

Student Learning Outcomes

Measuring Student Learning

Measurement

“When you can measure what you are speaking about, and express it in numbers, you know something about it.”

-Lord Kelvin

“If you can't measure it, you can't improve it.”

-Peter Drucker

Outcomes

- Tasks that students should be able to do upon completion of the course.
 - Think about SWBATs: Students will be able to ...
- Bloom's Action Verbs
 - **Identify** the different types of chemical compounds
 - **Predict** the formula of chemical compounds
 - **Describe** the difference between an acid and a base

Introductory Chemistry (CHM-200)

- Use the periodic table of elements to determine basic chemical and physical properties of the elements.
- Compare experimental results in the laboratory to chemical concepts learned in lecture.
- Demonstrate facility in the laboratory by safely performing experimental protocol.
- Solve basic level problems using measurements, formulae, and/or dimensional analysis to solve word problems related to chemical concepts.
- Communicate understanding of chemical vocabulary and chemical names.

Measuring SLOs in my classes

- Solve basic level problems using measurements, formulae, and/or dimensional analysis to solve word problems related to chemical concepts.
- I cannot measure the above objective with one single problem
 - Break into sub-objectives
 - Create assessments that measure each sub-objective

Sub-Objectives (SOs)

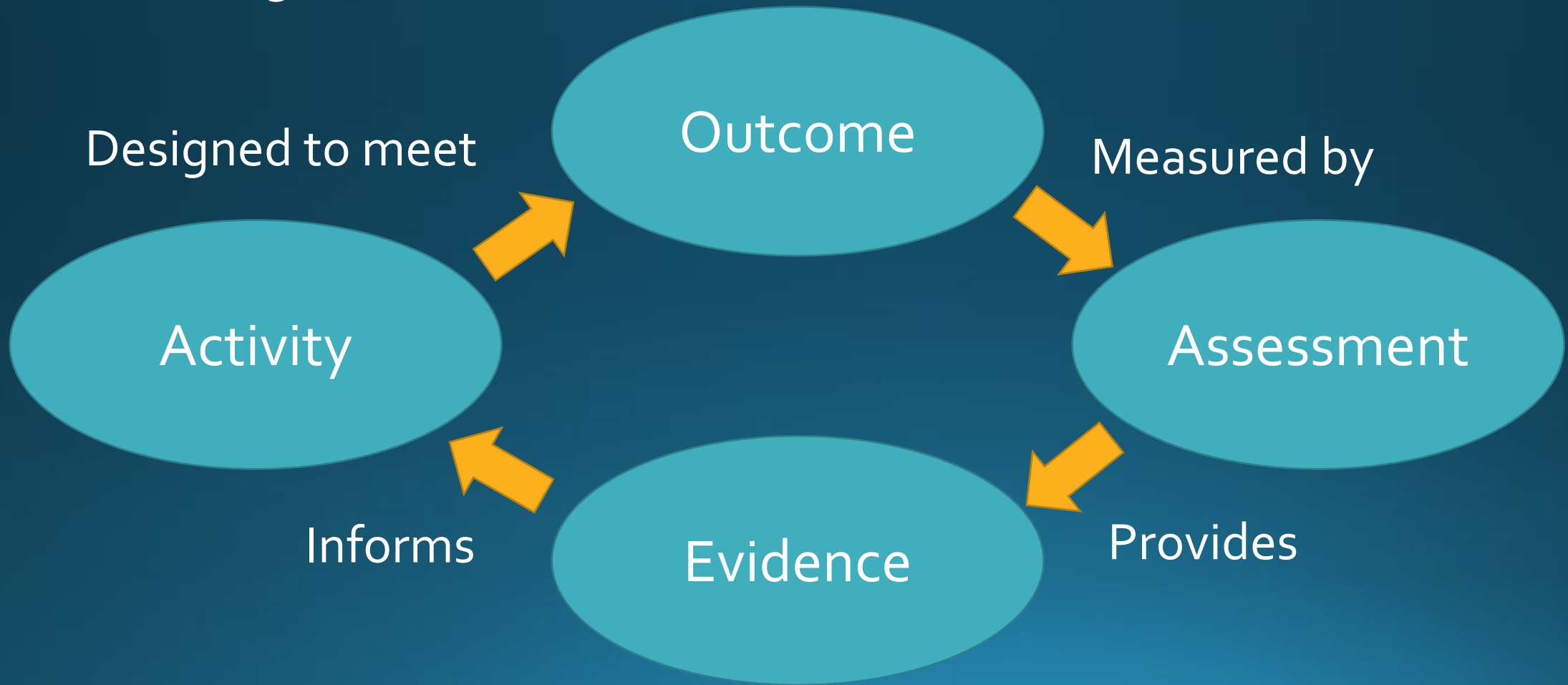
Focus on dimensional analysis: What tasks should my students be able to accomplish if they meet the SLO at the end of the semester?

Students will be able to...

- SO #1 **Identify** conversion factors from equalities.
- SO #2 **Create** conversion factors from written statements or equalities.
- SO #3 **Use** conversion factors to calculate single-step unit conversions.
- SO #4 **Use** conversion factors to calculate multi-step unit conversions.
- SO #5 **Apply** conversion factors to **solve** word problems.

Actionable Research

- Measuring SLOs gives me data that I can use to improve student learning



Measuring the Sub-Objectives

- Class A: “Normal” Instruction
- Class B: Focus on group activities and assessments

Sub-Objective	Class A (Avg. Score)	Class B (Avg. Score)
3	Quiz 1: 83% Exam 1: 71%	Quiz 1: 82% Exam 1: 73%
4	Quiz 1: 73% Exam 1: 84%	Quiz 1: 66% Exam 1: 81%
5	Quiz 1: 25% Exam 1: 56%	Quiz 1: 80% Exam 1: 63%