

Cook For a Submarine Fleet

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PART I. PRODUCT DESCRIPTOR

Introduction: 7th grade math teachers who are looking for a short application activity to educate students to the important task of ordering a suitable amount of different ingredients in order to nourish various types of submarines that have been deployed for different periods of time. Students will be able to take their newly acquired knowledge of ratios, proportions and unit rates and apply them to this challenge which will open their eyes to the types of submarines over time, and the vast amounts of food needed as submarines became better suited to staying submerged over longer periods.

Learning Objectives:

This activity meets 7th grade Common Core State Standards for mathematics.

Students will learn to represent proportional amounts by using equations. *For example, if total amount t is proportional to the number n of items purchased at a constant price p , the relationship between the total cost and the number of items can be expressed as $t = pn$*

In this activity students will come to understand the enormous amount of familiar ingredients it takes to cook for an entire fleet over an extended period of time.

Students will discuss the methods that they used to figure out food quantities and relate their methods to proportional thought.

Common Core State Standards:

- [CCSS.Math.Content.7.RP.A.1](#) Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.*
- [CCSS.Math.Content.7.RP.A.2](#) Recognize and represent proportional relationships between quantities.
 - [CCSS.Math.Content.7.RP.A.2a](#) Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

PART II. LESSON PLAN

Introduction: 7th grade math teachers who are looking for a short application activity to educate students to the important task of ordering a suitable amount of different ingredients in order to nourish various naval fleets that have been deployed for different periods of time. Students will be able to take their newly acquired knowledge of ratios, proportions and unit rates and apply them to this challenge which will open their eyes to the ranges of fleets over time and the vast amounts of food needed as ships became better suited to stay submerged over longer periods of time.

Instruction: In this lesson students will apply their knowledge of proportions in order to calculate the total amount of different ingredients required to serve naval crews of various sizes over various periods of time throughout history. Students will discuss the methods that they used in order to figure this out, the challenges that they faced, and will be comparing their findings to that of other groups that were given similar assignments.

Materials

- Computer capabilities to show desired links
- Computers for research or print and distribute all links
- Copies of student companion

Procedure

Pre-Read: Food preparation and culinary specialists aboard a submarine:

<http://www.qsrmagazine.com/store/how-you-feed-navy>

Step 1 Hook: Read highlighted “Good, Bad, and the Ugly” parts out of Pig Boats, Fleet Boats and Mystery Meat. If Promethean software is available, blow these pictures up into a viewable flipchart for students to see.

Step 2 Launch: Explain the challenge of quantifying the amount of several ingredients that are needed given the following choices:

A) Choose your submarine type, a specific sub of that type, and crew size:

[SSNs](#), [SSBNs](#), [SSGNs](#)

Typical deployment lengths of different types of submarines:

Fast Attack Submarines, designated SSN (Ship Submersible Nuclear) deploy for 6 months, with about 60 days at sea over three time periods and occasional 90 day periods.

Ballistic Missile Submarines, designated SSBN (Ship Submersible Ballistic Nuclear) deploys for 90 days, but has two separate “Blue” and “Gold” crews of 160 men each, who exchange duty on the submarine every 3 months.

Guided Missile Submarines, designated SSGN (Ship Submersible Guided Missile Nuclear) deploys for 90 days, but has two separate “Blue” and “Gold” crews of 160 men each, who exchange duty on the submarine every 3 months.

B) Choose your length of deployment within the usual deployment ranges.

C) Choose your favorite food from the [*Official Military Recipes Index*](#)

D) Choose the frequency that the food is being served. Minimum is once a month, maximum is once a week, feel free to add one additional meal for “Halfway Night”.

Step 3 Investigate: Students should spend the first class period filling out the front side of their worksheet. They should then use computers to find and copy a recipe. From there, students should be figuring out their proportions. Recommended periods of time are 1 day for each column (example: assign the cook for a fleet on Monday, cook for the entire deployment on Tuesday, cook for the class on Wednesday, and cook for your family on Thursday).

