Branches of Science…

- How many branches of science do you know.
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- -
- -
- -
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- -

Types of scientists…

- Biology – The study of life.
- Geology – The study of Earth.
- Chemistry – The study of Matter.
- Physics – The study of matter and energy.

Aerodynamics: the study of the motion of gas on objects and the forces created

Anatomy: the study of the structure and organization of living things

Anthropology: the study of human cultures both past and present

Archaeology: the study of the material remains of cultures

Astronomy: the study of celestial objects in the universe

Astrophysics: the study of the physics of the universe

Bacteriology: the study of bacteria in relation to disease

Biochemistry: the study of the organic chemistry of compounds and processes occurring in organisms

Biophysics: the application of theories and methods of the physical sciences to questions of biology

Biology: the science that studies living organisms

Botany: the scientific study of plant life

Chemical Engineering: the application of science, mathematics, and economics to the process of converting raw materials or chemicals into more useful or valuable forms

Chemistry: the science of matter and its interactions with energy and itself

Climatology: the study of climates and investigations of its phenomena and causes

Computer Science: the systematic study of computing systems and computation

Ecology: the study of how organisms interact with each other and their environment

Electronics: science and technology of electronic phenomena

Engineering: the practical application of science to commerce or industry

Entomology: the study of insects

Environmental Science: the science of the interactions between the physical, chemical, and biological components of the environment

Forestry: the science of studying and managing forests and plantations, and related natural resources

Genetics: the science of genes, heredity, and the variation of organisms

Geology: the science of the Earth, its structure, and history

Marine Biology: the study of animal and plant life within saltwater ecosystems **Mathematics:** a science dealing with the logic of quantity and shape and arrangement

Medicine: the science concerned with maintaining health and restoring it by treating disease

Meteorology: study of the atmosphere that focuses on weather processes and forecasting

Microbiology: the study of microorganisms, including viruses, prokaryotes and simple eukaryotes

Mineralogy: the study of the chemistry, crystal structure, and physical (including optical) properties of minerals

Molecular Biology: the study of biology at a molecular level.

Nuclear Physics: the branch of physics concerned with the nucleus of the atom

Neurology: the branch of medicine dealing with the nervous system and its disorders

Oceanography: study of the earth's oceans and their interlinked ecosystems and chemical and physical processes

Organic Chemistry: the branch of chemistry dedicated to the study of the structures, synthesis, and reactions of carbon-containing compounds

Ornithology: the study of birds

Paleontology: the study of life-forms existing in former geological time periods

Petrology: the geological and chemical study of rocks

Physics: the study of the behavior and properties of matter

Physiology: the study of the mechanical, physical, and biochemical functions of living organisms

Radiology: the branch of medicine dealing with the applications of radiant energy, including x-rays and radioisotopes

Seismology: the study of earthquakes and the movement of waves through the Earth

Taxonomy: the science of classification of animals and plants

Thermodynamics: the physics of energy, heat, work, entropy and the spontaneity of processes

Zoology: the study of animals

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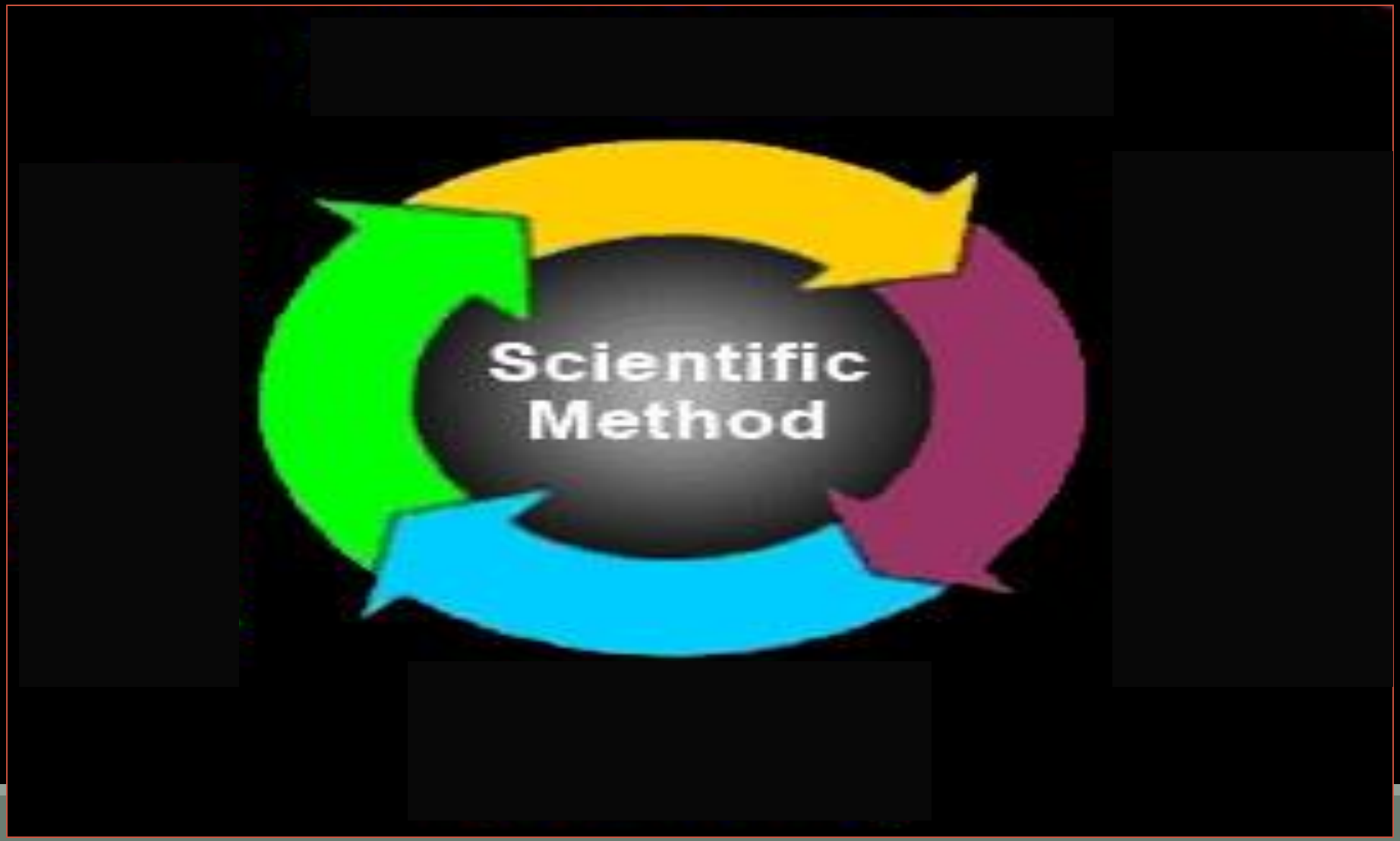
They all use the Scientific Method

The Scientific Method

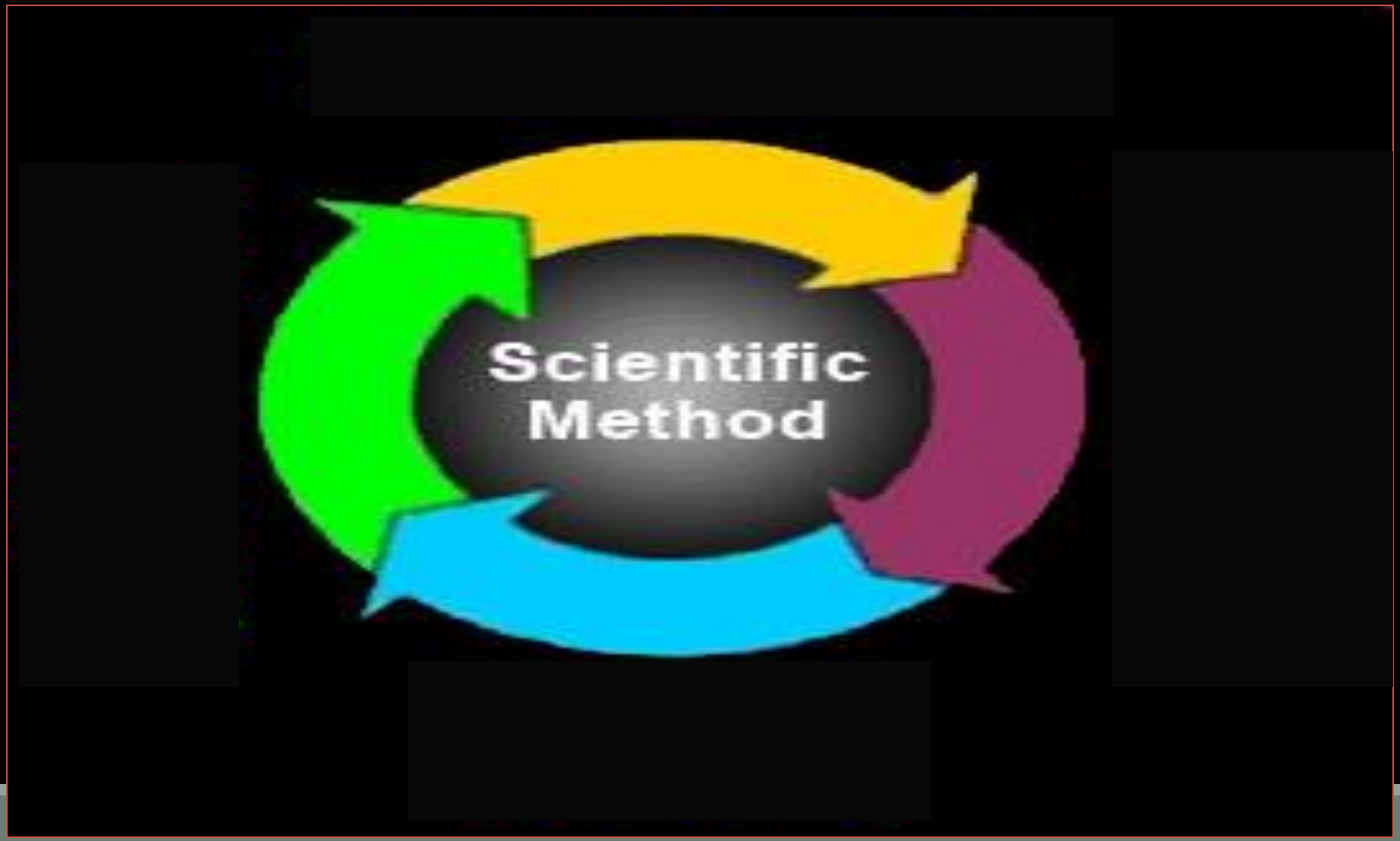
MR. BANKS

AUGUST 2014

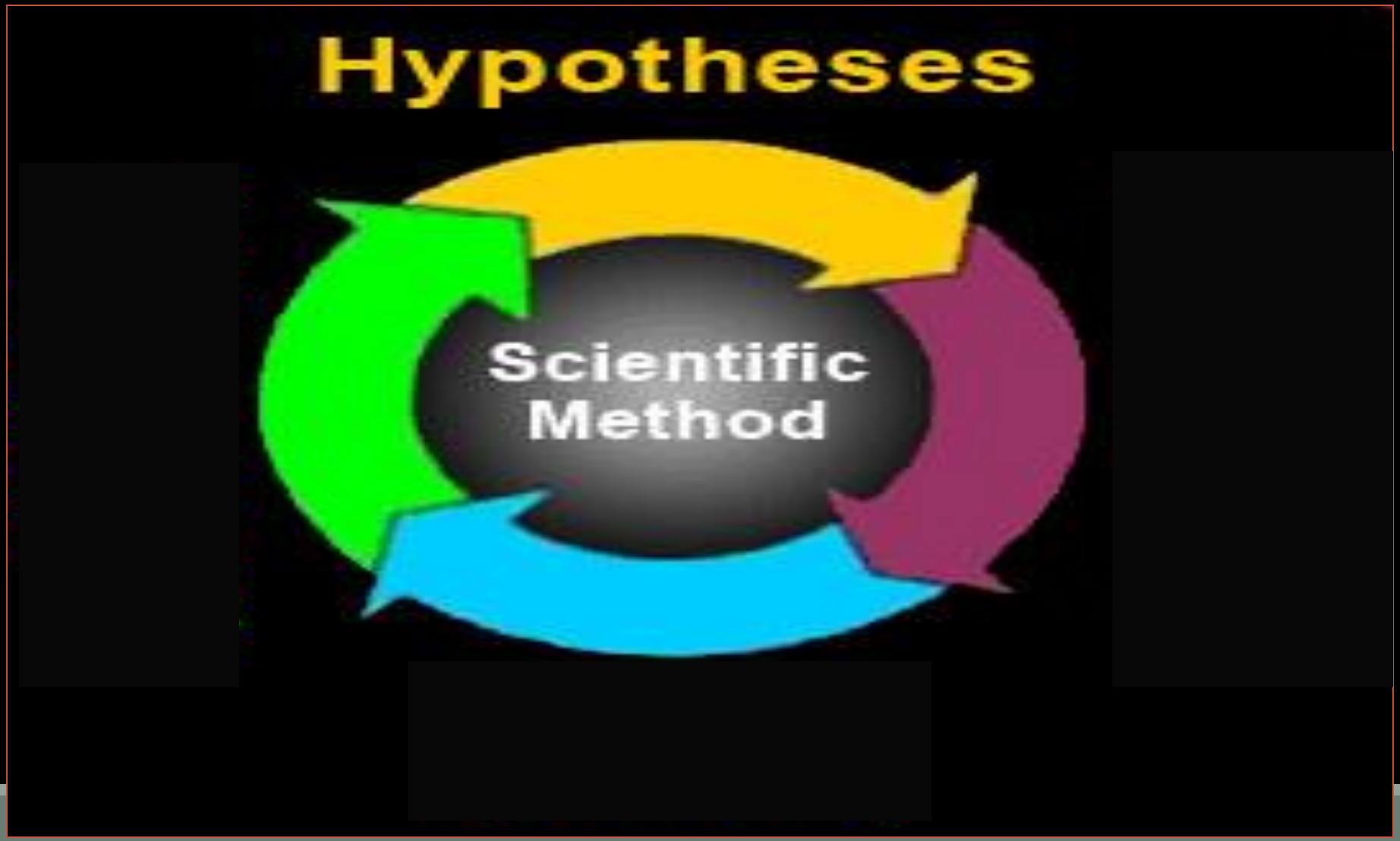
The Scientific Method:

