**STEM Lesson Plan for *The Hunger Games***

Title: Hunger is not a game! Understanding the Setting /Science of *The Hunger Games*

Part 1

**Context of Lesson**: This lesson serves as an extension activity for Chapters 1-2 of *The Hunger Games.* Chapters 1-2 are set in the futuristic version of North America, in a **dystopic** country called Panem. The government is corrupt, and while the individuals in charge of Panem live in luxury, the citizens of the country literally starve to death. The protagonist, Katniss Everdeen, lives in present-day Appalachia. The novel opens with her hunting and gathering food for her family, which consists only of her mother and sister, because her father died in a mining accident. As a teenager, Katniss is responsible for protecting her family from starvation, which they narrowly escaped a few years ago. For this lesson, students will examine various scientific topics- the human body’s basic needs regarding daily calorie intake, the average teenager’s daily caloric intake in 2012, the process of starvation, and edible plants of the Appalachian region. They will use this information to better understand the dystopic setting of this novel. They will recognize how present-day North America’s standards of living have deteriorated for the citizens of futuristic Panem.

Grade Level: High School- English 9-10

Lesson Design Questions:

* What are the essential questions for the lessons?

*What amount of calories does the average teenager consume in a day?* Part 1

*What are the human body’s basic needs regarding nutrition?*  Part 1

*How does a person starve to death?* Part 2

*How could a person survive in the wild in present-day Appalachia?* Part 2

* 1. Why are these questions relevant?

These questions allow students to master Common Core Reading **and** Writing Standards for Literacy in Science and Technical Subjects

* 1. What is the connection to real life?

These questions connect *The Hunger Games* and biology to real life in a way that personalizes the story and science for students.

* What techniques are used to make the lesson:
	1. Inquiry-based?

This lesson will allow the students to investigate their own needs and habits regarding daily caloric intake. They will also investigate how that compares to other teenagers in their school.

* 1. Project-based?

Students will explore daily caloric requirements and design a weekly menu for teenagers based on USDA daily caloric values.

* What are the lesson outcomes?
	1. Students will be able to apply the formula for mean.
	2. Students will be able to construct a weekly food menu based on current daily caloric guidelines.
	3. Students will be able to conduct short research to answer a question
	4. Students will be able to gather relevant information from digital sources
	5. Students will be able to produce clear and cohesive writing to attend to a question
* How is participant discourse promoted?

Students will begin the lesson by doing inquiry on daily caloric needs for teenagers in groups of 3s. Students will then track their own daily diets. Upon completing this, students will work as a class to determine the class average, along with the implications- are they higher or lower in comparision? Students will then design their own menus independently and complete the interpretation piece.

* How are science, technology, engineering, and mathematics addressed in the lesson?

**Science:** Students will research the current dietary guidelines for teenagers.

**Technology:** Students will be using approved Internet resources to find answers to essential questions.

**Engineering:**  Students will design a meal plan for themselves that utilizes current recommended caloric guidelines. Students will then come back after a week and determine how difficult their menus were to maintain. They will make appropriate modifications.

**Mathematics:** Students will be applying formulas to calculate the Average Number of Calories consumed in both 9th grade males and females.

1. Use the table below to match standards.

| **Standard** | **Standard Number (s)** | **Activity** |
| --- | --- | --- |
| **Common Core Standard for Mathematical Practice** | 456 | Model with mathematicsUse appropriate tools strategically.Attend to precision. |
| **International Technology Education Association** **Standards for Technological Literacy** | 311 | Relationship among technologies and other fields.Apply the design process |
| **Common Core Reading Standards for Literacy in Science and Technical Subjects** | 478 | Produce clear and coherent writing.Conduct short research project to answer a questionGather relevant information from digital sources |
| **Common Core Writing Standards for Literacy in History/ Social Studies, Science and Technical Subjects** | 7 | Use mathematical processes |
| **Skills and Processes Core Learning Goals for Science** | 34567 | Carry out scientific investigations effectively Demonstrate that data analysis is a vital aspect of the process of scientific inquiry Use appropriate methods for communicating in writing and orally the process and results of scientific investigation Use mathematical processesShow connections between sciences and other fields  |
| **Content Standard** | 12 | * Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
* Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
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1. 5E Model – STEM lessons will use the 5E Model

| **5E Lesson Components** | **Description of Activity** |
| --- | --- |
| **Engagement**The activities in this section capture the participants’ attention, stimulate their thinking, and help them access prior knowledge. | Students research what the recommended daily caloric intake is and then track themselves to see how they compare.  |
| **Exploration**In this section, participants are given time to think, plan, investigate, and organize collected information. | Students will research the national guidelines. They will then accumulate their own personal data. They will then assemble the class’ data and analyze the results.  |
| **Explanation**Participants are now involved in an analysis of their exploration. Their understanding is clarified and modified because of reflective activities. | Students would create a new weekly menu based on their findings. They would summarize their choices and make interpretations about why their current caloric intakes are higher/lower than recommended.  |
| **Extension**This section gives participants the opportunity to expand and solidify their understanding of the concept and/or apply it to a real world situation. | Students will determine if their menus were feasible to maintain. They will then make appropriate modifications to make their menus more doable in the real world.  |
| **Evaluation**Evaluation occurs throughout the lesson. Scoring tools developed by teachers and participants target what participants must know and do. Consistent use of scoring tools improves learning. | Students will evaluate their current caloric intakes and make the appropriate modifications based on the daily recommended values. They will then test and evaluate their self-made menus to see if these guidelines are manageable in their daily life as students.  |

**Hunger is Not a Game Investigation Name\_\_\_\_\_\_\_\_\_\_\_\_**

# Inquiry: Conduct an internet search to determine what the recommended caloric intake per day is for teenagers, male and female. Use approved internet sites ([www.livestrong.com](http://www.livestrong.com), [www.cdc.gov](http://www.cdc.gov) ).

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1. **Investigation: Record your daily caloric intake for the day. Analyze your results. As a male or female are you above or below the recommendation?**

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**Students will write their number and sex on an index card, anonymously. Teacher will collect cards and post the numbers at the front of the room. Students will then find the average of the class for males and females.**

Mean = sum of elements / number of elements
              = a1+a2+a3+.....+an/n

**Analyze your results. Is the class average for females and males above/below the recommended daily caloric intake for teenagers? Are your individual results higher/lower than the class average for your sex?**

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1. **Implementation: Design a weekly menu for yourself for breakfast, lunch, and dinner, using food label information. Use the website** [**http://fnic.nal.usda.gov/**](http://fnic.nal.usda.gov/) **to get accurate nutritional information. Make sure that you stay within the recommended daily caloric guidelines.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| **B:** |  |  |  |  |  |
| **L:** |  |  |  |  |  |
| **D:** |  |  |  |  |  |
| **Total:** |  |  |  |  |  |

1. **Interpretation: Write a summary of your exploration. Would you find it difficult or easy to stay within a certain range for nutrition? What factors might keep you from following this plan?**

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**Modified Menu after One Week’s Trial**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** | **Friday** |
| **B:** |  |  |  |  |  |
| **L:** |  |  |  |  |  |
| **D:** |  |  |  |  |  |
| **Total:** |  |  |  |  |  |

**Discuss how this modified menu would work better in the real world for a student.**

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