Step 4 Debrief: Students will answer a series of reflective metacognitive questions that will help them describe how they were able to work out the investigation.

Step 5 Extend/Assign: During the last day, challenge students to bring in their recipes and try and bring in military volunteers to try them. Students can also create a way to illustrate the quantity of an ingredient that would be needed to be brought on board. *Example: Bring in an empty can of crushed tomatoes and use its measurement and weight requirements to create a proportion to the tomatoes needed in order to feed your submarine fleet.*

PART III. STUDENT COMPANION

Name: _____

Period: _____

Date: _____

Cook For a Submarine Fleet

Launch: You are the Culinary Specialist Chief (CSC) aboard your chosen boat. Find the amount of each ingredient that you need to bring on board.

A) First your ship. Choose which of the submarines you will be on board.

USS New Hampshire (SSN 778), Groton, CT: Fast Attack Submarine

Designated SSN (Ship Submersible Nuclear) deploy for 6 months, with about 60 days at sea over three time periods and occasional 90 day periods. This active fast-attacker contains an active crew of 130 men. The USS New Hampshire is a Virginia-class nuclear-powered attack submarine, commissioned in 2008 and currently in active service.

USS Henry M. Jackson (SSBN-730), Bangor, WA: Ballistic Missile Submarine

Designated SSBN (Ship Submersible Ballistic Nuclear) deploys for 90 days, but has two separate “Blue” and “Gold” crews of 160 men each, who exchange duty on the submarine every 3 months. The USS Henry M. Jackson is a United States Navy Ohio-class ballistic missile submarine that has been in commission since 1984. She is the only U.S. Navy ship to have been named for United States Senator Henry M. “Scoop” Jackson (1912–1983) of Washington and the only Ohio-class submarine not named after a US state.

USS Ohio (SSBN-726/SSGN-726), Bangor, WA: Guided Missile Submarines

Designated SSGN (Ship Submersible Guided Missile Nuclear) deploys for 90 days, but has two separate “Blue” and “Gold” crews of 160 men each, who exchange duty on the submarine every 3 months. The USS Ohio the lead boat of her class of nuclear-powered fleet ballistic missile submarines, was the fourth vessel of the United States Navy to be named for the 17th state. She was commissioned with the hull designation of SSBN-726, and with her conversion to a guided missile submarine she was re-designated SSGN-726.

Chosen Submarine:	
Number of Crew:	
Time of Deployment:	

B) Next your recipe. Go to www.combatindex.com/recipes/recipes_home.html

Choose anything to cook to your crew!

Meals are served at a frequency of anywhere from one to three weeks. Favorite meals are also served during the “Halfway Night” celebration as well.

Chosen Recipe:	
Meal Frequency:	

Cook For a Submarine Fleet

Recipe File

Now use your knowledge of solving proportions in order to figure out how much of each ingredient you need for A) to feed your entire crew one meal, B) to feed your entire crew for the entire length of the deployment, C) to feed our class one meal and D) to feed your family.

Please show your work on separate sheets and save it. It will help you answer the response questions later.

ONE RECIPE YIELDS 100 SERVINGS (feeds 100 people)

Ingredient (find online)	Amount Needed For Recipe (find online)	Amount Needed For One Meal	Amount Needed For the Deployment	Amount Needed For Our Class	Amount Needed For Family

Discussion Questions. Please prepare these for our discussion on a separate sheet of paper.

- 1) Explain step-by-step what you did in order to prepare the ingredients in order to cook for your fleet.
- 2) How did the proportions for cooking for our class/families compare to cooking for the fleet?
- 3) Were there any “shortcuts” or “formulas” that you can share that helped you figure out your proportions?
- 4) Is two hundred pounds of your main ingredient enough to bring on board for the deployment?
- 5) What was most difficult about Cook For a Fleet? Explain how you persevered.

Extra: Answer the following questions about the proportions you have found in writing on a piece of paper.