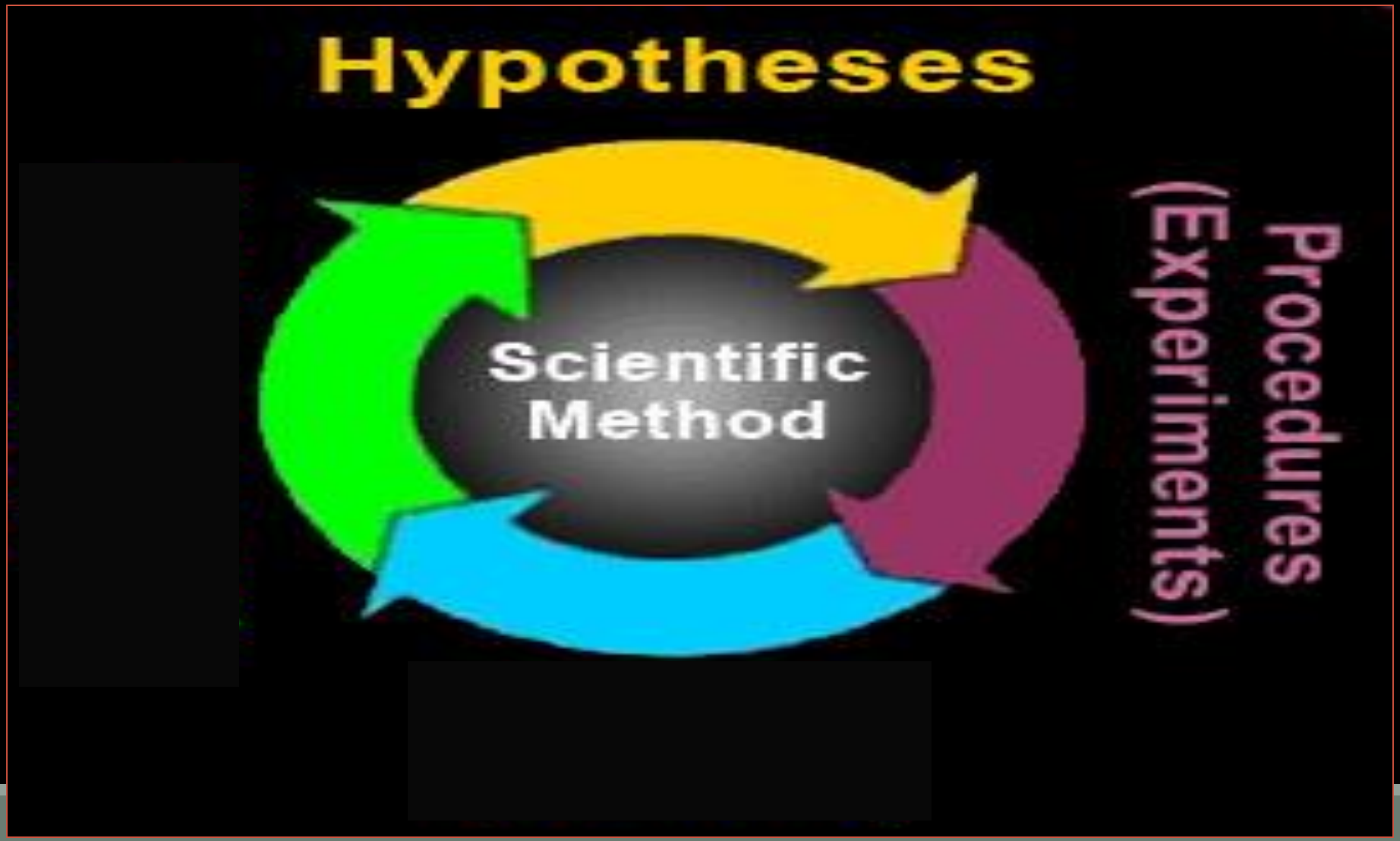


The Scientific Method: A way to ask and answer scientific questions by making observations and doing experiments.



Hypotheses: A proposed explanation made on the basis of limited evidence and is a starting point for further investigation.





Conclusion: What you learned from the results of your experiment.

Hypotheses

A proposed explanation made on the basis of limited evidence and is a starting point for further investigation.

- More than just an educated guess.
- It is testable, you can perform an experiment and determine if the hypothesis is correct.
- Based on current or previous observations.

Scientific method: A process that is the basis for scientific inquiry (questioning and experimenting).

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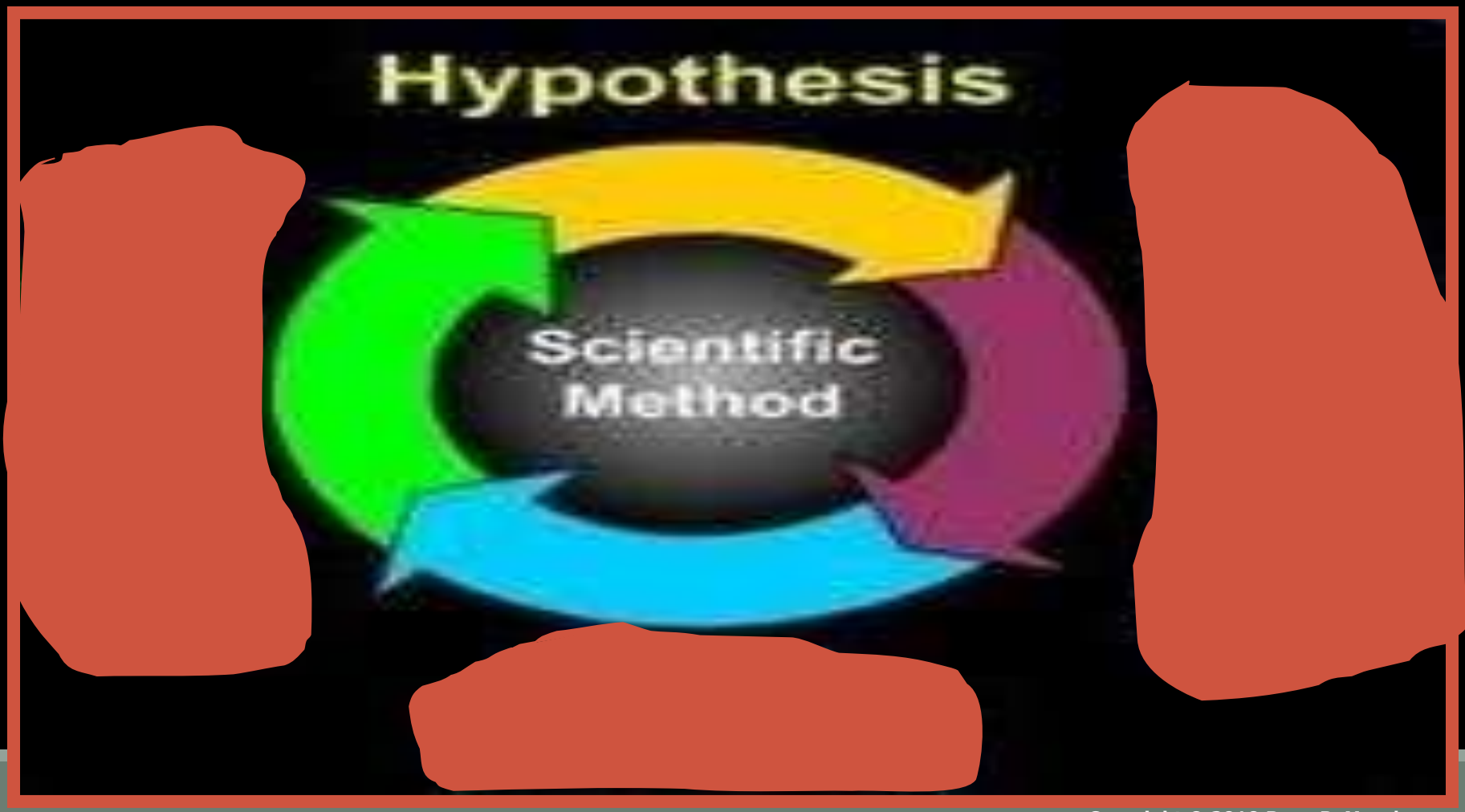

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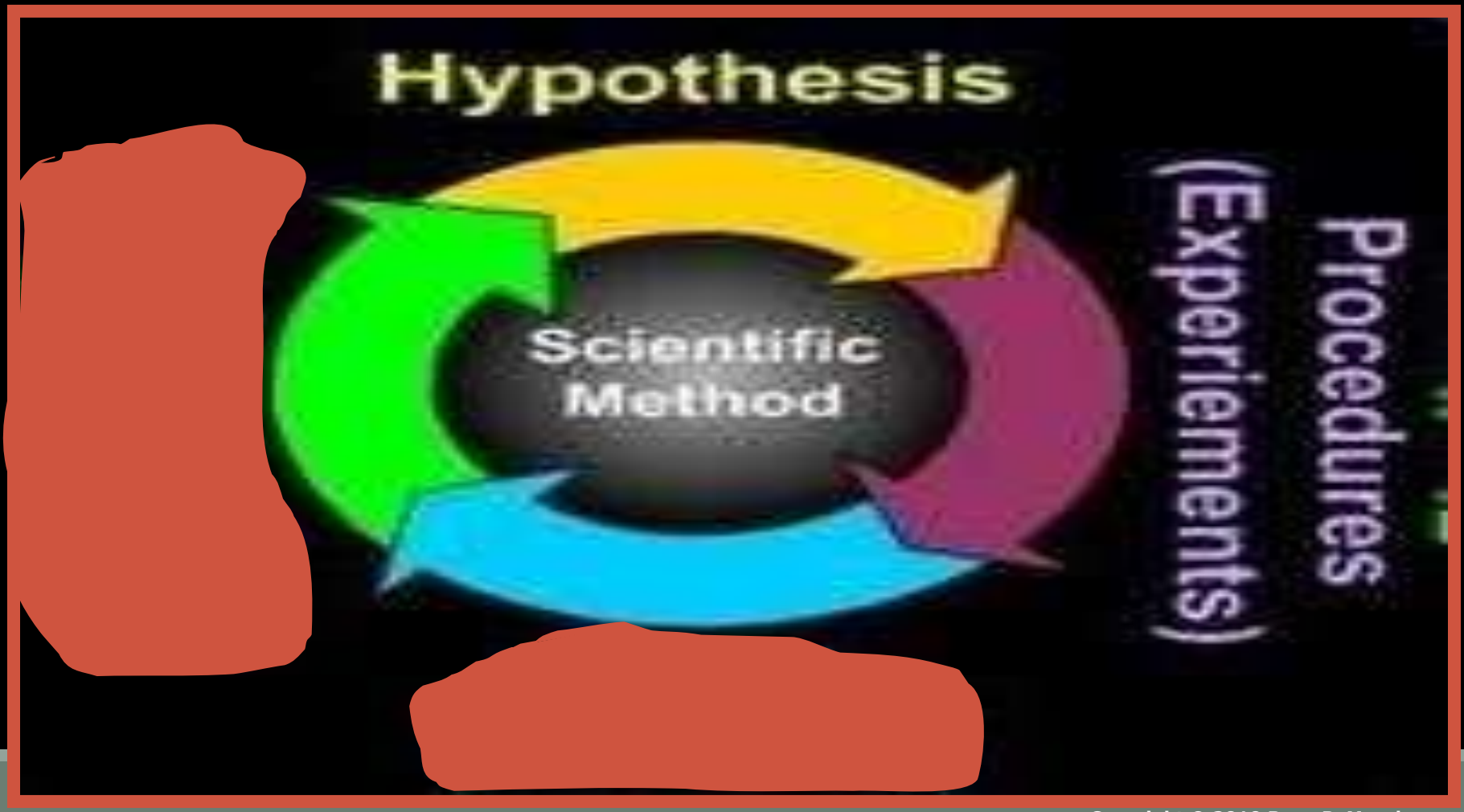

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Observe

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Uses your senses, sight, sound, taste, touch, smell

