Research Hypothesis Goals/Broad and Specific objectives

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At the end of this lesson the students should be able to:

- Explain the purpose of Goals/broad and specific research objectives
- Develop goal/broad and specific research objectives
- Explain and justify application of hypothesis
- Relate hypothesis to scientific method
- Formulate Hypothesis
- Differentiate between the null and alternative hypothesis

What is a Goal?

Goal

I want to lose 40 pounds by Christmas.

Objectives

I will follow the Atkins diet. I will also do 30 minutes of cardio exercise per day and 20 minutes lifting weights.

XYZ Inc. reported a giant loss

Goal

Become profitable

Objectives

Lay off workers, close branches, etc.

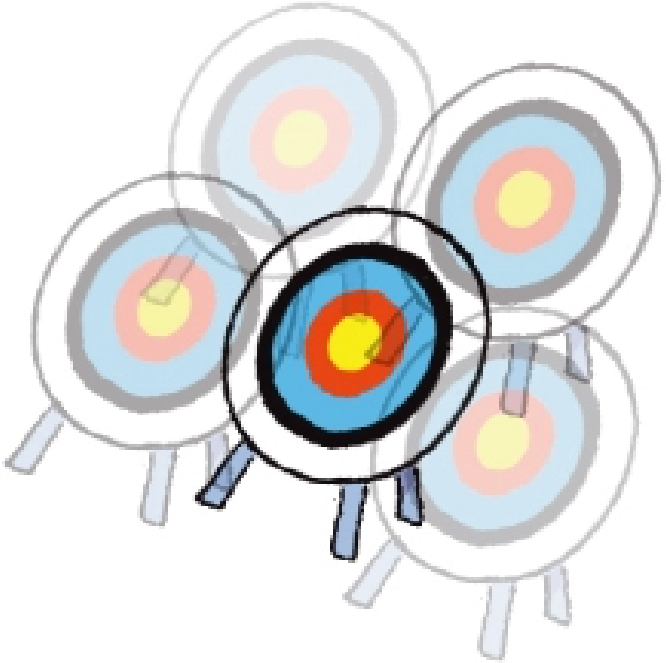
A goal describes where you want to be in the future. However, unlike an objective, it does not explain how you plan to get there.


GOALS
OBJECTIVES

Goals vs. Objectives

- Goals are where you want to be
- Objectives are the steps needed to get there
- Goals – broad, lofty ideas that are intangible, abstract and may not be measureable; long-term
- Objectives – SMART; short-term

Objective?????



Something which you plan to do or
Achieve an aim or purpose.

Why need Research Objective

Research objectives demonstrate what you wish to attain in your study .

Objectives inform a reader of what you want to achieve through the study ,therefore it should be clear and specific.

It gives focus to the study thus specifying the measurability of the variables of the study .

From Where Do You Get Research Objectives From????????

Research objectives are derived from t
knowledge gaps and states what is new
what activity necessarily needs investigat

The research objective means what to do and what to achieve.

The research objectives must be SMART

- **Specific** (Relating to one thing not to other)
- **Measurable** (can be measure in terms of output)
- **Achievable** (describes a task which can be achieved)
- **Realistic** (accepting thing as they are in reality and not making decisions based on unlikely hopes for the future)
- **Time limit** (set deadlines and milestones, times when you will sit down and reflect on and review your progress).

How are the Research Objectives Stated

It should be listed under two headings

- **General**
- **Specific**
- **General objective is an overall statement of the thrust of your study it also states the main associations and relationships that you seek to discover or establish**
- **Specific objectives are narrow in focus and more specific**

Specific objectives should be numerically listed

They should be clear and each specific objective contains only one aspect of the study .

Use action-oriented words /verbs e.g ‘to determine’ , measure, find, explore , compare ,analyze ,ascertain, access ,establish, discover, determine, identify..

Wording of your objectives determines the type of your research design you need to adopt to achieve them.

Example

General objective:

- Causes of smoking in college students

Specific objectives:

- To discover the frequency of cigarette smoking among college students.
- To explore the causes of cigarette smoking among college students.

