audience
 - » *Ask them questions*
 - › Include all required components
 - › Summarize the main points at the end
 - › Assign roles within the team
 - › Practice, practice, practice!

- Following this discussion, teams will develop an outline for their presentation to the class and nutrition expert.
 - › Remind them that their purpose is to use the evidence they are collecting about their food diary and the diary itself to convince the class and the nutrition expert to select their diary to be used for the rest of the year. They must use their background research on healthy eating habits and the data they collect in their surveys to support their stance about their food diary.
- Students can use PowerPoint, Prezi, or other similar means to create an electronic visual for their presentations.
- For the last 5 minutes of class, distribute the Mean Pre-Test ([Appendix 14](#)).

✓ **TEACHER TIP!** Review this pre-test before class tomorrow to identify common errors and misconceptions and create homogenous pairs for tomorrow based on misconceptions. Do not score and return pre-tests; they are just to inform you about the students' existing knowledge.

- Students will complete the pre-tests and turn them in.

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt: ***“List the characteristics of a good audience member.”***
- Collect the Exit Slip for the day as students leave the classroom.



Key Questions of the Day:

*How do we calculate mean responses?
Why do we use mean responses?*

(Optional, cut if class does well on pre-test and go to Day 15)



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Calculate mean.
- Explain why one uses mean responses.



Required Materials

- Calculators
- Calculating Means Practice – [Appendix 15](#) – One per student
- Calculating Mean Slips – [Appendix 16](#) – One per student



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- *“In mathematics, what is the mean?”*

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- Capture responses on the board.
- Put students in their assigned homogenous pairs and give each pair a set of Calculating means slips ([Appendix 16](#)).
- Give students time to match the calculated means or equation to the correct set of numbers.
- Monitor groups and allow students to work until they have worked through some of their misconceptions.
- Explain that, *“As we prepare to receive the survey data about our food diaries, we need to understand how to calculate the mean so that we can accurately analyze the data and draw conclusions.”*

MIDDLE

40 minutes

- Provide the definition, “A mean (\bar{x}) is a numerical average. It tells you the average of a set of numbers. To calculate it, you take the sum (\sum) of all of the numbers (x) in a set ($\sum x$) divided by the amount of numbers in the set (n).”

$$\text{Equation } \bar{x} = \frac{(\sum x)}{n}$$

Example 1:

You have mowed lawns for the neighbors for several months and earned a different amount each month. You want to know the mean amount of money you have earned each month based on the following earnings:

MONTH	AMOUNT EARNED
April	\$55
May	\$80
June	\$130
July	\$130
August	\$110
September	\$75

Equation:

$$\bar{x} = \frac{(55+80+130+130+110+75)}{6} = \$100$$

- Students complete Calculating Means Practice (Appendix 15) with their partner.
- Explain the following, ***“Let’s try an example from your survey data. Each item on your survey has a numerical answer. Your participants circled a number under the headings Strongly Disagree to Strongly Agree for each item. You can calculate an average for each item to determine, overall, how your participants felt about the item.”***
- Have one team read you the numerical responses to one item from all of their surveys and write them on the board.
- Ask each student to write out their equation based on the given numbers. Check with a neighbor.
- Visit each team to check their equations as they work out any differences with their partner.
- Have students calculate the mean and have each pair post their equation and answer on the board.
- Work through the equations and answers together to show them the correct equation and answer.
- Have each team break into pairs or threes. Assign one pair/threesome the even numbers from their surveys and the other pair the odd numbers and have them calculate the mean score for each of their assigned items.
- Return to whole groups and check their answers with the other pair/threesome.
- Match these scores to the category (Strongly Disagree to Strongly Agree). These are the scores students will use in their presentations about their food diary.
- Use a few examples from the groups to demonstrate for the class. (e.g, A mean score of 4.2 means that the student agreed with the statement that the diary was easy to use).

CLOSING*5 minutes*

- Students will turn in their Exit Slip for that day. They will respond to the following prompt: ***“What does a mean score represent? Why do we use mean scores to summarize data?”***
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

How well did your food tracking system work?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Analyze the results of the food tracking system survey.
- Describe the benefits and drawbacks of the food tracking system.
- Develop a presentation for the class and nutrition expert that explains the system and how it was received by the participants.



Required Materials

- Surveys collected back from students who participated in the food diary test
- Calculators
- Computers
- Internet



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- *“What are you expecting to see today for the results of the study?”*

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- Have a brief discussion about the overall predictions students made about their results.
- Explain that, ***“Today we are going to analyze the data on the surveys and integrate that information into your final presentations.”***

MIDDLE

40 minutes

- Each team must calculate the mean scores for each question on the survey and respond to the following questions:
 - › Which items on your survey (about the food tracking system) had the highest mean responses?
 - › Which items on your survey had the lowest mean responses?
- Once the calculations are complete, each team should add their mean scores to their presentation. They must explain what the mean scores for each indicate about their food tracking system. For example, if the mean score for all items about ease of use was a 4 or higher, participants agreed or strongly agreed that the tracking system was easy to use.
- Visit each team as they work to determine what their mean scores indicate about each item.

- Post the following on the board as a guide:

\bar{x} RANGE	RESPONSE
0 - 1.49	Strongly Disagree
1.4 - 2.49	Disagree
2.4 - 3.49	Neutral
3.5 - 4.49	Agree
4.5 - 5	Strongly Agree

- Remind students that their presentation must include a discussion of these survey results. Each team must address which components of their tracking system work well and which need changes. They should draw conclusions and make recommendations about the changes they would make.
- Any remaining time in the class period should be focused on teams finalizing their presentations.

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt:
“How do you feel about the results of your data? Do you agree or disagree with the findings of the study?”
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

(Continuation of Day 15)

How well did your food tracking system work?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Analyze the results of their food tracking system survey.
- Describe the benefits and drawbacks of the food tracking system.
- Develop a presentation to the class and nutrition expert that explains the system and how it was received by the participants.



Required Materials

- Computers
- Internet
- Project Rubric – [Appendix 17](#) – One per team
- Collaboration Rubric – [Appendix 18](#) – One per team



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- **“What clarification do you need to finish up your presentations?”**

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- Answer any questions the students still have about their presentations.
- Explain that, **“This is the last day you will have in class to work on finishing up your presentations.”**

MIDDLE

40 minutes

- Have computers available for students to work on their presentations.
- Teams should work to complete their presentations.
- Remind them to review the project description and the presentation rubric to ensure that they are addressing the entire project.
- If any teams finish early, ask to see their work to assess progress.
- Then, as teams finish, ask them to complete the collaboration rubric ([Appendix 18](#)).
- Each team should provide an electronic copy of the presentation to you before the end of the day.
 - ✓ **TEACHER TIP!** Even if students are going to make changes for homework, they must give you what they have at the end of the class. This will eliminate issues at the start of the presentations if someone on a team is absent or can't log into a computer. You'll have a copy available to work from.

CLOSING*5 minutes*

- Students will turn in their Exit Slip for that day. They will respond to the following prompt:
***“What is your role in the team’s presentation?
Are you ready for it?”***
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

Which components of each food tracking system worked well?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Compare food tracking systems.
- Demonstrate effective presentation skills.



