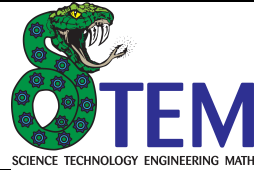


Leadership and Collaboration

Unit Length: 3 Weeks



Science Unit Plan

Teacher: Holly Robinson		Grade: 9	Course: PWC			
Unit Title: Leadership and Collaboration - Scientific Units and Measures						
LEARNING TARGETS						
LT1: I can describe fundamental physical quantities and units.						
UNIT OVERVIEW				Overall summary of the unit, activities, tasks, and/or content.		
<p>This unit will serve an introduction to measurements used in science. Students will use scales, meter sticks, and other measurement tools to develop an understanding of taking measurements in the science classroom and lab. Additionally, students will participate in activities such as scavenger hunts, planning construction and building structures to familiarize and practice using numbers and units. Each activity is performed with a team or partner, which allows students to practice scientific Habits of Interaction as standardized by Hamilton County Schools. Students will complete lab reports for selected activities, which require a practice of good science techniques. This knowledge will prepare them for the study of Physical Sciences by providing good measurement and calculation skills, as well as preparing students to work in collaborative groups during project based learning activities.</p>						
MOTIVATORS				Hooks for the unit and supplemental activities. (PBL scenarios, video clips, websites, literature)		
<p>Students will watch the Mars Probe Crash video (Somebody Got Fired!) to introduce the concept of the importance of using well-taken and consistent measurements. They will then participate in an activity where no standard measure is used and experience the frustration of trying to communicate results to a classmate who used a different measure.</p>						
Week	Learning Targets	Materials & Resources	Instructional Procedures		Differentiated Instruction	Assessment
1	LT1: I can describe fundamental physical quantities and units. TN CLE 3237.1.1	Technology: iPad with following apps: Goodnotes Notability YouTube Apple TV Edmodo	<u>Essential Questions</u> Why does having a unified system of measure matter in science? <u>Set</u> Student “Hook” and Probe—Mars Rover: Somebody Got Fired! (Mars Probe Crash)		<u>Remediation</u> Students will complete an additional measure-taking activity that will be designed by the	

	Investigate fundamental physical quantities of mass and time.)	<p>Videos: Intro to Metric System: Bill Nye http://youtu.be/Mekx]se2vgs</p> <p>Significant Figures: http://youtu.be/eCj76hz7jPM</p> <p>Accuracy and Precision http://youtu.be/8Cl5CeIT7hU</p> <p>NASA Fail http://youtu.be/q2L5_swAT5A</p> <p>Accident at Jefferson High http://youtu.be/PxyDImUYo14?list=PLfM-n9FcC6oWAKfTqA_6vo8l7OP0GkxUI</p> <p>Materials: Meter sticks Fabric Rulers Plastic Rulers Steel Marbles Fabric Bits</p> <p>Websites: Google Forms</p>	<p><u>Teaching Strategies</u> A 5 E plan that begins with student activities to engage will be used. Students will complete each piece of the activities using the HCDE Science Habits of Interaction and Habits of Mind.</p> <p>Day 1: Engage with hook NASA Fail—Crash of the Mars Probe Probe—Paige Keely Books—“How Far Did It Go?” Day 2: Safety Quiz/Accident at Jefferson High video Day 3: Finish Jefferson High/Pictures of Lab Scenarios: Students will be given a teacher-generated scenario and ask how the situation could have been prevented and then what steps should be taken to address the situation. Day 4: Explore: Scavenger Hunt-- teams use metric lab rulers, meter sticks, homemade ruler and body to measure a variety of objects. We then try (unsuccessfully!) to communicate our results. Day 5: Extend/Explain Comparison of Scavenger Activity Results/Model Lab Report: Step by step in-class completion to model expectations for lab reports and explain template.</p> <p><u>Summarizing Strategy</u> Public Record—3 Essential Lab Safety rules and Mock Hypothesis: Students post through Edmodo link and into Google Forms.</p> <p><u>Homework</u> Students will watch a video to understand the SI system basics. Intro to Metric System: Bill Nye</p>	<p>teacher. This will specifically target any demonstrated weaknesses. Additional styles will be provided (ie, written, song, etc. to address many learning styles).</p> <p><u>Enrichment:</u> Students will develop a conversion method for unconventional measurement styles (x pinky fingers equal x meters, etc.)</p> <p><u>Learning Styles</u> Kinesthetic, visual, auditory and verbal.</p>	
2	<p>LT1: I can describe fundamental physical quantities and units. TN CLE 3237.1.1 Investigate fundamental physical quantities of mass and time.)</p>	<p>Technology: iPad with following apps: Goodnotes Notability YouTube Apple TV Edmodo</p> <p>Materials: UC Davis ChemWiki: http://chemwiki.ucdavis.edu/Analytical_Chemistry/Quantifying_Nature/Significant_Digits/Significant_Figures</p> <p>Make It Metric! http://www.uen.org/Lessonplan/preview.cgi?LPid=21571</p>	<p><u>Essential Questions</u> How can you take accurate measurements? How does the SI system allow me to convert between units?</p> <p><u>Set</u> Bullseye! Game</p> <p><u>Teaching Strategies</u> A 5 E plan that begins with student activities to engage will be used. Students will complete each piece of the activities using the HCDE Science Habits of Interaction and Habits of Practice.</p> <p>Day 6: Explore: Accuracy vs. Precision; Bullseye! Activity: Students will spin 3 times and place a mark as near the bullseye as possible. They will then analyze their bullseye for accuracy and precision. Day 7: Extend/Explain: Scientific Notation/Sig Figs Sig Figs: UC Davis Rules and any teacher-designed Jeopardy Game Day 8: Sig Figs Wrap Up/Sig Fig Formative Day 9: Explore: Metric Conversions</p>	<p><u>Remediation</u> Students needing remediation for Accuracy and Precision will draw examples of accuracy and precision and explain the difference to a peer tutor.</p> <p>Students struggling with Scientific Notation, Sig Figs and Metric will work with a Team Captain, and be given elementary-level resources to</p>	Formative #1: Lab Safety and Accuracy/Precision

