



Program Information	<i>[Lesson Title]</i>		TEACHER NAME		PROGRAM NAME			
	<i>Simple Interest</i>		Shannon Pelsnik		Parma City School District			
Program Information	<i>[Unit Title]</i>		NRS EFL(s)		TIME FRAME			
	<i>Advanced Math Topics</i>		2 – 6		120 - 150 minutes			
Instruction	<u>ABE/ASE Standards – Mathematics</u>							
	Numbers (N)		Algebra (A)		Geometry (G)		Data (D)	
	Numbers and Operation	N.3.2 N.3.3	Operations and Algebraic Thinking	A.4.4	Geometric Shapes and Figures		Measurement and Data	D.3.2
	The Number System	N.4.12	Expressions and Equations		Congruence		Statistics and Probability	
	Ratios and Proportional Relationships	N.4.9	Functions		Similarity, Right Triangles. And Trigonometry		Benchmarks identified in <i>RED</i> are priority benchmarks. To view a complete list of priority benchmarks and related Ohio ABE lesson plans, please see the Curriculum Alignments located on the Teacher Resource Center (TRC).	
	Number and Quantity				Geometric Measurement and Dimensions			
					Modeling with Geometry			
	Mathematical Practices (MP)							
	X	Make sense of problems and persevere in solving them. (MP.1)			X	Use appropriate tools strategically. (MP.5)		
	X	Reason abstractly and quantitatively. (MP.2)			X	Attend to precision. (MP.6)		
X	Construct viable arguments and critique the reasoning of others. (MP.3)			X	Look for and make use of structure. (MP.7)			



X	Model with mathematics. (MP.4)	X	Look for and express regularity in repeated reasoning. (MP.8)
LEARNER OUTCOME(S)		ASSESSMENT TOOLS/METHODS	
<ul style="list-style-type: none"> • Solve simple interest word problems. • Use the four operations to solve word problems involving money. 		<ul style="list-style-type: none"> • Individual practice problems – Students will complete practice problems with 80% accuracy • Teacher will walk around during group work and individual work to check for understanding. Further review in next class if not mastered. • Post-tests 	
LEARNER PRIOR KNOWLEDGE			
<ul style="list-style-type: none"> • Comprehension of multiplication, division, percents, and decimals – computation and applied. • Basic calculator skills. • Basic computer and internet skills. 			
INSTRUCTIONAL ACTIVITIES		RESOURCES	
<ol style="list-style-type: none"> 1. Handout student copies of <i>Mathematics Formula Sheet & Explanation</i> (attached). <ol style="list-style-type: none"> a. Point to the simple interest formula. Have student point to the simple interest formula on their formula sheet. Assist students who cannot locate the formula on their handout. 2. Write the following on the white board: <ol style="list-style-type: none"> a. $I=Prt$ b. Interest = Principal x rate x time c. Interest (the interest money created in dollars) d. Principal (the “principal” or starting amount of money) 		<p>Student copies of <i>Mathematics Formula Sheet & Explanation</i> (attached)</p> <p>Mathematics Formula Sheet & Explanation [PDF file]. (n.d.). Retrieved from http://www.gedtestingservice.com/</p> <p>White/chalk board</p> <p>Scratch Paper</p> <p>Pencils</p>	



<p>e. Rate (Interest Rate % per year) f. Time (The time the money is invested or borrowed, in years)</p> <p>3. Write the following example on the board: a. I bought a TV for \$500. I charged it on my credit card. It will take me 3 years to pay it off. The interest rate on my credit card is 14%. How much is the simple interest? How much will I pay total?</p> <p>4. Have students use a calculator to complete the example. a. Plug in: $500 \times 14\% \times 3$ OR $500 \times .14 \times 3$</p> <p>5. Write the following example on the board: a. I bought a car for 22,000. I took out a 5 year loan and am paying 6% interest. What is the simple interest? How much will I pay total?</p> <p>6. Have students use a calculator to complete the example. Walk around the room to monitor for understanding.</p> <p>7. Hand out student copies of the worksheet <i>Simple Interest Activity</i> (attached) a. Project the <i>Simple Interest Activity</i> on the overhead. b. Model steps 1-6 for students using the overhead projector, computer, and internet. c. Pause for questions after each step. Model steps 1-6 again if needed or ask a student to model steps 1-6 using the same method. d. Have students complete the <i>Simple Interest Activity</i> on computers individually or alone. e. Teacher will walk around checking for understanding and offering additional help as students complete independently.</p>	<p>Calculators for student use</p> <p>Computers for student use</p> <p>Internet access</p> <p>Projector, ability to project</p> <p>Student copies of <i>Simple Interest Activity</i> (attached)</p> <p>Student copies of <i>Simple Interest Word Problems</i> (attached)</p> <p>Student copies of <i>Simple Interest Word Problem Answers</i> (attached)</p>
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<p>8. After students finish, have them share their completed worksheets with the class.</p> <ol style="list-style-type: none">Have students calculate their monthly house payments for the 30 year loan.Ask them to add the cost of their house + the simple interest. Explain this is the total they will pay on the house.Have them divide the total by 360.The answer will be there monthly payments <p>9. Discuss: Could you afford these monthly payments. Why or why not?</p> <ol style="list-style-type: none">What other expenses do you need to consider? (i.e.: house insurance, utilities, food, car) <p>10. If students would like more examples, have them calculate monthly payments of a 15 year house loan (total cost/180), 5 year new car (total coast/5), and 3 year used car (total cost/3) using the information from the <i>Simple Interest Activity</i>. Pause for discussion and/or questions.</p> <p>11. For additional practice, handout student copies of <i>Simple Interest Word Problems</i> (attached) and <i>Simple Interest Word Problem Answers</i> (attached).</p>	
<p>DIFFERENTIATION</p> <ul style="list-style-type: none">Give extra help to students who need it; pair lower-level with higher-level students.Use overhead projector and worksheets for tactile and visual learners.Teacher can model more examples if needed.	