Required Materials

- Computers
- Project Presentation Audience Feedback – [Appendix 19](#)



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- *“List two questions you can ask each team about their food diary.”*

OPENING

5 minutes

- Read the Bell-Work question and but don't solicit responses from the students. The questions should be saved for the presentations.
- Review the qualities of a good audience before the presentations begin.
- Introduce the nutrition expert guest and review presentation procedures (time limits if you've set them, who may ask questions, completion of peer reviews) before the first team presents. It is suggested to determine order of presentation by random draw.

MIDDLE

40 minutes

- Each team presents.
- As each team finishes their presentation, students in the audience should ask their questions.
- After the question and answer session, the students in the audience should complete the presentation rubric ([Appendix 19](#)).
- Students should also write, in their research journals, which components of the team's tracking system they think worked well and should be considered for the final product.
- If there is time at the end of the class, following the presentations, each team should meet for five minutes to compare individual notes about the other teams' tracking systems. Each team should have a shared list in their research journals of the components they think worked well. They will refer to this information the next day.

CLOSING*5 minutes*

- Students will turn in their Exit Slip for that day. They will respond to the following prompt:
“Explain a new fact about food tracking that you learned from the presentations today?”
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

(Continuation of Day 17)

Which components of each food tracking system worked well?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Compare food tracking systems.
- Select components of food tracking systems that worked well.
- Develop a food tracking system to use for the rest of the course.



Required Materials

- Computers
- Project Presentation Audience Feedback – [Appendix 19](#) – One per student



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- *“List three things you can do during the presentations to show your classmates respect?”*

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- If the class is large enough to continue presentations today, introduce any guests, review the presentation procedures, and remind students to have their questions ready to ask each team when they are finished.

MIDDLE

40 minutes

- Complete presentations and peer evaluations.
- Solicit feedback from your expert(s) to begin class discussion about the components of each system that worked well.
 - › Teams may refer to their notes.
- The students will work with the expert to revise their tracking system based on components from the teams' work. They do not have to represent each team's work in the final product.
- Students will write a reflection in their research journals responding to the following questions:
 - › How do you feel about the final food tracking system?
 - › How well do you think it will work? Why?

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt: *“List at least one component or attribute of another team's food diary that you would like to incorporate into yours.”*
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

How do you write a report on your food diary research?



Estimated Time

One 50-minute class period



Learning Objectives

As a result of this lesson, students will be able to:

- Write a report based on their research.



Required Materials

- Computers
- RMIT Sample Research Report – [Appendix 20](#) – One per student
- Research Report Outline – [Appendix 21](#) – One per student
- Report Rubric – [Appendix 22](#) – One per student



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- **“What are the key components of a research report?”**

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- Make a list of responses on the board.
- Have a brief discussion about the expectations for the research report.
- Explain that, **“Now that we have received input from the expert, the final step is to update the food tracking system and create your final report on the entire development process.”**

MIDDLE

40 minutes

- Distribute RMIT Sample Research Report ([Appendix 20](#)) to the students.
- Students should read the document and underline the components of the report that they think are important.
- Add these to the class list.
- Share with students the Research Report Outline ([Appendix 21](#)).
 - › Remind students about APA format citations and have them use the sample research report to format headings.
 - › Give students remainder of day nineteen and all of day twenty to complete their reports.
- Students should consider the feedback they received on their surveys and from their peers and the nutritionist during their presentation, and address the following questions in their reports.
 - › What pieces of the food diary you created worked well?
 - › What pieces should be changed? Why?

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt:
“What surprised you about people’s reactions to the food diary? What did you think would work better/worse?”
- Collect the Exit Slip for the day as students leave the classroom.



Key Question of the Day:

(Continuation of Day 19)

How do you write a report on your food diary research?



Estimated Time

Two 50-minute class periods



Learning Objectives

As a result of this lesson, students will be able to:

- Write a report based on their research.



Required Materials

- Computers
- RMIT Sample Research Report – [Appendix 20](#) – One per student
- Research Report Outline – [Appendix 21](#) – One per student
- Report Rubric – [Appendix 22](#) – One per student
- Self-Reflection Form – [Appendix 23](#) – One per student



Bell-Work

- Provide students with the weekly Bell-Work sheet ([Appendix 1](#))
- *“What questions do you have about your reports?”*

OPENING

5 minutes

- Read the Bell-Work question and solicit responses from the students.
- Answer any questions the students have about the research reports.

MIDDLE

40 minutes

- Students should have the rest of this class period to continue working on their research reports.
- Share with students the Research Report Outline ([Appendix 21](#)).
 - › Remind students about APA format citations and have them use the sample research report to format headings.
 - › Give students remainder of day twenty and day twenty-one (if needed) to complete their reports.
- Students should consider the feedback they received on their surveys and from their peers and the nutritionist during their presentation, and address the following questions in their reports.
 - › What pieces of the food diary you created worked well?
 - › What pieces should be changed? Why?
- When students are finished with their reports, they should complete the self-reflection form ([Appendix 23](#)).
- Next, students will collect their evidence for this project and add it to their portfolio with their captions and descriptions for each item. Portfolios are due to the teacher at the end of the day.



- The portfolio should include a description and explain that items from each project will be added to the portfolio on the final day of each project and that students will have time to write a reflection statement for each project.

ITEM	DESCRIPTION

CLOSING

5 minutes

- Students will turn in their Exit Slip for that day. They will respond to the following prompt:
“What is the most important message you learned from completing this project?”
- Collect the Exit Slip for the day as students leave the classroom.



Daily Bell-Work Journal

MONDAY

DATE _____

TUESDAY

DATE _____

WEDNESDAY

DATE _____

THURSDAY

DATE _____

FRIDAY

DATE _____



Daily Exit Tickets



DAY EXIT TICKET Name: (First, Last) _____
 Date: _____ Period: _____

Topic: _____



Continue your answer on the back if necessary

DAY EXIT TICKET Name: (First, Last) _____
 Date: _____ Period: _____

Topic: _____



Continue your answer on the back if necessary

DAY EXIT TICKET Name: (First, Last) _____
 Date: _____ Period: _____

Topic: _____



Continue your answer on the back if necessary

DAY EXIT TICKET Name: (First, Last) _____
 Date: _____ Period: _____

Topic: _____



Continue your answer on the back if necessary

DAY EXIT TICKET Name: (First, Last) _____
 Date: _____ Period: _____

Topic: _____



Continue your answer on the back if necessary



Essential Question

How should we monitor our eating to maintain a healthy lifestyle?

Engagement Scenario:

Malnutrition occurs in people who are either undernourished or over-nourished. Approximately 30% of children in the United States are obese while 1% are undernourished. Many people have no idea what they actually eat in a given day and whether they are making good food decisions. Your CTSO (FFA, FCCLA, HOSA, etc.) has asked you – as a member of the organization’s healthy lifestyle committee – to write a food diary for high school students and develop the tools students would need to use the diary. They will use the food diary the class develops for a healthy lifestyle program they are conducting. The goal is to help students become more aware of the foods they consume and the impact those foods could have on overall health.

Your team will research healthy eating and determine guidelines for adolescents to follow. Based on the guidelines, your team will develop a food diary that allows you to track food and calorie consumption. You will use the food diary you develop and test it among your peers for usability. You will compare your eating habits and the habits of your peers to those suggested by your research using pie charts. You will calculate the necessary caloric intake for an individual based on Resting Metabolic Rate and activity levels and use this caloric intake recommendation in the guide for your food diary.

