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Fueling Performance: Tailored Nutrition Strategies for Female Athletes

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Fueling Performance: Tailored Nutrition Strategies for Female Athletes

and

Lesson Plan: Exploring Nutrition: Research, Writing, and Presentation

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Senior Capstone

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Project Proposal

Focus:

What are the most effective nutrition strategies for female athletes to optimize their performance and address specific female physiological needs?

Alignment with Common Theme and HCOM:

This topic aligns with the "Food for thought" theme of this class by discussing the nutritional needs of female athletes. Examining how dietary choices and nutritional strategies impact athletic performance and overall well-being contributes to a deeper understanding of the intersectionality of nutrition, gender, and sports performance.

Purpose:

The primary purpose of this project is to investigate and provide evidence-based recommendations for nutrition strategies tailored to the specific needs of female athletes, focusing on optimizing performance and addressing physiological factors such as macro and micronutrient intake and menstrual cycle-related fluctuations concerning energy expenditure, nutrient needs, and muscle and bone health. This study seeks to identify nutrition strategies essential for improving the performance and overall well-being of young women in sports and beyond.

Capstone Title:

Fueling Performance: Tailored Nutrition Strategies for Female Athletes

Working Summary:

This project aims to explore the unique nutritional considerations for female athletes, with a focus on optimizing performance and addressing specific physiological needs. Through comprehensive research, the project will identify strategies for optimizing iron intake to prevent

anemia, managing calcium and vitamin D for bone health, and addressing menstrual cycle-related changes in energy expenditure and nutrient needs. Practical recommendations will be made to help female athletes maximize their potential and support their overall health.

Sources:

Holtzman, Bryan, and Kathryn E Ackerman. "Recommendations and Nutritional Considerations for Female Athletes: Health and Performance." *Sports Medicine (Auckland, N.Z.)*, U.S. National Library of Medicine, Sept. 2021, www.ncbi.nlm.nih.gov/pmc/articles/PMC8566643/.

Chidi-Ogbolu, Nkechinyere, and Keith Baar. "Effect of Estrogen on Musculoskeletal Performance and Injury Risk." *Frontiers in Physiology*, U.S. National Library of Medicine, 15 Jan. 2019, www.ncbi.nlm.nih.gov/pmc/articles/PMC6341375/#:~:text=However%2C%20unlike%20bone%20and%20muscle,prone%20for%20catastrophic%20ligament%20injury.

"Iron Deficiency: An under-Recognized Condition in Female Athletes." *Cleveland Clinic*, Cleveland Clinic, 19 Mar. 2024, consultqd.clevelandclinic.org/iron-deficiency-an-under-recognized-condition-in-female-athletes.

Next Steps:

The next step to take is to flesh out my thesis statement in response to the research question. I also need to find a baseline on the hormone and nutrition levels of women in and outside of sports. Because this topic is not widely studied, It will take me a little bit longer to find sources that help me with my claim. I will look through Kinesiology textbooks from peers from that major to begin my research and findings.

Timeline:

Week 1-2: finalize the topic and research question, and find at least 5 resources to help with the research topic

Week 3-4: outline essay structure and finish thesis statement. Complete research and outline.

Week 5-8: Begin writing body paragraphs, connecting evidence with my claim.

Week 9: Revise and turn in a rough draft, wait for feedback.

Week 10-11: Revise and finish the research essay, and begin on the lesson plan and poster.

Week 12- Due Date: Finish capstone project including research paper, lesson plan, poster, and final formatting.

