Curriculum Sample Template

Max. 8 Pages

Grade Level	6	**Content Area**	Mathematics
Course Title (grades 9-12 Only)			
Length of Unit	2 weeks (project and lessons)	**Time of Year**	Block 4 of 10
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	6.EE.6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	The following lesson shows the rigor/relevance framework outlined in the Program of Instruction. Students will be required to take the knowledge learned in lessons and apply it to a real world situation. Students will be creating a project in which they use, and demonstrate mastery of, the standard.		
Standard Number and Description *List the Number* and full description for the required Standard.*	6.EE.7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers		
Summative Assessment *Describe a cumulative and comprehensive activity, clearly separate from instruction and guided or independent practice, which allows each student to individually demonstrate mastery of the required Standard. A copy of the summative assessment must be attached to the curriculum sample.*	The summative assessment will be a paper pencil test in which students individually write and solve equations based on real world situations presented in word problems. A copy of the assessment is attached to this curriculum sample.		
Scoring Scale and Mastery Level *Explain how the assessment is scored, to include points per question, how points are awarded, total points possible, criteria necessary to demonstrate mastery, and grading scale. A copy of the answer key and scoring rubric (whichever applicable) must be attached to the curriculum sample.*	Each question of the test will be worth 3 points. Students will be awarded 1 point for designing a model of the problem, 1 point for turning model into an equation, and 1 point for the solution and explanation. There will be a total of 8 questions and 24 possible points. The grading scale will be: 0-16 = No Grade (required retake), 17-19 = C, 20-21 = B, and 22-24 = A. Students must score 17 or more points(70% minimum) to demonstrate mastery. An answer key is attached to this curriculum sample.		
Materials/Resources Needed	Resources for the lesson: individual white boards, document camera and projector Resources for the project: Computers with Internet access and power point, projector, classroom phone.		

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

<table>
<tr><th>Lesson
(add as needed)</th><th>Instruction</th><th>Student Activities</th></tr>
<tr><td>1</td><td>Students will be introduced to their project. Students will be told that they will be placed in teams in which they will research a class field trip. Students will be given a limit of $12 per student. Teams must determine the cost per student of admittance using the total cost of admittance for the class (px = q). Students must determine the cost of lunch per student using the total cost of lunch for the class (px = q). Students must determine amount of money left over for souvenirs using the limit of $12 per student and the costs of admission and lunch per student (p + x = q). Teams will conduct research through phone interviews to designated field trip locations (zoo, botanical gardens, desert museum, etc...). Teams will design interview questions prior to calling. Teams will also use Internet searches of gift shops to determine possible souvenirs. Teams will present their research in a power point that includes the above calculations and how the students figured the price per student admission and lunch. Students will also present the amount students will have for souvenirs, how they calculated it, and at least 3 souvenirs students could purchase. The power points will be assessed on a separate rubric not included in this sample. The project is introduced in this curriculum sample to show how the standard is taught through the rigor/relevance framework outlined in the Program of Instruction.

After introducing the project students will be told that in order to do the calculations necessary they will have to learn how to model and solve real world math equations. Students will be introduced into a method for solving problems. Students will first review the skill of writing variables (6.EE.6). After this students will be shown how to model equations using a bar model. Students will be given several word problems and represent them using the bar model. Teacher will help students individually who need it at this time. Before students leave for the day they will do a think-pair-share in which they explain to each other how to model a problem using a bar model. As a check for understanding the teacher will require students to solve a bar model problem, which will be their ticket out of class. Upon leaving class they will be given their homework involving bar models.</td><td>Students will complete as a whole group a bar models of word problems as modeled by the teacher.

Students will complete individually bar models of problems while teacher helps students needing additional instruction.

Students will think-pair-share with a partner describing how to complete bar models

Students will complete a bar model upon leaving the class.

2 Examples of bar model for a problem.
Students will complete as homework several bar model problems.

1. The total cost of a movie for 4 students is $23.00. What is the cost of the ticket per student?
<table><tr><td colspan="4">$23.00</td></tr><tr><td>T</td><td>T</td><td>T</td><td>T</td></tr></table>
2. Joe has $12.00. If he spends $5.75 on a movie ticket and $2.25 on popcorn, how much does he have left over for a drink?
<table><tr><td colspan="3">$12.00</td></tr><tr><td>$5.75</td><td>$2.25</td><td>D</td></tr></table></td></tr>
</table>