After reading informational texts on nutrition and participating in enabling learning activities intended to assist you in researching, conducting, and analyzing an approach to monitoring proper nutrition, write a report in which you analyze the effectiveness of your food diary, providing examples to illustrate and clarify your analysis.

You will present your food diary, eating data, and usability results to a nutrition expert and leaders in the student organization and apply their feedback and the usability feedback you receive from your peers to revise your food diary. As a class, you will choose a food diary to use for the remainder of the course.



Research Notes

Name _____ Project _____ Date _____

Question

Search Terms

Enter all search terms you intend to use here. Circle any that result in a good reference:

Reference (Not all sections apply to all sources)

Author(s): _____

Title: _____

Website: _____

Publisher: _____

City/State: _____

Year: _____ Pages: _____

Notes



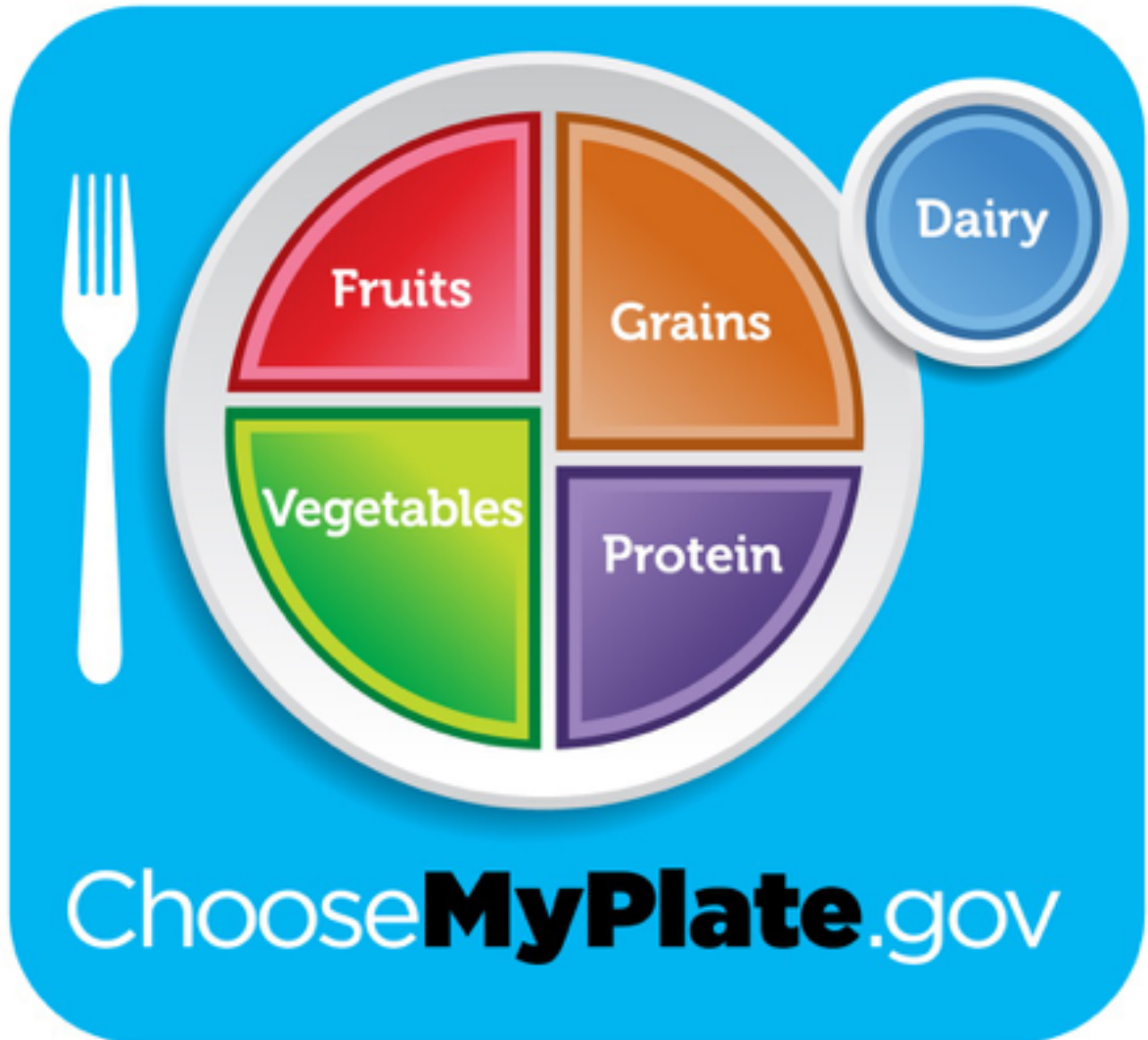
Project Management Log: Team Tasks

Project Name _____

Team Members _____

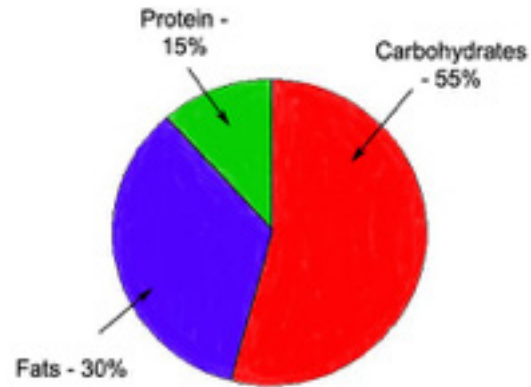
TASK	WHO IS RESPONSIBLE	DUE DATE	STATUS	DONE

MyPlate



Pie Chart Pre-Test

1. Answer the following questions about this pie chart:



- a. What is the top category for food consumption?

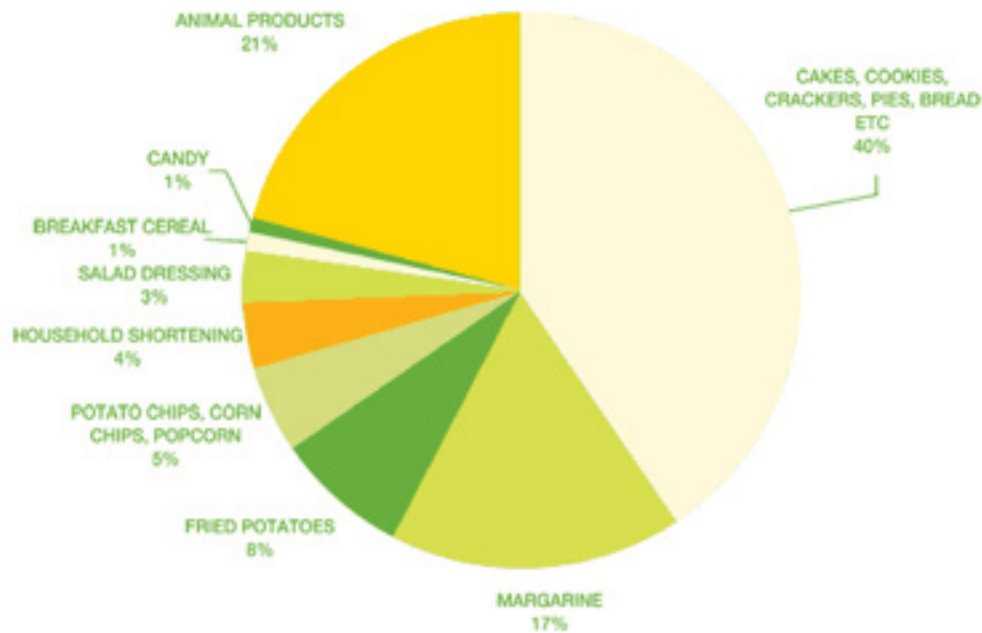
- b. What total percentage do protein and fats make up?

