# Chapter 2: Measurements in Chemistry

## August 20, 2014

Objectives

1. Describe the major units of measure in the English, metric, and SI systems, and be able to convert the units from one system to another.
2. Describe the prefixes used to make measurements of length and volume larger or smaller.
3. Describe the difference between exact and inexact numbers.
4. Describe uncertainty and significant figures and how they are obtained for a measurement.

Activities

1. TTW lecture on chapter 2, sections 1-4 of the text, enhancing the lecture with the PowerPoint provided on Moodle to the students.
2. TLW take notes on the presentation.
3. TTW work the example problems in the book on the board.
4. TLW participate in a class activity where the students are answering problems from the end of the chapter as part of a group discussion (3, 7, 9, 11, 17, 22, 29, 32, 36)
5. TLW complete a set of assigned practice problems independently from the end of the chapter (4, 8, 10, 13, 18, 23, 25, 31, 33, 37).

## August 21, 2014

Objectives

1. Describe how you obtain significant figures in calculations involving addition and subtraction.
2. Describe how you obtain significant figures in calculations involving multiplication and division.
3. Describe how you round answers in a calculation.
4. Round off an answer to the correct significant figures after carrying out a mathematical operation involving addition or subtraction.
5. Round off an answer to correct significant figures after carrying out a mathematical operation involving multiplication or division.

Activities

1. TTW lecture on chapter 2, sections 5 of the text, enhancing the lecture with the PowerPoint provided on Moodle to the students.
2. TLW take notes on the presentation.
3. TLW participate in a class activity where the students are answering problems from the end of the chapter as part of a group discussion (41, 43, 45, 47, 49, 51, 53)
4. TLW complete a set of assigned practice problems independently from the end of the chapter (42, 44, 46, 48, 50, 52).

## August 22, 2014

Objectives

1. Convert the units of a measurement from one system to another.
2. Determine if a number is exact or inexact.
3. Determine the correct amount of significant figures in a measurement.
4. Round to the correct number of significant figures after carrying out a mathematical operation involving addition or subtraction.
5. Round to the correct amount of significant figures after carrying out a mathematical operation involving multiplication or division.

Activities

1. TLW complete a quiz in which they must convert units of a measure from one system to another, determine if a number given is exact or inexact, determine the correct amount of significant figures in a measurement, and round to the correct number of significant figures after completing an addition, subtraction, multiplication, or division problem.
2. TTW facilitate a discussion in which students ask for clarification on any part of the quiz they may or may not have understood.

## August 25, 2014

Objectives

1. Describe how to write a measurement /number in scientific notation and maintain the correct number of significant figures.
2. Report data and results using scientific notation to the proper number of significant figures.
3. Describe how you convert from Scientific notation to decimal notation.
4. Describe unit conversion factors involving length, mass, volume, energy, and temperature.
5. Describe how dimensional analysis units are used in a calculation.
6. Use the factor-label method to convert units.

Activities

1. TTW lecture on chapter 2, sections 6-8 of the text, enhancing the lecture with the PowerPoint provided on Moodle to the students.
2. TLW take notes on the presentation.
3. TTW work the example problems from the chapter on the board with the students.
4. TLW participate in a class activity where the students are answering problems from the end of the chapter as part of a group discussion (55, 57, 59, 61, 63, 69, 71, 73, 77, 79, 81, 83, 85, 87, 89)
5. TLW complete a set of assigned practice problems independently from the end of the chapter (56, 58, 60, 62, 64, 67, 68, 70, 72, 74, 78, 80, 82, 84, 86, 88).

## August 26, 2014

Objectives

1. Describe the density of materials and how density is calculated.
2. Describe Celsius, Kelvin, and Fahrenheit temperature scales.
3. Convert from Celsius scale to Kelvin of Fahrenheit and vice versa.
4. Describe heat energy and how it is measured in calories, dietary calories, and joules.

Activities

1. TTW lecture on chapter 2, sections 9-10 of the text, enhancing the lecture with the PowerPoint provided on Moodle to the students.
2. TLW take notes on the presentation.
3. TTW work the example problems from the chapter on the board with the students.
4. TLW participate in a class activity where the students are answering problems from the end of the chapter as part of a group discussion (91, 93, 95, 97, 105, 107, 109)
5. TLW complete a set of assigned practice problems independently from the end of the chapter (92, 94, 96, 98, 101, 102, 103, 104, 106, 108, 110, 111, 112).

## August 27, 2014

Objectives

1. Describe how to write a measurement /number in scientific notation and maintain the correct number of significant figures.
2. Report data and results using scientific notation to the proper number of significant figures.
3. Describe how you convert from Scientific notation to decimal notation.
4. Describe unit conversion factors involving length, mass, volume, energy, and temperature.
5. Describe how dimensional analysis units are used in a calculation.
6. Use the factor-label method to convert units.
7. Describe the density of materials and how density is calculated.
8. Describe Celsius, Kelvin, and Fahrenheit temperature scales.
9. Convert from Celsius scale to Kelvin of Fahrenheit and vice versa.
10. Describe heat energy and how it is measured in calories, dietary calories, and joules.

Activities

1. TLW complete a quiz in which they must write numbers with the correct number of significant digits, covert numbers from decimal notation to scientific notation and vice versa, use dimensional analysis and the factor label method to convert from one set of units to another, calculate density, and convert from the Celsius scale to Kelvin or Fahrenheit and vice versa.
2. TTW facilitate a discussion in which students ask for clarification on any part of the quiz they may or may not have understood.

## August 28, 2014

Objectives

1. Students will continue to develop their skills in the following areas:
   1. Metric system units
   2. Determining exact or inexact numbers
   3. Determining the uncertainty in a measurement and reporting it to the correct number of significant figures,
   4. Using significant figures when performing mathematical operations
   5. Changing numbers from decimal to scientific notation and vice versa
   6. Using conversion factors and dimensional analysis to convert units with the factor-label method
   7. Calculate density
   8. Convert among the three temperature scales (Celsius, Kelvin, and Fahrenheit)

Activities

1. TTW facilitate a review session in which students are answering OWL questions on the promethean board in teams.
2. TLW compete in a review game against other teams by completing questions on the promethean board.
3. TTW answer any questions about the material students may have.

## August 29, 2014

Objectives

1. Students will demonstrate their understanding of the following areas:
   1. Metric system units
   2. Determining exact or inexact numbers
   3. Determining the uncertainty in a measurement and reporting it to the correct number of significant figures,
   4. Using significant figures when performing mathematical operations
   5. Changing numbers from decimal to scientific notation and vice versa
   6. Using conversion factors and dimensional analysis to convert units with the factor-label method
   7. Calculate density
   8. Convert among the three temperature scales (Celsius, Kelvin, and Fahrenheit)

Activities

1. TLW complete a test on chapter 2, covering all the objectives taught.