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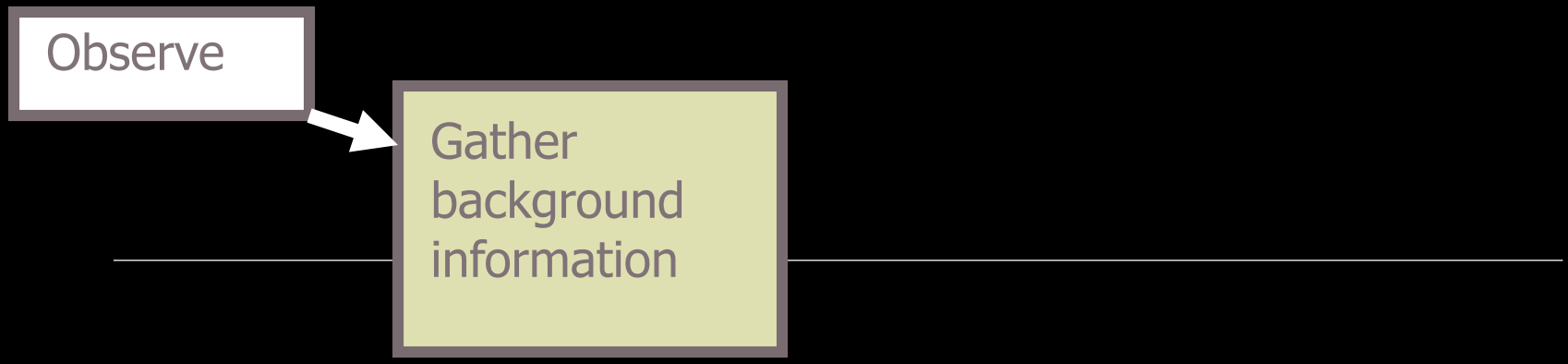
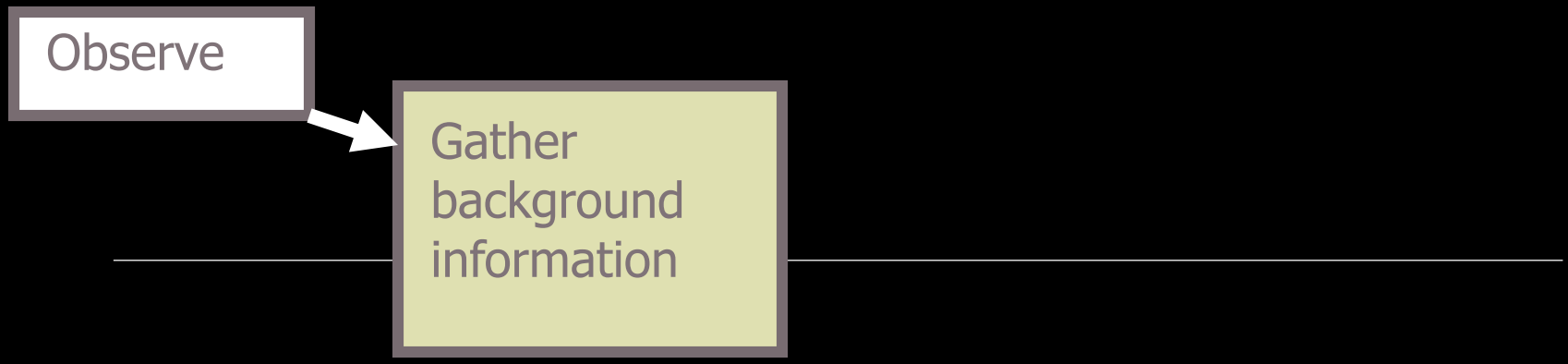
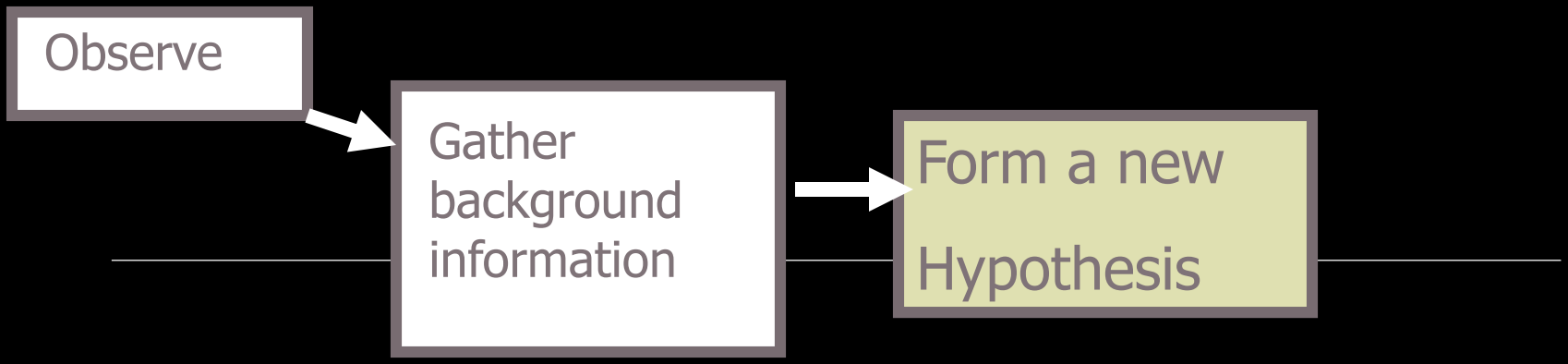
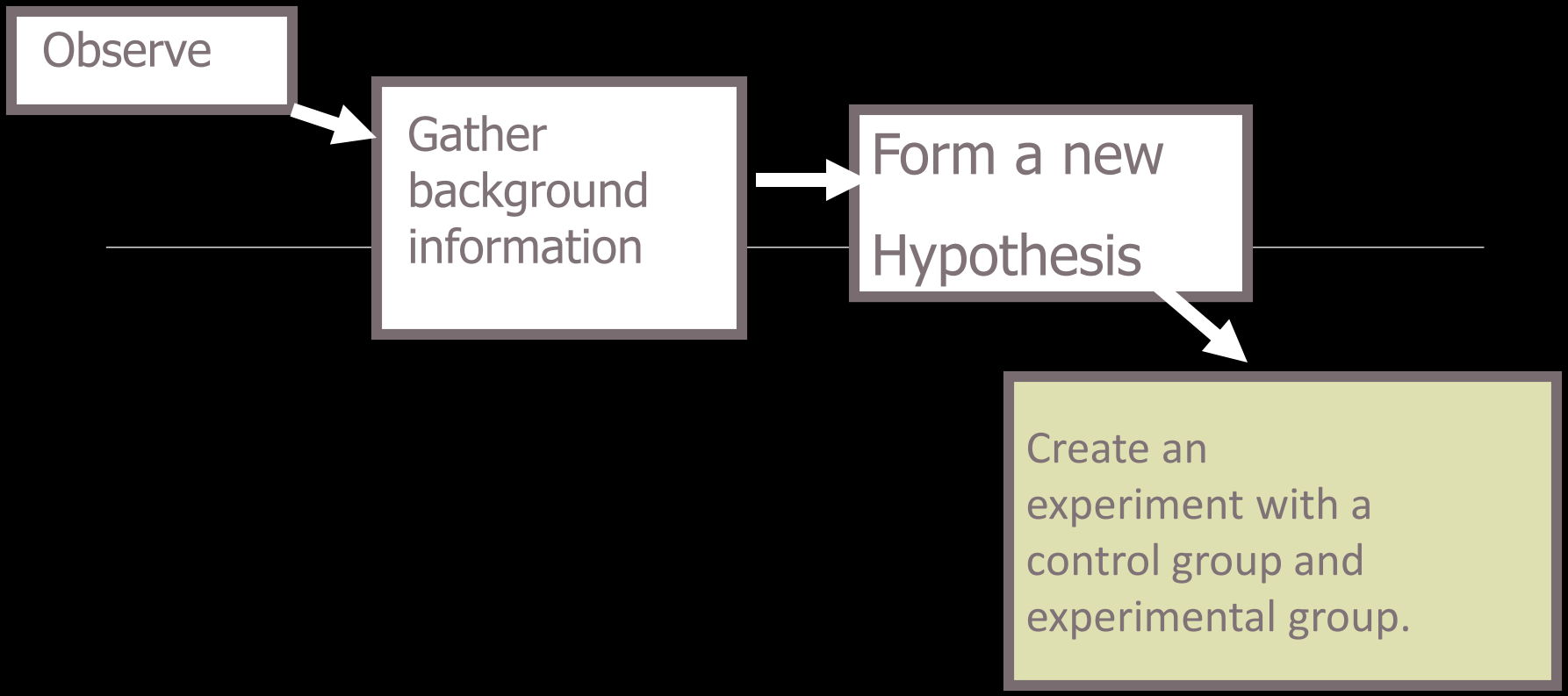
Observe

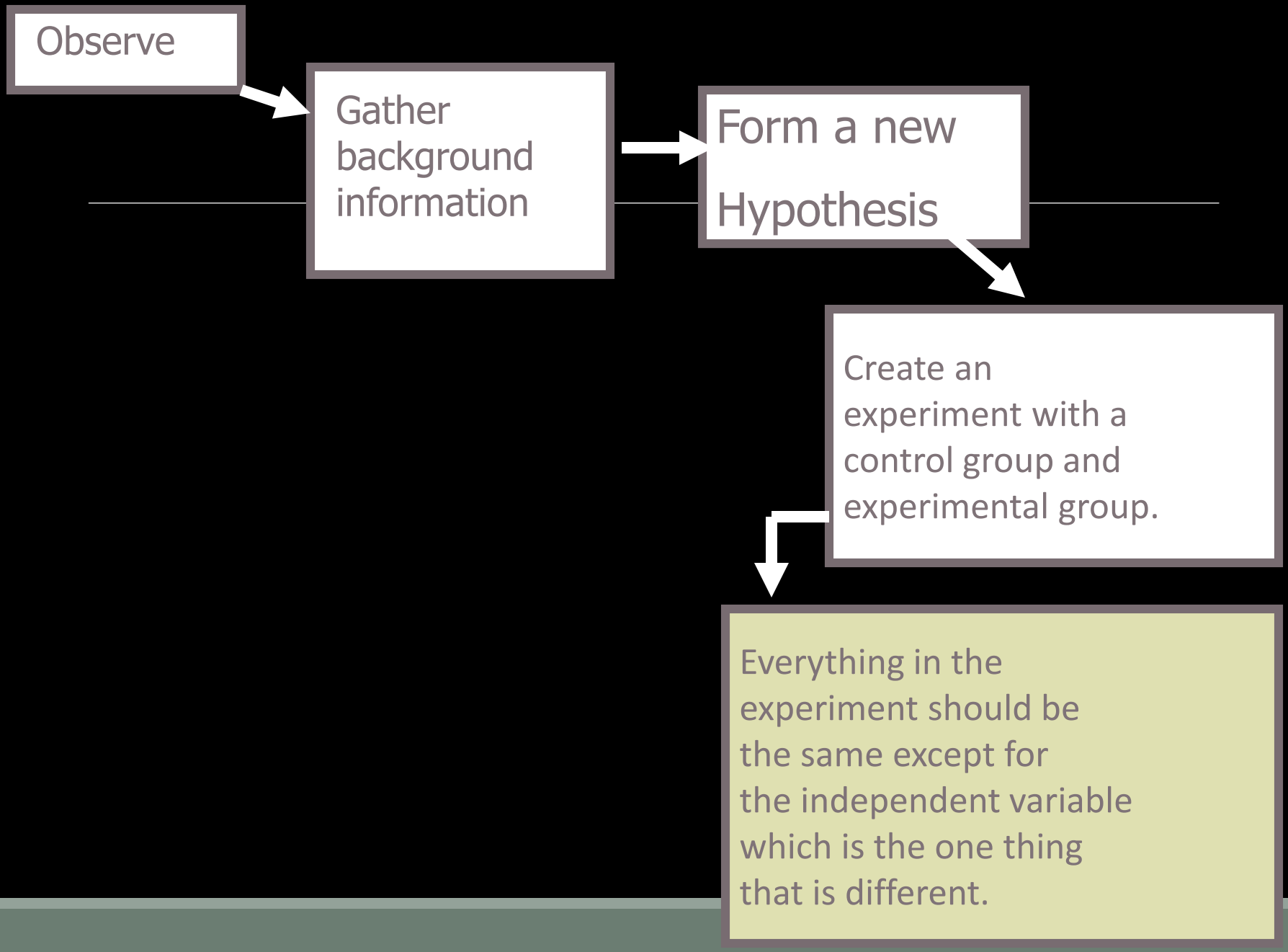
Leads to questioning / generating a problem to answer.

