

Money Conversion

Lesson six



Terminal Objective

Use dimensional analysis to convert money from US dollars to foreign currency or foreign currency to US dollars.

Content Standard Reference:

Grade 7 Measurement and Geometry

7.1.3 – Use measures expressed as rates and measures expressed as person-days to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer.

Materials

1. Money Conversion PowerPoint
2. Money Conversion Worksheet
3. White board

Time Required

1 class

Keyword

1. **Dimensional analysis** - using unit analysis to help make conversions from one unit to another.

Introduction of Lesson

Anticipatory Set:

Ask students: How many dimes are in a ten dollar bill? They are converting dollars to dimes.

Student Objective:

Students will be able to use dimensional analysis to convert money from US dollars to a foreign currency and foreign currency to US dollars.

Purpose:

When students travel to other countries, they must use the currency of that country. The Port of Long Beach is a major international seaport. It is important for Port employees to understand how to convert foreign currencies.

Lesson

Input

Dimensional analysis is using unit analysis to help make conversions from one unit to another. Review the five steps for dimensional analysis.

Modeling

1. Read the situation. Identify the original units.
2. Write the original units as a fraction.
3. Decide what is the conversion factor for the new unit.
4. Be sure to set up the problem so the original units will divide out.
5. Simplify the expression and divide out the common units.

Check for Understanding

Have students work with a partner to make sure they have the five steps written correctly in their notes.

Lesson cont'd

Input

Use dimensional analysis to convert the units for this situation:

I have ten dollars. How many dimes are in ten dollars?

Modeling

Step 1. What are the original units? dollars

Step 2. Write as a fraction.

$$\frac{10 \text{ dollars}}{1}$$

Step 3. Write the multiplication sign and fraction bar.

$$\frac{10 \text{ dollars}}{1} \cdot \underline{\hspace{2cm}}$$

Step 4. What is the conversion factor?

1 dollar = 10 dimes

Step 5. Simplify the expression and divide out the common units.

$$\frac{\cancel{10 \text{ dollars}}}{1} \cdot \frac{10 \text{ dimes}}{\cancel{1 \text{ dollar}}} = 100 \text{ dimes}$$

Input

Tell students: Let's pretend you are traveling to Great Britain. You have a food bill for 10 pounds. How many U.S. dollars would that be?

Modeling

The conversion rate is 1 pound = 2.04 dollars.

Set up the expression using the five steps.

Check for Understanding

Have students put their expressions on white boards. On the count of three, check the expressions.

Lesson cont'd

Answer:

$$\frac{10 \text{ pounds}}{1} \cdot \frac{2.04 \text{ dollars}}{1 \text{ pound}} = 20.4 \text{ dollars}$$

Input

A ship from China is coming to the Port of Long Beach. The captain of the ship has 2,500 yuan. How many US dollars does he have?

Modeling

The conversion rate is 1 yuan = 0.1321 dollars

Set up the expression using the five steps.

Check for Understanding

Have students put their expressions on white boards. On the count of three, check the expressions.

$$\frac{2,500 \text{ yuan}}{1} \cdot \frac{0.1321 \text{ dollars}}{1 \text{ yuan}} = 330.25 \text{ dollars}$$

Have students work with a partner or in their group. Explain how to change foreign currency to U.S. dollars. Call on one group to explain the process.

Answer: Write an expression using dimensional analysis to eliminate the original units.

Input

Now let's change U.S. dollars to foreign currency. Ten dollars is how many euros? Look at the conversion chart on the Money Conversion Worksheet.

A Country	B Money	C One dollar in Foreign currency	D Foreign Currency in one dollar
Britain	Pound	\$1 = 0.49 pound	1 pound = \$2.04
France	Euro	\$1 = 0.73 euro	1 euro = \$1.38
Mexico	Peso	\$1 = 10.78 pesos	1 peso = \$0.09

Lesson cont'd

Modeling

See Money Conversion Worksheet for the chart. Students should decide which column they will use to find the conversion factor.

The original unit is dollars so they will be using column C.

Check for Understanding

Have students use

- one finger for A
- two fingers for B
- three fingers for C
- four fingers for D

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Question: Convert ten dollars to euros.

One dollar = 0.73 Euros

Write the expression:

$$\frac{10 \text{ dollars}}{1} \cdot \frac{.73 \text{ euros}}{1 \text{ dollars}}$$

Answer:

$$\frac{10 \text{ dollars}}{1} \cdot \frac{0.73 \text{ euros}}{1 \text{ dollar}} = 7.30 \text{ euros}$$

Input

Students work alone for five minutes doing the problems independently. Then students will work in small groups to compare their answers. Select two groups to share out how they set up the problems.

Lesson cont'd

Guided Practice

Use the chart to try these two examples.

Question 1: One hundred dollars to pounds.

Answer:

$$\frac{100 \text{ dollars}}{1} \cdot \frac{.49 \text{ pounds}}{1 \text{ dollars}} = 49.00 \text{ pounds}$$

Question 2: Convert one hundred pesos to dollars.

Answer:

$$\frac{100}{1} \cdot \frac{.09}{1} = 9 \text{ dollars}$$

Closure

Tell students to discuss the steps used to convert money with their group. Students should give the five steps to dimensional analysis.

Input

Have students complete the Money Conversion Worksheet.

Check for Understanding

Students will work alone on the worksheet. Once most students have finished the first five problems, have them compare answers with members of their group or their partner. Select one student from each group to explain how to work the first five problems. Students should complete the rest of the worksheet for homework.

Money Conversion Worksheet

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Directions

Use the conversion chart to complete the problems. Be careful to use the correct column.

Country	Money	One US Dollar in Foreign Currency	Foreign Currency in One US Dollar
Britain	Pound	0.49	2.04
France	Euro	0.73	1.38
Mexico	Pesos	10.78	0.09
China	Yuan	7.57	0.13
Japan	Yen	121.82	0.008

- 5 dollars = _____ pounds
- 10 dollars = _____ euros
- 50 dollars = _____ pesos
- 150 dollars = _____ Yuan
- 1000 dollars = _____ yens
- 5000 yen = _____ dollars
- 650 Yuan = _____ dollars
- 850 euros = _____ dollars
- 700 pounds = _____ dollars
- 500 pesos = _____ dollars

The Port of Long Beach charges ships for the time they are at the berth being loaded and unloaded. The length of the vessel determines the daily charge. A ship that is 200 meters long must pay \$2882 per day.

- If the ship is from China, how many Yuan would the company pay for each day?
- If the ship is from France, how many euros would the company pay for each day?

Money Conversion Worksheet Answers

Answers

Answers:

1. 2.45 pounds
2. 7.30 euros
3. 539 pesos
4. 1,135.5 Yuan
5. 121,820 yens
6. 40 dollars
7. 84.50 dollars
8. 1,173 dollars
9. 1,428 dollars
10. 45 dollars
11. 21,816.74 Yuan
12. 2,103.86 euros