- c. What is the difference in consumption between carbohydrates and protein?

- d. What is the total percentage for all of the categories of consumption in this chart?
What should it be?



2. Answer the following questions for this pie chart on the sources of trans-fat for American adults:

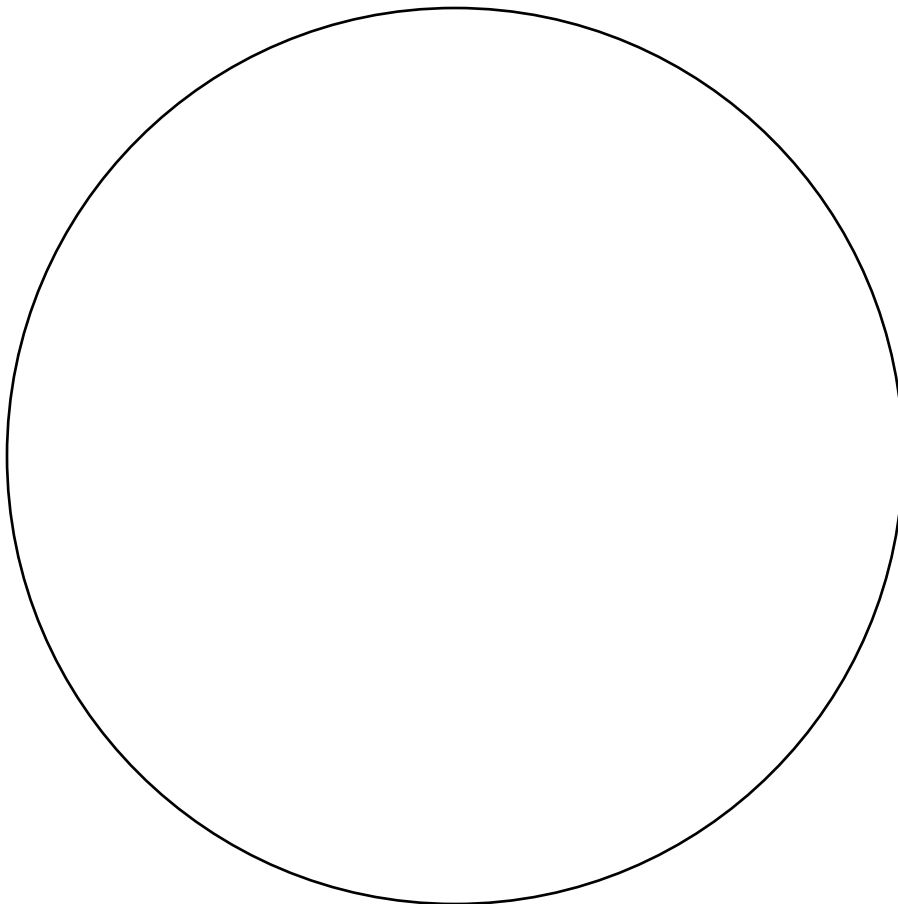


- What is the largest source of trans-fat in the diets of American adults?
- What percentage of the trans-fat in the diet of American adults comes from margarine, salad dressing, and household shortening?
- What are the bottom four sources of trans-fat in the diet of American adults?
- What is the total percentage represented in this chart?



3. Create a pie chart based on the data below for the Average American's annual Consumption. Ask your teacher for any tools you would like to use:

TYPE OF FOOD	POUNDS CONSUMED
Flour & Cereal	192.3
Caloric Sweeteners	141.50
Vegetables	415.4
Coffee, Cocoa & Nuts	24
Fruits	273.2
Fats & Oils	85.5
Red Meat	110
Poultry	73.6
Fish & Shellfish	16.1
Eggs	32.7
Cheese	31.4
Dairy (non-cheese)	600.5





MyPlate Pie Chart

	FRUITS	VEGETABLES	GRAINS	PROTEIN	DAIRY	OILS
Girls	1.5 cups	2.5 cups	0.75 cups	0.625 cup	3 cups	0.10 cups
Boys	2 cups	3 cups	1 cup	0.813 cups	3 cups	0.125
Percentage						
Degrees in Circle						

1. Convert the raw data to percentages.
2. Check that the percentages add up to 100%.
3. Calculate the size of each segment:
 - a. Degrees of segment = (decimal value of percentage) x (360o)
4. Check that your segments add up to 360o.
5. Starting at 12 o'clock on the circle use a protractor to measure the first segment.
 - a. Mark this measurement and start here to measure the next.
 - b. Repeat for each segment.
6. Label and color the segments for contrast.
7. Create a title and key.

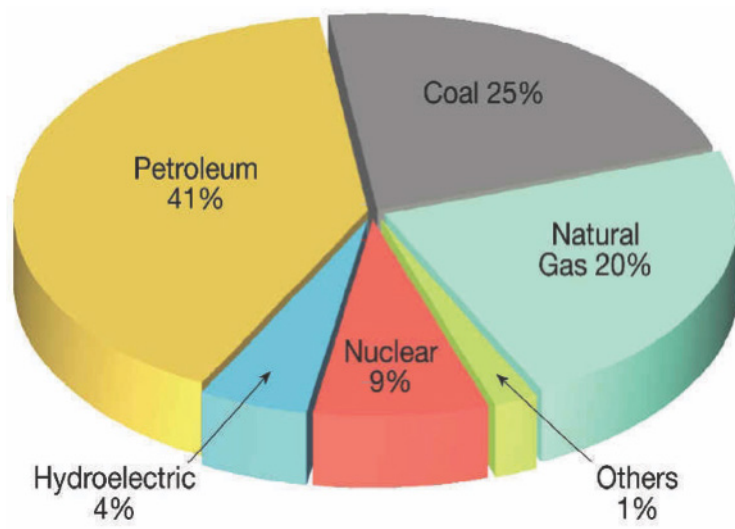


Intro to Pie Charts

Name _____

Answer the following questions based on this pie chart:

US Energy Consumption

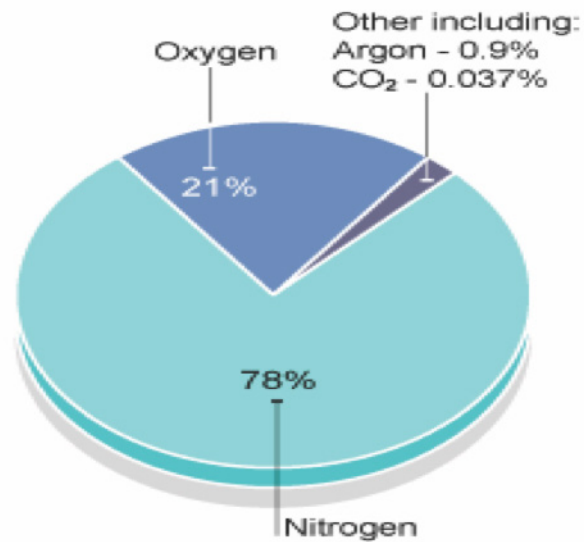


1. What are the top two categories for energy consumption?
2. What total percentage does hydroelectric and nuclear energy make up? (*Show work*)
3. What is the difference in U.S. consumption between coal and natural gas? (*Show work*)
4. What is the total percentage of all sectors in this pie graph? (*Show work*)
5. What is the smallest category in this graph? What is something that could fit into this category?



