

## EDUCATOR'S GUIDE

# Cook for a Crew

## Preparation

### Overview and Objectives

This lesson is geared toward students in grades 6–12.

Participants will learn about the food served on *Intrepid* during its time of service and the math needed by mess cooks to prepare appropriate amounts of food for a crew of more than 3000 men. Participants 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.

Participants will discuss the methods that they used, the challenges they faced, and will compare their findings with those of other groups that were given similar assignments.

This lesson includes a [slideshow](#) in which an instructor can lead participants through the jobs of mess cooks and lead them through the math skills needed to scale recipes on their own.

### Instructional Modalities

This activity was designed for both synchronous or asynchronous instruction.

For **synchronous instruction**, we recommend a platform that allows both for whole class discussion and for students to interact in small groups.

For **asynchronous adaptations**, we provide suggestions for teachers to provide additional support for the activities and for students to share their work with each other.

### Materials

- [Cook for a Crew slideshow](#)
- [Activity Worksheets](#) (p. 5 - 8)
- **Blank Piece of Paper**
- **Pencil**
- **Calculator (optional)**

## Standards

### Common Core

CCSS.Math.Practice.4 –  
Model with mathematics.

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.

## COOK FOR A CREW Grades 6-12

### Lesson

#### **Introductory Activity**

- Participants will watch [three-minute video](#) on feeding *Intrepid's* crew and answer these questions:
  - **Have you ever prepared a meal before? What makes cooking challenging?**
  - **What might be difficult in feeding a crew of 3000 sailors?**
- Introduce students to idea of meal planning. Make connection to planning meals for a family – buying ingredients at grocery store, altering recipe to accommodate certain numbers of people, etc.
- Explain that the same needs to be done on naval ships and in other places (school cafeterias, restaurants, etc.).

#### **Core Activity**

- Explain the challenge of quantifying the amount of several ingredients that are needed given so many variables. Recipes typically yield 100 servings, but not every crew is exactly 100 people. Recipes must be scaled up or down accordingly. Also when planning needed ingredients, how often the meal is served must be taken into consideration.
- Review the process of scaling a recipe with participants
- Have participants look through the recipe cards and select which recipe they would most enjoy eating.
- Have participants go through the Cook for the Crew! Worksheet and scale the recipe for feeding the crew once, for feeding the crew over the course of a deployment, and feeding their family. Students should use scratch paper to show all of their work. Once participants have completed the table on the worksheet, guide them through the given discussion questions.
- Share the responses with the whole group

### Asynchronous Adaptation

Have participants go through the [slideshow](#) on their own and scale the recipes on their own using the worksheets attached. Have participants share their discussion responses using Flipgrid.

**COOK FOR A CREW** Grades 6-12

## Extension Activities

To deepen student engagement with this content, you may choose to add the following activities :

### **Additional Recipe Scaling**

Model the mathematics for recipe scaling with your students using [Number Pieces](#) by the [Math Learning Center](#).

### **Additional Recipe Scaling**

Have participants look through any of the additional recipes in the [slideshow](#) and scale the recipe for the same audiences or any other audience they can think of.

### **Try Out a Recipe!**

Have participants look through any of the recipes in the [slideshow](#) and scale the recipe down for their family. Have them try cooking the recipe with their family and share how it tasted!

## Additional Resources/ References

### **Background Information on scaling**

Scaling involves using proportions and fraction multiplication to adjust a given amount.

For example, to yield 100 servings a recipe for cookies requires –

- 2 ½ cups of sugar
- 2 ¾ quarts of flour

But we want the recipe to yield 200 servings. This is done using fraction multiplication.

