Theme 8 - Medicine

Outcomes	Content	Activities/Resources	Assessment
1. Understand classes of medication and the purposes these classifications serve **Target Standards** **4.R.CI.1** Determine theme or central idea of a text and how it is conveyed through particular details…including its relationship to supporting ideas; provide an objective summary of the text. **3.W.TT.2b** Write informative/explanatory texts…Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. **4.W.RB.1** Conduct research projects to answer a question…drawing on several sources (including electronic sources) and generating additional, related focused questions that allow for multiple avenues of exploration.	How are different medications classified? What is the purpose and benefit of classifying medication? Summary and paragraph development skills Research skills	Students read the VeryWellHealth article "**Drug Classes: Making Sense of Medication Classification**." Use the handout **"Drug Classes Worksheet**" to help students practice summarizing a written text. Have students read each RECAP section and highlight the most important & relevant phrases or vocabulary. Then ask students to develop and write their own summary paragraphs for each of the four sections of the article. Show them how to use the recap information as a topic sentence, and then identify key ideas in the preceding section that will become their supporting details. Emphasize the importance of paraphrasing to avoid plagiarism. **ELL Support: Conduct a peer editing session after the paragraphs are finished so students can get input and guidance from others.** Ask students to do additional research on the ATC and USP classification systems outlined in the last section of the article. Students should explain what the category criteria are, give examples, and further explain the differences between the two systems. Ask students to develop additional questions they have on the topic that spring from their research. Students may share what they learn in a slide presentation, recorded audio or video, or written summary.	Highlighted phrases and vocabulary words on the worksheet Four completed summary paragraphs on the worksheet Choice of visual, audio, or written presentation of additional research into ATC and USP classification systems.

2. Learn to read drug labels **Target Standards** **4.R.RS.4** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as used in specific scientific or technical contexts. **4.R.CI.2c** Analyze how a text makes connections among and distinctions between individuals, ideas, or events, through comparison, analogies, or categories.	What key terms are important to know when reading drug labels? ● Generic name ● Trade name ● Manufacturer ● National Drug Code (NDC) ● Lot/Control number ● Drug form ● Dosage strength ● Total amount in vial ● Prescription warning ● Expiration date	Students read the article "**How to Read a Drug Label" - DrugWatch**. As a whole class, discuss key terms and vocabulary, focusing on the sample label pictures. Emphasize the differences between OTC and prescription medicines. Distribute to students the handout titled **How to Read Drug Labels Worksheet** Review page 1 vocabulary as needed, and then have students complete the example drug label activity.	Completed drug label worksheet
3. Learn about apothecary and metric measurement and conversions **Target Standards** **4.S.CC.1c.** Pose and respond to specific questions with elaboration and detail… **3.MD.1** Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb., oz.; l, ml; hr., min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit…	What is the apothecary system of measurement? What is the metric system and what does it measure? How do we convert to the metric system?	As an introduction, ask the class for examples of different types of measurement. As they share answers, make a chart showing systems of length, weight, and volume. Discuss which types of measurement might be used often in healthcare fields. *(Use this opportunity to incorporate a variety of healthcare jobs in the discussion.)* Use the handout **Apothecary and Metric Measurements** to introduce common measurement and conversions related to medicine and ask students what might be measured with the different units. ● Discuss vocabulary ● Explain both systems through comparison	Completed handout "**Meters-Liters-Grams**" You could also save some of the exercises from the **Math-in-CTE** lesson as additional assessment measures.

3.MD.9 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step real world problems.		Refer to the "**Math in CTE Lesson Plan**" and use the introduction section as a summary of the apothecary and metric systems. Then use the relevant parts of the lesson plan in sections #3, 4, and 5 to provide instruction and practice for students.	
4. Use rounding for dosage calculations **Target Standards** **2.NBT.9** Use place value understanding to round whole numbers to the nearest 10 or 100. **3.NBT.12** Use place value understanding to round decimals to any place. **4.S.CC.2** Interpret information presented in diverse media and formats (e.g., visually, quantitatively, orally)...	What are accurate ways of rounding decimals when working with dosages?	Discuss various ways that medications can be administered. Examples include pill, powder, liquid, and IV administration. Use the resource **General Dosage Rounding Rules** to show how each medication is measured in the healthcare system and the proper way of rounding numbers in each format. Using the provided example for each type of medicine as a model, quiz students with additional questions to increase comprehension. Show students this eight minute YouTube video on **Rounding Decimals**. (*You may want to skip to the 1:00 minute mark to start.*) Pause the video after each rounding concept is demonstrated, and check for comprehension. Consider creating and practicing one additional problem for each rounding concept before playing the next segment of the video. **ELL support: Turn on subtitles/closed captions while playing the video.** Use the **SafeMedicate Rounding Rules** charts to provide additional review and as a student resource.	Students complete the rounding exercises on pages 6-11 from the resource **Medication Math for the Nursing Student**. The instructor may want to review some examples of rounding to the whole number, tenths, and hundredths before administering this assessment.