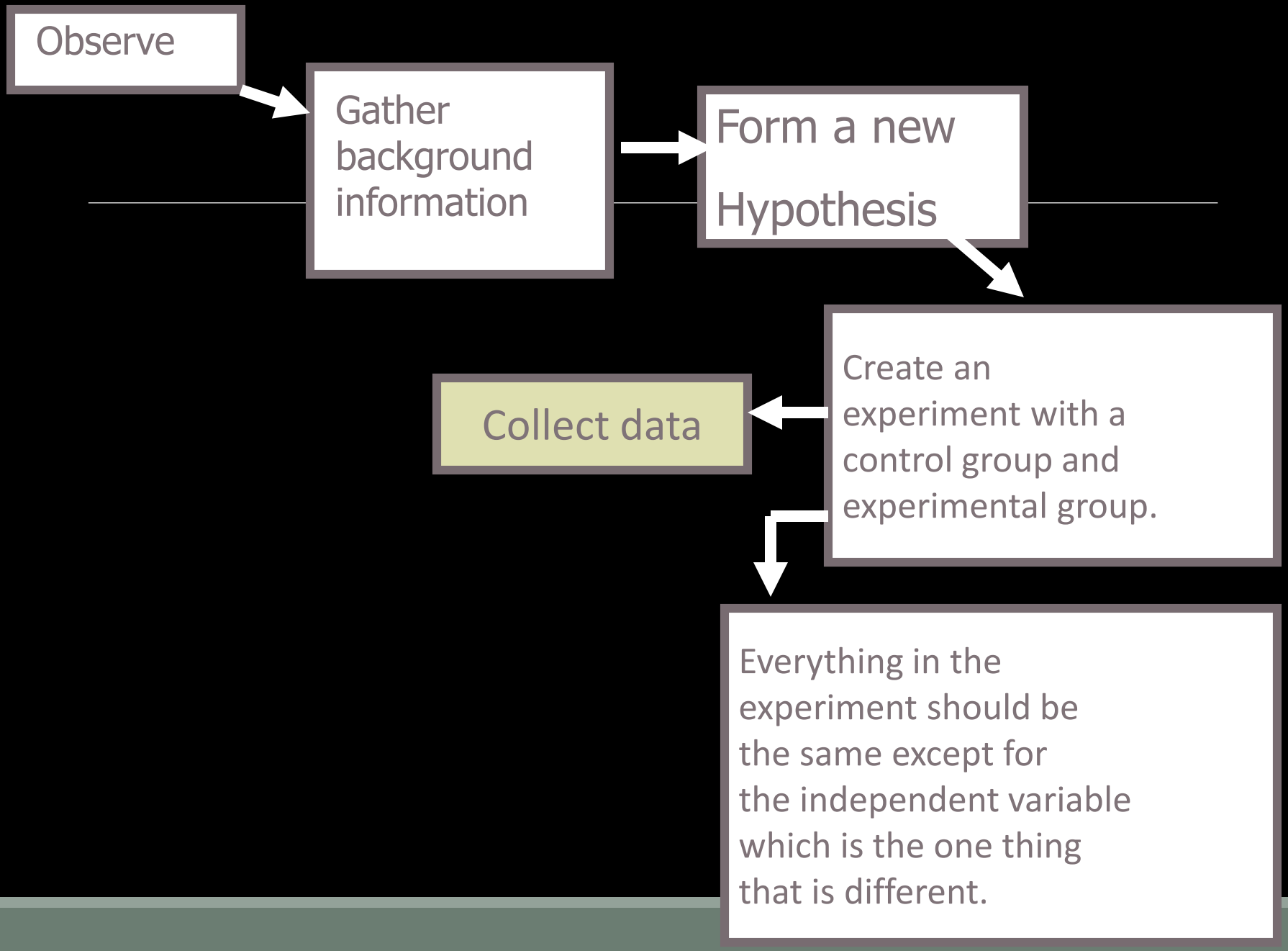


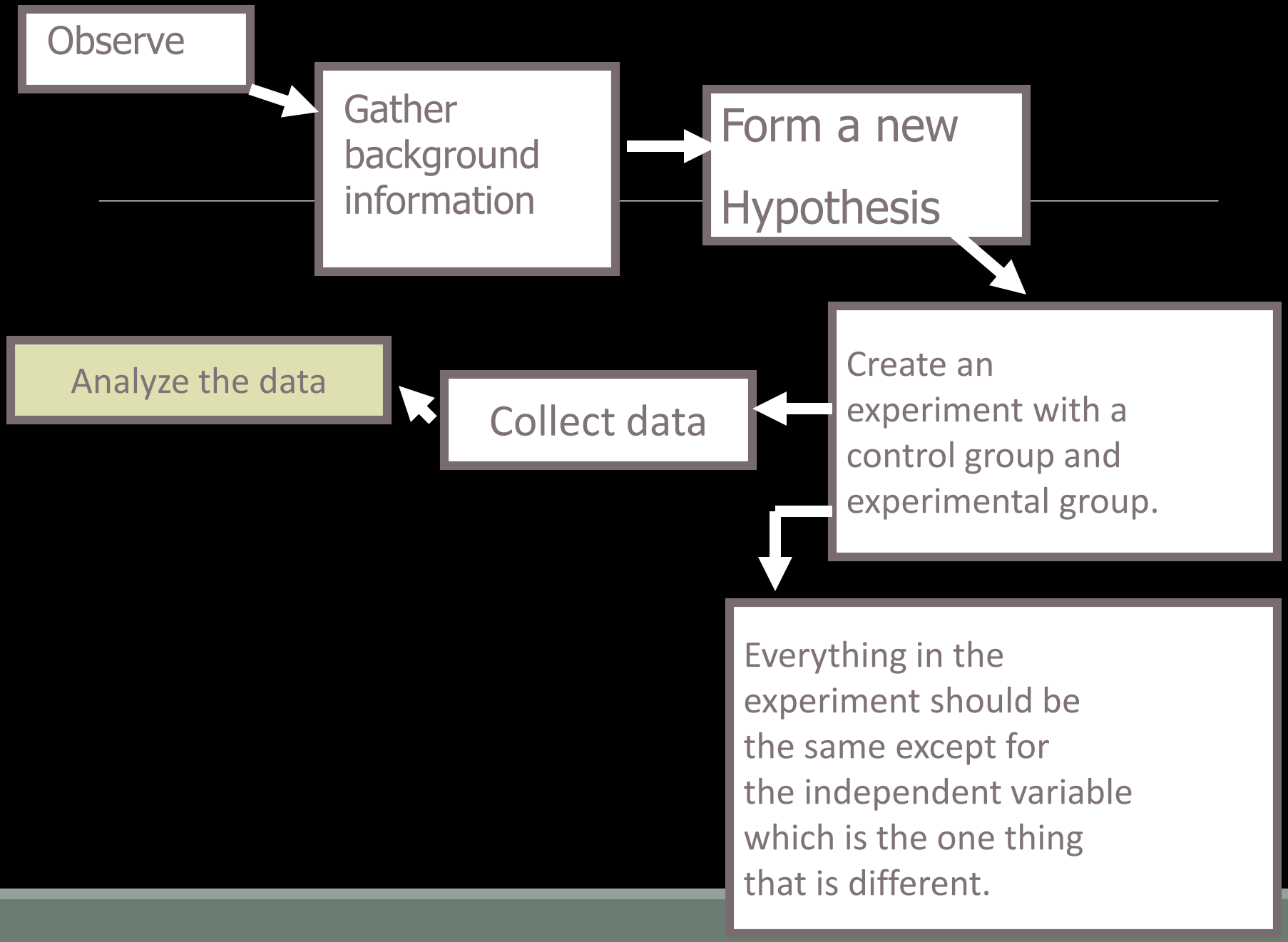


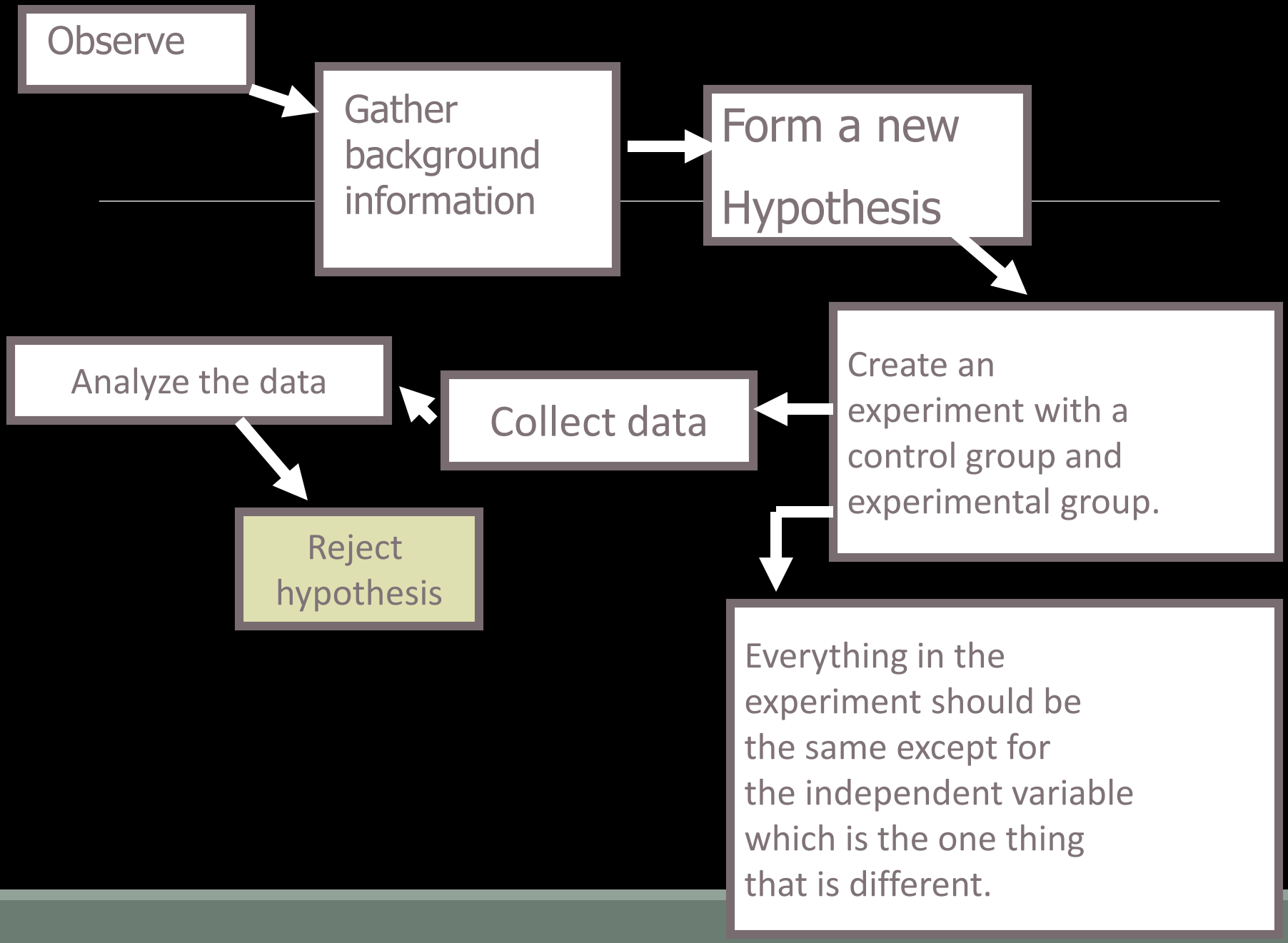


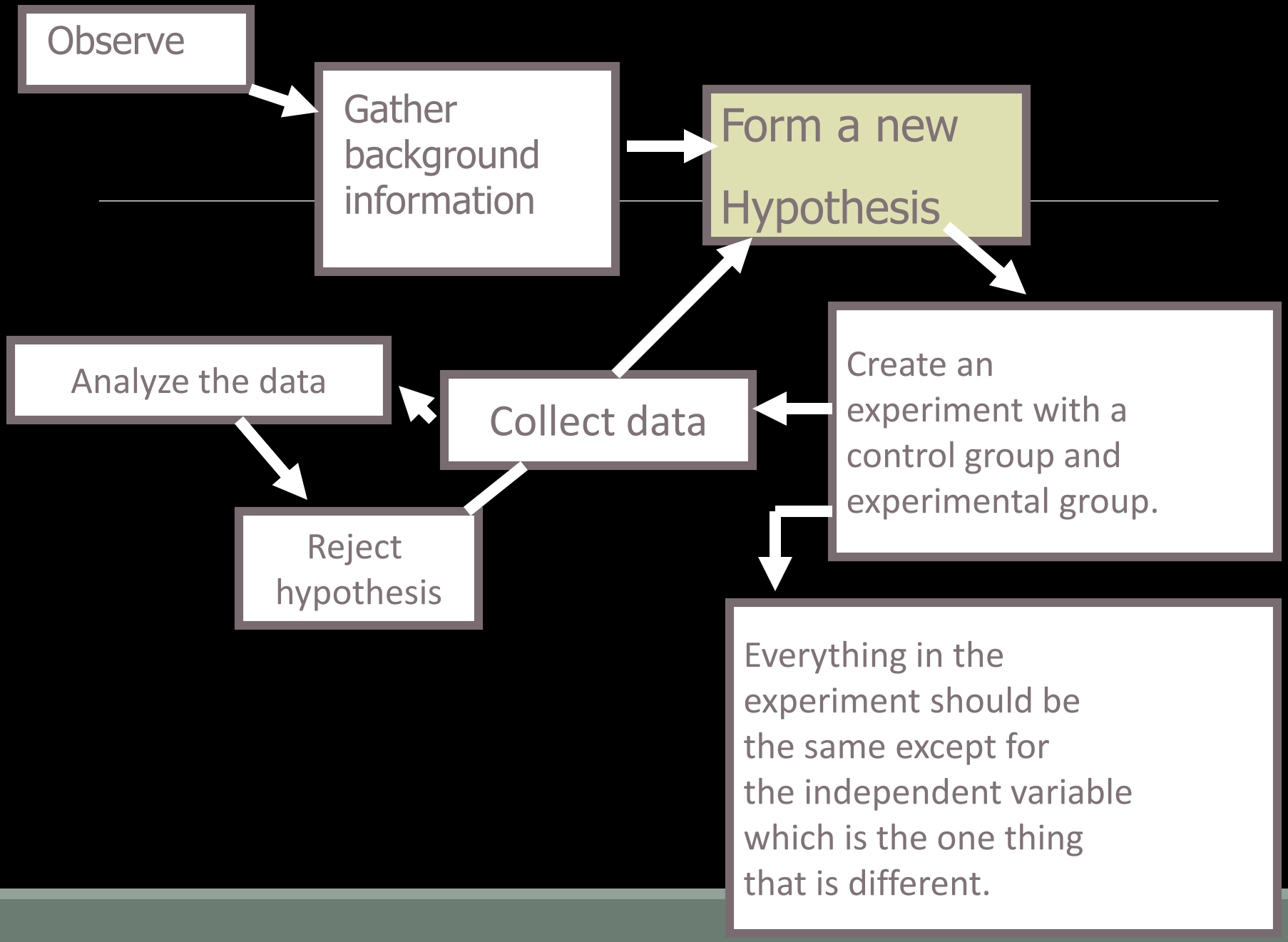