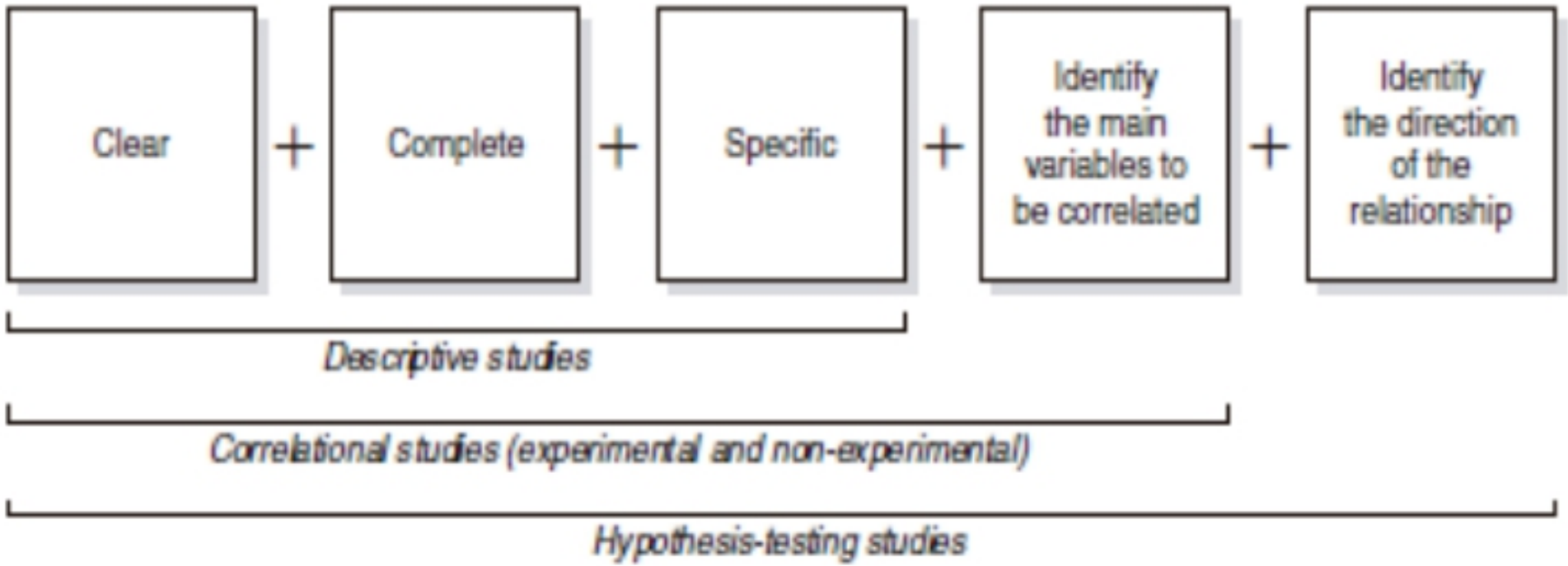


FIGURE 4.5 *Characteristics of objectives*

Observation

- Medical students experience a high level of stress during their undergraduate course

Task

- Formulate General and specific objectives.

