Testable learning outcomes for CHEM 4 – Exam #2

The slide numbers listed below correspond to those on the posted **PowerPoint slides**. For various reasons, they might not necessarily match the **recorded lectures**.

1) **All CHEM 4 exams are cumulative.**
   a) You are responsible for all the material that was covered on Exam #1
   b) In particular, make sure you are able to do all three types of naming: ionic, molecular, and acids (Textbook Sections 5.6 – 5.10)

2) **Section 2.1 – 2.4; Significant figures and measurements (Monday, October 5)**
   a) Know the definitions/terms on the clicker questions. [Slide 5]
   b) Be able to discuss and identify "exact numbers". [Slides 6]
   c) Be able to discuss "measurements". [Slides 7-8]
   d) Be able to make a measurement with the correct number of digits. [Slides 9, 10] and [Slide 2 from next class]
   e) Be able to apply the rules for identifying the number of significant figures in a measurement. [Slides 11 – 14]
   f) Be able to write any number in "scientific notation" in order to avoid "ambiguous zeros". [Slide 12]
   g) Be able to carry out calculations with x/÷ and report the answer with the correct number of digits. [Slides 15 – 17] and [Slide 1 from next class]

3) **Section 2.4 cont., 5.11; Formula mass (Wednesday, October 7)**
   a) Know the definitions/terms on the clicker questions. [Slide 7]
   b) Be able to carry out calculations with +/- and report the answer with the correct number of digits. [Slides 8 – 9, 11 – 13]
   c) Be able to calculate formula mass for a given compound and report the answer with the correct number of digits. [Slides 10 – 13] and [Slide 1 from next class]
   d) **Not responsible for:** Chemistry in the News. [Slide 5]

4) **Section 2.4 cont.; Mixed +/- and x/÷ calculations (Friday, October 9)**
   a) Be able to carry out calculations with mixed +/- and x/÷ and report the answer with the correct number of digits. [Slides 4 – 8] and [Slide 1 from next class]

5) **Section 2.5 – 2.6; Units/Conversions (Monday, October 12)**
   a) Know definitions/terms on the clicker questions. [Slide 5]
   b) Be able to make conversion factors from equalities. [Slides 7 – 8 and 11 – 13] and [Slide 2 – 3 from next class]
   c) Be able to carry out metric ↔ metric, English ↔ English, and metric ↔ English conversions. [Slides 9 – 10 and 14] and [Slide 1 from next class]
   d) **Not responsible for:** Chemistry application. [Slide 6]

6) **Section 2.7 – 2.8; Units/Conversions (Wednesday, October 14)**
   a) Be able to carry out multi-step conversions. [Slides 7 – 11] and [Slide 1 from next class]

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7) **Section 2.9; Units raised to a power: Area and volume (Friday, October 16)**
   a) Be able derive squared and cubed conversion factors. [Slide 6 – 8]
   b) Use squared and cubed conversion factors to carryout calculations. [Slide 9 – 12] and [Slide 1 from next class]

8) **Section 2.10 – 2.11; Density (Monday, October 19)**
   a) Be able to calculate density. [Slide 6 – 7]
   b) Know basic information about density. [Slide 8]
   c) Be able to use densities in calculations. [Slides 9 – 11] and [Slide 1 from next class]

9) **Section 3.8 – 3.10; Energy and temperature (Wednesday, October 21)**
   a) Know basic information about energy and temperature. [Slide 6 – 10]
   b) Be able to perform calculations related to energy including converting between various units of energy. [Slides 11 – 12] and [Slide 1 from next class]
   c) Be able to convert between the three temperature scales. [Not covered in lecture, but you are responsible for it]
   d) **Not responsible for:** Coronavirus Unveiled article. [Slide 4]

10) **Section 3.11 – 3.12; Heat capacity (Friday, October 23)**
   a) Know basic information about heat capacity. [Slide 6 – 10]
   b) Be able to perform calculations that involve heat capacity. [Slides 11 – 16] and [Slides 1 – 2 from next class]

11) **Section 3.12 cont.; Heat capacity (Monday, October 26)**
   a) Be able to carry out various calorimetry calculations including finding the Calorie content in food using data from a bomb calorimeter. [Slides __]