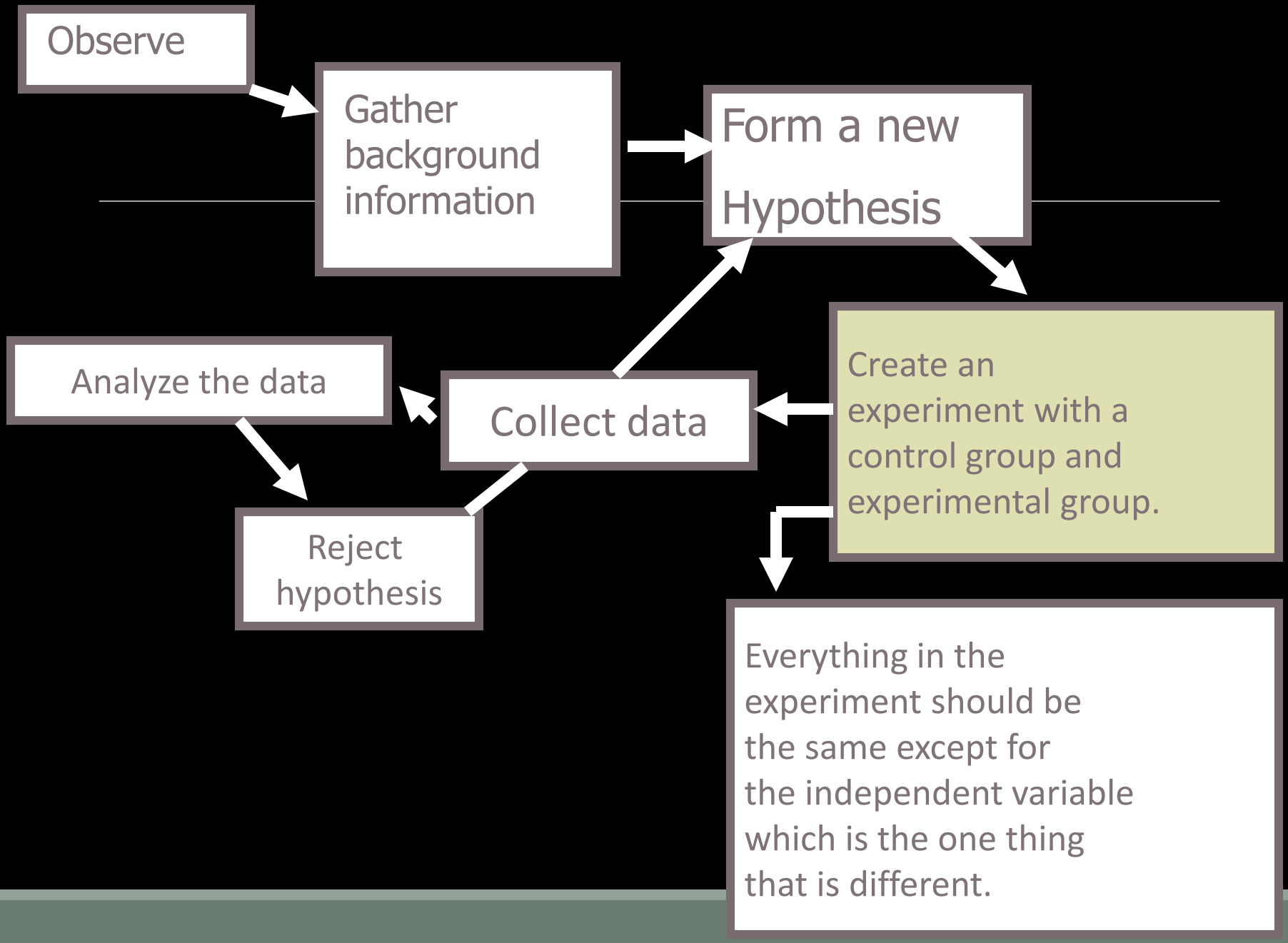


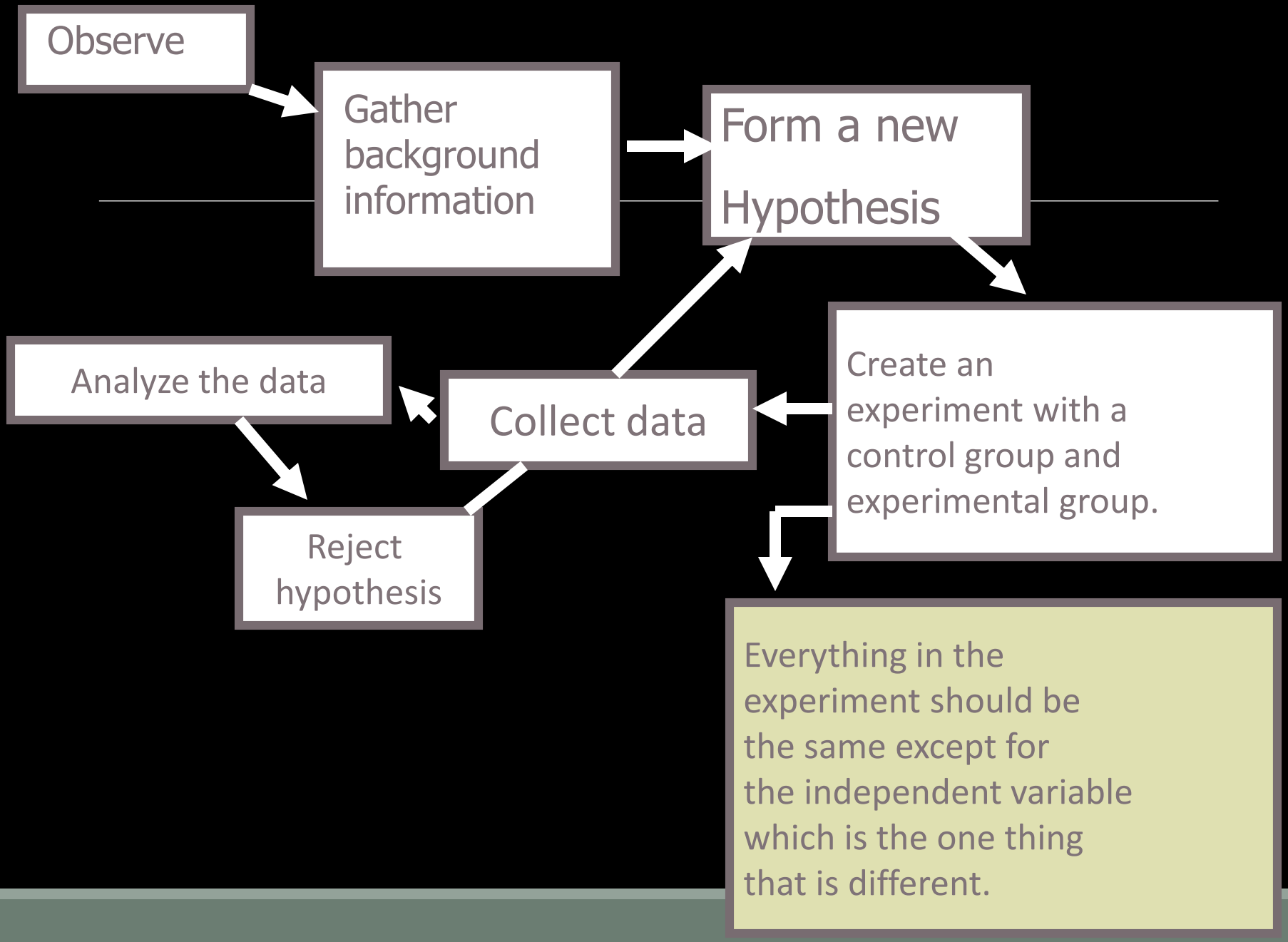


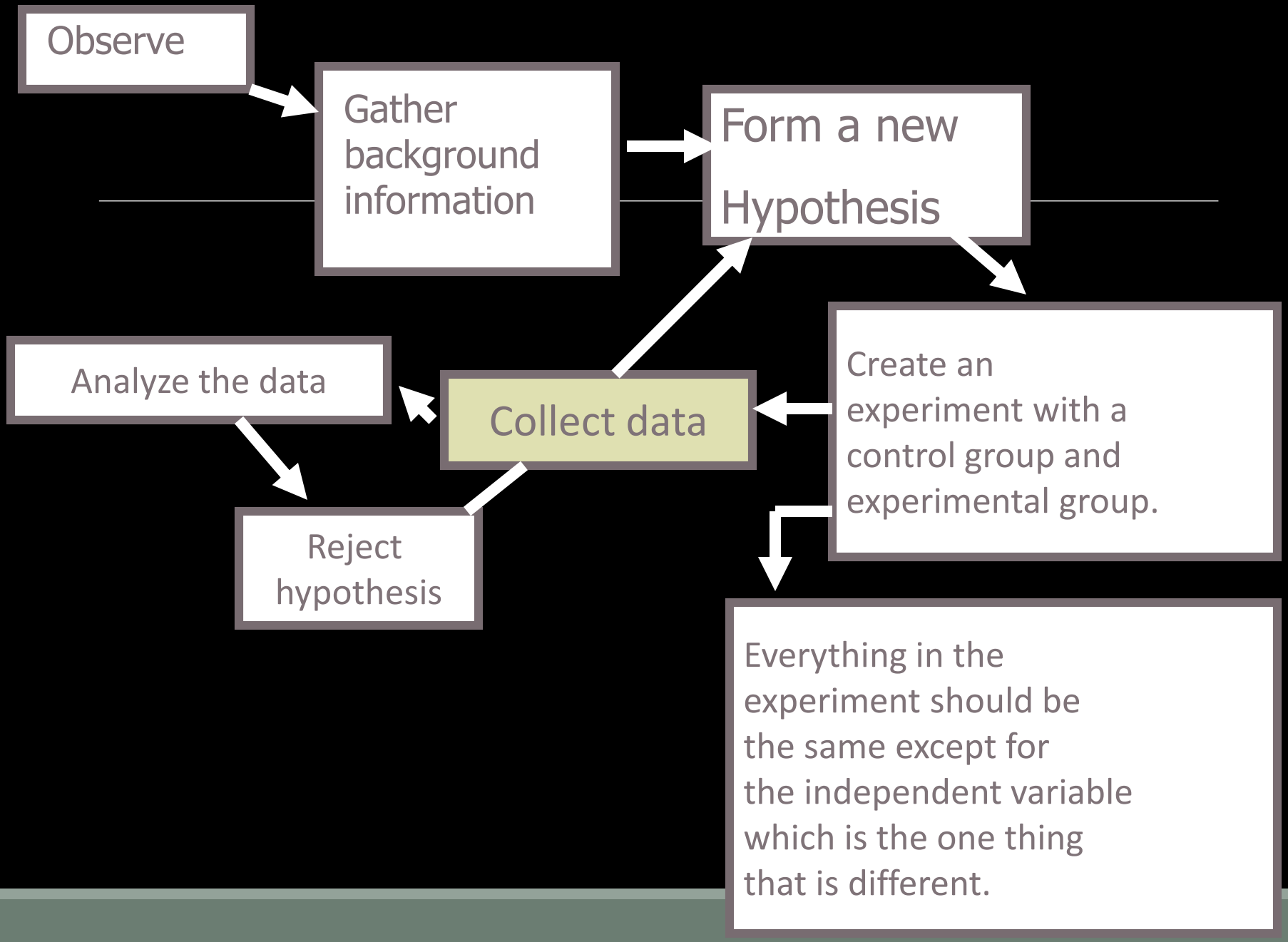


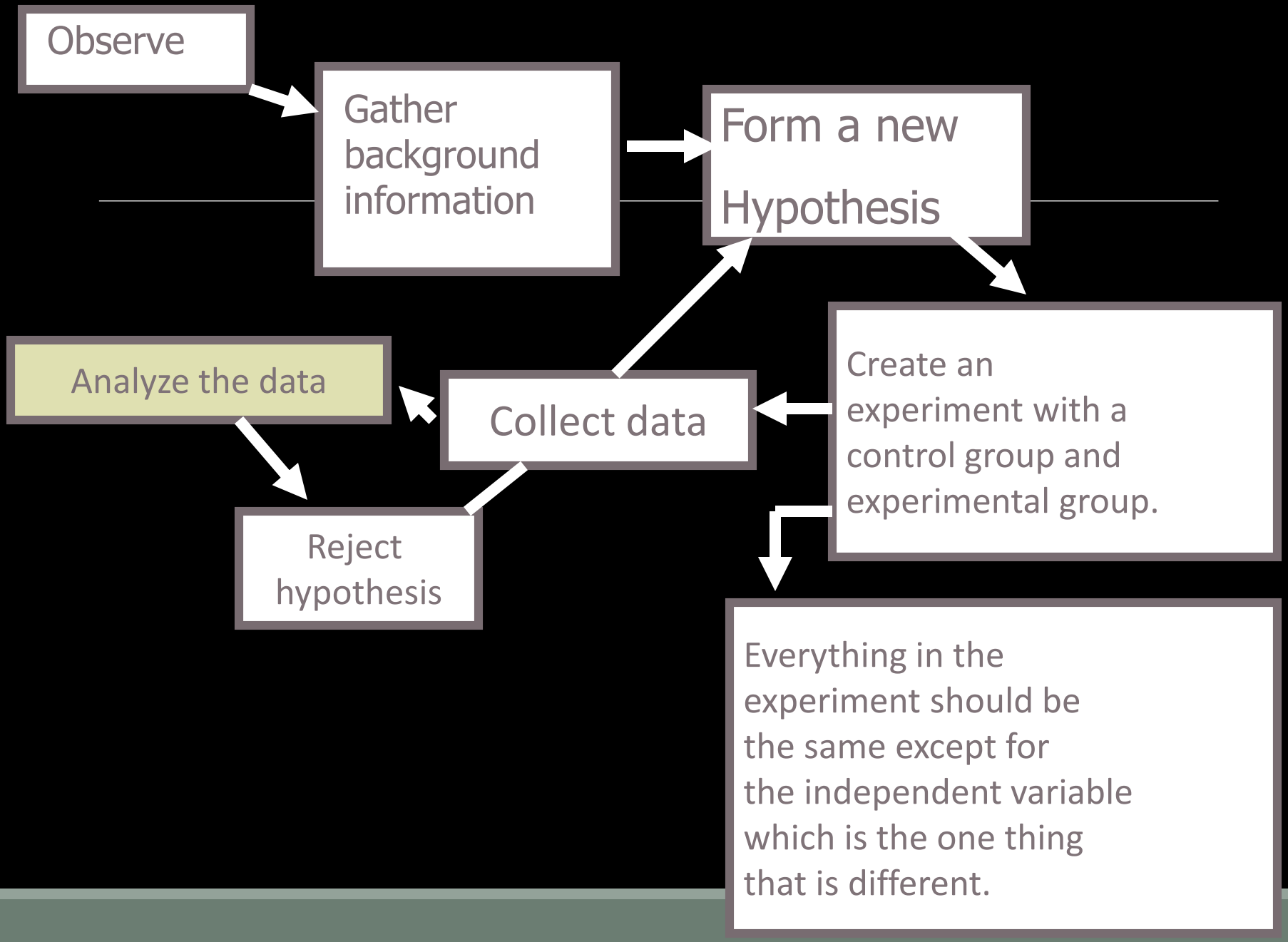