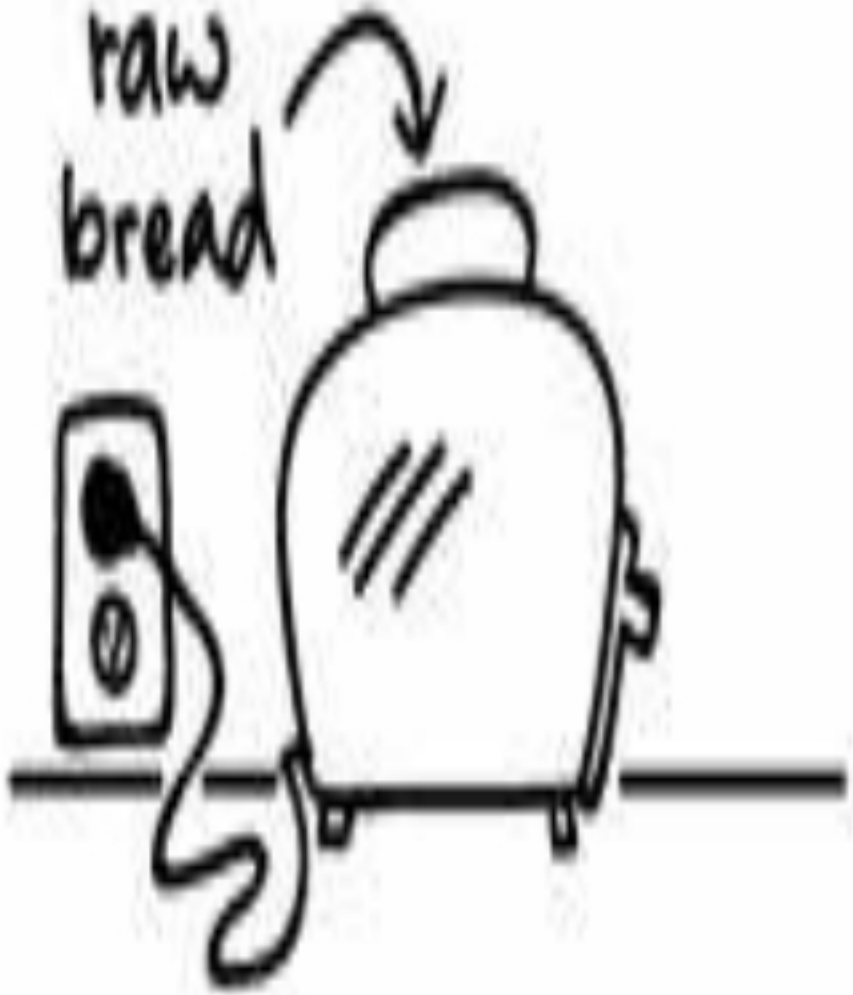
- **To determine the prevalence of stress among medical students of medical colleges in kpk**
- To observe an association between the levels of stress and their academic performance.
- To find out the differences in level of stress among male and female students

Hypothesis

What ?

Why ?

How ?



① Observation:

The toaster won't toast!

② Question:

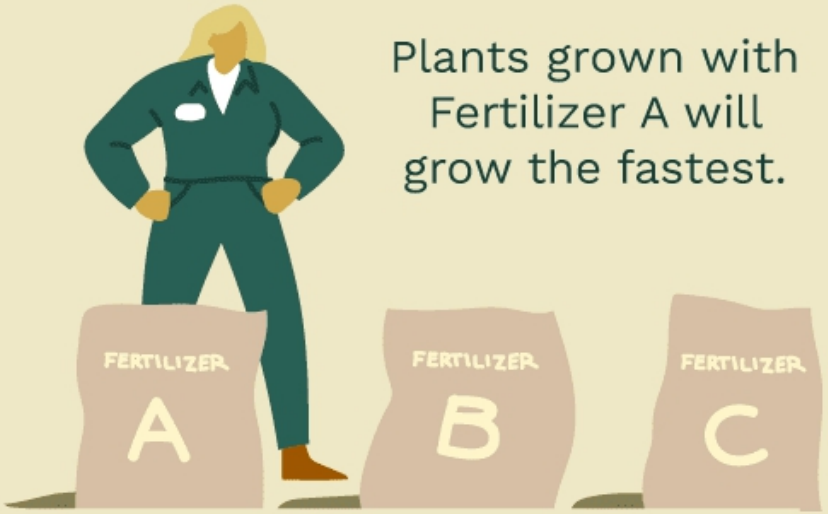

③ Hypothesis:
Maybe the outlet is broken.

Observation

Which type of fertilizer works the best?

Question

Plants grown with Fertilizer A will grow the fastest.



Hypothesis

Results

The hypothesis was proven correct.

Conclusion

The Scientific Method

Think of a Question

Hypothesis

Create a Experiment

Record Data

Draw a Conclusion

The Scientific Method

Question
Ask a question, and then research your topic.

