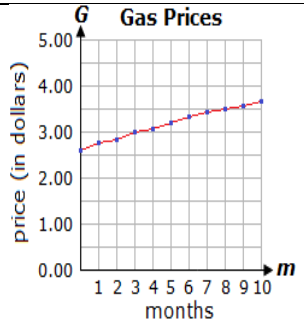
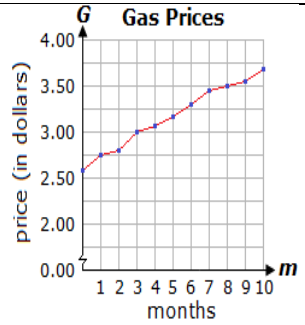
Curriculum Sample Template – 8 Pages Max. (12 pages for integrated ELA sample)

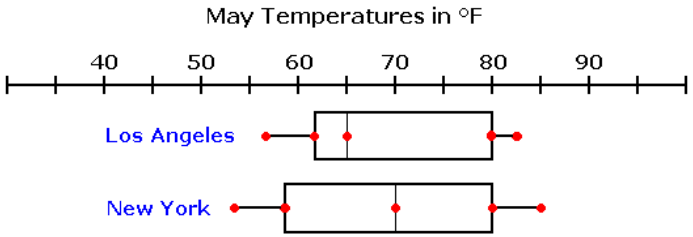
Grade Level	9	**Content Area**	Math
Course Title (grades 9-12 Only)	High School :Number and Quantity		
Expected Prior Knowledge *List the knowledge/skills mastered earlier in the year that are foundational to the mastery of the Required Standard(s).*	Prior to this lesson, students are expected to have mastered the following: The Algebraic formulas like the distance formula , formulas , various types of graphs like line graphs , bar graphs , box and whisker graphs and pie graphs.		
Alignment to Program of Instruction *Describe how the methods of instruction found in this sequence of lessons align to the Program of Instruction described in the application package.*	This sample aligns with the program of instruction because it is delivered by scaffolding through a group work, Cooperative learning. The content is aligned to STEM. Team work and problem solving, structured inquiry are expected while learning concepts.		
Standard Number* and Description *The standard number and description of the Required Standard(s) being instructed and assessed to mastery in the curriculum sample.*	N.Q: Reason quantitatively and use units to solve problems. #A.1 - Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.		
Materials/Resources Needed *List all items the teacher and students will need for the entire sequence of instruction (excluding common consumables)*	Teacher white board, individual student white boards, dry erase pens, graph papers, notebooks.		

* ***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, Cluster, Standard (e.g., 6.EE.B.7). For HS Math, use Conceptual Category-Domain, Cluster, Standard (e.g., A-REI.C.6).*

Lesson (add as needed)	Instructional Strategies	Student Activities
1	**Activation of prior knowledge:** Teacher will direct students to write the various units of measurement for weight, distance and solve the given multi-step equations. **Objective:** Students will (SW) learn to use the units as a way to understand and guide the solution of multi-step problems. **Key points:** Volume formulas for 3D figures Cubic Units Volume of :- Cylinder = $\pi r^2 h$, Cone = 1/3 $\pi r^2 h$, Sphere = 4/3 πr^3 Prism = BA*h , Pyramid = 1/3 BA*h , Margin Of Error **Introduction to new material:** TW model by providing examples of the rules for significant digits as follows: 1. Non-zero digits are always significant. 2. Zeros to the left of another digit are NOT significant. 3. Zeros between non-zero digits are always significant. 4. Zeros at the end of a number and to the right of a decimal point are always significant. 5. Zeros at the end of a number, but to the left of a decimal point are NOT significant. TW explain, model, and think aloud to solve problems involving ➢ The margin of error by using their knowledge of the rules for significant digits. ➢ Volume of 3 D figures. **Guided Practice:** TW the instruct pairs of students to solve the following problems involving margin of error by using rules of significant digits and some problems finding the volume of 3D figures. TW lead and model the discussion of the examples. **Ex1.** Stephanie measured the length of her bedroom. She discovered that her measurement had a margin of error of0.005 feet. Which of the following could be the measured length of her bedroom?	**SW** write the various units of measurement for weight and distance and solve the given multi-step equations. **SW** write the objective in their interactive notebook. **SW** listen as teacher explain today's key points and take notes. **SW** actively listen to the teacher. SW copy the notes and examples given by the teacher. **SW** work on examples with the guidance of teacher by using the volume of cylinder formula and the distance formula and the margin of error.

