Developing Measurable Objectives

Key Component of Good Assessment
Assessment-based Program/Activity Development

1. Identify Need or Hypothesis
2. Define goal/desired outcomes
3. Develop Activity to Achieve Goal
4. Develop Measurable Objectives For Activity Based Upon Goal/Outcomes
5. Develop/Find Assessment Based Upon Testing of Objectives
6. Use Assessment Results to Evaluate/Improve/Justify Activity, Adjust Objectives or Test Hypothesis
7. Continue or Discontinue Activity
First Step to Effective Objectives

- Identify **problem** that needs to be solved (Goal*)
  - Girls attend outreach activities but do not enter engineering
  - Reference resources:
    - Experience
    - Prior assessment results
    - Literature
- Identify **goal** that supports mission and strategic vision of your institution and program
  - Create camp that effectively recruits girls to enroll in engineering
    - Helps keep focus
    - Integrates programming
- Develop **objectives**

*Goals must support missions!"
Objectives should …

- Be specific.
  - Address the target audience.
  - Define a specific change we want in our participants.

- Support overall program goals/mission.
  - Recruiting and retaining …
  - But objectives take these broad goals and “operationalize” them.

- Be measurable.
Objectives Specify What You Want to Happen. . .

as a result of individuals participating in your activity!

- Identify Problem: Pre-College kids don’t know what engineers do!
- Create Specific Objective:
  - After participating in the High School Engineering Camp, participants will be able to identify different engineering careers and engineering majors as measured by: results on immediate and post-surveys

Note: Remember that to measure an outcome, surveys must have questions directly relating to this objective.
Sometimes our objectives..

- Are really statements of participant or project personnel activities.

Students will read about engineering applications and discuss connections to the world around them.
Sometimes our objectives..

- Are so broad that they are more of a goal statement than an objective about how participants will be changed.

Create a successful program that can be duplicated in other communities and leverage our project’s funding in future programs.
Often our objectives..

- Are on the right track but aren’t specific enough to be measurable.

*Build awareness of different types of science careers ...*

*or*

*To make science understandable.*
Why Do Objectives Matter?

- Helps to identify what we want to know before we design/implement activity.
- Maintain focus on desired outcomes during implementation.
- Focus activity planning on the participant
- Focus the assessment
- Allow us to know if we achieved what we set out to achieve
Writing Objectives: Specifying Results You Want

- Recruitment Camp Example Objectives
  - Promote interest in engineering for girls who had not expressed / shown this interest
    - As measured by pre- and post-survey responses
  - Recruit girls to engineering at Penn State
    - As measured by survey and admissions data
  - Retain upper-level engineering student women
    - As measured by survey and tracking for retention
Examples of Objectives

- For Activities Designed to Change Attitudes (Pre-College camps, classes, etc.)
  - After attending a summer engineering camp, participants will respond that engineering is a good choice as a major.

- Improvements?
  - After attending a summer engineering camp, participants will indicate a positive change in their opinion of girls studying engineering based upon answers to a pre-post-survey.
Examples of Objectives

- For Activities Designed to Inform (Open House, Major Night, etc)
  - Participants will have an increased awareness of science as major after attending open house.
- Improvements?
  - Participants will demonstrate greater understanding of science as major based upon answers to a pre- post- survey.
  - Listing of majors, careers, industries, etc.
  - Choose activities scientists engage in.
Examples of Objectives

● For Activities Designed to Change Behavior (Workshops, camps, classes, etc.)
  – After camp participation, participants will say they know it is important to study math.

● Improvements?
  – After camp participation, participants will enroll in higher level math courses.

Note: Challenge with this objective is that it requires following up and gathering information on which classes they take after participation.