Answer the following questions based on this pie chart:

Gases in Our Atmosphere



1. Which two gases make up most of our atmosphere?
2. What total percentage do those two gases make up? (Show work)
3. Which gases make up less than 1% of our atmosphere?
4. What is the difference in percentage between nitrogen and oxygen? (Show work)
5. What do all the percentages add up to? (Show work)



Calculating Daily Energy Balance

Name _____ Section _____ Date _____

Part I Resting Metabolic Rate

Resting metabolic rate varies depending on age, gender, and weight. Use the equations below to calculate your approximate RMR.

World Health Organization Equations

- Convert body weight to kilograms:
_____ lb \div 2.2 lb/kg = _____ kg
- Find the appropriate formula in the table below, and calculate your RMR. (For example, a 19-year-old male weighing 80 kg would have an RMR of approximately $(15.3 \times 80) + 679 = 1224 + 679 = 1903$ calories a day.)

AGE RANGE (YEARS)	Equation to Derive RMR in cal/day	
	MALES	FEMALES
10–18	$(17.5 \times \text{wt}) + 651$	$(12.2 \times \text{wt}) + 746$
18–30	$(15.3 \times \text{wt}) + 679$	$(14.7 \times \text{wt}) + 496$
30–60	$(11.6 \times \text{wt}) + 879$	$(8.7 \times \text{wt}) + 829$
Over 60	$(13.5 \times \text{wt}) + 487$	$(10.5 \times \text{wt}) + 596$

$$\text{RMR} = \left(\frac{\text{_____}}{\text{(factor from table)}} \times \frac{\text{_____}}{\text{(body weight)}} \text{ kg} \right) + \frac{\text{_____}}{\text{(factor from table)}} = \text{_____ cal/day}$$

Harris Benedict Equations

- Convert body weight to kilograms: _____ lb \div 2.2 lb/kg = _____ kg
- Convert height to centimeters: _____ in. \times 2.54 cm/in. = _____ cm
- Use the appropriate equation to calculate RMR. (For example, a 20-year-old female 160 cm tall, weighing 60 kg, would have an RMR of approximately $655 + (9.56 \times 60) - (1.85 \times 160) - (4.68 \times 20) = 1431$ calories a day.)

$$\text{Women: RMR} = 655 + (9.56 \times \text{weight _____ kg}) + (1.85 \times \text{height _____ cm}) - (4.68 \times \text{age _____ yr}) = \text{_____ cal/day}$$

$$\text{Men: RMR} = 66.5 + (13.8 \times \text{weight _____ kg}) + (5 \times \text{height _____ cm}) - (6.76 \times \text{age _____ yr}) = \text{_____ cal/day}$$



Part II Daily Energy Expenditures

List all your activities for a 3-day period and classify them according to the categories listed in the table below. (Representative values of the calorie costs of different types of activities are presented below as multiples of resting metabolic rate.) Table 7.1 provides general guidelines for how to classify your sports and fitness activities: Activities with high cardiorespiratory endurance ratings probably fall in the heavy category, those with medium CRE ratings in the moderate category, and those with low CRE ratings in the light category. Take your intensity into account when classifying fitness activities; basketball, for example, can be played at an easy pace or intensely.

Your total daily energy expenditure can be estimated by calculating a daily activity factor based on the amount of time you engage in activities in each category of intensity. By adding up weighted activity factors and finding the average, you can calculate total daily energy requirements. Since your activity levels probably vary widely from day to day, it's more accurate to calculate energy output for several days to come up with an average daily range of calorie output.

<i>Activity Category</i>	<i>Unit Time of Activity</i>	<i>Representative Value for Activity Factor per Unit Time of Activity</i>
<i>Resting:</i>	Sleeping, lying down	RMR × 1.0
<i>Very light:</i>	Seated and standing activities such as driving, lab work, writing, typing, cooking, playing cards, or playing a musical instrument	RMR × 1.5
<i>Light:</i>	Walking on a level surface 2.5–3.0 mph, house cleaning, child care, carpentry, restaurant trades, and sports/activities with low fitness ratings such as golf, bowling, and sailing	RMR × 2.5
<i>Moderate:</i>	Walking 3.5–4.0 mph, gardening, carrying a load, and sports/activities with medium fitness ratings such as baseball and volleyball	RMR × 5.0
<i>Heavy:</i>	Walking with a load uphill, heavy manual labor, sports/activities with high fitness ratings such as aerobic dance and cross-country skiing	RMR × 7.0

For each day, add up the total number of hours for each activity category. Then multiply the total duration for each category by the category's activity factor. Add the weighted activity factors, then divide the total weighted activity factor by 24 to get an average daily activity factor. A sample of completed calculations for one day is shown below.

SAMPLE

ACTIVITY	DURATION	CATEGORY	CATEGORY	ACTIVITY FACTOR	DURATION	WEIGHTED ACTIVITY FACTOR
Sleeping	8 hours	resting	Resting	1.0	8	8.0
Eating in dorm	1-1/2	very light	Very Light	1.5	13	19.5
Class	5	very light	Light	2.5	1	2.5
Bicycling to class, lab ...	1	moderate	Moderate	5.0	1	5.0
Job in library	2-1/2	very light	Heavy	7.0	1	7.0
Cleaning room/laundry	1	light	Total		24 hours	42.0
Basketball	1	heavy	Average daily activity factor (Total of weighted factors ÷ 24)			1.75
Studying in library	4	very light				



RECORDS FOR 3 DAYS

Day 1

ACTIVITY	DURATION	CATEGORY

Day 1

CATEGORY	ACTIVITY FACTOR	DURATION	WEIGHTED ACTIVITY FACTOR
Resting	1.0		8.0
Very Light	1.5		19.5
Light	2.5		2.5
Moderate	5.0		5.0
Heavy	7.0		7.0
Total		24 hours	42.0
Average daily activity factor (Total of weighted factors ÷ 24)			

Day 2

ACTIVITY	DURATION	CATEGORY

Day 2

CATEGORY	ACTIVITY FACTOR	DURATION	WEIGHTED ACTIVITY FACTOR
Resting	1.0		8.0
Very Light	1.5		19.5
Light	2.5		2.5
Moderate	5.0		5.0
Heavy	7.0		7.0
Total		24 hours	42.0
Average daily activity factor (Total of weighted factors ÷ 24)			

Day 3

ACTIVITY	DURATION	CATEGORY

Day 3

CATEGORY	ACTIVITY FACTOR	DURATION	WEIGHTED ACTIVITY FACTOR
Resting	1.0		8.0
Very Light	1.5		19.5
Light	2.5		2.5
Moderate	5.0		5.0
Heavy	7.0		7.0
Total		24 hours	42.0
Average daily activity factor (Total of weighted factors ÷ 24)			



Day 1 average daily activity factor _____

Day 2 average daily activity factor _____

Day 3 average daily activity factor _____

Finally, use the middle or average of your three daily activity factors to calculate your average daily energy output. For RMR, use the value you calculated in the first part of this lab. (For example, a person with an average daily activity factor of 1.75 and an RMR of 1450 calories a day would have an approximate daily energy expenditure of $1.75 \times 1450 = 2537.5$ calories per day.)

