

# Research Project Course

## Lecture 1: Research Terminology

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# Tentative Syllabus

- ▶ Week 1: Research terminology
- ▶ Week 2: Experimental Design
- ▶ Week 3: How to do statistics for your research?
- ▶ Week 4: How to write your research project? Part 1
- ▶ Week 5: How to write your research project? Part 2
- ▶ Week 6: How to use EndNote to manage references

**EXAM:** You must prepare a write-up on your own research project. Note you should use ALL Course Materials to write your research

How do you conduct and write your research project?

# Grading system

▶ Research Project course	10%
- Assignments	
▶ Preliminary Oral Presentation	20%
▶ Mentor	10%
▶ Final Oral Presentation	40%
▶ Mentor	20%
Total grade	100%



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# What is research?

- ▶ **Research** is a process of searching for an answer for a specific question through a systematic analysis.
- ▶ The results of research lead to new findings which eventually would enhance our understanding in a specific topic.
- ▶ Research is indispensable in economical, social and political progress.

# What are the aims of Research?



- ▶ to discover new knowledge
- ▶ to investigate a phenomenon to identify the cause-effect relationship
- ▶ to develop new scientific tools
- ▶ to find solutions to scientific problems
- ▶ to solve problems that we encounter in our life

# What motivates you to do research?

- ▶ To fulfil a requirement for a degree
- ▶ To solve a physical problem
- ▶ Curiosity for finding new things
- ▶ To get recognition

# Research Requirements



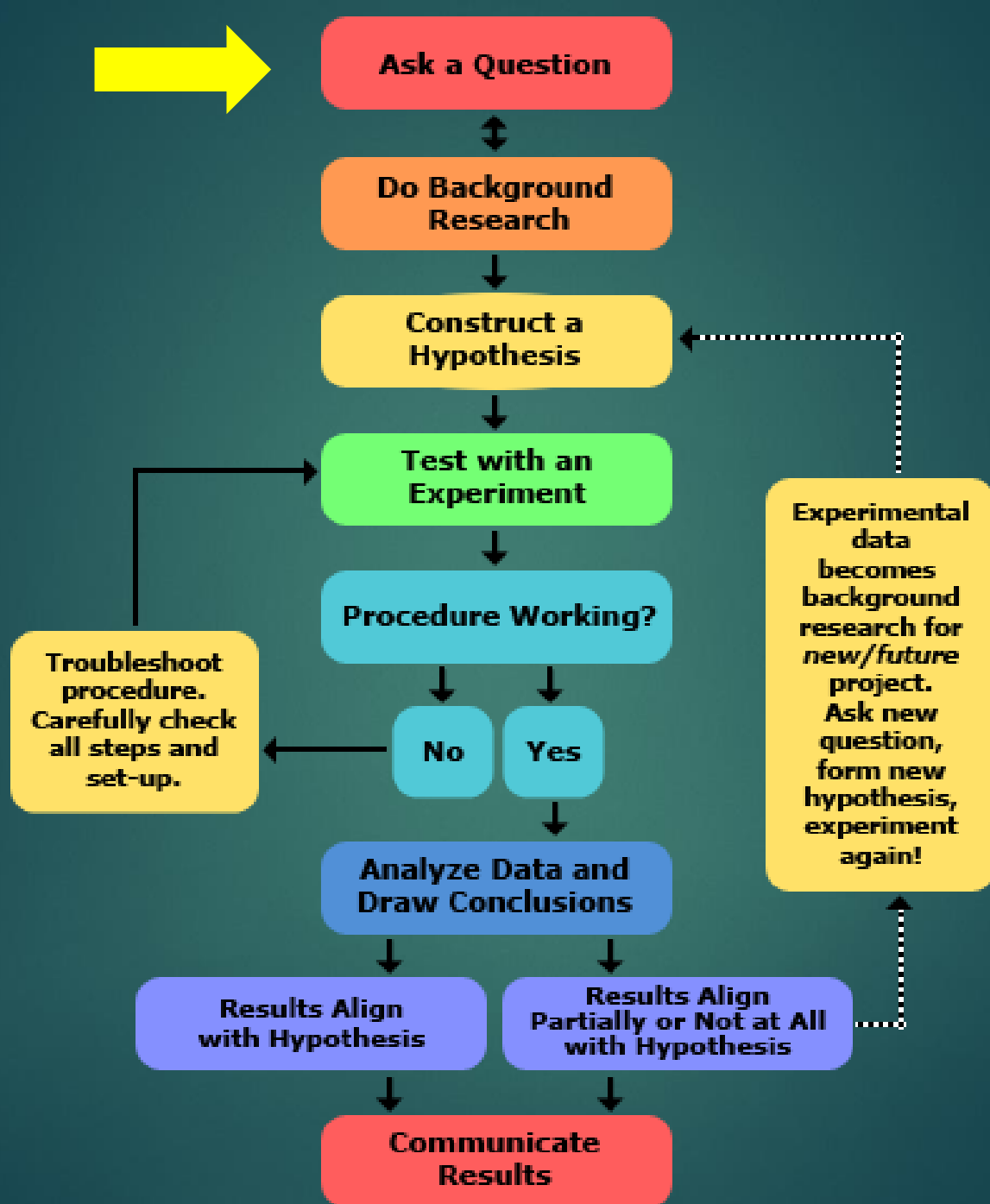
- ▶ Space-Lab
- ▶ Funding-Money
- ▶ Tools and equipment
- ▶ Idea
- ▶ Literature Review
- ▶ Knowledge – data collection – how to use tools and equipment.
- ▶ Writing skills



# Scientific Research Method

## Observation





# General Terminology in Research



- ▶ **Hypothesis:** an idea that has not been proven
- ▶ **Experiment:** a scientific test in which you perform a series of actions and carefully observe their effects to learn about something. (used to test the validity of hypothesis)
- ▶ **Treatment:** is a process of changing something.

