



BETA SESSION

All scientific experiments must contain a *CONTROL* group and at least one *EXPERIMENTAL* group.

EXPERIMENTAL group: A group where the variable under consideration is present and changed from experiment to experiment.

CONTROL group: A group where the variable under consideration is either absent or it is not changed from experiment to experiment. The *CONTROL* is necessary so we have a baseline to compare against our various experiments...

Note that it is critical that only ONE variable be present and changed in each experiment. If we want to test 10 different variables: we need at least 10 different experiments. If we want to test one variable, but change it 10 times: we need at least 10 different experiments.

→ **TASK β -1: Recall the list of variables and hypotheses from your ALPHA Session. For EACH of your hypotheses, answer the following:**

- 1) How do you propose we manipulate the variable being tested in the EXPERIMENTAL group?
 - Example: If students decided RED ALGAE was the variable/species to be tested, do they:
 - 1) Do one experiment which one species of red algae, and another which uses a different species of red algae? Or,
 - 2) Do one experiment which is one species of red algae, and another which uses the Antarctic cyanobacteria? Or,
 - 3) Do multiple experiments, each with a different species of algae?
- 2) How do you propose we construct the CONTROL?
 - Example: In the hypothetical experiment above, RED ALGAE was the variable/species being tested. In the CONTROL, the variable/species (RED ALGAE) can't be "absent" because we need something to compare our cultures to. So the students would have to make sure the species in the CONTROL was not changed from experiment to experiment. That would work if we wanted to compare different cultures of RED ALGAE against the control, but it wouldn't be as applicable if we also wanted to experiment on Antarctic cyanobacteria, because the different species will respond differently (and make direct comparisons between the two somewhat difficult).