Fueling Performance: Tailored Nutrition Strategies for Female Athletes

Nutrition plays a fundamental role in athletic performance, yet there remains a distinct gap in understanding the specific dietary needs of young female athletes, particularly those in high school. This paper aims to address this gap in understanding the specific physiological factors that influence the unique nutritional demands of these athletes amidst training and competition. The research applied will explore the importance of hormonal fluctuations, macronutrients, and micronutrients, overall looking to find better nutrition strategies for women in sports and off the field. This project identifies ways to optimize iron intake to prevent anemia and manage calcium and vitamin D for bone health. This paper will also address menstrual cycle-related changes in energy expenditure and macronutrient needs including carbohydrates, protein, and creatine to improve muscle function. Unfortunately, most young girls are shown to lack the essential nutrients their body needs to perform safely in athletics. This is why athletes need to understand how hormones, nutrition, and performance work together. The goal of this paper is to begin the discussion of nutrition and raise awareness of female athletes' dietary recommendations. For all athletes, hormones play a large role in performance and muscle health. For example, estrogen fluctuations can affect tendon and ligament function, which can tremendously increase the risk of injury in active sports. Additionally, the menstrual cycle's influence on hormones and nutrients can lead to challenges such as iron deficiency and anemia. Aside from hormone influence, research shows a high percentage of iron deficiency among female athletes of all ages. With iron deficiency, insufficient calcium and vitamin D intake in women involved in sports can reflect in their bone health, leaving the door open for possible fractures or breaks. Because research on women in sports is sparsely provided, it is important to advocate for attention and research in this area to protect the well-being and performance of

young athletes. Creating a lesson plan out of this research will help students further understand the way their body works and how to fuel it properly. By integrating this research into a lesson plan, students will engage in “Domain 3 Composition and Rhetoric”, according to the Content Domains for Subject Matter Understanding and Skill in English. They will develop research skills, critically evaluate sources, interpret findings into writing, and learn presentation skills. By creating multimedia presentations, they will create new and personal nutrition plans, empowering them to advocate for their own unique well-being, while also gaining a deeper understanding of the relationship between, nutrition, hormones, and overall health.

The importance of tailoring nutrition plans to meet the specific needs of female athletes has gained recognition in recent years. With the rise of strong female-led athletic teams and players, more research is necessary to help these women. According to The National Library of Medicine, In an article titled, “Recommendations and Nutritional Considerations for Female Athletes: Health and Performance” they explain how women athletes need a specific nutrition plan to optimize their performance and health. The author discusses the lack of female participants in athletic performance studies, “In 2011–2013, studies published in three of the world’s top sports medicine journals had women representing 39% of study participants and only 4% of studies were female-only. Follow-on studies in… 2015; for example, for studies of athletic performance, 63% were conducted in male subjects only, 33% in male and females, and a paltry 3% were solely focused on female athletes.”(Holtzman 1). Male athletes have dominated the athletic world for centuries, but with the recognition of strong female athletes, we must focus on the needs of all athletes regardless of gender, age, or physiological needs. In contrast, it's also important that women recognize that their bodies' needs are much different than men's. Once a month, most girls and women experience menstruation. This cycle causes hormones to fluctuate

and estrogen levels rise and fall twice during the full cycle. Tailoring nutrition and workout plans around this fluctuation can help decrease the chance of injury or malnutrition. Dramatic changes in estrogen levels can cause a person to feel fatigued, and according to the National Institute of Health, “However, unlike bone and muscle where estrogen improves function, in tendons and ligaments estrogen decreases stiffness, and this directly affects performance and injury rates. High estrogen levels can decrease power and performance and make women more prone to catastrophic ligament injury.”(Baar 1). As we can see, estrogen provides a bit of give and take when it comes to the performance of our bodies. While it may improve the function of bone and muscle tissue, there is a chance of tendon or ligament rupture. Young female athletes should learn to keep track of their cycle as best they can, so adjustments can be made to their training weeks. Another hormone that women have a low function in is testosterone. This single hormone is what separates males from females and according to the Science Diet, higher testosterone levels can give athletes a bigger advantage in performance. Increased testosterone levels can have benefits, according to the National Library of Medicine, “Increase in circulating testosterone provides a major, ongoing, cumulative, and durable physical advantage in sporting contests by creating larger and stronger bones, greater muscle mass and strength, and higher circulating hemoglobin as well as possible psychological differences. In concert, these render women, on average, unable to compete effectively against men in power-based or endurance-based sports.” (Handelsman 1). While testosterone is a naturally produced hormone, athletes can take advantage of this hormone unregulated. Testosterone is a widely used tool in the fitness industry along with other steroids and is illegal to use, but it does give male athletes a natural and significant advantage in performance. The most important thing for female athletes' health when it comes to hormones is listening to your body and understanding your body in