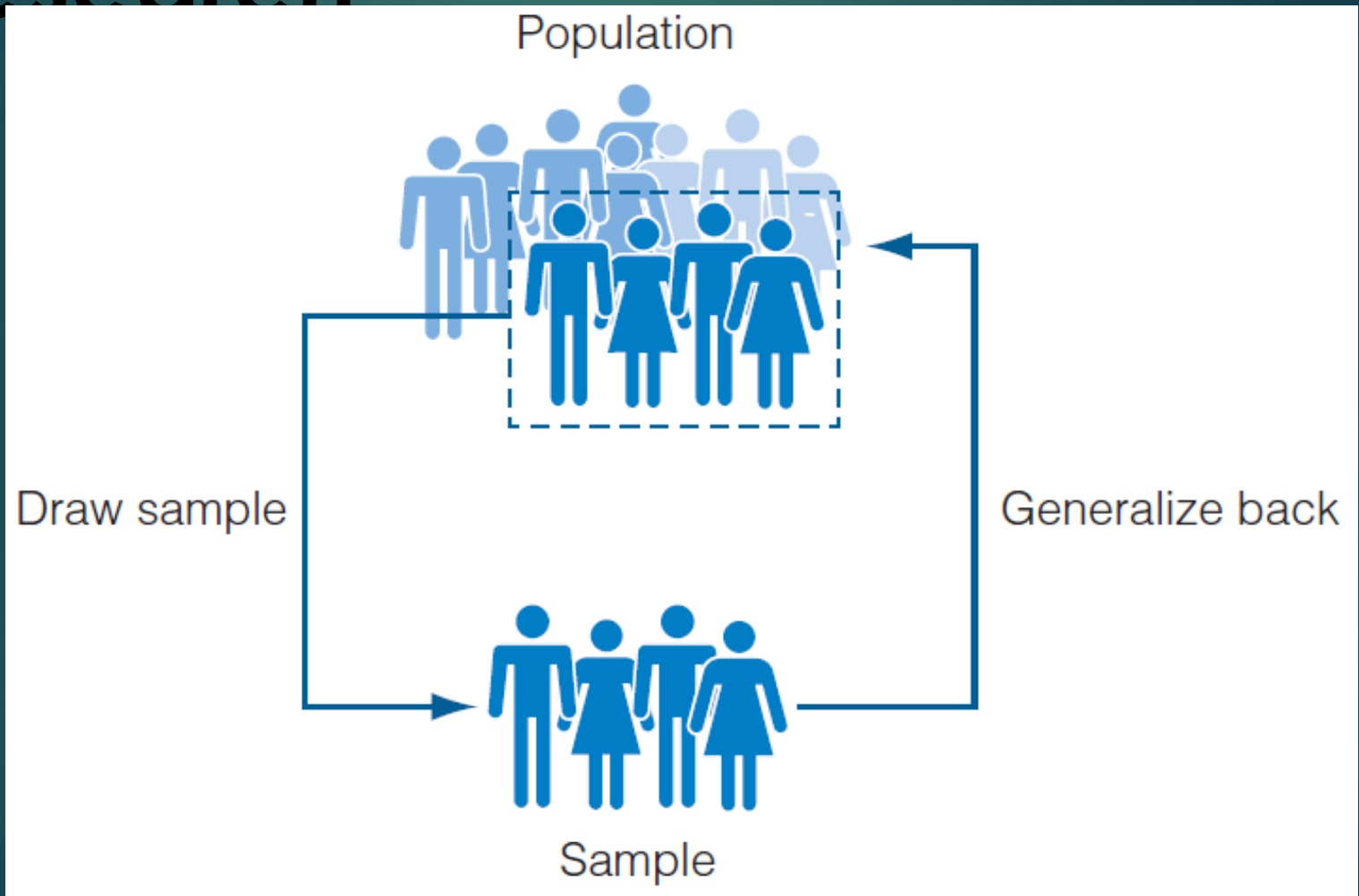
# General Terminology in Research

- ▶ **Factor:** experimental variables, controllable conditions (light, temperature).
- ▶ **Replication:** repeating an experiment or procedure more than once. (repetition)
- ▶ **Randomization:** arrangement of treatments to experiments in a random way.

# General Terminology in Research

- ▶ **Sample:** number of repetitions that represents the population.
- ▶ **Sample size:** total number of samples used in an experiment.
- ▶ **Reproducibility:** to cause something to happen again in the same way.
- ▶ **Ethics:** rules that determine acceptable and unacceptable things in research.
- ▶ **Plagiarism:** to claim other people's work to be your own.

# General Terminology in Research



# General Terminology in Research

- ▶ **Types of variables**
- ▶ **Independent variables:** are changed in the experiment.
- ▶ **Dependent variables:** are affected by independent variables.
- ▶ **Control variables:** should not be changed.



# Questions?