Roscommon Area Public Schools – Curriculum Framework
Course: Chemistry I
Unit Number: 2 Unit Title: Measurements and Calculations
Timeframe: 2.5 weeks

Stage 1: Identify Desired Results		
Essential Question: *What thought-provoking questions will foster inquiry, meaning making and transfer?* • *An essential question is open ended; has no simple "right answer."* • *Is meant to be investigated, argued, looked at from different points of view* • *Encourages active "meaning making" by the learner about important ideas.*	• How do I know if I am computationally setting up my measurements/data correctly to generate correct solutions? • What is the true meaning of significant figures and uncertainty and does this grow into the concepts of precision vs. accuracy?	

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• *Raises other important questions.* • *Naturally arises*		
Scaffold Questions: *What questions can we ask students that break the essential question into smaller pieces of content?*	How can we use evidence to support scientific claims? • Why is accuracy and precision important in chemistry? • Why is the quoted number of significant figures important when presenting chemical data? • How can our understanding of chemistry be used to solve problems? • How does the molecular structure of a material impact its properties on a macro scale and the way that material functions?	
Brief Summary of Unit:	• Scientific Method • Units of Measurement • Using Scientific Measurements	
Desired Understanding:	A. List the seven SI base units of the SI system of measurement. B. Know and use the common SI prefixes in unit conversion factor calculations.	

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The long-term accomplishments that students should be able to do with knowledge and skill, on their own. Frames Standards as long-term performance accomplishments. Answers the questions Why? And What can you do with this?	C. Use significant figures to express the exactness of measurements. D. Perform calculations involving conversion factors and unit analysis. E. Understand concepts of mass and weight, their differences and usefulness to the study of matter. F. Use scientific notation to express and evaluate large and small measurements and calculations. G. Be able to light the Bunsen burner, and make adjustments for its efficient heating of materials in the laboratory. H. Use the triple beam balance and an electronic balance to make precise and accurate measurements of mass in the laboratory. I. Define the concepts of accuracy and precision. J. Explain the difference between qualitative and quantitative descriptions of matter and list examples of each. K. Define density and perform calculation of this quantity from mass and volume measurements taken in the laboratory and given in problems.	
Science Discipline Core Ideas - *Subject* *List all of the standards in this unit.*	HS PS1-1, HS PS2-B, HS PS3 -2.	

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Science Practices *Which practices will be focused on during this unit?*	1. Asking questions (for science) and defining problems (for engineering) 2. Developing and using models 3. Planning and carrying out investigations 4. Analyzing and interpreting data 5. Using mathematics and computational thinking 6. Constructing explanations (for science) and designing solutions (for engineering) 7. Engaging in argument from evidence 8. Obtaining, evaluating, and communicating information	
Science Crosscutting Concepts *Which Crosscutting Concepts will be focused on during this unit?*	Patterns, Cause and Effect, Scale, Proportion, and Quantity, Systems and system models, Energy and Matter, Structure and Function, and Stability and Change.	
Essential Standards* *List the Essential Standards that will be taught and assessed in this unit.*	**HS-PS3-2. HS-PS1-1. HS-PS1-2.**	
Crossover standards*		

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Connection to other content areas (Option)		
Alignment to the Vision of High Quality Instruction in Science *(How do the instructional targets in this unit align to the district's vision of high quality instruction?)*	*Provide opportunities for deeper thinking.* • Teachers anchor their instruction in questions related to natural and physical phenomena to engage students' curiosity around natural events • Students engaging in multiple rounds of creating and revising scientific questions, mental models, explanations and evidence-based arguments through observations and experiences • Teachers using a variety of discourse strategies with students to get them to think deeply and to respond to each other's thinking • Students prompting each other to engage in sense-making talk during investigations and other activities • Students' ideas being represented publicly and worked on by the class • Teachers using specialized tools and routines to support students who are not willing or able to participate without help	

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	• Students speaking up about what information or experiences they need to move their thinking forward. *List the seven SI units of the SI system of measurements.* *Know and use the common SI prefixes in unit conversion and factor-labeling calculations.* *Use significant figures to express the exactness of measurements.* *Perform calculations involving conversion factors and unit analysis.* *Understand concepts of mass and weight , their differences and usefulness to the study matter.* *Use of scientific notation to express and evaluate large and small measurements and calculations.* *Be able to light a Bunsen burner and make adjustments for its efficient heating of materials in the laboratory.* *Use of the quadruple beam balance and the analytical electric balances, to make precise and accurate measurements of mass in the laboratory.* *Define the concepts of accuracy and precision.* *Explain the difference between qualitative and quantitative descriptions of matter and list examples of each.* *Define density and perform calculations of this quantity from mass and volume measurements taken in the laboratory and*	