connection to your cycles. While it is possible to get these hormones checked by a doctor and look for solutions or supplements, not all athletes have that privilege. Thankfully, it is possible to trick your body into producing testosterone by eating certain foods, which is a cheaper alternative to medical testing and supplements. According to Medical News Today, “Certain foods, including oysters, leafy greens, fatty fish, and olive oil, may encourage the body to produce more testosterone. Foods that contain zinc, vitamin D, and magnesium may be key.”(Leonard 1). As we can see, it is possible to increase testosterone levels naturally through foods, but it's always important to consult a medical professional or team when changing your diet. Overall, hormone fluctuations and menstruation play a large role in athletic performance and overall health. Young girls experience a flood of hormones as they go through puberty, understanding them and how to balance them out could prove extremely helpful both in and outside of athletics. While it may be difficult to keep track of personal levels, listening to your body and incorporating a nutritious diet is vital to improving the performance of all female athletes. By advocating and discussing nutrition among women, we can push for more research and studies on hormone balances and it’s reflection on sports.

While hormones play a big role in performance, macronutrients play a big part in fueling and sustaining muscle health. Micronutrients are often overlooked when it comes to everyday diets, but they are needed to enhance recovery and optimize performance. All athletes lose iron during their daily performance, their loss of body fluids during a performance causes their bodies to drop in iron levels. Because of this, many athletes implement high-iron foods like salmon, beans, or tomatoes into their diets. However, female athletes lose more iron on top of their normal levels loss through sweat. When women menstruate and shed their uterine wall, the blood loss causes iron levels in the body to further decrease, which can cause anemia. Having anemia

as an athlete can cause shortness of breath, irregular heartbeats, and many other symptoms that can hinder performance. According to the Clevland Clinic, in an article on Iron deficiency in athletes, “Up to 35% of female athletes and up to 52% of adolescent female athletes have iron deficiency”(CC 1). Unfortunately, there aren't many field tests on iron deficiency in women's sports, especially for younger girls. Very few medical practices have researched the menstrual effects on anemia and iron deficiency. By bringing attention to this topic we can further promote awareness and pursue more research and tests for this subject. Along with iron levels, women also have to consider calcium and vitamin D supplementations for their bone health. A study on “The Assessment of the Supply of Calcium and Vitamin D in the Diet of Women Regularly Practicing Sport”, posted in the National Library of Medicine looks at the levels of calcium and Vitamin D in women. They found, “The research was completed by 593 women at the age of 18–50 (median 25) who played sports regularly…The median calcium and vitamin D intake in a diet was 502 mg/day and 5.2 μg/day, respectively. In relation to the EAR [Estimated Average Requirement] norm for calcium and AI [Adequate Intakes] norm for vitamin D, 92.0% of the examined participants in a group demonstrated lower than recommended calcium intake levels and 97.3% showed lower than recommended vitamin D intake levels.” (Wrzosek 1). Looking at the results of this study, we can see that almost all female athlete participants were lacking in Calcium and Vitamin D nutrients. Female athletes of all ages need to understand the connection between hormones, nutrition, and performance in order to prevent injury. There is an alarming prevalence of iron deficiency among female athletes, which proves why there needs to be further exploration and research in this field. Also by raising awareness, more young girls in sports can begin thinking about how to improve their nutritional health and implement more calcium, vitamin D, iron, and other important micronutrients.