5. Understand what drug allergies and adverse reactions are, the differences between them, and what causes them **Target Standards** **4.S.CC.1** Engage effectively in a range of collaborative discussions **4.S.CC.1c.** Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion. **4.S.CC.1d** Pose questions and comments with relevant observations and ideas that bring the discussion back on topic as needed. **4.R.RS.2** Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. **4.R.CI.1c** Cite several pieces of textual evidence that most strongly support analysis of what the text says explicitly …; predict probable outcomes	What is a drug allergy and how common is it to have one? What is an adverse reaction to a drug and what causes it?	Introduce the idea of drug allergies and adverse reactions by leading a class discussion on allergies, drug reactions, and other experiences with medicines based on students' personal experience. Invite students to predict how common true drug allergies are among the public. Students read the article **"**Drug Allergy and Other Adverse Reactions to Drugs." Encourage students to work in pairs or small groups, reading one heading/section of the article at a time and stopping to summarize and discuss each section before moving on. Ask students to complete the following questions and submit in writing: 1. Explain what a drug allergy is and what an adverse drug reaction is. Give at least one example of each. 2. Discuss the similarities and differences between a drug allergy and an adverse reaction. 3. Write at least three questions a medical professional might ask a patient who presented with symptoms of a possible drug allergy. Provide AHRQ's "Medicine Wallet Card" for students to use. Ask students to brainstorm different scenarios when a medicine wallet card could be helpful, even life-saving. Possible discussion questions: ● Why and when would this be useful? ● Why is it necessary to list nonprescription medicines and vitamins, herbs, or supplements in addition to prescription medicines?	Group discussion before and during reading of text Complete written answers to questions

from knowledge of events obtained from a reading selection.		• Who might need this information besides a doctor or pharmacist? • Will you start using this resource? • Is keeping one copy for yourself enough, or would it be wise to give another to a family member or friend? Visit the AHRQ website for additional information and resources on smart, safe medicine practices.	
6. Read drug labels in order to determine the dosage strength and unit. Calculate the individual dose a client will receive. **Target Standards** **4.R.RS.4** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical contexts **4.R.RS.11** Transcribe and interpret information, data, and observations to apply information learned from reading to actual practice. **4.R.FW.3** Use informational texts, internet web sites, and/or technical materials to review and apply information sources for occupational tasks.	What are common prescription abbreviations medical personnel should know? How should the information on a typical prescription be accurately interpreted? • Medication type and dosage • Method of administration • Frequency and duration How can the dosage formula be used to calculate the amount of medicine needed to fill a prescription?	***"Calculating Dosage" lesson from Contextualized math lessons*** **Activity 1: Prescription Abbreviations** Have students work individually or in pairs to review and study common prescription abbreviations listed in the scenario. **ELL Support: Students can make flash cards to quiz each other on the terms, using the Theme Vocabulary sheet as a resource.** Then students complete Worksheet 1. **Activity 2: Decoding Prescriptions** As a class, review the sample prescription and decode the information. Using copies of Worksheet 2, have students practice translating the information on several prescriptions. Handouts 2A, 2B, & 2C have sample prescriptions, or you can use others of your choosing. **Activity 3: Calculating Dosage** Explain the dosage formula to students. As a class, practice putting the information into the formula and calculating the dosage. One example is contained in the scenario. You may want to provide additional examples for students. Have students	Completed Worksheets 1, 2 and 3 (as many as the instructor chooses to assign) Summative quiz from Calculating Dosage lesson (found on page 13 of lesson) **IL IELCE Civics Competency: EM14. Describe ways employers may evaluate work performance.**

3.EE.2c Evaluate expressions at specific values for their variables. Include expressions that arise from formulas in real-world problems. Perform arithmetic operations, including those involving whole number exponents…		complete Worksheet 3A and Worksheet 3B.	
7. Understand the metric system and be able to convert measurements **Target Standards** **3.MD.1** Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb., oz.; l, ml; hr., min, sec. Record measurement equivalents in a two-column table. **4.RP.3c** Represent proportional relationships by equations **4.RP.4** Use proportional relationships to solve multistep ratio and percent problems.	• Use the metric system • Convert measurements within and between the metric and US customary systems • Use ratios and proportions • Use decimals • Solve multi-step problems	Preview the modules in the **"Healthcare Math - Using the Metric System"** lesson. Select the relevant modules for the class and cover the material with students. After completing each module, students should be able to: • Identify metric and customary units of measurement and their abbreviations (Module 1) • Convert units of measurement within and between the metric and customary systems (Module 2) • Solve multi-step measurement problems (Module 3) Use this additional online resource as needed for extra practice and support: http://www.metric-conversions.org/	Students complete assigned worksheets from the **"Converting Units of Measure"** lesson plan" (Assign designated worksheets for evaluation, depending on which concepts are emphasized during the lesson.)