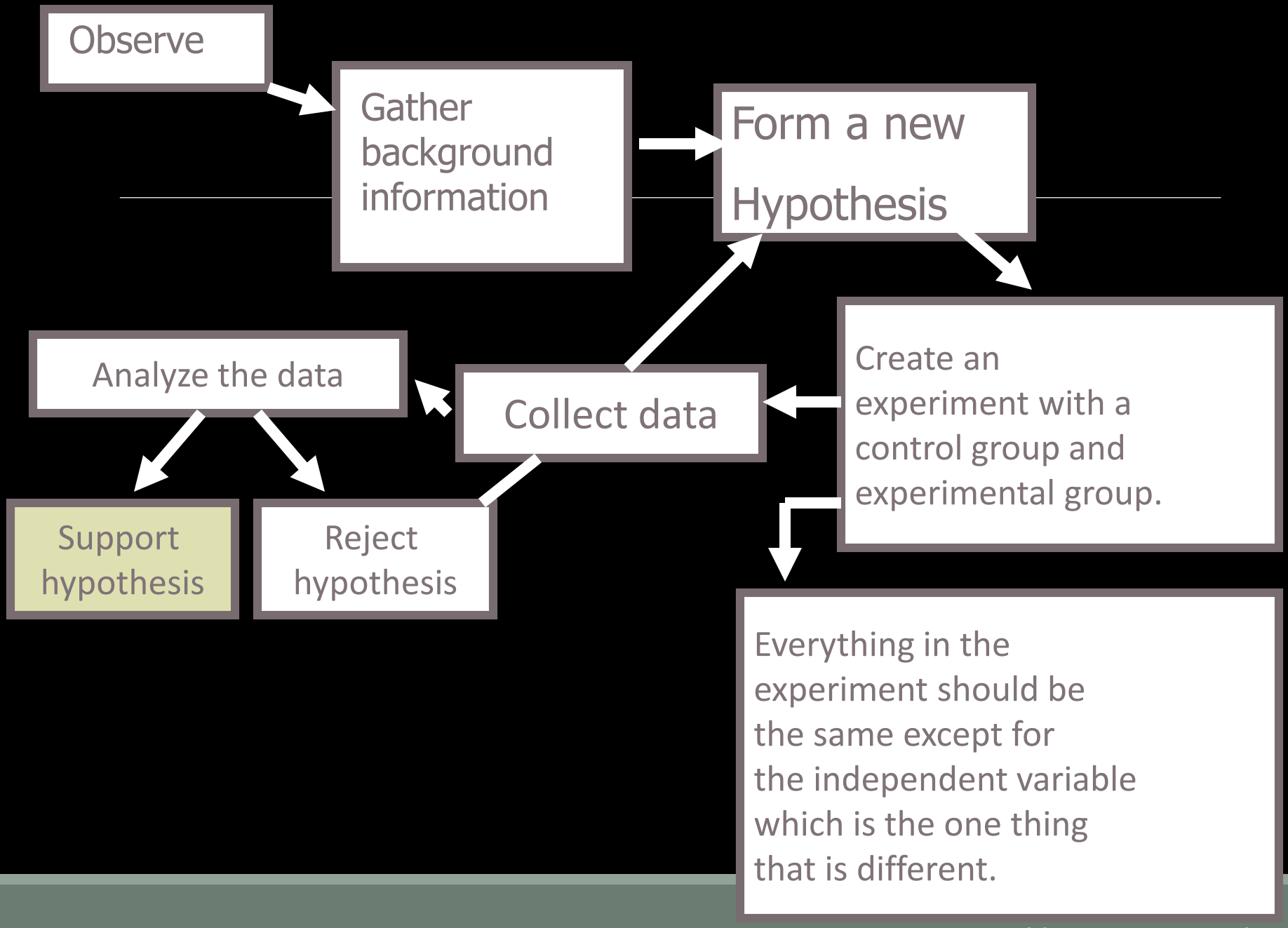


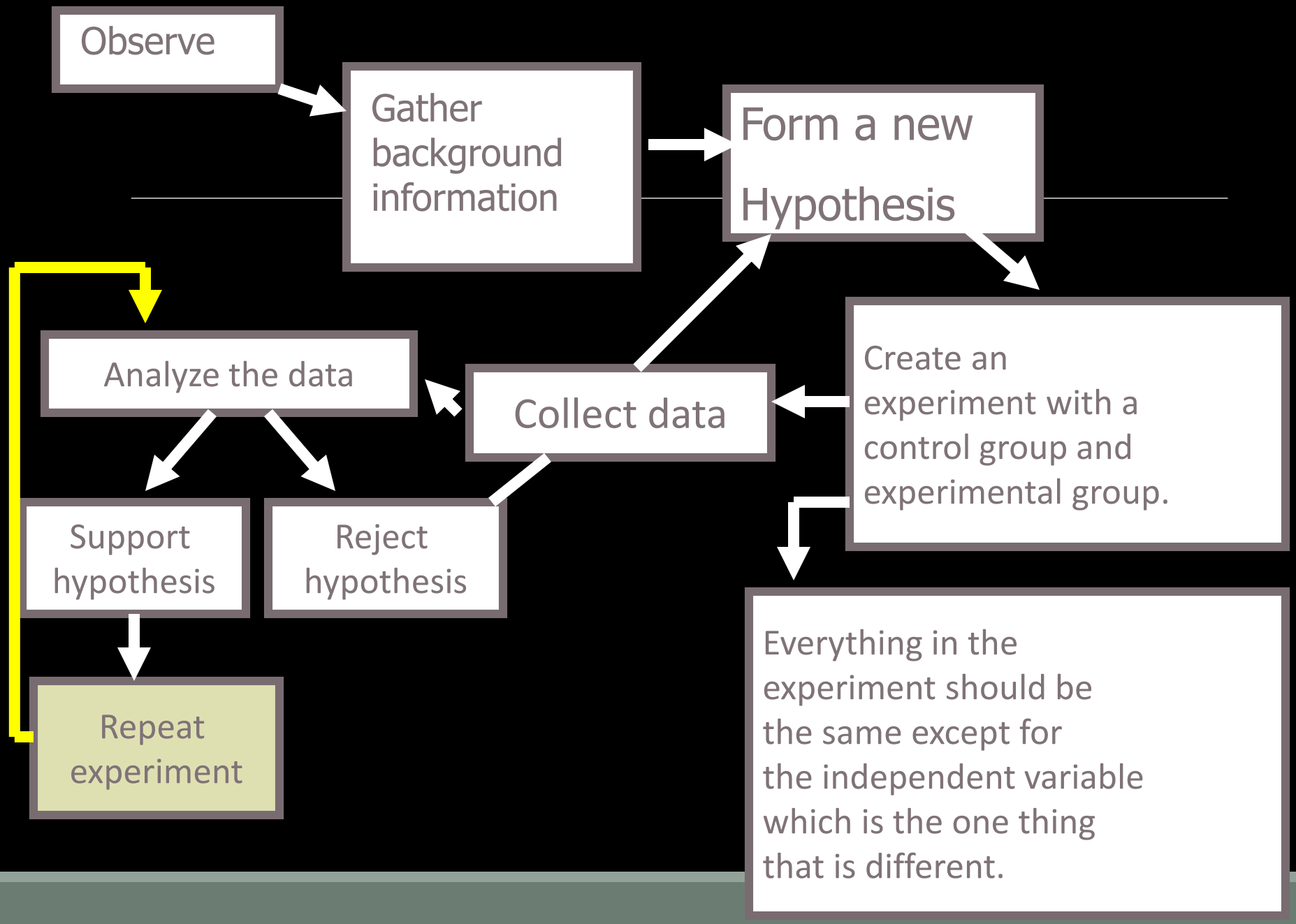


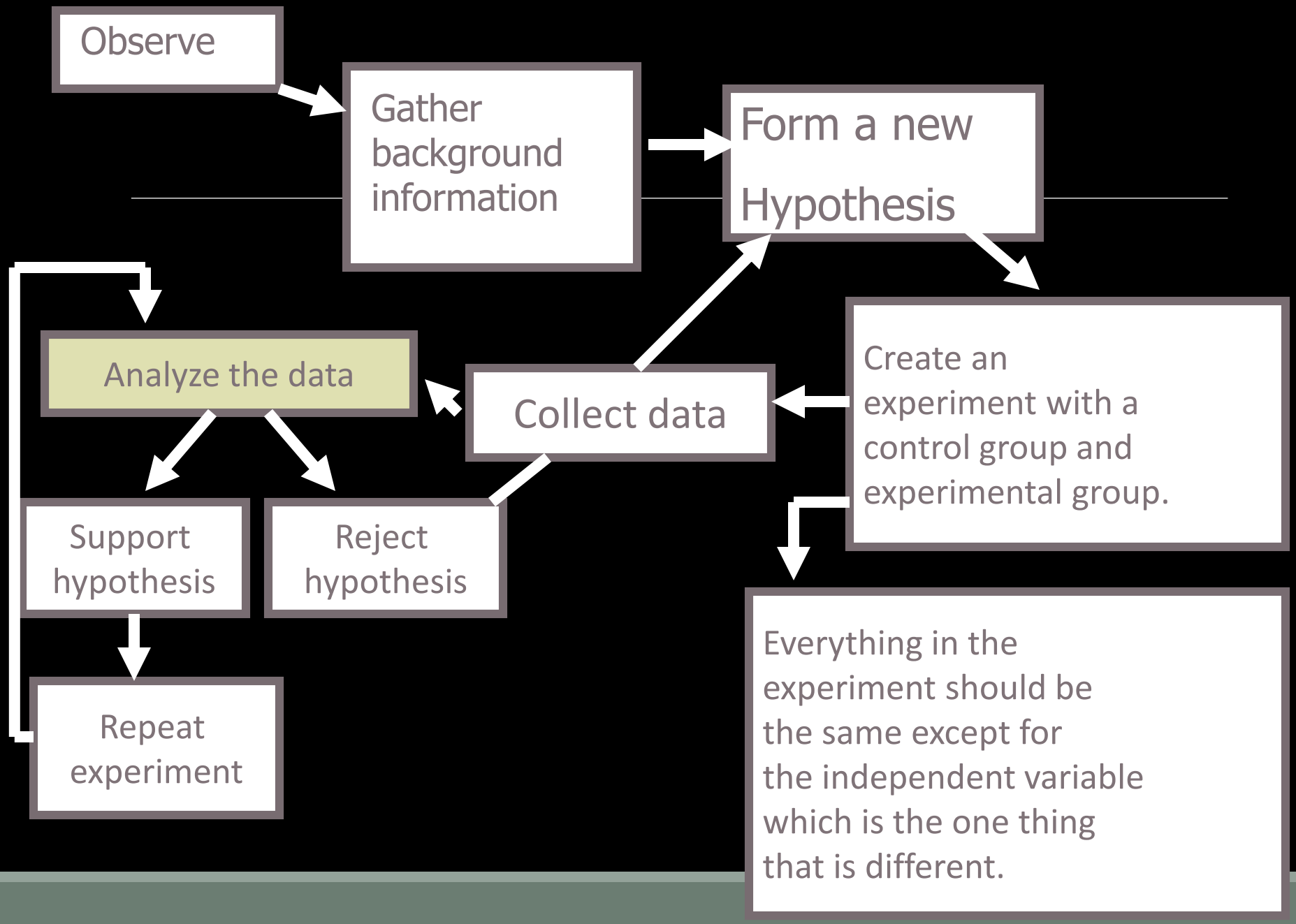


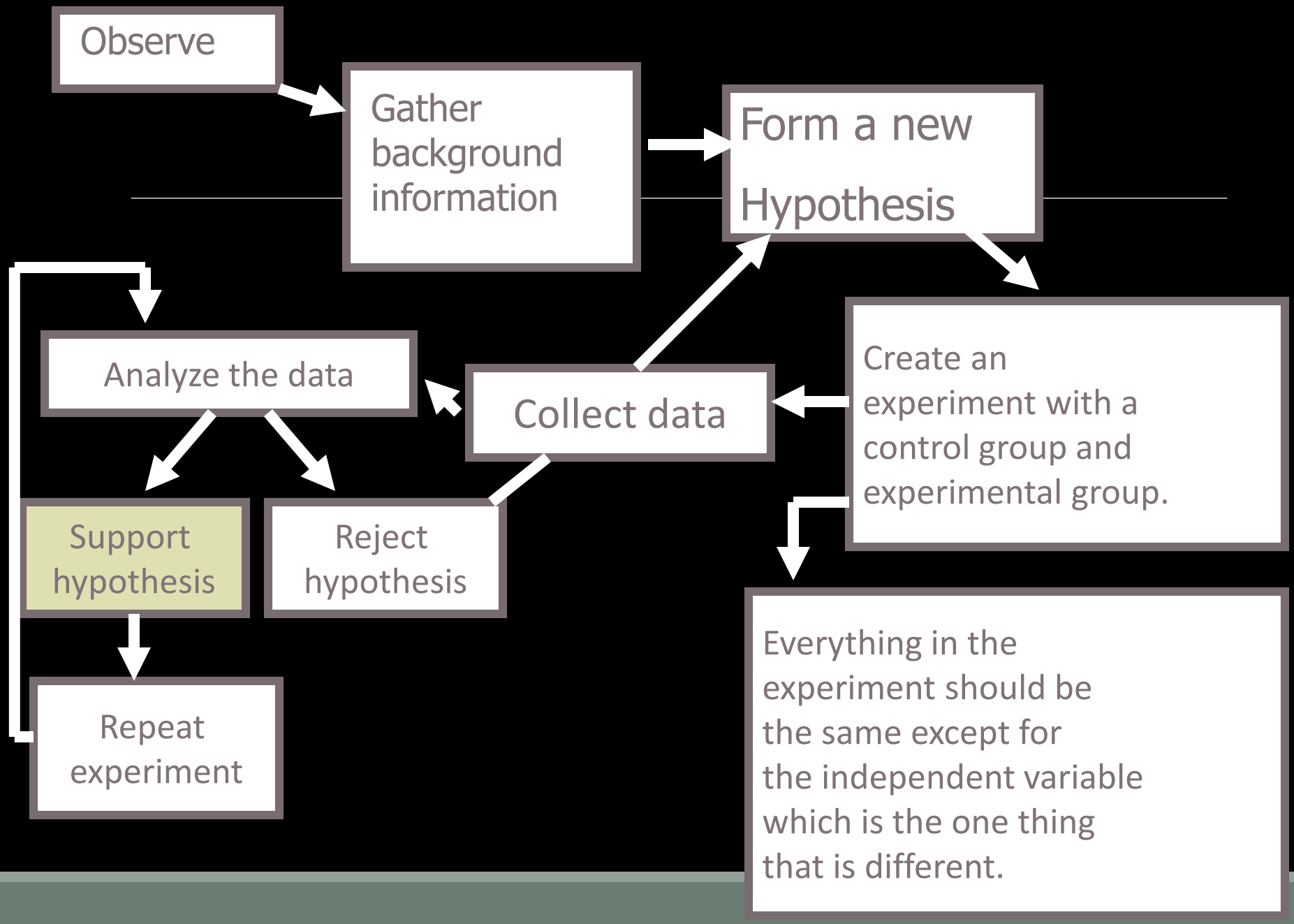


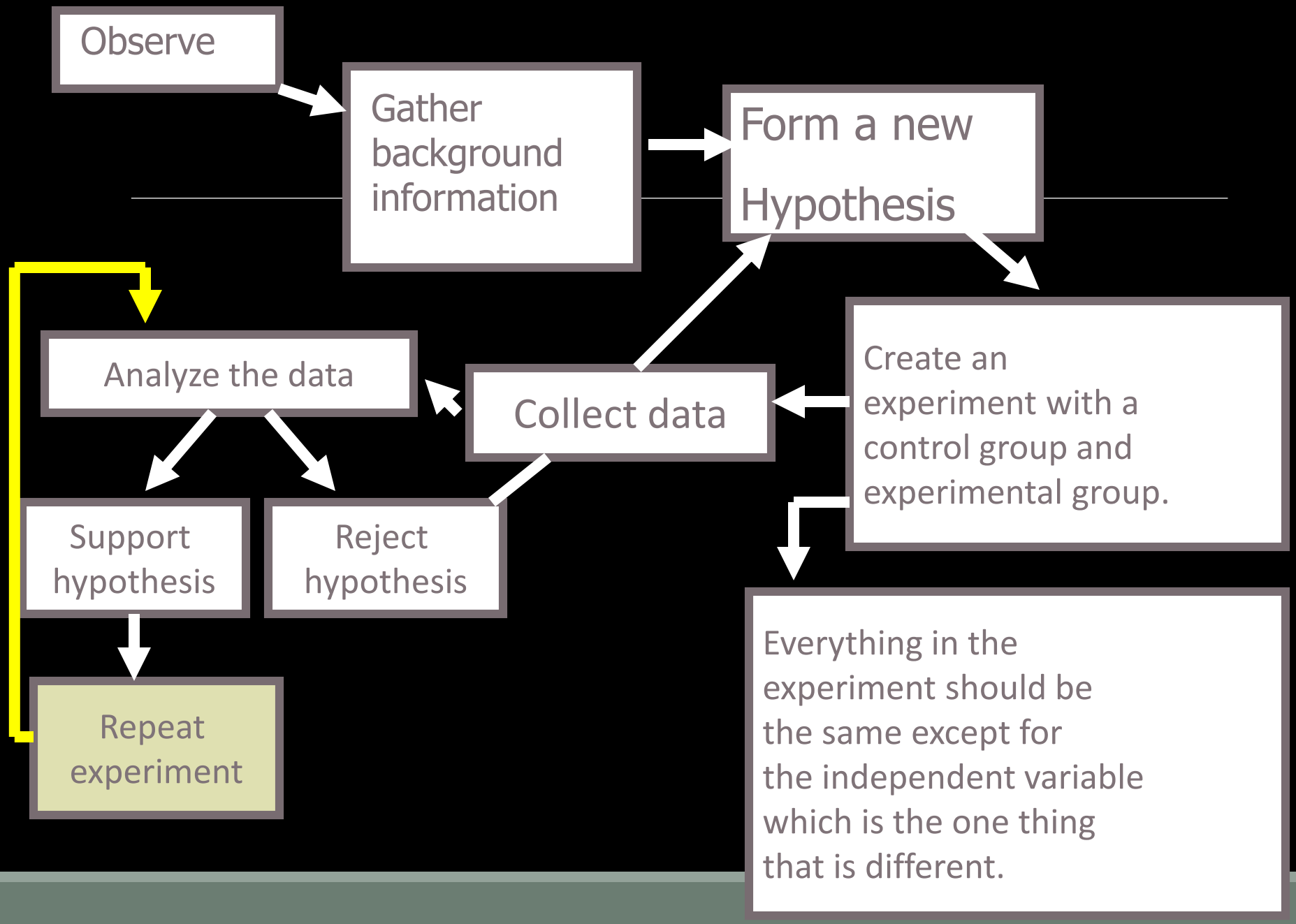