In contrast to micronutrients, macronutrients like fats, carbohydrates, and proteins are a fundamental part of athletic performance. These nutrients play a big role in fueling muscles and supporting the needs of female athletes. In an article posted by Loyola Medicine called "Nutrition for Female Athletes: Strategies for Peak Performance" by Dr. Haemi Choi, discussed the importance of fulfilling your body's macronutrient needs. Dr, Choi notes, "At the core of sports nutrition for female athletes are the macronutrients: carbohydrates, proteins, and fats. Each plays a crucial role in athletic performance and recovery. Carbohydrates serve as the primary energy source, particularly important for high-intensity training and endurance sports."(Choi 1). We tend to implement macronutrients into our daily food intake, but tailoring specific amounts can help boost athletic performance. Carbohydrates are our bodies' main form of energy, they come in the form of sugar, fibers, and starches, often found in fruits, vegetables, grains, and dairy products. On days when women's estrogen levels drop, implementing heavier loads of carbohydrates can improve energy and mood levels. On the other hand, protein intake is also a very important aspect of an athlete's dietary needs. This macronutrient provides for cell structure and repair and is needed for fast post-exercise recovery and injury healing. Athletes who don't consume enough protein can slow down their muscle growth, leading to possible injury and increased soreness. Muscle repair and growth is not the only benefit of increasing intake of protein, it also aids in maintaining hormonal balance. Hormonal fluctuations related to the menstrual cycle can slow athletic performance and recovery. By consuming adequate protein, athletes can help regulate hormone levels, supporting overall health. It's a general rule for protein intake to take your weight in pounds and that number is how many grams of protein you should consume daily. For athletes who don't eat animal meat for their protein, they can consider other proteins like beans, nuts, grains, and protein substitutes. Along with protein, there is a

lesser-known macronutrient that proves exceptional for muscle growth and recovery. Creatine is a nutrient made of three amino acids and is secreted through the muscles during exercise. A definition by the Clevland Clinic states, “Creatine is a natural source of energy that helps your skeletal muscles flex (contract). It helps create a steady supply of energy in your muscles so they can keep working, especially while you’re exercising.”. There has been extensive research done on the benefits of creatine but very few studies have been done on its effects on female athletes. While this is a naturally occurring nutrient the body creates, it is widely suggested for athletes to consume creatine supplements to boost its benefits. In an article posted by the National Library of Medicine titled, “Creatine Supplementation in Women’s Health: A Lifespan Perspective” creatine is essential to improve performance, “Creatine supplementation among pre-menopausal females appears to be effective for improving strength and exercise performance.
Post-menopausal females may also experience benefits in skeletal muscle size and function when consuming high doses of creatine; and favorable effects on bone when combined with resistance training.”(Smith-Ryan 1). Creatine is an important nutrient for muscle growth, energy production, and exercise performance. Women athletes should consider incorporating creatine supplementation into their diets to improve their lives inside and outside of the gym. Studies are still being done on the benefits of creatine, including brain function and health. Adequate intake of macronutrients is necessary, with proteins aiding in muscle repair and growth, carbohydrates supplying energy, and creatine improving strength and muscle size. Understanding these nutritional needs can empower female athletes to perform at their peak, while also ensuring sustainable success outside of the gym.

To create an effective nutrition plan, athletes need a multifaceted approach tailored to individual needs and goals. Nutrient consumption plays a large role in supporting performance