		<p>Todaysmeet.com—classroom chatroom</p>	<p>King Henry Activity; designing your own game to teach 5th graders. Students should reference: Make It Metric! website Day 10: Extend/Explain: Metric Conversions: add piece to game where 5th grade students will learn to convert. Day 11: Metric Conversions: guided practice</p> <p><u>Summarizing Strategy</u> Structured Talk: Students will have private think time, then, share their ideas with a partner. They should respond to the prompt, “Give a process for taking accurate and precise measurement.” Today’s Meet</p> <p><u>Homework</u> Guided Practice worksheets (and finish for homework): Metric Mania, Scientific Notation, and Significant Figure counting, addition, subtraction, multiplication and division problems.</p>	<p>reteach basic skills.</p> <p><u>Enrichment</u> These students will learn the “fencepost style” for complete conversion. This is the type used in college courses, and is set up as a ratio, showing conversion factors.</p> <p><u>Learning Styles</u> Kinesthetic, visual, auditory and verbal.</p>	
3	<p>LT1: I can describe fundamental physical quantities and units. TN CLE 3237.1.1 Investigate fundamental physical quantities of mass and time.)</p>	<p>Technology: iPads with Apps: Goodnotes Notability Google Drive (for submission of Lab Reports; this is where science notebooks are stored) Edmodo</p>	<p><u>Essential Questions</u> How can we convert between differing metric prefixes? What is the difference in mass and weight?</p> <p><u>Set</u> Comparing Mass: Students take the mass and weight of various daily objects and try to explain why one scale reads differently (most don’t notice the electric balances are set to Newtons).</p> <p><u>Teaching Strategies</u> A 5 E plan that begins with student activities to engage will be used. Students will complete each piece of the activities using the HCDE Science Habits of Interaction and Habits of Mind.</p> <p>Day 12: Explore: Mass: First portion of the Comparing Mass Lab; students find mass in grams only and practice using balances (reading correctly, using right sig figs, etc.) Day 13: Explore: Time: Guided practice converting between hours, minutes and seconds. Extend/Explain: Follow-up Lab Report Activity for Mass: Have students write and submit their first lab report, using teacher provided template. Day 14: Explore/Extend/Explain: Weight and Newtons: Second part of Comparing Mass Lab. Students will weigh same objects, only this time they will weigh in Newtons and try to explain why the readings are different from same scales and materials. Day 15: Evaluate: Tie Up Game/Formative—Jeopardy for Sig Figs, Scientific Notation, Mass, Weight and Time.</p> <p><u>Summarizing Strategy</u> Tie Up Game Reveal Answers to Keely Probe</p>	<p><u>Remediation</u> Students will revisit the middle-school concept of mass and matter using a teacher-selected video and worksheet to choose which is matter and which is weight.</p> <p>Students with poor lab reports will participate in the PB and Jelly Sandwich (describe making this sandwich to someone who doesn’t know what it is) building activity to address good lab report writing.</p> <p><u>Enrichment:</u> Students moving more quickly will be given the Lab Report Critique to</p>	<p>Formative #2: Significant Figures, Scientific Notation and Metric Conversions</p> <p>Summative #1: Lab Safety, Accuracy and Precision, Significant Figures, Scientific Notation, Metric Conversion, Mass vs. Weight and Time.</p>

			<u>Homework</u> Guided Practice worksheets (and finish for homework): Time Lab Report #1	discuss good and bad lab report techniques.	
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