Average of three daily activity factors _____ 3 RMR _____ cal/day
(from Part 1)

5 approximate daily energy expenditure: _____ cal/day

Sources: National Research Council. 1989. *Recommended Dietary Allowances, 10th ed.* Washington, D.C.: National Academy Press. World Health Organization. 1985. *Energy and Protein Requirements: Report of a Joint FAO/WHO/UNO Expert Consultation.* Geneva: World Health Organization, Technical Report Series 724.

Adapted from Fahey/Insel/Roth, *Fit and Well, Sixth Edition.* © 2005 The McGraw-Hill Companies.



ASK
YOURSELF
WORK
SHEET

Calculating energy balance

Are these people in energy balance?

For each example, calculate the person's energy expenditure by adding calories burned through BMR and daily activities. Compare this number to the amount of calories consumed (food energy intake).

Determine whether these people are likely to lose weight, gain weight or remain at a constant weight if they continue this lifestyle. Make recommendations for improving each situation.

Henry is 28 and works as a builder on a construction site. He weighs 89 kg and is 190 cm tall. Can you calculate his BMI?

Henry awakes at 5.30 every morning, gets ready for work and has a large breakfast. This usually takes 30 minutes, burning 70 calories. He then rides his bike to work for one hour, burning 300 calories. He works an 8-hour shift, burning 200 calories per hour and takes a short break mid-morning for a snack and something to drink. At work, he has one hour to rest and have a cooked lunch he brings from home; this burns 50 calories.

After work, he rides his bike home again for one hour, burning 300 calories. At home, he has a snack and spends an hour playing with his children, burning 150 calories and then helps them with their homework for an hour, burning 70 calories. The rest of the evening he relaxes with his family, reads the newspaper and has dinner; this burns 70 calories per hour. At 10.00 pm he goes to bed. He burns 53 calories per hour until he wakes up again.

We know that Henry:

- has a BMR of 2045 calories per day
- burns at least 3000 calories in daily activity
- consumes an average of 5000 calories a day

1. What is Henry's overall energy balance? (BMR + calories burned from daily activity compared with calorie intake (food and beverages consumed))
2. Is he likely to gain weight, lose weight or maintain the same body weight if his food intake (calories) and activity level remain the same?
3. What advice would you give to Henry, taking into consideration his BMI and current energy balance status?



★ 'BMR' is the amount of energy required for basic body functions.

The calculations used here are:

Men: $(13.7 \times \text{wt in kg}) + (5 \times \text{ht in cm}) - (6.8 \times \text{age in years}) + 66$

Women: $(9.6 \times \text{wt in kg}) + (1.8 \times \text{ht in cm}) - (4.7 \times \text{age in years}) + 655$

BMI Formula: $\text{weight (kg)} / [\text{height (m)}]^2$

09_00/06



ASK
YOURSELF
WORK
SHEET

Calculating energy balance (cont.)

Irene is 19 and works as a radio DJ. She weighs 71 kg and is 161 cm tall.
Can you calculate her BMI?

She gets up every morning at 6 am, eats breakfast and rushes out of her house so she can be on time for her morning radio programme which starts at 7 am. Her colleague who lives next door, gives her a lift to work every day; sitting in the car for 30 minutes burns about 30 calories. Irene's radio programme lasts 4 hours starting at 7 am and finishing at 11 am, burning 70 calories per hour. She snacks and drinks various beverages throughout her programme. When her programme is finished, she works for two hours on her computer, updating the radio's web-site and replying to emails. This burns 80 calories per hour. She takes a 1 hour break to eat a big lunch, relaxing and talking with her colleagues; this burns 70 calories. After lunch she spends another 2 hours in the office, preparing her next programme, listening to music and looking for interesting stories about the latest music stars. This burns 80 calories per hour.

After work, Irene usually meets some friends for 2-3 hours to get something to eat for dinner; sometimes they go to a local pub or the cinema, burning 70 calories an hour. She goes to bed at around 11 o'clock. She burns 50 calories an hour until she wakes up again.

We know that Irene:

- has a B.M.R. of 1537 calories per day
- burns at least 1260 calories in daily activity
- consumes an average of 3200 calories a day

1. What is Irene's overall energy balance? (BMR + calories burned from daily activity compared with calorie intake (food and beverages consumed))
2. Is she likely to gain weight, lose weight or maintain the same body weight if her food intake (calories) and activity level remain the same?
3. What advice would you give Irene, taking into consideration her BMI and current energy balance status?



**Calories
IN**
Food
Beverages

**Calories
OUT**
Body functions
Physical activity



09_00/06



ASK
YOURSELF
WORK
SHEET

Calculating energy balance (cont.)

Marie is 35 and she is a farmer. She weighs 50 kg and is 168 cm tall.
Can you calculate her BMI?

In the morning she awakes at 6 am, takes one hour to prepare breakfast for her family, do a few household chores and eats her own breakfast; this burns 120 calories. She then walks to her fields for half an hour, burning 130 calories. She ploughs, plants, weeds and digs for 6 hours each day. This burns 200 calories per hour. At noon she has a 2 hour break to have a little food and rest; this burns 70 calories per hour. When she has finished her work for the day, she walks home again (130 calories).

At home, she spends one and a half hours taking care of her chickens and preparing the evening meal for her family, burning 110 calories an hour. After dinner she spends some time with her husband and children, finishes her household chores (burning 120 calories) and goes to bed around 10.30 pm. She burns 50 calories an hour while she is sleeping.

We know that Marie:

- has a B.M.R. of 1273 calories per day
- burns at least 2380 calories in daily activity
- consumes an average of 1800 calories a day

1. What is Marie's overall energy balance? (BMR + calories burned from daily activity compared with calorie intake (food and beverages consumed))
2. Is she likely to gain weight, lose weight or maintain the same body weight if her food intake (calories) and activity level remain the same?
3. What advice would you give Marie, taking into consideration her BMI and current energy balance status?



★ You can check your answers on
Answer Work sheet **Calculating energy balance**

09_00/06



Concept Map Rubric

CRITERIA	3	2	1	0
Concepts and Terminology	Shows an understanding of the topic's concepts and principles and uses appropriate terminology and notations.	Makes some mistakes in terminology or shows a few misunderstandings of concepts.	Makes many mistakes in terminology and shows a lack of understanding of many concepts.	Shows no understanding of the topic's concepts and principles.
Knowledge of the Relationships among Concepts	Identifies all the important concepts and shows an understanding of the relationships among them.	Identifies important concepts but makes some incorrect connections.	Makes many incorrect connections.	Fails to use appropriate concepts or appropriate connections.
Ability to Communicate through Concept Maps	Constructs an appropriate and complete construct map and includes examples. Places concepts in appropriate hierarchy and places linking words on all connections. Produces a concept map that is easy to interpret.	Places almost all concepts in an appropriate hierarchy and assigns linking words to most connections. Produces a concept map that is easy to interpret.	Places only a few concepts in an appropriate hierarchy or uses only a few linking words. Produces a concept map that is difficult to interpret.	Produces a final product that is not a concept map.