and managing hormonal fluctuations throughout the menstrual cycle. By understanding the connection between hormones and nutrition, athletes can implement dietary techniques that boost energy levels and promote recovery. Recommending unique meal plans and supplementation provides athletes with the tools to meet their body's needs effectively. By acknowledging that each body works differently, this research can promote the use of creating personal plans. By furthering research on this topic, coaches, trainers, and nutritionists can provide evidence-based guidance to their athletes. Despite challenges, such as access to resources and time constraints, solutions can be adopted to overcome these obstacles. There are many food options for natural nutrition intake and free online resources and further research. Ultimately, prioritizing effective nutrition strategies not only optimizes performance but also contributes to long-term health and well-being, ensuring sustainable success for female athletes. In an article by Gatorade Sports Science Institute, they discuss the nutritional recommendations for women in sports. The findings explain the importance of tailoring nutrition plans for female athletes based on a hierarchy of nutritional needs. Athletes are advised to focus on laying a strong nutritional foundation before advancing to more personalized nutrition plans. The menstrual cycle is also a significant factor, with fluctuations in estrogen levels impacting muscle strength and bone mineral density. Recommendations suggest tweaking macronutrient intake particularly protein and carbohydrates to match hormonal changes throughout the cycle and consulting a doctor for hormone testing. The Gatorade Sports Science Institute discusses the importance of individualized plans, "Nutrition plans should advance from simple to complex as an athlete becomes more experienced. Consultation with a sports dietitian can identify nutritional deficiencies and improve plans. Adequate energy availability sets the foundation for athlete health and performance."(GSSI 1). Adequate nutrition is crucial, and consulting with a sports

dietitian can help identify deficiencies and optimize nutrition plans. While research on menstrual cycle-based nutrition strategies is still evolving, athletes are encouraged to adjust their diets based on individual factors and preferences. While we consume macronutrients in our everyday meals, it could help to increase the intake of these nutrients. Increasing carbohydrates during a woman's cycle can help balance out energy expenditure and increasing protein intake can improve muscle mass and recovery. In a study done by The Medical University of South Carolina, they noted, “The general rule for the amount of protein a person needs is 0.6-1.0 grams of protein per pound of body mass. This means that if you have an athlete who is 185 lbs. then they would need around 111-185g of protein per day.” (McCarley 1). By using research, athletes and students both can find a tailored nutrition plan that fits their unique needs. While they do have general recommendations online, it's important to check with your doctor or dietitian beforehand. Overall, a unique nutrition plan for women athletes can improve hormonal fluctuations, and energy levels, along with bone, muscle, and brain health.

This research blends into a lesson plan where students will explore the fundamental question: How can research and planning help address the nutritional needs of our bodies? Through research, students will delve into different aspects of nutrition, researching ways to enhance their own well-being. By understanding that each body has its own unique needs, students will gain insight into the dietary requirements and eating habits, creating awareness of the relationship between nutrition and mental health. As students conduct research, they will learn skills in compiling information into papers and correctly citing sources. By learning outline practices and going through drafting and revising, students will improve their writing process. By later integrating multimedia presentations, students will communicate their findings and understand the nutrition needs of their peers. Blending this research into a lesson plan will

empower students to not only address their own nutritional needs but also to become critical thinkers and researchers. Through Domain 3 Composition and Rhetoric of the Content Domains for Subject Matter Understanding and Skill in English, students will develop writing skills, research strategies, citations, and presentation methods, overall creating sustainable well-being and educational success.

Overall, by understanding how nutrition enhances the performance and well-being of young female athletes, we can address their unique physiological needs. By investigating factors like hormonal fluctuations, iron intake, bone and muscle health, and menstrual cycle-related functions, tailored nutrition strategies are used to improve athletic performance. Effective nutrition strategies for young female athletes require a personalized approach and considering individual differences and goals. Without many studies on female athletes or menstrual cycle-based nutrition strategies, a need for continued exploration and refinement of recommendations is needed. However, as we advocate for personalized plans, we also have to acknowledge the lack of research on female athletes, especially younger girls. Despite these obstacles, we can push for further research and promote awareness among athletes. As we move forward, it can prove to be very important to implement these ideas, particularly within educational settings. By incorporating this into lesson plans, students can develop critical research skills, evaluate sources, and gain a deeper understanding of the relationship between nutrition, hormones, and overall health. Ultimately, by improving our understanding of nutrition, we can pave the way for sustainable success in health and empowerment of athletes to thrive on and off the field.