	<ul style="list-style-type: none">• Individual and Whole Class instruction.
Reflection	TEACHER REFLECTION/LESSON EVALUATION Students really enjoyed this lesson, reaching interest in all students.
	ADDITIONAL INFORMATION

Mathematics Formula Sheet & Explanation

The 2014 GED® Mathematical Reasoning test contains a formula sheet, which displays formulas relating to geometric measurement and certain algebra concepts. Formulas are provided to test-takers so that they may focus on *application*, rather than the *memorization*, of formulas.

Area of a:

square	$A = s^2$
rectangle	$A = lw$
parallelogram	$A = bh$
triangle	$A = \frac{1}{2}bh$
trapezoid	$A = \frac{1}{2}h(b_1 + b_2)$
circle	$A = \pi r^2$

Perimeter of a:

square	$P = 4s$
rectangle	$P = 2l + 2w$
triangle	$P = s_1 + s_2 + s_3$
Circumference of a circle	$C = 2\pi r$ OR $C = \pi d$; $\pi \approx 3.14$

Surface area and volume of a:

rectangular prism	$SA = 2lw + 2lh + 2wh$	$V = lwh$
right prism	$SA = ph + 2B$	$V = Bh$
cylinder	$SA = 2\pi rh + 2\pi r^2$	$V = \pi r^2 h$
pyramid	$SA = \frac{1}{2}ps + B$	$V = \frac{1}{3}Bh$
cone	$SA = \pi rs + \pi r^2$	$V = \frac{1}{3}\pi r^2 h$
sphere	$SA = 4\pi r^2$	$V = \frac{4}{3}\pi r^3$

(p = perimeter of base with area B ; $\pi \approx 3.14$)

Data

mean	mean is equal to the total of the values of a data set, divided by the number of elements in the data set
median	median is the middle value in an odd number of ordered values of a data set, or the mean of the two middle values in an even number of ordered values in a data set

Algebra

slope of a line	$m = \frac{y_2 - y_1}{x_2 - x_1}$
slope-intercept form of the equation of a line	$y = mx + b$
point-slope form of the equation of a line	$y - y_1 = m(x - x_1)$
standard form of a quadratic equation	$y = ax^2 + bx + c$
quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Pythagorean theorem	$a^2 + b^2 = c^2$
simple interest	$I = Prt$ (I = interest, P = principal, r = rate, t = time)
distance formula	$d = rt$
total cost	total cost = (number of units) \times (price per unit)

Simple Interest Activity

$$I=Prt$$

1. Pick a House at:

<http://www.realtor.com/>

Describe the house you picked. How much does the house cost?

2. Go to:

<http://www.bankrate.com/finance/mortgages/current-interest-rates.aspx>

What current interest will you pay on a fixed 15 year loan? On a fixed 30 year loan?

3. What is the simple interest on your house if you pay it off in 15 years? 30 years?

4. Pick a new car and a used car:

<http://www.autotrader.com/>

Which cars did you pick? How much do your cars cost?

5. Go to:

<http://www.bankrate.com/finance/auto/current-interest-rates.aspx>

Find the current interest rate for a new car with a 5 year loan.

Find the current interest rate for a used car with a 3 year loan.

6. What is the simple interest you will pay on your new car?

What is the simple interest you will pay on your used car?

$$I = P \cdot r \cdot t$$

I = Interest Paid or Earned in \$

P = Principal in \$

r = Interest Rate in %

t = Time in Years

Word Problems: Simple Interest

1. A bank is offering 2.5% simple interest on a savings account. If you deposit \$5000, how much interest will you earn in one year?
2. To buy a car, Jessica borrowed \$15,000 for 3 years at an annual simple interest rate of 9%. How much interest will she pay if she pays the entire loan off at the end of the third year? What is the total amount that she will repay?
3. Nancy invested \$6000 in a bond at a yearly rate of 3%. She earned \$450 in interest. How long was the money invested?
4. Mr. Johnson borrowed \$8000 for 4 years to make home improvements. If he repaid a total of \$10,320, at what interest rate did he borrow the money?
5. John's parents deposited \$1000 into a savings account as a college fund when he was born. How much will John have in this account after 18 years at a yearly simple interest rate of 3.25%?
6. To buy a laptop computer, Elaine borrowed \$2,000 for 3 years at an annual simple interest rate of 5%. How much interest will she pay if she pays the entire loan off at the end of the third year? What is the total amount that she will repay?
7. TJ invested \$4000 in a bond at a yearly rate of 2%. He earned \$200 in interest. How long was the money invested?
8. Mr. Mogi borrowed \$9000 for 10 years to make home improvements. If he repaid a total of \$20,000 at what interest rate did he borrow the money?
9. Bertha deposited \$1000 into a retirement account when she was 18. How much will Bertha have in this account after 50 years at a yearly simple interest rate of 7.5%?
10. Joshua borrowed \$1000 from his friend and paid him back \$1050 in six months. What simple annual interest did Joshua pay his friend?