Hypothesis
What's your best guess?

Procedure
Write very specific directions for your experiment.

Experiment
Observe closely and record data.

Data Analysis
Organize and evaluate your data.

Conclusion
What did you find? Was your hypothesis correct?

Abstract
Summarize your experiment.

Presentation
Create a display and present to the judges.

Scientist image courtesy of ScottSchrantz, Flickr.com

What is a hypothesis ?

Hypothesis

proposed explanation that aims to answer the question formulated

Hypothesis

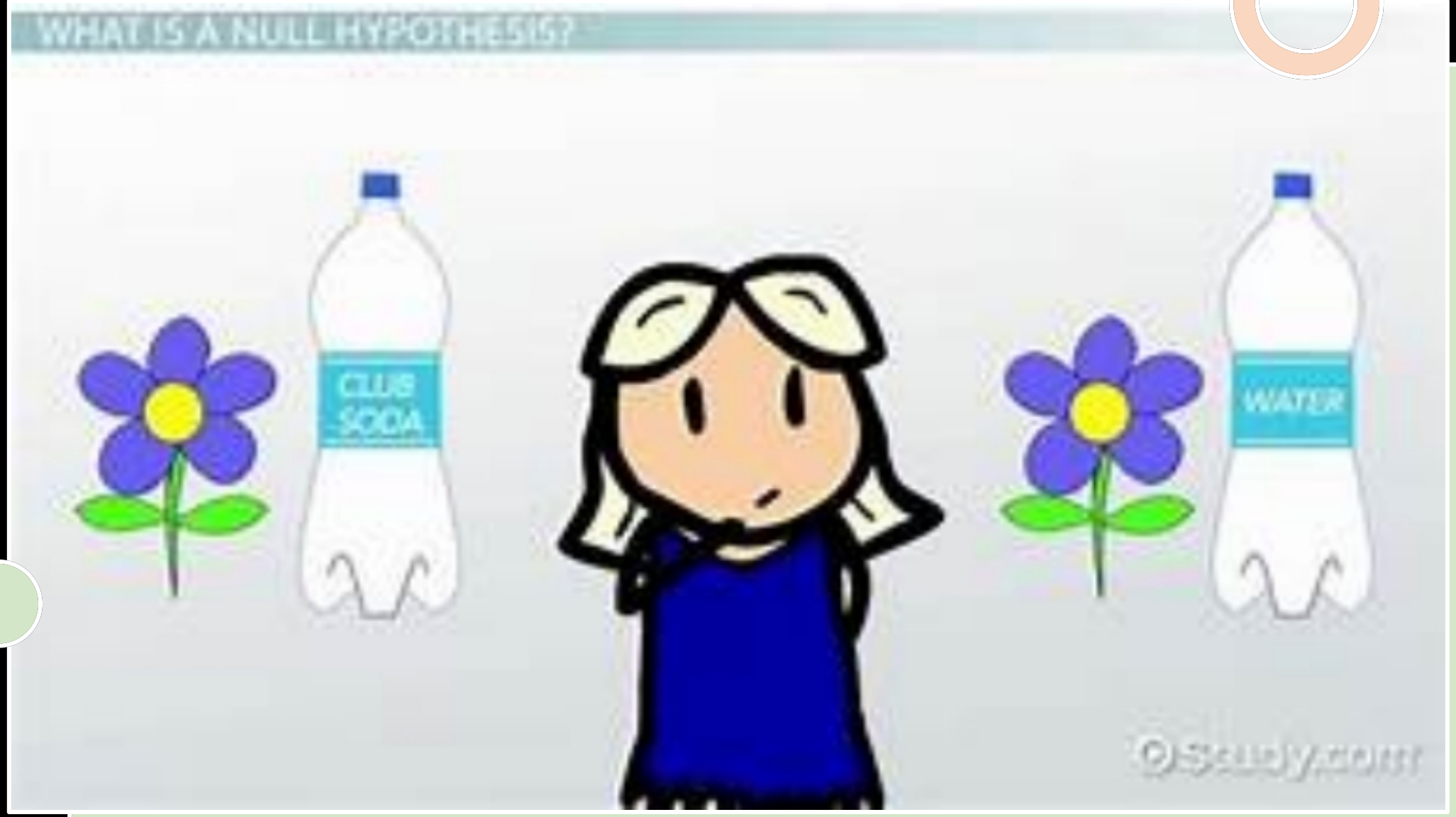
- A suggested solution to the problem/question.