Adapted from (Bartels, B.H. (1995). *Promoting mathematics connections with concept mapping. Mathematics Teaching in the Middle School, 1(7), 542-549*



Food Diary Survey

Respond to each item by circling the number that best matches your opinion:

ITEM	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
It was easy for me to use this food diary.	1	2	3	4	5
The food diary made me think about what I eat.	1	2	3	4	5
I would use this food diary to track my eating in the future.	1	2	3	4	5
This food diary is better than other food diary I've used.	1	2	3	4	5
I understood what I was supposed to do in this food diary.	1	2	3	4	5

Comments on the food diary:

ITEM	STRONGLY DISAGREE	DISAGREE	NEUTRAL	AGREE	STRONGLY AGREE
It was easy for me to use this food diary.	1	2	3	4	5
The food diary made me think about what I eat.	1	2	3	4	5
I would use this food diary to track my eating in the future.	1	2	3	4	5
This food diary is better than other food diary I've used.	1	2	3	4	5
I understood what I was supposed to do in this food diary.	1	2	3	4	5

Comments on the food diary:



Calculating Means Pre-Test

1. What is a mean?
2. Calculate the mean for the age of students in the following data. Show your work:

Student ID	Age in years
121314	12.5
543210	13.25
789102	15.75
576879	11.5

3. A class of students wondered how many calories they were consuming, on average, during their afternoon snack. Calculate the mean calories per serving for the following data. Show your work:

Snack	Calories per serving
Chocolate Bar	210
Apple	95
Chips	152
Carrots	25
Almonds	163
Snack Cake	270

4. A weather service in Moscow, Russia records the lowest temperature of the day on the 4th of each month. Calculate the mean lowest temperature for the following data. Show your work:

4th of	Lowest temperature in °F	4th of	Lowest temperature in °F
January	-15	July	48
February	-27	August	58
March	9	September	36
April	27	October	39
May	33	November	18
June	36	December	24



Means Matching Slips

Cut and distribute to each pair. Monitor as they work to match them correctly. Not all slips match.

3, 5, 2, 3, 3, 6, 12, 4, 1, 5	4.4
33, 67, 52, 16, 36, 3, 11, 54, 8	$\bar{x} = \frac{33 + 67 + 52 + 16 + 36 + 3 + 11 + 54 + 8}{9}$
4.3, 5, 2.4, 1.5, 5, 3, 4.2, 3.1	3.56
0, 3, 7.8, 9, 19, 0, 4	6.11
	8.56
	3



Project Rubric

CATEGORY	EXCELLENT (15)	PROFICIENT (10)	SATISFACTORY (5)	UNSATISFACTORY OR NO ATTEMPT MADE (0)
ORGANIZATION	Includes all of the project components in an organized manner.	Missing one project component but somewhat organized.	Missing two project components and content is somewhat unorganized.	Missing three or more project components and content is unorganized.
CONTENT KNOWLEDGE	Detailed explanation of the topic. Explains the key components of the topic and can support findings with background information.	Contains a good description of the fundamentals of the topic and can somewhat support the findings with a little background information.	General to vague description of the fundamentals of the topic and has difficulty supporting the findings with background information.	Missing information regarding the description of the fundamentals of the topic, and unable to support the findings with background information.
COMPLETENESS	Project components are complete and demonstrate strong depth and breadth.	Project components are mostly complete, only moderately lacking in depth and/or breadth.	Project components are generally incomplete and lack in depth and/or breadth.	Some project components are incomplete and others completely lack depth and breadth.
SYNTHESIS	Responses are well organized, cohesive, and team components flow as a whole.	Responses are somewhat organized, cohesive, and team components sometimes lack flow as a whole.	Responses are lacking organization and cohesion and/or team components do not flow as a whole.	Responses are poorly organized, not cohesive, and the team components fail to create a whole coherent response.
REFERENCES	Thorough reference list included. References are in proper APA form and all inclusive of the citations in project.	References are missing one or two pieces of information.	References are included but not in proper form. Three or more references that are cited are missing.	No reference list included.
MECHANICS	No capitalization, spelling, punctuation or grammatical errors.	2 or less capitalization, spelling, punctuation or grammatical errors.	3-5 capitalization, spelling, punctuation or grammatical errors.	6+ capitalization, spelling, punctuation or grammatical errors.
VISUAL	Visual aids are neat, creative, and easy to follow.	Visual aids are somewhat neat, creative, and easy to follow.	Visual aids are somewhat messy, lacking creativity, and not as easy to follow.	Visual aids are messy, not creative, and difficult to follow.



Collaboration Rubric

	BELOW STANDARD	APPROACHING STANDARD	AT STANDARD	ABOVE STANDARD
RESPONSIBILITY FOR ONESELF	<ul style="list-style-type: none"> is not prepared and ready to work with the team does not do project tasks does not complete tasks on time does not use feedback from others to improve his/her work 	<ul style="list-style-type: none"> is sometimes prepared and ready to work with the team does some project tasks, but needs to be reminded competes some tasks on time sometimes uses feedback from others 	<ul style="list-style-type: none"> is prepared and ready to work with the team; is available for meetings and uses the team's communication system does what he or she is supposed to do without having to be reminded completes tasks on time uses feedback from others to improve his or her work 	<p><i>In addition to At Standard criteria:</i></p> <ul style="list-style-type: none"> does more than what he or she has to do asks for additional feedback to improve his or her work, beyond what everyone has been given
HELPING THE TEAM	<ul style="list-style-type: none"> does not help the team solve problems; may cause problems does not share ideas with other team members does not give useful feedback to others does not offer to help others 	<ul style="list-style-type: none"> cooperates with the team but does not actively help it makes some effort to share ideas with the team sometimes gives useful feedback to others sometimes offers to help others 	<ul style="list-style-type: none"> helps the team solve problems, manage conflicts, and stay focused and organized shares ideas that help the team improve its work gives useful feedback (specific and supportive) to others so they can improve their work offers to help others do their work if they need it 	<p><i>In addition to At Standard criteria:</i></p> <ul style="list-style-type: none"> steps in to help the team when another member is absent encourages others to share ideas, helps to make them clear, and connects them to the team's work notices if a team member does not understand something and takes action to help
RESPECT FOR OTHERS	<ul style="list-style-type: none"> does not pay attention to what teammates are talking about does not show respect for teammates (may interrupt, ignore ideas, hurt feelings) 	<ul style="list-style-type: none"> usually listens to teammates, but not always is polite and kind to teammates most of the time, but not always 	<ul style="list-style-type: none"> listens carefully to teammates is polite and kind to teammates 	<p><i>In addition to At Standard criteria:</i></p> <ul style="list-style-type: none"> encourages the team to be respectful to each other recognizes everyone's strengths and encourages the team to use them



Project Presentation Audience Feedback

Student Team _____

Project Name _____ Date _____

Thank you for attending our project presentations and taking the time to write thoughtful answers to the following questions:

1. What did you learn from this presentation, or what did it make you think about?

2. What did you like about this presentation?

3. Do you have any questions about the topic or about how the project was done?

4. Any other comments about this presentation?



Sample research report

Executive Summary (Summary or Abstract)

The aim of this report was to investigate UniLab staff attitudes to personal mobile phone use in staff and team meetings. A staff survey on attitudes towards the use of mobile phones in the staff / team meetings was conducted. The results indicate that the majority of staff find mobile phone use a major issue in staff meetings. The report concludes that personal mobile phones are disruptive and should be turned off in meetings. It is recommended that UniLab develops a company policy banning the use of mobile phones except in exceptional circumstances.

