

## *Math-in-CTE Lesson Plan*

Lesson Title: State Income Taxes	Lesson Number: BU09
Occupational Area: Business and Marketing	
CTE Concept(s): Income Tax	
Math Concepts: Percentages, proportions	
Lesson Objective:	After completion of this lesson, the students should be able to compute state income tax based on a percent basis.
Supplies Needed:	Chalkboard/Whiteboard Overhead (optional) State Income Tax Worksheet
Link to Accompanying Materials:	<a href="#">Business/Marketing BU09 Downloads</a>

<b>THE "7 ELEMENTS"</b>	<b>TEACHER NOTES (and answer key)</b>
<p><b>1. Introduce the CTE lesson.</b></p> <p>Students have been working towards an understanding of “Gross and Net Income” Have students review, as a warm-up, the following definitions: gross income, net income, and taxable wages.</p> <p>Ask the student how many have jobs. Discuss pay versus earnings. (hopefully students will discuss tax, if not, bring it up as a difference between pay and earnings)</p> <p>Ask why states collect taxes (ex: education, highways, police protection, etc)</p> <p>Most states require employers to withhold a certain amount of pay for state taxes. In some states, the tax withheld is a <u>percent</u> of <u>taxable wages</u>.</p>	<p><u>Gross Income:</u> The total amount of money earned within a pay period or annually.</p> <p><u>Net Income:</u> The actual money received after all deductions (taxes, insurance, etc) have been taken out of the gross income.</p> <p><u>Taxable Wages:</u> The amount of wages to be taxed after exemptions have been deducted.</p> <p>Annual Gross Pay - Exemptions = Taxable Wages</p>
<p><b>2. Assess students’ math awareness as it relates to the CTE lesson.</b></p> <p>What is the definition of a percent?</p> <p>Give one way to find 10% of 100?</p>	<p><u>Percent:</u> part of a whole (%)</p> <p>Answers vary: Multiply .10(100)=10</p> <p>Use the method described below:</p> $\frac{x}{100} = \frac{10}{100} = 10$

**3. Work through the math example embedded in the CTE lesson.**

Problem: Bob's gross pay is \$18,900. He is Single and claiming 1 dependant. His state has an income tax rate of 4%. How much will be withheld from his paycheck?

STEP1: Find the taxable wages.  
(Annual Gross pay - Exemptions)

$$\$18,900 - \$2,200 = \$16,700$$

STEP2: Calculate the State Income Tax.

How much is withheld of \$16,700 at 4%?

$$\frac{x}{\$16,700} = \frac{4}{100}$$

STEP3: Cross multiply to solve for x

$$100 \cdot x = 4 \cdot \$16,700$$

$$100x = \$66,800$$

$$\frac{100x}{100} = \frac{\$66,800}{100}$$

$$x = \$668.$$

Bob will have \$668 withheld this year in state taxes.

You may wish to create an overhead with the following table (it will be used in this problem and the next):

Personal Exemptions	
Single	\$1,500
Married	\$3,000
Each Dependant	\$700

One way to calculate percentages is using the ratio:

$$\frac{IS}{OF} = \frac{\%}{100}$$

This will take a statement like "How much is withheld of \$16,700 at 4%" and easily translate it into a proportion to solve.

IS=x (we don't know "is")

OF=\$16,700

% = 4

**4. Work through related, contextual math-in-CTE examples.**

Suzie earns a gross pay of \$34,000. She is married to Steve with 3 dependants. Her state income rate is 5%. How much will she have withheld in state income taxes this year?

Answer: \$1,445

**5. Work through traditional math examples.**

1. What is 20% of 50?
2. 12 is what % of 32?

Answers:

1. 10
2. 37.5%

<p>3. Where else are percentages used?</p>	<p>3. Examples will vary, some given: Percentage of sales (at a retail store), Percentage of ethanol in gasoline, Percentage of daily value (calories, fat, protein)</p>
<p><b>6. Students demonstrate their understanding.</b> State Income Tax Worksheet</p>	<p>Answers:</p> <ol style="list-style-type: none"> <li>1. \$1500</li> <li>2. \$5100;\$2976.00</li> <li>3. \$392</li> <li>4. \$1437.30</li> <li>5. \$1416.50</li> <li>6. 192</li> <li>7. 9.76</li> <li>8. 12.50</li> <li>9. 29.20</li> <li>10. 3.5%</li> </ol>
<p><b>7. Formal assessment.</b> Unit Test Question: Melvia Hoskins earns \$18,000 a year as a librarian. The state income tax rate is 3.6% of taxable income. Her personal exemptions total \$3,700. How much is withheld from her taxable wages for state income tax each year?</p>	<p>Answer: \$514.80</p>