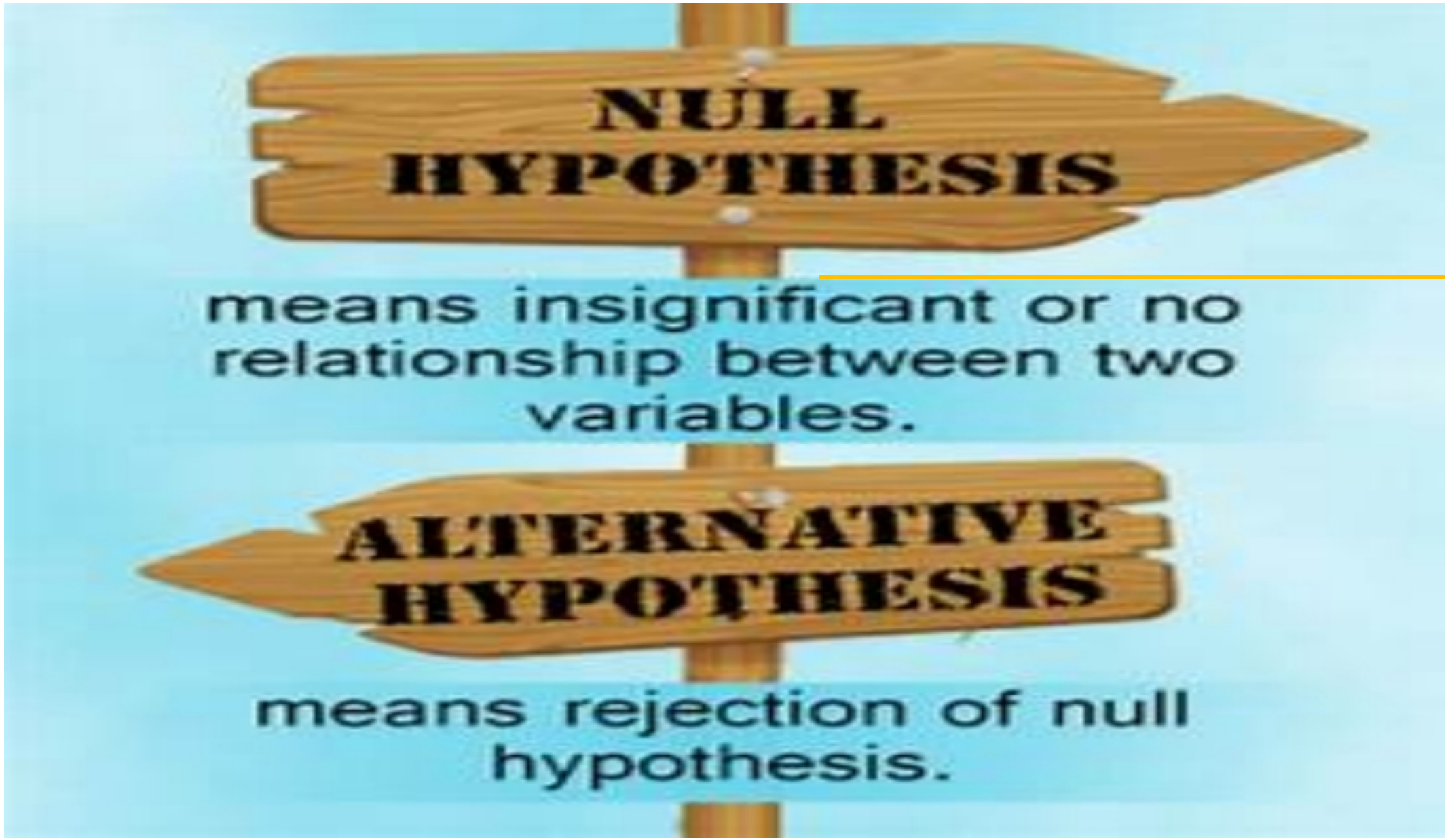
- If…Then…

Examples of Hypothesis

1. Chocolate **may cause** pimples.
2. Salt in soil **may affect** plant growth.
3. Plant growth **may be affected** by the color of the light.
4. Bacterial growth **may be affected** by temperature.
5. Ultra violet light **may cause** skin cancer.

Developing a hypothesis


WHAT IS A NULL HYPOTHESIS?
CLUB SODA
WATER


NULL HYPOTHESIS
means insignificant or no relationship between two variables.
ALTERNATIVE HYPOTHESIS
means rejection of null hypothesis.

Null Hypothesis (H_0)

-The assumption you're beginning with

-The opposite of what you're testing

