Goals and Objectives

Listing course goals and objectives in a syllabus is the clearest way to communicate course expectations to students.

Well-written goals and objectives tell students what is to be learned, and what behaviors will be expected of them and graded.

Goals

- Goals are broad, generalized statements about what is to be learned. Goals are a target to be reached.
- Goals loosely define what is to be learned, but are too broad and "fuzzy" for designing assessment.
- Examples:
    - Students will understand the process of making a reasoned argument.
    - Students will be familiar with the global, ethical, and policy implications of chemical technologies.
    - Students will learn mathematical methods of proof.

In order to better describe what kind of work is expected in the course and to more easily design assessment, more specific statements of what the learner must "do" are desirable.

That's where **objectives** come in. Objectives are tools to ensure students reach course goals.

Objectives

- Instructional objectives are **specific, measurable, short-term, observable** student behaviors.
    - You cannot tell when students have reached **goals**, but you can tell when they have reached **objectives**.
    - *You can't know what someone is thinking, but you can know what they're doing.*

- Objectives lead to easier assessment.
- Objectives always target two areas:
    - Audience
    - Behavior

Example: Students [audience] will *follow and apply* [behaviors] scientific protocols so that data are reproducible, comparable, and standardized.

- Some words to avoid when writing objectives: know, understand, appreciate, aware, familiar.

- When preparing objectives, ask:
    - What should students know or be able to do when they finish the course?
    - How will students demonstrate their learning?
    - What level of learning do I want students to achieve?
    - What is the acceptable evidence that students have succeeded?

Examples of Objectives:

Students will…

Draw meaningful conclusions from tables and graphs of data, or from images or videos from which data can be obtained. (*Steve Van Hook; Physics 211*)

Create tables and graphs that provide a meaningful summary of experimental data and/or relationships between quantities. (*Steve Van Hook; Physics 211*)

Use proportional reasoning to analyze the mathematical structure of the relationship between quantities (e.g., if X doubles, what happens to Y?). (*Steve Van Hook; Physics 211*)

Defend the validity of solutions in terms of limiting values, special cases, and reasonableness of how it depends on relevant variables. (*Steve Van Hook; Physics 211*)

Clearly define the coordinate system/reference frame in which your analysis is being done, be able to justify this choice of reference frame, and be able to articulate how a different choice of reference frame would affect your results. (*Steve Van Hook; Physics 211*)

Describe causes of selected diseases in molecular, cellular, and biochemical terms. (*Meredith Defelice; BMB 464*)

Evaluate current experimental procedures and data in disease diagnosis, research, and treatment. (*Meredith Defelice; BMB 464*)

Identify appropriate positive or negative controls for an experiment. (*Meredith Defelice; BMB 442*)

Predict expected results of experiments based on understanding the theory behind those experiments. (*Meredith Defelice; BMB 442*)

Formulate conclusions based on data sets. (*Meredith Defelice; BMB 442*)

Organize data into descriptive tables and graphs. (*Meredith Defelice; BMB 442*)

Interpret NMR, IR and Mass Spec data of small organic compounds and apply this information to analyze the progress of reactions you carry out at the bench. (*Jackie Bortiatynski and Sheryl Rummel*; *Chemistry 203*)

Isolate, separate, and purify organic compounds. (*Jackie Bortiatynski and Sheryl Rummel*; *Chemistry 203*)