	Ex2. Diameter of the base of a right circular cylinder is 7 cm. If its height is 40 cm, find its volume? **Ex3**. Find the volume of a sphere with radius 12 inches and height 34 cm and express your answer in cubic meters? **Independent practice:** TW instruct students to solve questions related to margin of error and volume and distance formulas. **Assessment:** TW give a quick "exit ticket" in which students have to answer a few questions and reflect on what they learned in class. TW will review the concepts in the next class based on the reflection.	**SW** work on some Practice questions given by the teacher. **SW** complete the exit ticket by answering the questions in it.
2	**Activation of prior knowledge:** TW direct students to find the time taken for an object to travel 1,125 miles at the rate of 45m/hr. to activate the previous learned objective and TW direct students to name all the types of graphs they learned in their previous classes. **Objective:** SW learn when to use a specific graph and will interpret the scale and the origin in graphs and data displays. **Key points:** Line graph; Bar graph; circle graph; Histograms. **Introduction to new material:** TW explain what type of variables are used and best represented by various graphs. TW will explain Bar graphs, line graphs and circle graphs. **Guided Practice and Exploration:** TW guide the students to collect data on student's favorite sport from the class and choose a graph to represent that data: a bar graph, line graphs and circle graph. The teacher will pull the students who are not ready for the independent practice and ELL students and students with special needs to form a small group intervention in the class and reteach the concept. Ex1. The graphs below show the price of gas, *G(m)*, for the first 10 months last year in Hanksville. Both graphs show the same information.	**SW** use the distance formula to find the time taken by the object to cover 1,125 miles at the rate of 45 m/hr. SW write the names of all graphs. **SW** write the objective in their interactive notebook. **SW** listen as teacher explains today's key points and take notes. **SW** actively listen to the teacher. SW copy the notes and examples given by the teacher. **SW** walk around the class and collect the data of the favorite sport from their classmates and chose a graph that best represents the data collected by them and graph the data.

	 Graph A  Graph B Brian is preparing a presentation and wants to emphasize that gas prices increased greatly over the first 10 months last year. Interpret and Choose the graph that is best to emphasize the increase in the gas prices and explain why. **Independent practice:** Teacher will give questions for the students to practice. **Assessment:** Teacher will give a few questions to answer and ask the students to show work on student's small white boards. TW review the concept based on the student work.	**SW** answer the questions given by the teacher and show their work on graph papers. **SW** answer the questions on individual white boards and show it to the teacher.
3	**Activation of prior knowledge:** TW direct students to answer a few questions from the graphs displayed **Objective:** SW learn when to use a specific graph and will interpret the scale and the origin in graphs and data displays. **Key points:** Scale; Interquartile; Lower Quartile; Upper Quartile; Histogram; Median. **Introduction to new material:** TW explain the importance of scale in interpreting the given graphs. TW explain to display data using various	**SW** will interpret the given graphs and answer the questions. **SW** write the objective in their interactive notebook. **SW** listen as teacher explains today's key points and take notes. **SW** actively listen to the teacher. SW copy the notes and examples given by the teacher.

	types of graphs. TW model to interpret the graphs and choosing the appropriate graph for a given situation. Ex. Which city had a higher median temperature in May and by how many degrees?  **Guided Practice and Exploration:** TW guide the students to draw a graph with appropriate scale and to interpret and choose the appropriate graph for the given situation. The teacher will pull the students who are not ready for the independent practice and ELL students and students with special needs to form a small group intervention in the class and reteach the concept. **Independent practice:** Teacher will give questions for the students to practice. **Assessment:** TW give a quick "exit ticket" in which students have to answer a few questions and reflect on what they learned in the class TW review the concept based on the student work.	**SW** work on Practice questions given by the teacher under the teacher guidance on graph paper provided. **SW** answer the questions given by the teacher and show their work on small white boards. **SW** complete the exit ticket by answering the questions in it.
	Activation of prior knowledge: TW direct students to solve a linear equations for the X value. **Objective:** SW learn various algebraic formulas and use in real world situations. **Key points:** Equation	**SW** use the inverse operations to find the value of X. **SW** write the objective in their interactive notebook. SW listen as teacher explains today's key points and take notes.