Alternative Hypothesis (H_1)

-The claim you're testing

NULL HYPOTHESIS EXAMPLES

THE NULL HYPOTHESIS ASSUMES THERE IS NO RELATIONSHIP BETWEEN TWO VARIABLES AND THAT CONTROLLING ONE VARIABLE HAS NO EFFECT ON THE OTHER.

Observation

Logical Hypotheses

- Stated in terms of null & alternate hypotheses.
- Null Hypothesis (Ho).

  Students who drink caffeine will be not be able to memorise information faster than students who do not drink caffeine.
- Alternative Hypothesis (Ha).

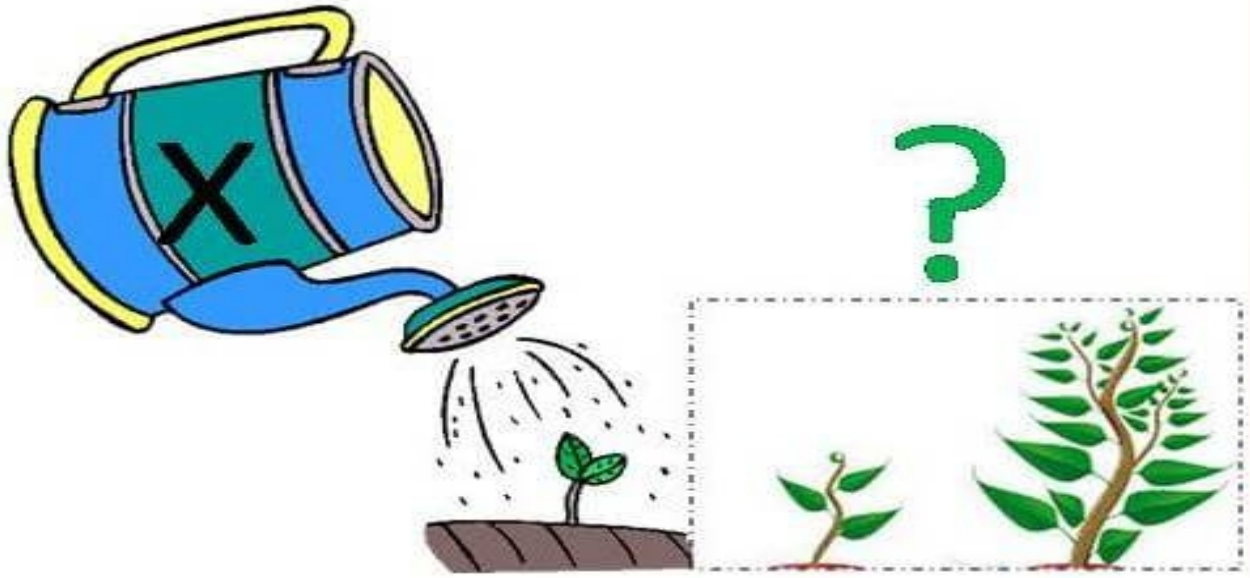
  Students who drink caffeine will be able to memorise information faster than students who do not drink caffeine.