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Lesson Plan: Exploring Nutrition: Research, Writing, and Presentation

This lesson plan follows the Content Domains for Subject Matter Understanding and Skill in English (California Commission on Teacher Credentialing):

Domain 3 Composition and Rhetoric

3.1 Written Composing Processes (Individual and Collaborative)

a. Reflect on and describe their own writing processes
b. Investigate and apply alternative methods of prewriting, drafting, responding, revising, editing, and evaluating
c. Employ such strategies as graphic organizers, outlines, notes, charts, summaries, or précis to clarify and record meaning
d. Integrate a variety of software applications (e.g., databases, graphics, and spreadsheets) to produce print documents and multimedia presentation

3.5 Research Strategies

a. Develop and apply research questions
b. Demonstrate methods of inquiry and investigation
c. Identify and use multiple resources (e.g., oral, print, electronic; primary and secondary), and critically evaluate the quality of the sources
d. Interpret and apply findings
e. Use professional conventions and ethical standards of citation and attribution
f. Demonstrate effective presentation methods, including multimedia formats

Thematic Question:

How can research and planning help address the nutritional needs of our bodies?

Learning Objective:

Students will understand the role of research by addressing the unique nutritional needs of individuals. They will research scholarly texts to understand their own nutritional well-being, recognize the differences of nutrition among different people, identify eating habits, and use effective research, writing, and presentation techniques. Students will also learn to reflect on their writing processes, employ various planning and drafting strategies, create and apply research questions, find credible sources, interpret and apply findings, and adhere to citation standards.

Timeline: This lesson plan spans over a period of 5 weeks, consisting of 3 lesson days per week, totaling 15 days of instruction.

Week 1: Understanding Our Nutrition

Day 1: Introduction to Nutrition

Objective: Introduce students to the basics of nutrition and diet understanding its impacts on health.

Lecture: Provide an overview of nutrition, including the roles of macronutrients (carbohydrates, proteins, fats/lipids) and micronutrients (vitamins, minerals). Then discuss the concept of a balanced diet and possible differences in individual nutrient levels.

Activity: Engage students in a discussion about their current eating habits and relationships towards food.

Possible questions to ask:

- Have/Do you follow any diets or diet trends?
- How do you feel about your current relationship with food?
- Have you noticed any influence from friends, family, or social media on your food choices?

Assignment: Have students keep a food journal for the next two days, recording what they eat or drink throughout the day.

Day 2: Exploring Macronutrients

Objective: Introduce students to the functions and types of macronutrients.

Lecture: Discuss the importance of macronutrients, and discuss types of macronutrients like fiber or water. Discuss the first day of their food journal assignment and compare it to what they have learned about macronutrients.

Activity: Divide students into three groups and assign each group one macronutrient each(carbohydrates, proteins, fats). In their groups, instruct students to make a poster on their assigned macronutrients including recommended intake, related foods, and any other information they feel nessesary. Each group presents their findings to the class in a 3-5 minute discussion.

Assignment: Continue the food journal, and write a short paragraph reflecting on your choices and what was discussed in the class lecture.

Day 3: Exploring Micronutrients

Objective: Introduce students to the importance of micronutrients and their personal eating habits.

Lecture: Discuss the role of micronutrients in maintaining health and preventing disease, understanding the importance of consuming nutrient-rich foods.
Activity: Assign each student a single vitamin or mineral, and have them create a poster for their assigned micronutrient. Posters need to include information about the nutrient and its importance, related foods or drinks, and recommended daily intake. Students will then walk around the room and view their peer's posters. Following the viewing, facilitate a class discussion on micronutrients and discuss anything new or interesting they saw.
Assignment: (Optional/EC) Continue your food journal through the weekend and write a page-long reflection on your personal eating habits and nutritional needs.