4	Multi-Step equation Inverse operations **Introduction to new material:** TW introduce various algebraic formulas like $T = 2\pi\sqrt{\frac{L}{g}}$ H = ut + ½ gt^2 **Guided Practice and Exploration:** TW guide the students to solve various algebraic formulas. The teacher will pull the students who are not ready for the independent practice and ELL students and students with special needs to form a small group intervention in the class and reteach the concept. **Independent practice:** Teacher will give questions for the students to practice. **Assessment:** TW give a quick "exit ticket" in which students have to answer a few questions and reflect on what they learned in the class TW review the concept based on the student work.	**SW** actively listen to the teacher. SW copy the notes and discuss the importance of given formulas in various fields. **SW** work on Practice questions given by the teacher under the teacher guidance in their notebooks. **SW** answer the questions given by the teacher and show their work. **SW** complete the exit ticket by answering the questions in it.
5	**Objective:** TW will quickly review the last 4 days lessons. TW provide graph papers and instruct the students to complete the summative assessment.	SW actively listen to the teacher review. SW complete the summative assessment.

Summative Assessment Items and Scoring: 5 points each.

1. M=d/v, the variable d is in kilometers and v is in milliliters
What are the units of M?
A. M= d/v **B.** M= km/mL **C.** M= KM/mL **D.** M = v/ml

2. Kevin spent $ 22 on 12 cranberry muffins, which quantities would be useful for finding the total mass of the muffins he bought?

Select all that apply

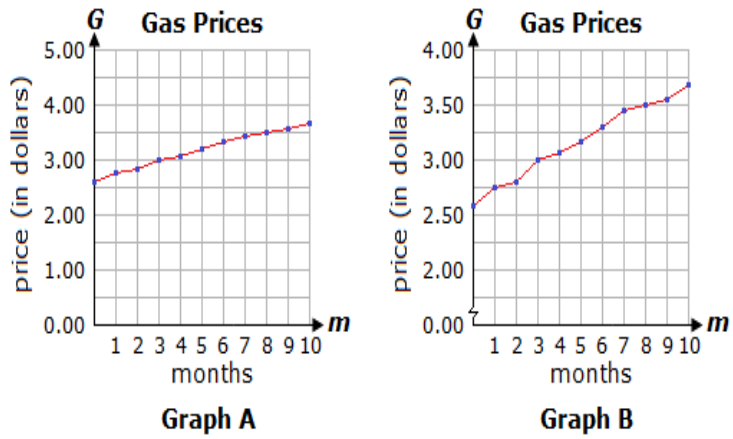
A. Average mass of one muffin
B. Average number of cranberries per muffin
C. Price per kilogram of muffins
D. Price of one muffin

3. The time, in T seconds, it takes for one complete swing of a pendulum is represented by the equation below, where L is the length of the pendulum in meters, and g is the acceleration due to gravity (L=9.81 m/g=s^2).

$$T = 2\pi\sqrt{\frac{L}{g}}$$

What is the approximate length of the pendulum if it takes the pendulum 3.7 seconds to complete one full swing? (Use π = 3.14)

4. The graphs below show the price of gas, *G(m)*, for the first 10 months last year in Hanksville. Both graphs show the same information.



Brian is preparing a presentation and wants to emphasize that gas prices increased greatly over the first 10 months last year.

Interpret and choose the graph that is best to emphasize the increase in the gas prices and explain why.

5. Lizzie measured the length of a trail near her house. She discovered that her measurement had a margin of error of 0.0005 mile. Which of the following could be the measured length of the trail?

A. 9.3 miles **B.** 9.26 miles **C.** 9.258 miles **D.** 9.2589 miles

Rubric for all questions

	3 points	2 Points	1 Point	0 - points
Problem Solving	**Answer is correct and appropriate units were chosen**	**Answer is correct and accurate**	**Answer is correct and accurate**	**Answer is incorrect.**
Math Communication	**Formula/Explanation/ reasoning is clearly provided.**	**Formula/explanation/reasoning is provided, but not in detail.**	**Formula/explanation/reasoning is not provided.**	**Formula/explanation/reasoning is not provided.**
Presentation	**Step by step process is clearly written and proper scale and justification for choosing the graph is provided.**	**Step by step process is written with some missing steps.**	**The sequential process is not written.**	**The sequential process is not written.**

Total: _____/15 Grading scale 15-14= 90% 13-12=80% 11-0 Reteach/Retest

Answer Key

1. B 2. A 3. 3.4 meters 4. Graph B 5. C