- 1) 1/3 of your Crew is on watch at any given time, meaning that 2/3 of your Crew is eating during 4 separate times during the day (00, 06, 12, 18). How does this change how you will prepare your recipe?
- 2) Suppose your mission is cut a month short and your boat is docked for repairs. How much of your main ingredient is left over?

Cook For a Submarine Fleet Rubric

Name: _____

Block: _____

CATEGORY	6	4	2	0
Completion of Proportions	All proportions are completed.	Most of your proportions are completed.	Some of your proportions are completed.	Several of the problems are not completed.
Correctness of Proportions	All proportions are solved correctly using fraction measurements which is the preferred method of cooking.	Most proportions are solved correctly using fraction or decimal measurements.	Some proportions are solved correctly using fraction or decimal measurements.	Only a small amount of proportions are solved correctly using fraction or decimal measurements.
Neatness of Proportions	Your proportions are presented in a neat, clear, organized fashion that is easy to read. All measurements are labeled.	The work is presented in a neat and organized fashion that is usually easy to read. Most measurements are labeled.	The work is presented in an organized fashion but may be hard to read at times. Some measurements are labeled.	The work appears sloppy and unorganized. It is hard to know what information goes together. No measurements are labeled.
CATEGORY	3	2	1	0
Work Shown	You have clearly shown on a separate sheet how you were able to solve your proportions.	You have mostly showed on a separate sheet how you solve your proportions.	You have somewhat showed on a separate sheet how you solve your proportions.	Your work attachment is missing.
Discussion Questions	Your discussion questions are clearly thought out, are written in detailed complete sentences and fully answer the question.	Your discussion questions are mostly thought out, are written in complete sentences and fully answer the question.	Your discussion questions are somewhat thought out, but are in need of further justification.	Your discussion questions are missing or are minimal and do not contain complete thought and/or sentences.
Letter of Thanks Written	You have included a clear, concise, authentic letter of thanks to our presenters.	You have included a basic letter of thanks to our presenters.	You have included only a minimal letter of thanks to our presenters.	You are missing a letter of thanks to the presenters.

Score: _____ / _____

PART IV. PERTINENT INFORMATION AND LINKS

Links: These links provide important information for the completion of the Cook For a Naval Fleet investigation.

- 1) Interview with retired Chief Warrant Officer Rudy Shappee, a 20-year Navy veteran:
<http://www.kpbs.org/news/2010/jun/21/cooking-feed-army/>
- 2) Typical deployment lengths of different types of submarines:
Fast Attack Submarines, designated SSN (Ship Submersible Nuclear) deploy for 6 months, with about 60 days at sea over three time periods and occasional 90 day periods.
Ballistic Missile Submarines, designated SSBN (Ship Submersible Ballistic Nuclear) deploys for 90 days, but has two separate “Blue” and “Gold” crews of 160 men each, who exchange duty on the submarine every 3 months.
Guided Missile Submarines, designated SSGN (Ship Submersible Guided Missile Nuclear) deploys for 90 days, but has two separate “Blue” and “Gold” crews of 160 men each, who exchange duty on the submarine every 3 months.
- 3) Classification of submarines:
SSNs http://www.navy.mil/navydata/fact_display.asp?cid=4100&tid=100&ct=4
SSBNs http://www.navy.mil/navydata/fact_display.asp?cid=4100&tid=200&ct=4
SSGNs http://www.navy.mil/navydata/fact_display.asp?cid=4100&tid=300&ct=4
- 4) U.S. Navy food options
http://www.combatindex.com/recipes/recipes_home.html
Example:
http://www.combatindex.com/recipes/Devils_Food_Cake.pdf
- 5) Halfway Night: “Clean” look at the SSBN-633 Casimir Pulaski
<http://www.usscasimirpulaski.com/halfwaynight.htm>
- 6) Further In-Depth Reading
http://www.public.navy.mil/subfor/underseawarfaremagazine/Issues/Archives/issue_46/pig_boats.html