**SUPPLEMENTAL INSTRUCTION ACTIVITY**

**TOPIC: Unit Conversions and Dimensional Analysis**

**APPLICABLE COURSES:** All Math Courses, all Nursing Courses,All chemistry courses starting from Chem 110 and other courses in other disciplines.

**LEARNING OUTCOME:** (What will students be able to do by the end of the workshop?)

***After completing this workshop, students should be able to perform unit conversion using dimensional analysis.***

**CONTENT:** (What do students need to know to accomplish the outcome?)

1. Definition of Dimensional Analysis and the “Unit Fraction”.
2. Single Step Unit Conversions
3. American Unit Conversions of Length, Weight and Capacity
4. Metric Conversions of Length, Weight and Capacity
5. American and Metric Conversions
6. Multistep Unit Conversions
7. American Unit Conversions of Length, Weight and Capacity
8. Metric Conversions of Length, Weight and Capacity
9. American and Metric Conversions
10. Converting Rates
11. Nursing, Chemistry and other Rate Applications

**METHOD:** *(How will the instructor deliver content? Short lecture, handouts, Powerpoint, other audio-visual presentation)*

-The lesson is divided into 3 segments composed of lecture and examples followed by student practice and sharing.

-First, the instructor distributes the exercise worksheet and any supporting handouts.

Part A (about 20 min): The instructor will present segment 1 with examples (single step conversion). Students will then attempt the practice problems. After the students try the practice problems, the instructor posts the solutions/answers on the screen for students to check their work. Next, in pairs, students will discuss wrong answers with their partners and figure out why they got it wrong.

*Note to Instructors: Feel free to skip some of the example or practice problems if time does not permit you to finish.*

Part B (about 15 min): The instructor will present segment 2 with examples (multistep unit conversions). Students will then attempt the practice problems. After the students try the practice problems, the instructor posts the solutions/answers on the screen for students to check their work. Next, in pairs, students will discuss wrong answers with their partners and figure out why they got it wrong.

*Note to Instructors: Feel free to skip some of the example or practice problems if time does not permit you to finish.*

Part C (about 10 min): The instructor will present segment 3 with examples (rate conversions). Students will then attempt the practice problems. After the students try the practice problems, the instructor posts the solutions/answers on the screen for students to check their work. Next, in pairs, students will discuss wrong answers with their partners and figure out why they got it wrong.

*Note to Instructors: Feel free to skip some of the example or practice problems if time does not permit you to finish.*

Part D (about 10 min): Next students complete a short quiz where they are asked to compute unit conversions using dimensional analysis. After completing the quiz, the instructor posts the solutions/answers on the screen. Students check their results.

Part E (about 5 min): Students complete the self-reflection activity. The instructor can also look over the quizzes while the students are completing the self-reflection activity to give feedback to students.

**ACTIVE LEARNING STRATEGIES:** (How will students apply their knowledge? Solve a problem, create a project, analyze a case, explain a process)

Students reflect on the exercises and teach each other by verbalizing the steps they took to reach their conclusions.

**ASSESSMENT METHOD:** (How will the instructor know that the students met the outcome? Check for understanding. ) (10 minutes.)

Students complete a quiz where they are asked to convert units using dimensional analysis. The quiz includes single step and multistep conversions and rate problems. After completing the quiz, the instructor posts the solutions/answers on the screen. Students check their results. The instructor can also look over the quizzes while the students are completing the self-reflection activity to give feedback to students. If students do not successfully complete the worksheet quiz, they may be referred to individual tutoring or a guided learning activity.

**SELF-REFLECTION ACTIVITY:** (What will the instructor do to get students to reflect on how they learned the content? What they learned, how they learned it, how they will apply it in their coursework)

(5 minutes.)

-What do you think is the most difficult part of unit conversions and Dimensional Analysis? Do you think a better understanding of fractions would help?

-What steps might you take to get better at converting units?