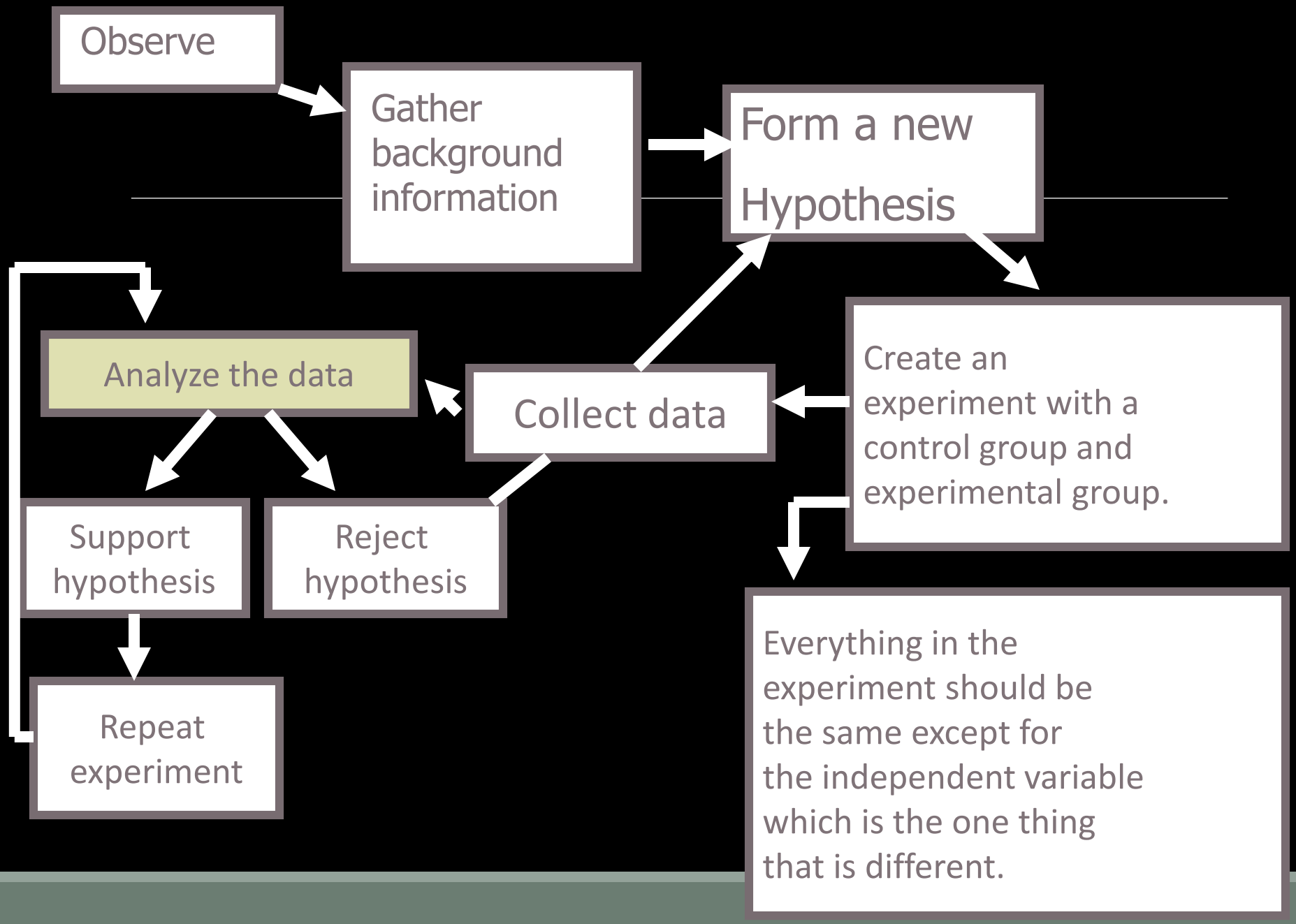


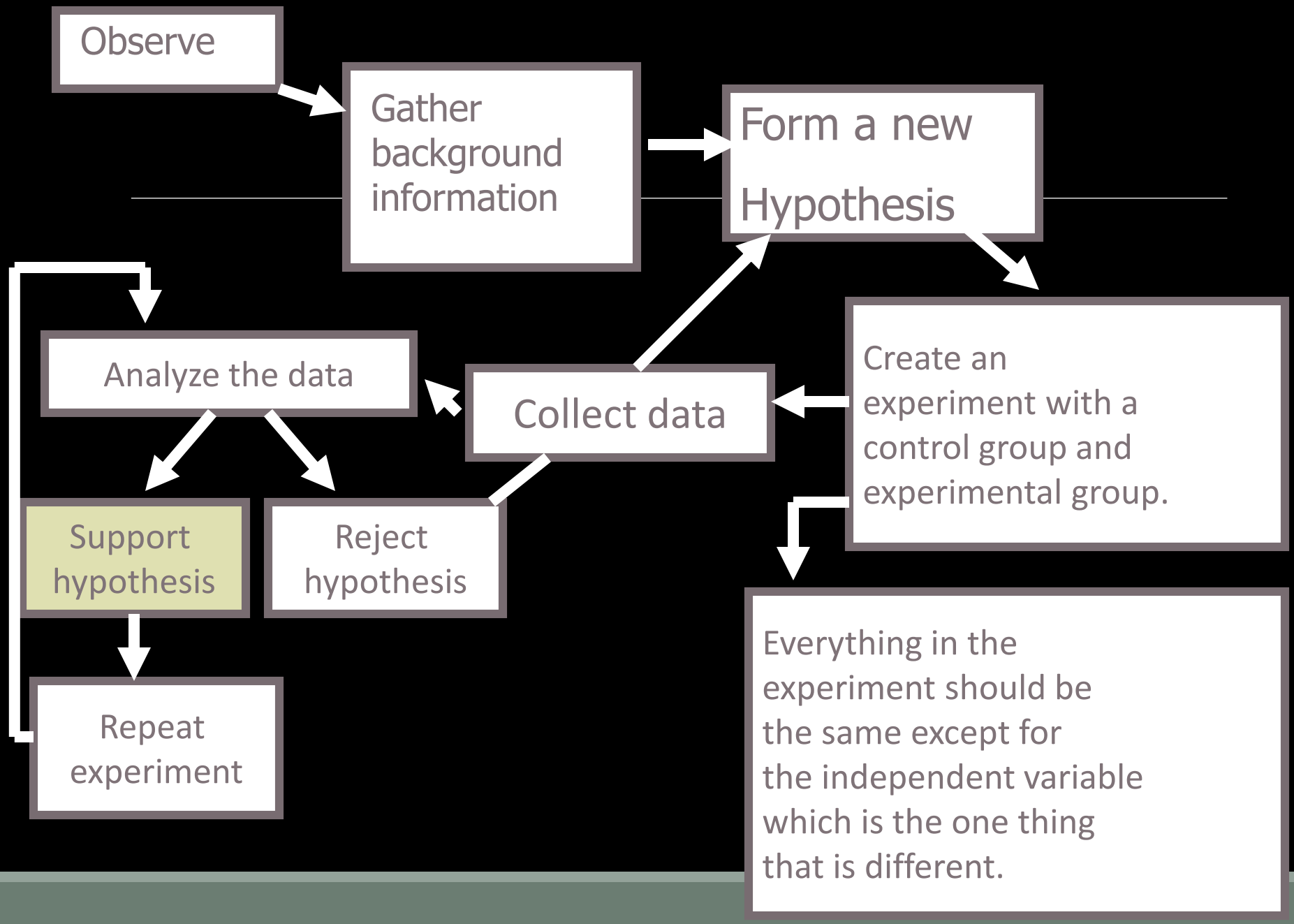


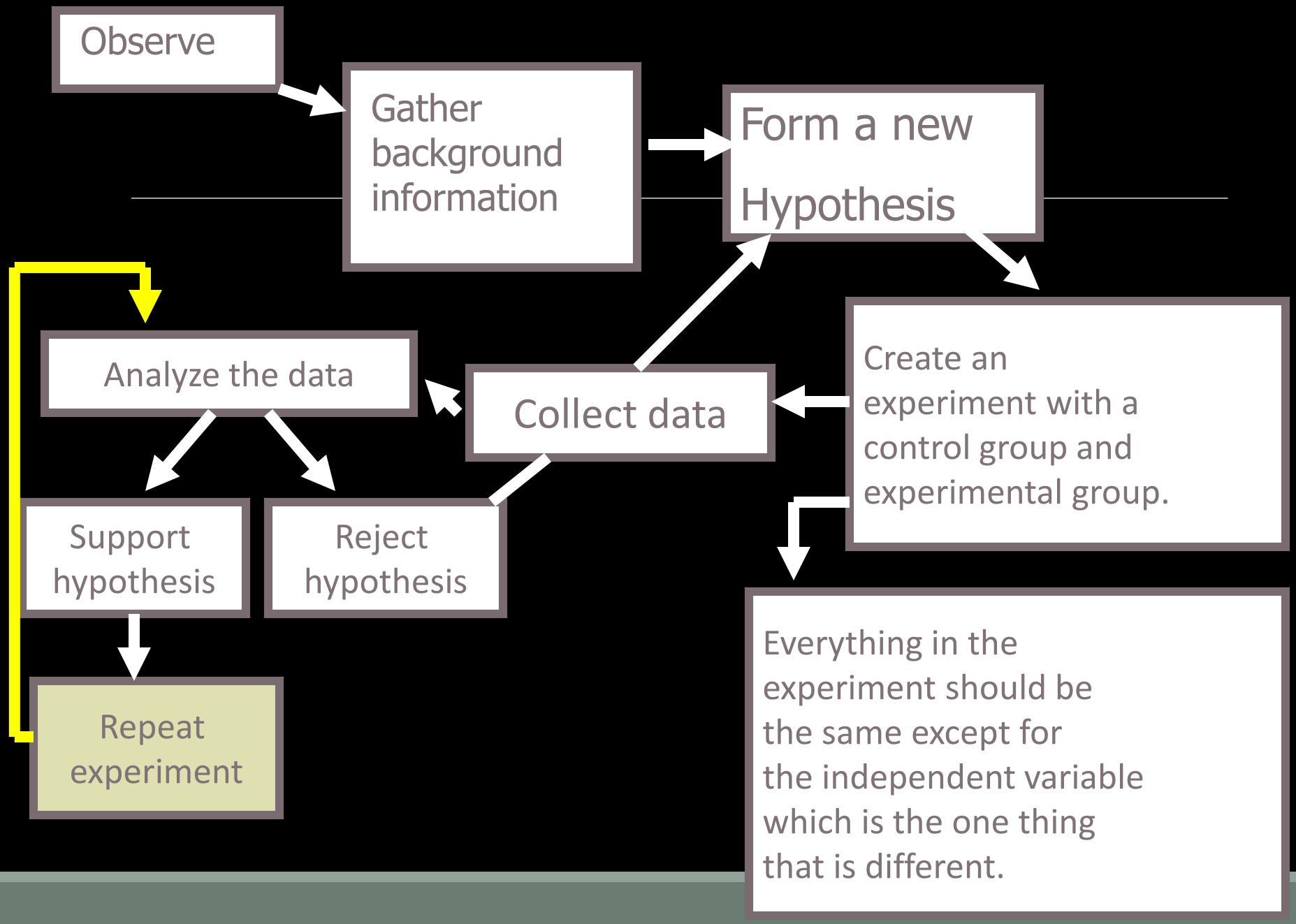


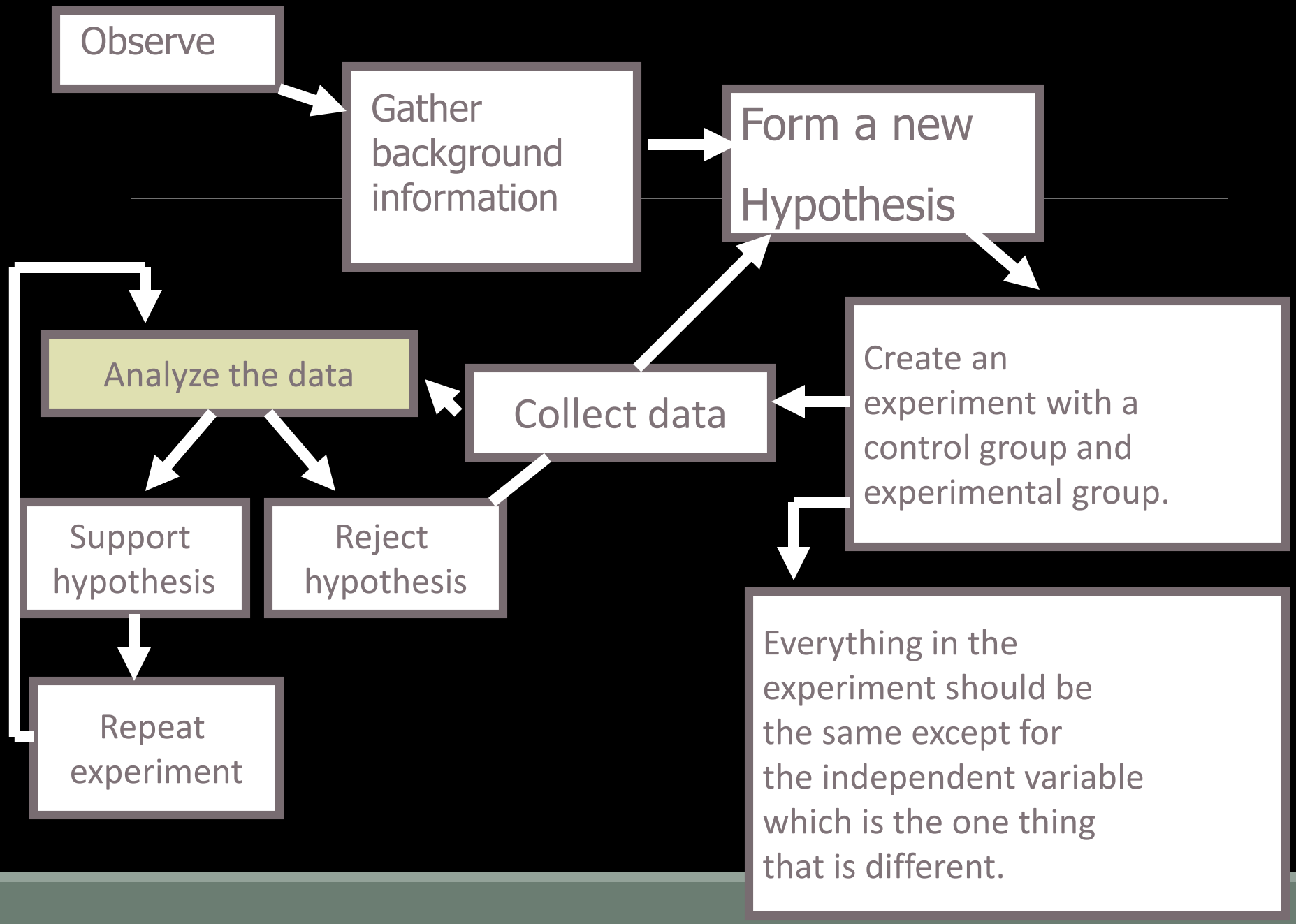