Week 2: Research Strategies

Day 1: Introduction to research strategies
Objective: Students will learn how to find credible sources and create correct citations.
Lecture: Provide an overview of research tools and databases for finding scholarly sources, such as academic journals and databases like Google Scholar, PubMed, and Library resources. Demonstrate how to use these tools to locate relevant research articles or texts. Discuss the importance of using credible sources in academic research and the consequences of relying on unreliable sources. Discuss how to create research questions that are not too broad or narrow, and how to look up articles based on keywords from research questions.
Activity: Find two scholarly articles that relate to nutrition, and use two different databases.
Assignment: Give out Essay assignment and rubric, have students think of research questions related to nutrition or dietary habits. Encourage clear and specific questions that can be answered through scholarly sources, offer examples of strong research questions.

Day 2: Evaluating Source Credibility
Objective: Teach students how to evaluate the credibility of sources.
Lecture: Provide guidelines for evaluating source credibility, including considerations like author background, publication date, peer review, and biases. Discuss common signs of unreliable sources, including lack of citations, outdated information, or misleading information.

Activity: Display a series of randomly found sources on the projector or board, then with each article, discuss on whether the source is reliable or not. Provide about 10 different websites, articles, or journals that are both credible and not credible.
Assignment: Have students finalize their research questions and find at least two different sources that support their question. Before submitting their sources, they should check the credibility of each source using the criteria discussed in class.

Day 3: Citing Sources
Objective: Teach students how to properly cite sources within academic writing.
Lecture: Show students different citation styles commonly used in academic writing (APA, MLA, Chicago Style). Show format citations for different types of sources including journals, articles, books, and websites.
Activity: Place students in groups of 2-4 and have them pick five different sources. Groups will look at websites together and gather information needed for citations. Students will then individually cite the sources, and then compare their citations with each other.
Assignment: Have students compile their selected sources for the research paper and create a bibliography using the appropriate citation style.

Week 3: Research Paper
Day 1: Drafts and Outlines
Objective: Teach students effective prewriting strategies to organize their thoughts and structure their outlines.
Lecture: Explain the benefits of prewriting, including brainstorming, outlining, and drafting/revisong processes. Demonstrate how to begin outlining including creative tools like mind/road maps. Discuss different methods of outlining, such as topic and paragraph outlines. Demonstrate how to create an effective outline for research papers.
Activity: Have students work individually or in pairs to develop outlines for their research papers. Encourage them to include key points, evidence connection, and different tools from the lecture in their outlines.
Assignment: Have students begin to turn their outlines into rough drafts of their research papers. Focus on developing paragraphs and integrating evidence from their sources.

Day 2: Understanding Writing Styles and Formatting
Objective: Introduce students to different writing styles and formatting techniques commonly used in academic research papers.
Lecture: Provide an overview of major writing styles like APA (American Psychological Association) and MLA (Modern Language Association). Explain the importance of specific formatting guidelines to help their paper with clarity, consistency, and credibility.
Activity: Discuss examples of research papers formatted in APA and MLA. Discuss differences in citation formats, reference lists, headings, and margins.
Assignment: Have students choose a writing style (APA or MLA) for their research paper and finish a rough draft of their research paper. Have students print out a couple of copies of their rough draft to bring to class.

Day 3: Peer Revision
Objective: Facilitate peer feedback and revision to improve the quality of students' research papers.
Lecture: Discuss the process of peer review in academic writing, explaining its role in improving the quality of writing through collaboration and evaluation. Provide guidelines for giving and receiving feedback.
Activity: Organize a peer review session in groups of 3-4 where students exchange their drafts and provide constructive feedback to their peers. Provide guidelines for revising such as including strengths, weaknesses, organization, clarity, and formatting.
Assignment: After receiving feedback from their peers, students will revise and finalize their papers. Full paper guidelines are attached below in the guideline section.