<table>
<tr><td>2</td><td>Students begin the day with bell work reviewing the bar models from the previous day. Using the bar models students created from the bell work, the teacher models how to turn the bar model into an equation with variables. Students work with a partner to turn the bar models from their homework into equations. Students are then given problems in which they have to create bar models and turn the model into an equation. During this time the teacher can help students with individual problems. To check for understanding the teacher asks students to create bar models and equations for a problem on their white boards. After students have finished the problem on their white board the teacher places the students in their teams to try to solve the equation. When the team solves the equation they are instructed to write out how they came up with their answer. Groups may have different ways to solve (guess and check, estimate, etc...). Groups then present how they solved the problem modeling it for the class using the document camera. Students are given homework assignment in which they are required to create bar models and write equations. They must also try to solve 2 of their equations.</td><td>Students will create bar models for bell work
Students will work with a partner to create equations from bar models
Students will work individually to create equations from bar models
Students will work in teams to solve equations
Students will present how the team solved the equation
Students will complete homework in which they create bar models and equations and try to solve 2 equations
Sample:
1. The total cost of a movie for 4 students is $23.00. What is the cost of the ticket per student?
<table><tr><td colspan="4">$23.00</td></tr><tr><td>T</td><td>T</td><td>T</td><td>T</td></tr></table>Equation: 4T = 23.00</td></tr>
<tr><td>3</td><td>Students review previous day work as bell work. Students then review different methods for solving equations (guess and check, estimating, inverse operation with double checking answer). Students are then given problems to solve individually in which they are required to model the problem with a bar model, write an equation with variables, solve the equation, write explanation of solution method. Students will work on these problems individually while teacher helps students with misunderstandings. In preparation for the summative assessment students are given three problems that they must solve as they did earlier. Each problem is to be signed off by a different student. Having a problem signed off means that a peer is shown the answer and the student explains how they solved it. If the peer agrees he signs it off, if not it is brought to the teacher to correct misunderstandings</td><td>Students will complete bell work creating bar models and equations
Students will work individually on creating bar models, equations, solving equations, and explaining method used.
Students will complete a peer review problems</td></tr>
<tr><td>4</td><td>Students will do review problems like the individual ones they did the previous day in order to review for their summative assessment. Students will then complete the attached summative assessment. After completing the assessment students will begin to work on the project aspect of this</td><td>Students will solve review problems
Students will complete assessment.</td></tr>
</table>

	standard applying the skills they learned in the previous lessons.	

Paste Summative Assessment Here:

Solving Real-world Mathematical Problems

For each problem you must:

- Create a bar model
- Turn the bar model into an equation
- Solve the equation, and give an explanation of the method used

1. The price of three shirts is $39.60. What is the price of each shirt?

2. Tomas spent $16.54 at the store which included the price of his items plus tax. He bought a notebook that was $6.32 and a pencil sharpener that cost $8.81. What was the cost of the tax?

3. The cost of five large pizzas was $49.95. How much did each pizza cost?

4. Four sisters wanted to buy a new bike to share. The bike cost $253.80. How much did each sister have to pay?

5. In the cafeteria Juan paid $1.80 for lunch, and $0.75 for chips. If Juan paid with $5.00 how much change will he have?

6. Sandra has a tomato plant that grows a total of 28 tomatoes. If she gives 6 to her Mom and 4 to her uncle, how many will she have left to give to her Grandma?

7. Three runners in a relay race must run a total of 8 miles. If the runners each run the same amount, how far will each runner run?

8. Maria is buying gifts for her family. She bought a picture frame for her Mom that cost $6.45. She bought a hat for her Dad that cost $9.48. If she went to the store with $20.00, how much does she have left to spend on her brother?

Paste Answer Key/Scoring Rubric Here:

Each question of the test will be worth 3 points. Students will be awarded 1 point for designing a model of the problem, 1 point for turning model into an equation, and 1 point for the solution and explanation. There will be a total of 8 questions and 24 possible points. The grading scale will be: 0-16 = No Grade (required retake), 17-19 = C, 20-21 = B, and 22-24 = A. Students must score 17 or more points (70% minimum) to demonstrate mastery.

Solving Real-world Mathematical Problems
Answer Key

1. bar model

$39.60		
S	S	S

Equation: 3S = 39.60
Solution: S = $13.20 Explanation should demonstrate understanding of how to solve. If explanation is solid, and an arithmetic mistake is the reason for a wrong answer student may receive a half-point. This will be true of all problems. E.G. There are three friends who want the same color shirt. They have $39.60 and agree that each person will have the same amount of money to spend. So, the $39.60 is divided by 3 which is $13.20 per shirt or S.

2. Bar model

$16.54		
$6.32	$8.81	T

Equation: 6.32 + 8.81 + T = 16.54
Solution: T = $1.41

3. Bar model

$49.95				
P	P	P	P	P

Equation: 5P = 49.95
Solution: P = $9.99

4. Bar model

$253.80

S	S	S	S

Equation: 4S = 253.80
Solution: S = $63.45

5. Bar model

$5.00		
$1.80	$0.75	X

Equation: 1.80 + 0.75 + X = 5.00
Solution: X = $2.45

6. Bar model

28		
6	4	G

Equation: 6 + 4 + G = 28
Solution: G = 18

7. Bar model

8		
R	R	R

Equation: 3R = 8
Solution: R = 2.67

8. Bar model

$20.00		
$6.45	$9.48	B

Equation: 6.45 + 9.48 + B = 20.00
Solution: B = $4.07