To begin, convert both amounts from mixed numbers to improper fractions by multiplying the whole number by the denominator of the fraction and then adding the value of the numerator. Once this is done the whole number of the fraction is dropped and this new number becomes the numerator:

$$\text{Whole number} \rightarrow 2 \frac{1}{2} \begin{array}{l} \leftarrow \text{numerator} \\ \leftarrow \text{denominator} \end{array}$$

$$2 \frac{1}{2} \text{ cups sugar} = \frac{5}{2} \text{ cups sugar}$$

$$2 \frac{3}{4} \text{ quarts flour} = \frac{11}{4} \text{ quarts flour}$$

Next, we need to figure out the proportion to get the number of servings we want. Do this by putting the desired number of servings in

$$\frac{\text{Desired servings} \rightarrow 200}{\text{Recipe yield} \rightarrow 100} = \frac{2}{1}$$



Copyright Intrepid Museum. All rights reserved. Materials may be reproduced for educational purposes. Updated August 2023

**COOK FOR A CREW** Grades 6-12 the numerator and the recipe yield in the

denominator of a fraction. Then simplify

Now multiply the improper fraction of the ingredient amount by the proportion for the desired number of servings

to figure out how much of each ingredient you need. Remember, to multiply

fractions simplify numbers diagonal to each other and then multiply across

*Sugar*

$$\frac{5}{2} \times \frac{2}{1} = \frac{5}{\cancel{2}} \times \frac{\cancel{2}1}{1} = \frac{5}{1} \times \frac{1}{1} = \frac{5}{1} = 5 \text{ cups of sugar}$$

*Flour*

$$\frac{11}{4} \times \frac{2}{1} = \frac{11}{\cancel{2}4} \times \frac{\cancel{2}1}{1} = \frac{11}{2} \times \frac{1}{1} = \frac{11}{2} = 5\frac{1}{2} \text{ quarts of flour}$$

In order for this recipe to yield 200 servings we need-

- 5 cups of sugar
- 5 ½ cups of flour

**The Museum is deeply grateful to the funders that make our education programs possible:**



*This project was made possible in part by the Institute of Museum and Library Services, Award ID: CAGML-247144-OMLS-20*



3. What are “midrats” and who were they meant to serve?

## ACTIVITY 2: VIDEO REFLECTION

Directions:

Watch the [“Recipe Scaling Math” video](#) and answer the following question

To yield 100 servings a recipe for cookies requires  $2\frac{3}{4}$  quarts of flour. How much flour would one need for a recipe that yields 200 servings?



Copyright Intrepid Museum. All rights reserved. Materials may be reproduced for educational purposes. Updated August 2023

5

## COOK FOR A CREW Grades 6-12 **ACTIVITY 3: COOK FOR THE**

### **CREW!**

Directions:

You are the Culinary Specialist Chief (CSC) aboard *Intrepid*. Find the amount of each ingredient that you need to bring on board.

1. First, your ship. Let’s learn about your vessel and identify how long your deployment will be.

USS *Intrepid* (CV-11)

In service from 1943-1974, *Intrepid* would deploy for about 6-7 months at a time with an average crew of 3,000 men. During World War II, the U.S. Navy built hundreds of new ships, including 24 *Essex*-class aircraft carriers of which *Intrepid* was the eleventh. Decommissioned shortly after the end of the war, *Intrepid* was modernized and re-commissioned in 1954 as an

attack carrier (CVA) and then eventually became an antisubmarine carrier (CVS) in 1962.

2. Next, your recipe. Look through the recipe cards available in the [slideshow](#). Choose anything to cook your crew!

Chosen Recipe:
----------------

[Now use your knowledge of solving proportions](#) in order to figure out how much of each ingredient you need to –

- a) Feed your entire crew for one meal
- b) Feed your family for one meal

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



Copyright Intrepid Museum. All rights reserved. Materials may be reproduced for educational purposes. Updated August 2023

**COOK FOR A CREW** Grades 6-12

ONE RECIPE YIELDS 100 SERVINGS (feeds 100 people)

Ingredient	Amount needed for recipe	Amount needed for one meal	Amount needed for one meal for your family




Copyright Intrepid Museum. All rights reserved. Materials may be reproduced for educational purposes. Updated August 2023

**COOK FOR A CREW** Grades 6-12

**Discussion questions**

1. Explain step-by-step what you did in order to prepare the ingredients in order to cook for your crew.

2. How did the math for scaling the recipe for our families differ from the math scaling the recipe for the crew?



3. What was challenging about scaling your recipe?

4. Challenge Question: Is 200 pounds of your main ingredient enough to bring on board for the crew to eat your meal six times between resupplying ingredients?



Copyright Intrepid Museum. All rights reserved. Materials may be reproduced for educational purposes. Updated August 2023