Week 4: Building Presentations
Day 1: Introduction to Presentation Methods
Objective: Introduce students to effective presentation methods for creating engaging multimedia presentations.
Lecture: Provide an overview of key elements of a successful presentation, including slide organization, pictures and media, formatting, and text-to-slide ratio. Discuss different

presentation options like PowerPoint, Google Slides, Canva, etc. Help students understand the benefits of oral and multimedia presentations.
Activity: Have students explore different websites and begin brainstorming how they want to their presentation to look. Hand out presentation guidelines and discuss the individual research paper presentations. See the guidelines below.
Assignment: Students will begin drafting their presentation slides, focusing on content organization and slide design.

Day 2: Oral Communication Skills and Practice
Objective: Develop oral communication skills and confidence in public speaking.
Lecture: Introduce public speaking by showing TedTalk speeches on public speaking and confidence. Analyze each speaker including speaking clearly, maintaining eye contact, and engaging the audience. Provide tips for managing anxiety and building confidence.
Activity: Have students individually explore confidence techniques and write a short reflection on what they have learned and what works best for them. Facilitate a discussion of techniques and ideas as a class.
Assignment: Have students continue to work on their presentation and write note cards for their presentation speech.

Day 3: Finalizing Presentations
Objective: Assist students in finalizing their multimedia presentations and preparing for presentation day.
Lecture: a quick overview of presentation tips.
Activity: Allow the majority of class time to be dedicated to presentation work. Assist students with their slides and oral speeches.
Assignment: Finish slides and speech notes, following the guidelines provided. Remind students that practice will help alleviate nerves and anxiety.

Week 5: Presentations and Reflection
Students will reflect on their writing processes, research, and presentation skills, identifying strengths and areas for improvement

Students will assess their own work and process

In-class assignment: write a page reflecting on your experience during this lesson- what did you learn? What can you improve on? What did you do well?

Day 1: Student Presentations

Objective: Have students deliver their presentations.

Activity: Allow each student 7-10 minutes for presentation and peer questions. Encourage positive feedback and active listening from the audience.

Day 2: Student Presentations

Objective: Have students deliver their presentations.

Activity: Allow each student 7-10 minutes for presentation and peer questions. Encourage positive feedback and active listening from the audience.

Day 3: Reflections

Objective: Have students reflect on their research, writing, and presentation skills. Help students understand the importance of nutrition and heating healthy.

Activity: Facilitate a discussion on the role of nutrition in our lives and what they have learned from each other's presentations.

Questions to ask:

- What have you learned about the role of nutrition in your lives? How has your perspective changed?
- Reflecting on the last few weeks what did you find most difficult, your research, writing, or presentation process?
- What lessons or experiences from this lesson will you carry forward into your future academic or personal lives?

Assignment: Have students write a one-page reflection on their research, writing, and presentation process. Have them reflect on what they learned and their experience during these weeks.

Guidelines and Grading

Research Paper Guidelines

Objective: Write a research paper demonstrating your understanding of a nutrition concept of your choice. This paper will be 7-10 pages in a formatting of your choice (APA or MLA). This paper must include at least 4 scholarly sources following the appropriate citation style.

Criteria for grading:

- Clarity of thesis statement
- Depth of analysis
- Organization and structure
- Grammar and spelling
- Citation and Referencing
- Adherence to guidelines

Peer Review Guidelines

Objective: Provide constructive feedback to improve the quality of peers' research papers.

Criteria for peer review:

- Clarity: Asses clarity of writing including use of transitions and sentence structure.
- Grammar
- Citations and references
- Constructive feedback: Offer constructive criticism and suggestions for improvement respectfully and helpfully.

Presentation Guidelines

Objective: Create a 6-8 minute presentation based on your findings from your research paper.

Criteria for grading:

- Content organization
- Visual aids
- Speaking clarity and effectiveness
- Time management
- Audience engagement