Methods #2
Demonstration: Random Assignment

Propose to the students that you know two coaches with starkly different views on coaching basketball. You plan to have each coach work with a team for a substantial period of time - Then the teams will play each other in ten games. To begin, we want to start with teams that are balanced in terms of height, ability and conscientiousness. For the purposes of this demonstration, we will focus on the easiest of those to measure - height.

In a class of 25 to 30 students, you can usually obtain pretty balanced and representative groups by simply picking slips of paper, numbered with either a '1' or a '2,' from a hat. Have the '1's' line up on the left side of the room, the '2's' on the right. Each team aligns themselves in single file according to height, with the shorter students in the front and the taller ones in back. Have the kids "eyeball" the groups - are they balanced in terms of height? Then have one volunteer from each team calculate the mean, median and mode of each team, in inches. For consistency, round upward to eliminate any fractions.

Record the results on the board and ask the students if they see a significant difference between the two data sets. Then compare the group means to the mean of the entire class. In one recent class (n=28), the two teams, each with 14 members, averaged 66.4 and 66.7 inches, while the whole class mean was 66.45. That was an unusually powerful example, but we usually get close enough to make the point about the power of random assignment of volunteers.

To get a bit more out of this demonstration, you might also ask the students to calculate the three measures of central tendency in response to questions like, "How many shoes do you own?" (This idea comes from Steven Sterns) In one recent version of this activity, the mean number of shoes owned by males was just over six, while the mean number of shoes owned by females was a touch over twenty. This invited discussion of the roots of gender differences.

You can also use this information to get a grip on the concept of operational definitions. Just what is a 'shoe' anyway? Is a ski boot or a bedroom slipper a shoe? To what degree did the respondents in the demonstration agree on their sense of a shoe? How might we create a specific, measurable set of criteria that would ensure accurate data?

You may also use this activity to foreshadow typical issues with survey methodology. To what extent are people accurate in their survey responses? How much are they influenced by the tendency to offer socially desirable answers? To what degree are respondents simply trying to please the person administering the survey?

Methods #3
Operational Definitions

Consider using the following activity, perhaps in dyads and triads, to encourage students to wrestle with developing operational definitions. Reference to the last bulleted item (major depressive episode) foreshadows your upcoming work in Abnormal Psychology. We include the DSM-5 criteria for that disorder, to use in your debriefing.

An operational definition is a description of a concept or behavior in terms of how it is measured, such that separate observers could each apply it and reach reasonable agreement as to whether that concept or behavior is present. It provides an empirical set of criteria one can apply to measure or identify a concept or phenomenon.

Develop an operational definition for two of the following, by first *brainstorming* ideas, then paring that brainstorm list down in order to develop a checklist of *measurable characteristics* of each concept.

Assume that at least three observers would use this as a scoring rubric for detecting the presence of the thing you are defining, and that the goal is to achieve very high *inter-rater reliability* in applying the rubric.

- Class participation
- Effective teaching
- Pretty
- Funny
- Happy
- A "shift" in position while sleeping
- Poverty
- Major Depressive Episode

DSM-5 Clinical Criteria for Major Depressive Episode

Five or more of the following symptoms have been present during the same two-week period and represent a change from previous functioning; at least one of the symptoms is either, (1) depressed mood or (2) loss of interest or pleasure

- *Depressed mood most of the day, nearly every day, as indicated by either* subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). Note: In children and adolescents, can be irritable mood.
- *Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others*
- *Significant weight loss when not dieting or weight gain (e.g., a change of more* than 5 percent of body weight in a month), or decrease or increase in appetite nearly every day. Note: In children, consider failure to make expected weight gains.
- *Insomnia or hypersomnia nearly every day.*
- *Psychomotor agitation or retardation nearly every day (observable* by others, not merely subjective feelings of restlessness or being slowed down).
- *Fatigue or loss of energy nearly every day.*
- *Feelings of worthlessness or excessive or inappropriate guilt (which may be* delusional) nearly every day (not merely self-reproach or guilt about being sick).
- *Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).*
- *Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation* without a specific plan, or a suicide attempt or a specific plan for committing suicide.
- *The symptoms cause clinically significant distress or impairment in social, occupational or other important areas of functioning.*
- *The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).*

Methods #4a
Identifying the Components of an Experiment

Your students might benefit from the following as practice in identifying the key elements of an experiment. You can also use item #2 and item #3 to foreshadow ideas in Social Psychology (self-fulfilling prophecies and the mere exposure effect). This might help your students when they revisit these concepts later in the course.

1. In a study on the impact of taking one aspirin per day on the incidence of heart disease, one group of volunteers takes one aspirin daily over the course of the study, a second group takes a pill daily that they believe to be aspirin but which has no medicinal properties, and a third group takes nothing. At the end of the study, all of the volunteers are evaluated for evidence of heart disease or dysfunction.

A. State the null hypothesis.

B. Which group is the control group?

C. What is the dependent variable in this study?

D. What is the independent variable in this study?

E. Anticipate one possible confounding variable in this study.

2. In an experiment entitled *Expectation and Its Impact on Performance,* a group of new 4th grade students who have done poorly in school through grade three are randomly assigned to one of three groups. One group is assigned to a teacher who is given complete and accurate information on the academic potential of each student and is warned of difficulties that might be anticipated from each child; the second group is assigned to a teacher who is told that all her kids have shown unusual ability and motivation in previous years, and the third group is assigned to a teacher who is told nothing about the students. At the end of the year, performance of the three groups is compared using a standardized test measure.

A. State the null hypotheses.

B. Which group is the control group?

C. What is the independent variable in this study?

D. What is the dependent variable in this study?

E. Anticipate one possible confounding variable in this study.

3. A psychologist believes that contact between members of different racial groups (*mere exposure*) is likely to reduce levels of prejudice and discrimination. To examine this, she asks the superintendent of a school district whose schools have significant racial and ethnic diversity to bus some of the elementary school students to one "single race" school and the others to a "pilot school" where all classes are racially mixed. She intends to use survey methodology at the end of the school year to evaluate differences in levels of prejudice between the two schools.

A. What is the null hypothesis in this study?

B. What is the independent variable in this study?

C. What is the dependent variable in this study?

D. Anticipate one possible confounding variable in this study.