Wickenburg Unified School District
Wickenburg High School
CTE Academic Integration

Culinary Arts/Math
Fractions & Conversions

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Grade Level Participation: 10-12

Classes: Professional Foods & Culinary Arts

Lesson Description:

Fractions/Rationale

During the 2009-2010 school year the WHS students worked to improve their math skills in the Culinary Arts classroom. Fractions seem to be an area of much difficulty for many students. Even though fractions should be mastered at this point for high school students, we have found that many still avoid them or have difficulty working with them. The goal this year was to improve the student's ability to work with fractions. It was our intention that students would not only be better at understanding fractions, but in addition be better equipped to work with more advanced math concepts where fractions are only a small part of the equation.

Below are the CTE & Math Standards that were addressed in this project.

Math Standards:

S4 – C4 – PO 1
Use dimensional analysis to keep track of units of measure while converting.
Proportional Reasoning.

S4 – C4 – PO 4
Solve problems using ration & proportions.

Culinary Arts Standards:

9.8 Differentiate between the basic units of measurement: Standard & metric.
Formula to convert metric to standard.
Formula to calculate equivalents, quarts to gallons etc.

9.9 Explain areas, weight, volume, mass and density.
Calculate area, diameter, circumference etc.

14.3 Perform calculations to increase and decrease formulas.
Fraction review – adding/subtracting/multiplying/dividing fractions.

14.6 Utilize weights and measures to demonstrate proper scaling and measurement techniques.
Formula to convert pounds to ounces, decimals to fractions etc.

14.20 Explain the principle of food cost and food waste.
Calculate percentages, trim loss.

16.6 Apply basic math skills to recipe conversions.
Fraction review – adding/subtracting/multiplying/dividing fractions.

Fractions Lesson

At the beginning of the school year the Culinary students completed a unit on "Culinary Math". During this unit we returned to the basics of adding, subtracting, multiplying and dividing fractions. Worksheet posted below.

Name_____Date_____ Hour____

Part I. Adding & Subtracting Fractions with a common denominator.

To add or subtract fractions that have a common denominator, the numerators are added together or subtracted and the solution is placed over the common denominator in the result. Remember to create improper fractions to solve and also make sure you **reduce** your answer to the simplest form.

1. $\frac{1}{4} + \frac{1}{4} =$ _____

2. $\frac{3}{4} - \frac{1}{4} =$ _____

3. 1/8 + 3/8 = _____

4. $\frac{1}{2}$ + 5/2 = _____

5. $1\frac{1}{2} + 4\frac{1}{2} + \frac{1}{2} =$ _____

6. 7/8 - 5/8 = _____

7. 1 1/8 - 4/8 = _____

8. $4\frac{1}{2}$ + 12/2 = _____

9. 1/3 + 2/3 = _____

10. 1/8 + 3/8 + 2 3/8 = _____

Part II. Adding & Subtracting fractions with unlike denominators.

First you need to create improper fractions where necessary. In order to add or subtract fractions with unlike denominators, the fractions must be rewritten so that they have a common denominator. Do this by finding the lowest common factor and multiply the denominators by this factor until they are the same. After the denominators are the same, finish working the problem..

1. $\frac{1}{2} + \frac{3}{4} =$ _____

2. 2/3 + $\frac{3}{4}$ = _____

3. $1\frac{1}{2} + 2\frac{3}{4} =$ _____

4. 2/3 + $\frac{1}{4}$ = _____

5. $1\frac{1}{2} - \frac{1}{4} =$ _____

6. $2\ 2/3 + 1\frac{1}{4} =$ _____

7. 3/8 - $\frac{1}{4}$ = _____

8. 9/10 + 1/5 = _____

9. 7/8 + $\frac{3}{4}$ = _____

10. 6/10 – 1/5 = _____

Part III. Multiplying Fractions.

When multiplying fractions, the numerators and the denominators are multiplied separately. It does not matter if the denominators are common. Begin by converting any mixed numbers to improper fractions. Multiply straight across to get your answer. Remember that a whole number in fraction form is over "1". 2 = 2/1.

1. $\frac{1}{2}$ X 2/3 = _____
2. 5/8 X 1/8 = _____
3. 1 $\frac{1}{2}$ X 3/8 = _____
4. 3 $\frac{1}{2}$ X 2/3 = _____
5. 5/8 X 2/3 = _____
6. 3 X 5/8 = _____
7. 2 2/3 X 1/8 = _____
8. 3 $\frac{1}{4}$ X 1/8 = _____
9. 4 X 3/8 = _____
10. 1/5 X 2/3 = _____

Part IV. Dividing Fractions

When dividing fractions you do not have to create common denominators. First create improper fractions where necessary. Then use the "reciprocal" (upside down fraction) on one of the fractions and multiply as you did in part III. Remember that a whole number in fraction form is over "1". 2 = 2/1.

1. 7/8 ÷ 2 = _____
2. $\frac{3}{4}$ ÷ 2 = _____
3. 1 $\frac{1}{2}$ ÷ 2 = _____
4. 3 $\frac{3}{4}$ ÷ $\frac{1}{2}$ = _____
5. 1 1/8 ÷ 2 = _____
6. 5 3/8 ÷ 3 = _____
7. 6 2/3 ÷ 6 = _____
8. 4 1/3 ÷ 1/3 = _____
9. 4 1/3 ÷ 3 = _____
10. 5 ÷ 1/3 = _____

For the remainder of the school year the students were required to revisit fractions on a regular basis through the use of the “Recipe Conversion Worksheet” The recipe conversion worksheet (below) was an activity that was assigned before each “lab” (about every week). The students were required to practice their knowledge of fractions during the task of increasing or decreasing the yields of the recipes they were making.

Name _____Date _____ Period ____

Recipe Conversion

Use the recipe conversion formula below to increase or decrease the indicated recipe.

Recipe Name: _____

Desired yield ÷ Original Yield = recipe conversion factor

_____ ÷ _____ = _____

Original Yield Amount	Ingredient	Show your work	Desired Yield Amount

This conversion worksheet not only required knowledge of fractions but measurements & equivalents as well.

2010-2011 School Year Plans

Future 2010-2011 School year plans/improvements

At the beginning of the 2010-2011 school year a pre-test will be given to the students enrolled in both the beginning & advanced Culinary Arts courses. The pre-test will determine the present knowledge of each student in the following areas:

Adding, Subtracting, Multiplying, Dividing Fractions
Determining equivalents using "unit conversion"
Increasing/Decreasing recipe yields

After determining the level of each student in the Culinary Arts classes, a series of activities will be assigned throughout the school year that will give them practice in the above mentioned areas.

Continue with recipe conversion activities
Continue with proportional reasoning – converting units
Calculate trim loss with percentages
Converting decimals, fractions, percentages

Equivalents:

While students in the Culinary Arts classes are converting recipe yields they will need to have knowledge of how to convert measurements also. Using the "Unit Conversion" table will be an activity that the students will be assigned many times throughout the year. They will be able to use this concept not only in the Culinary Classroom converting quarts to gallons, but while converting such measurements as inches to miles, degrees Fahrenheit to Celsius, etc.

Post Test

At the end of the school year a post-test will be given to determine the effectiveness of the Math/Culinary activities.

Survey

A survey will be filled out by each of the students to get their opinion on how well the assigned activities helped them.