Effect of Bio-fertilizer ‘x’ on Plant growth

www.majordifferences.com

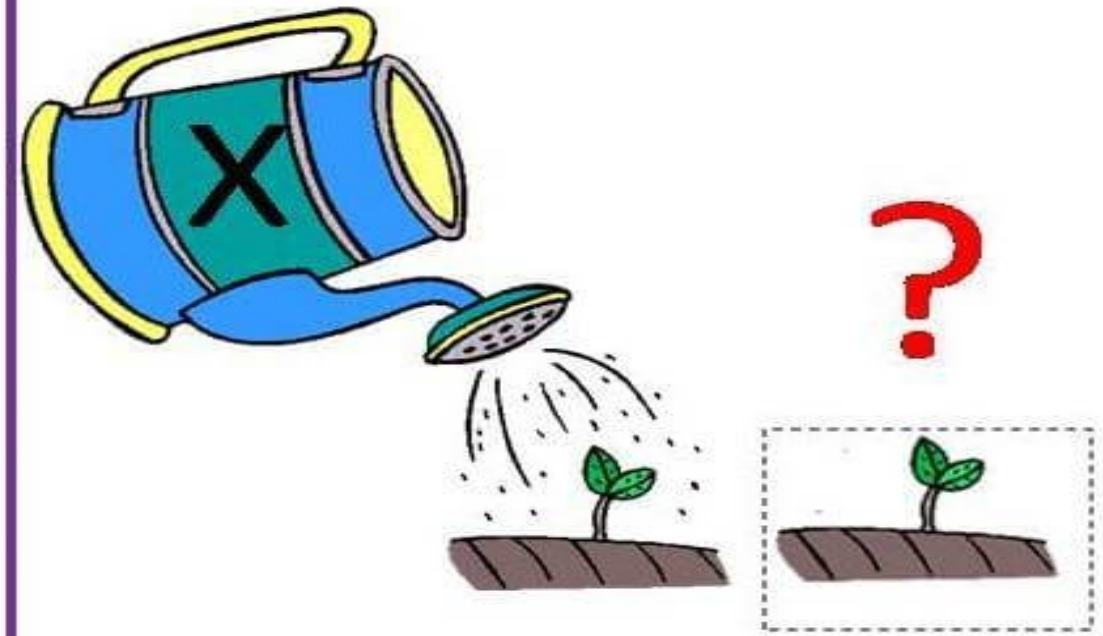
Alternative Hypothesis

H_1: Application of bio-fertilizer ‘x’ increase plant growth.



Null Hypothesis

H_0: Application of bio-fertilizer ‘x’ do not increase plant growth.



null hypothesis

- no difference between phenomena

$(H_0)\ x = y$

alternate hypothesis

- is difference between phenomena

$(H_{A1})\ x \neq y$

$(H_{A2})\ x > y$

$(H_{A3})\ x < y$

NULL AND ALTERNATIVE PROPERTIES

H_0	H_a
Assumption, status quo, nothing new	Rejection of an assumption
Assumed to be "true"; a given.	Rejection of an assumption or the given.
Negation of the research question	Research question to be "proven"
Always contains an equality $(=, \leq, \geq)$	Does not contain equality $(\neq, <, >)$

Using the last property, we can logically derive the possible null/alternative pairs:

$H_0 =$ $H_0 \leq$ $H_0 \geq$

$H_a \neq$ $H_a >$ $H_a <$

ALWAYS in opposition to each other; cannot both be true.

Review

- Define Objectives
- Justify the use of objectives in a research study/project
- Develop objectives
- Define hypothesis
- Differentiate between the null and alternative hypothesis

Task

Identify a topic from an observation

- What is your research question
- What is your goal/broad objectives
- What are your specific objectives ?
- What is your hypothesis
- Write your null and alternate hypothesis for your topic using the appropriate symbols

References

- Park’s textbook of Preventive and Social Medicine ;Chapter 18 Pgs 638-652

Images

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Thank
You!