Introduction

There has been a massive increase in the use of personal mobile phones over the past five years and there is every indication that this will continue. According to Black (2002) by 2008 almost 100% of working people in Australia will carry personal mobile phones. Black describes this phenomenon as 'serious in the extreme, potentially undermining the foundations of communication in our society' (2002, p 167). Currently at UniLab 89% of staff have personal mobile phones.

Recently a number of staff have complained about the use of personal mobile phones in meetings and asked what the official company policy is. At present there is no official company policy regarding phone use. This report examines the issue of mobile phone usage in staff meetings and small team meetings. It does not seek to examine the use of mobile phones in the workplace at other times, although some concerns were raised.

For the purposes of this report a personal mobile phone is a personally funded phone for private calls as opposed to an employer funded phone that directly relates to carrying out a particular job.

Methods

This research was conducted by questionnaire and investigated UniLab staff members' attitudes to the use of mobile phones in staff / team meetings. A total of 412 questionnaires were distributed with employees' fortnightly pay slips (see Appendix 1). The questionnaire used Likert scales to assess social attitudes (see Smith 2002) to mobile phone usage and provided open ended responses for additional comments. Survey collection boxes were located in every branch for a four week period. No personal information was collected; the survey was voluntary and anonymous.

Results

There was an 85% response rate to the questionnaire. A breakdown of the responses is listed below in Table 1. It can be clearly seen from the results that mobile phones are considered to be disruptive and should be turned off in meetings.

**Table 1**

Personal mobile phone usage in staff and team meetings is...	Strongly agree %	Agree %	Disagree %	Strongly disagree %
Not a problem	5	7	65	23
An issue	40	45	10	5
Disruptive	80	10	7	3
Phones should be permissible	6	16	56	22
Phones should be turned off	85	10	3	2
Allowed in some circumstances	10	52	24	14

The survey also allowed participants to identify any circumstances where mobile phones should be allowed in meetings and also assessed staff attitudes towards receiving personal phone calls in staff meetings in open ended questions. These results showed that staff thought that in some circumstances, eg medical or emergencies, receiving personal phone calls was acceptable, but generally receiving personal phone calls was not necessary.

Discussion / Interpretation of Results

It can be seen from the results in Table 1 that personal mobile phone use is considered to a problem; however it was acknowledged that in some situations it should be permissible. 80% of recipients considered mobile phones to be highly disruptive and there was strong support for phones being turned off in meetings (85%). Only 12% thought that mobile phone usage in staff and team meetings was not a problem, whereas 85% felt it was an issue. The results are consistent throughout the survey. Many of the respondents (62%) felt that in exceptional circumstances mobile phones should be allowed, eg medical, but there should be protocols regarding this.

These findings are consistent with other studies. According to Smith (2005) many companies have identified mobile phones as disruptive and have banned the use of mobile phones in meetings. Havir (2004) claims that 29% of staff meeting time is wasted through unnecessary mobile phone interruptions. This affects time management, productivity and team focus.

Conclusion

The use of mobile phones in staff meetings is clearly disruptive and they should be switched off. Most staff felt it is not necessary to receive personal phone calls in staff meetings except under certain circumstances, but permission should first be sought from the team leader, manager or chair.

Recommendations

It is recommended that UniLab develops an official policy regarding the use of mobile phones in staff meetings. The policy should recommend:

- mobile phones are banned in staff meetings
- mobiles phone may be used in exceptional circumstances but only with the permission of the appropriate manager or chair

Finally, the policy needs to apply to all staff in the company.



Research Report Outline

1. Introduce the problem you were seeking to solve.
 - a. Include data that supports that there is a problem.
 - b. Be certain to justify the need for your research and solution.

2. Describe the attributes of your food diary.
 - a. Support their inclusion in your food diary with the background research you did on food diaries and healthy eating.

3. Describe the methods you used to conduct research on the usability of your food diary.
 - a. Describe the survey and how you administered it.
 - b. Include any problems you encountered.
 - c. Describe how you analyzed the data you collected.

4. Results of data collection and analysis
 - a. Pieces of the food diary you and your peers liked using or found easy to use. Include data from your surveys in tables (see samples).
 - b. Pieces of the food diary you and your peers didn't like using or found difficult to use. Include data from your surveys in tables (see samples).

5. Conclusions drawn from results
 - a. Changes you would make to the food diary based on the surveys.

6. Summary of research results and conclusions



Research Paper Rubric

Name _____ Title _____ Grade _____

	A	B	C	D	F
Thesis	Clearly stated and appropriately focused.	Clearly stated but focus needed to be sharper.	Thesis stated but not appropriately focused.	Thesis is inferred but not stated.	No statement of thesis or objective for research observed.
Quality of Information	Information clearly related to the main topic, included consistent supporting details and/or examples.	Information clearly related to the main topic, provided adequate supporting details and/or examples.	Information clearly related to the main topic, provided some supporting details and/or examples.	Information related to the main topic, no details or examples provided.	Information had little or nothing to do with main topic.
Organization	Information is logically organized.	Information is adequately organized.	Information is somewhat organized.	Obvious lack of organization.	No observable organization.
Paragraph Construction	All paragraphs include introductory sentence, explanations or details, concluding sentence with a transition.	Most paragraphs include introductory sentence, explanations or details, concluding sentence with a transition.	Paragraphs included related information, but were typically not constructed well.	Paragraph structure was not clear and sentences were not typically related within the paragraphs.	No paragraphs observed.
Mechanics	No grammatical, spelling or punctuation errors observed.	Almost no grammatical, spelling or punctuation errors observed.	A few grammatical, spelling or punctuation errors observed.	Many grammatical, spelling or punctuation errors observed.	No observable effort in the area of mechanics.
APA style Parenthetical (In-Text) Citations	All sources accurately documented in parenthetical references. First page correctly headed.	All sources accurately documented in parenthetical references, but a few were not in APA format. No running header.	All sources accurately documented in parenthetical references, but many were not in APA format. No cover page or running header.	Some sources are not accurately documented. No cover page or running header.	No parenthetical references observed.
References	5 or more appropriate sources documented properly.	At least 2 appropriate sources documented properly.	At least 1 appropriate sources documented properly and 2 non peer reviewed.	At least 1 appropriate sources documented properly.	No observable effort in MLA formatting. No references provided.



Self-Reflection on Project Work

Think about what you did in this project and how well the project went. Write your comments in the right column.

Student Name:	
Project Name:	
Driving Question:	
List the major steps of the project:	
ABOUT YOURSELF:	
What is the most important thing you learned in this project:	
What do you wish you had spent more time on or done differently:	
What part of the project did you do your best work on:	
ABOUT THE PROJECT:	
What was the most enjoyable part of this project:	
What was the least enjoyable part of this project:	
How could your teacher(s) change this project to make it better next time:	