	in given problems.	
Stage 2: Determine Acceptable Evidence		

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(With the exception of formative assessments, all assessments listed in this section are required elements of the district's curriculum and the data associated will be collected in the district's performance management driver system.)		
Measure of Understanding (Performance Task) *(How will students demonstrate their attainment of the long term understanding?)*	*White-baording activities.* *Home work.* *Class assignments.* *Quizzes.* *Labs/Modeling Activities* *Tests.*	
Assessing the	*White-baording activities.* *Home work.* *Class assignments.* *Quizzes.* *Labs/Modeling Activities* *Tests.*	

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Performance Task *(How will we evaluate quality student work in the performance task? How will we determine that students can use their learning independently?)*		
Summative Assessments *(How will we know if students can demonstrate mastery of the unit's content, skills, and common core state standards?) Can overlap the performance-based evidence, thereby increasing the reliability of the overall assessment*	*White-baording activities.* *Home work.* *Class assignments.* *Quizzes.* *Labs/Modeling Activities* *Tests.*	

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(especially if the performance task was done by a group)		
Interim Assessments	*White-baording activities.* *Home work.* *Class assignments.* *Quizzes.* *Labs/Modeling Activities* *Tests.*	
Formative Assessments	Whiteboarding, Peer Discussions, & Surveys.	
Student Self-Reflection and Self-Regulation **(Student-Centered)** *(How will we measure students'*	Constantly reflect on past, present, and future learning. Making connections on recognizing rather than memorizing	

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ability to think meta-cognitively?)		
State Assessment Practice *(How will we measure students' ability to interact with content and skills in an MSTEP-like or SAT-like format?)*	*Model deeper thinking and ask probing questions,*	
Stage 3: Learning Plan **(Summary of Key Learning Events and Instruction)**		
	• Book section reviews. • Lab: Precision and Accuracy	

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What activities, experiences and lessons will lead to achievement of the desired results and success at the assessments ? *The learning events –* • *should be derived from the goals of Stage 1 and the assessments of Stage 2 to ensure*	• Density Labs indirect measurements, volume by displacement,and direct measurements. • Section review worksheet • Mathematical Conversions worksheets • Sig Fig Quiz • Chapter Test. • Modeling activities • Lab extensions • Stem applications • Daily Reading assignments • Book section reviews • Lab: Physical vs.Chemical Changes • Lab: Specific Heat of Metals "time permitting" • Chemical Reaction Rate-qualitative and quantitative, intro catalyst and energy of activation (can change)vs. Enthalpy (cannot change) • Section review worksheets • Energy Diagram and Changes Quiz • Chapter Test	

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alignment and effectiveness of the activities. • *should match the level of rigor within the standard* • *support student Acquisition, Meaning Making, and Transfer.*		
Learning Targets *What will students be taught? What should they know? What should they be able to do?*	*ist the seven SI units of the SI system of measurements.* *Know and use the common SI prefixes in unit conversion and factor-labeling calculations.* *Use significant figures to express the exactness of measurements.* *Perform calculations involving conversion factors and unit analysis.* *Understand concepts of mass and weight , their differences and usefulness to the study matter.* *Use of scientific notation to express and evaluate large and small measurements and calculations.*	

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	Be able to light a Bunsen burner and make adjustments for its efficient heating of materials in the laboratory. *Use of the quadruple beam balance and the analytical electric balances, to make precise and accurate measurements of mass in the laboratory.* *Define the concepts of accuracy and precision.* *Explain the difference between qualitative and quantitative descriptions of matter and list examples of each.* *Define density and perform calculations of this quantity from mass and volume measurements taken in the laboratory and in given problems.*	
How will the unit be sequenced and differentiated to optimize achievement for all learners? *Teaching -*	I will offer help before and after school. I will integrate real-world applications and provide STEM connections.	

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• *should reflect the instructional approaches most appropriate to the goals (not what is easiest or most comfortable for the teacher).* • *should employ resources most appropriate to the goals (not simply march through a textbook or commercial program).* • *be responsive to differences in learners' readiness, interests, and preferred*		

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ways of learning.		
Key Vocabulary	*Density, Precision, Accuracy, Percent Error, Measurement prefixes: Terra, Giga, Mega, Kilo, Base Unit, deci, centi, millii, micro, nano, & pico.* Inversely and directly proportional,	
Resources *Description or link to resources*	Modern Chemistry- Holt and Rineheart	