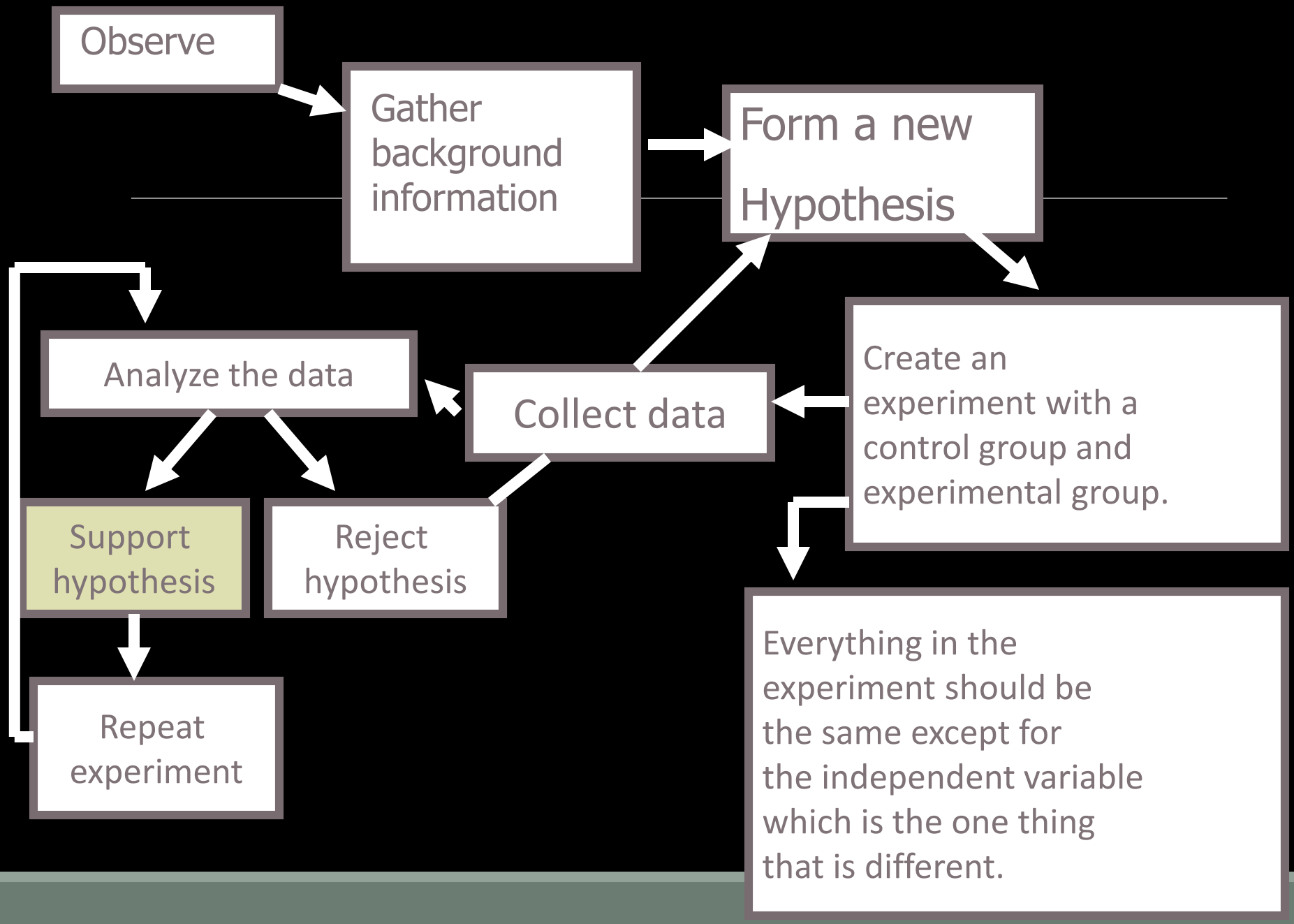


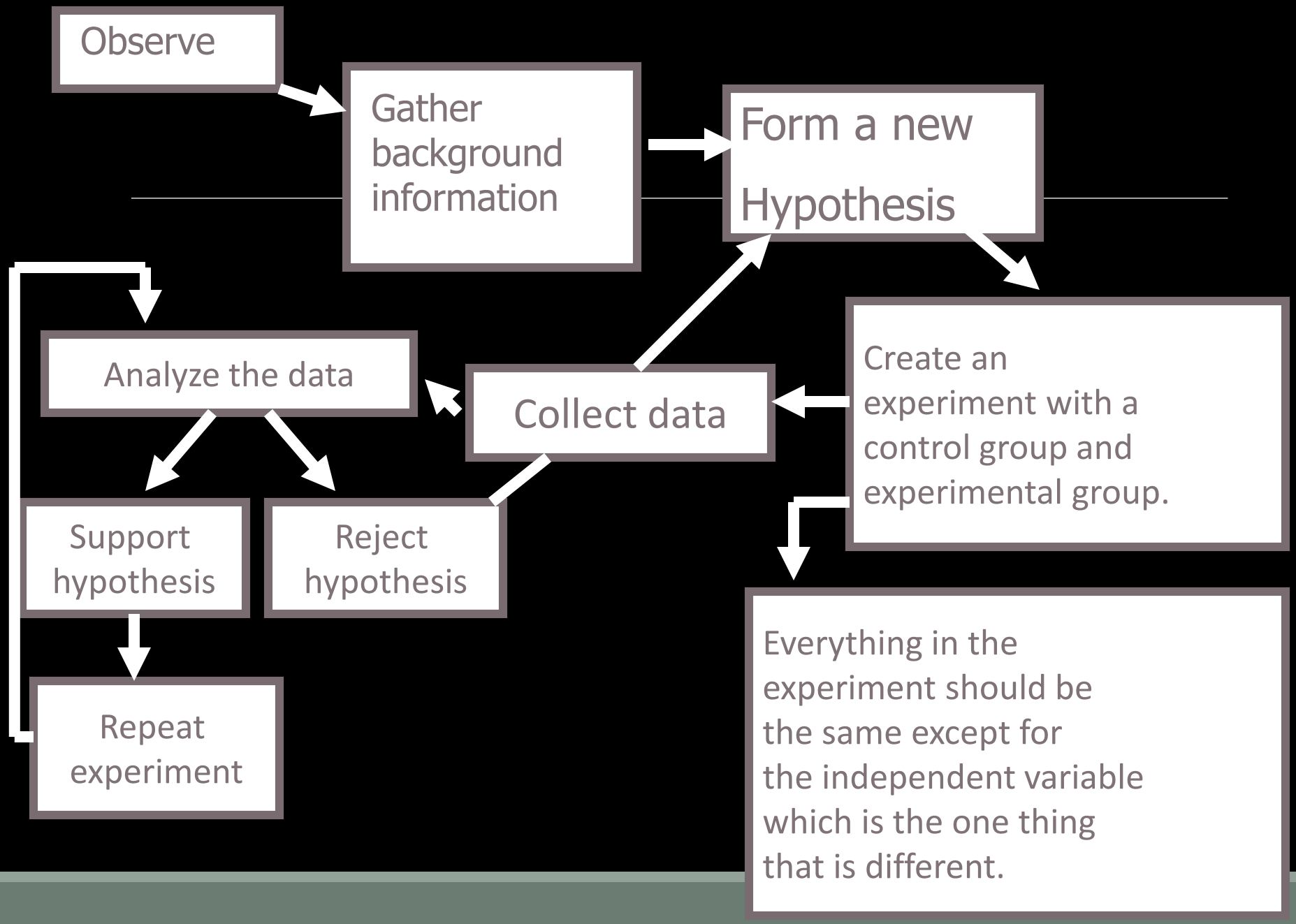


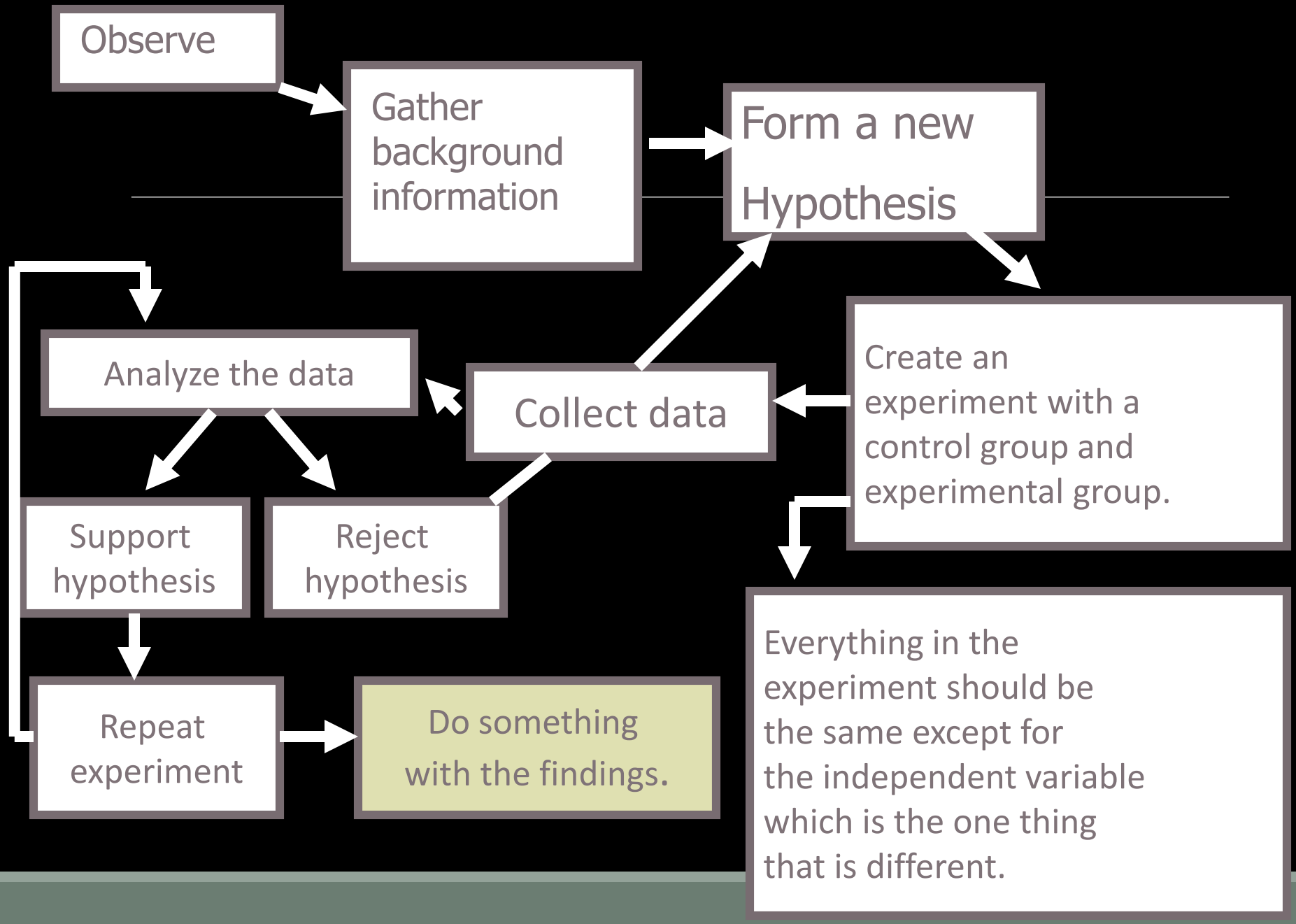


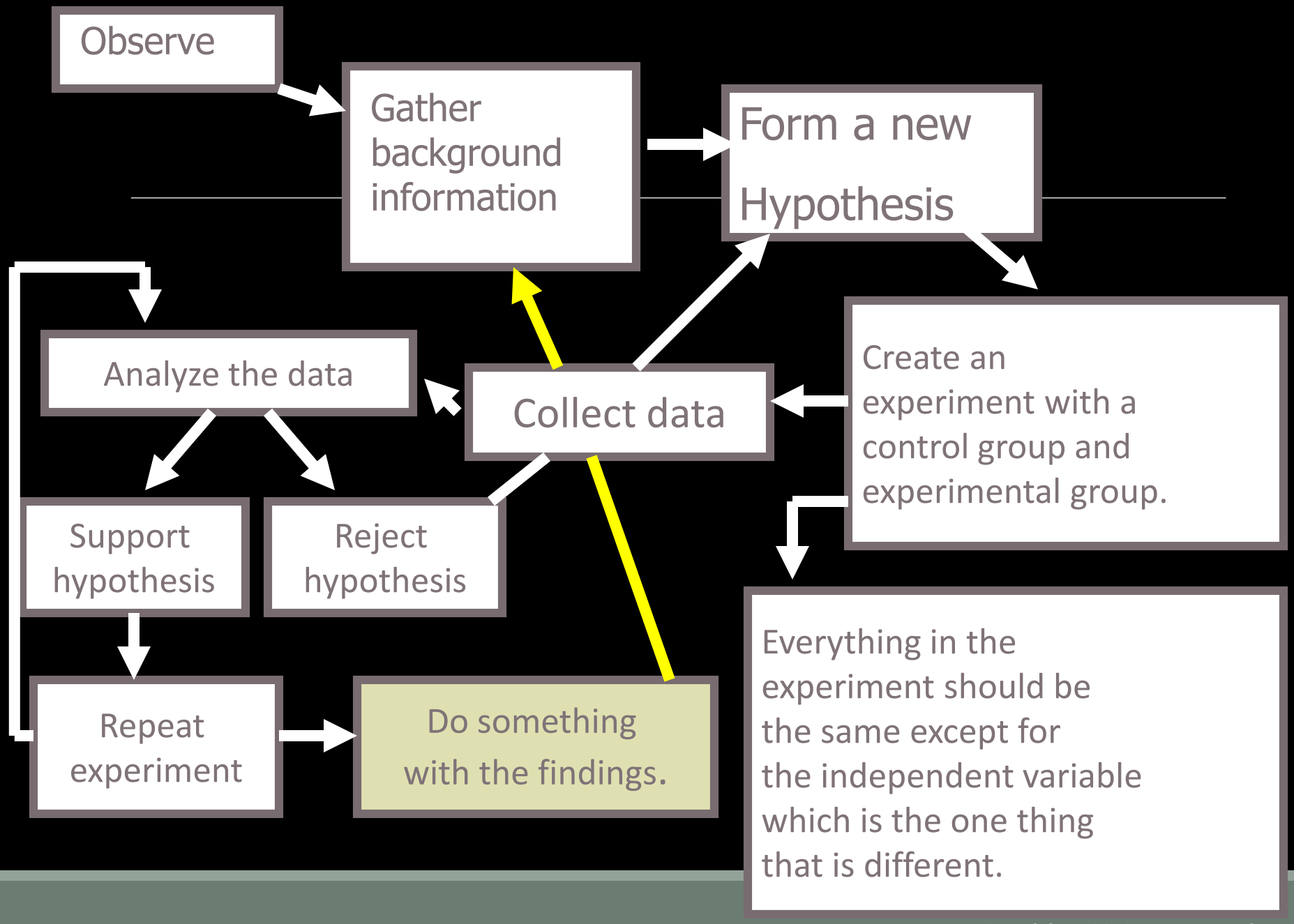


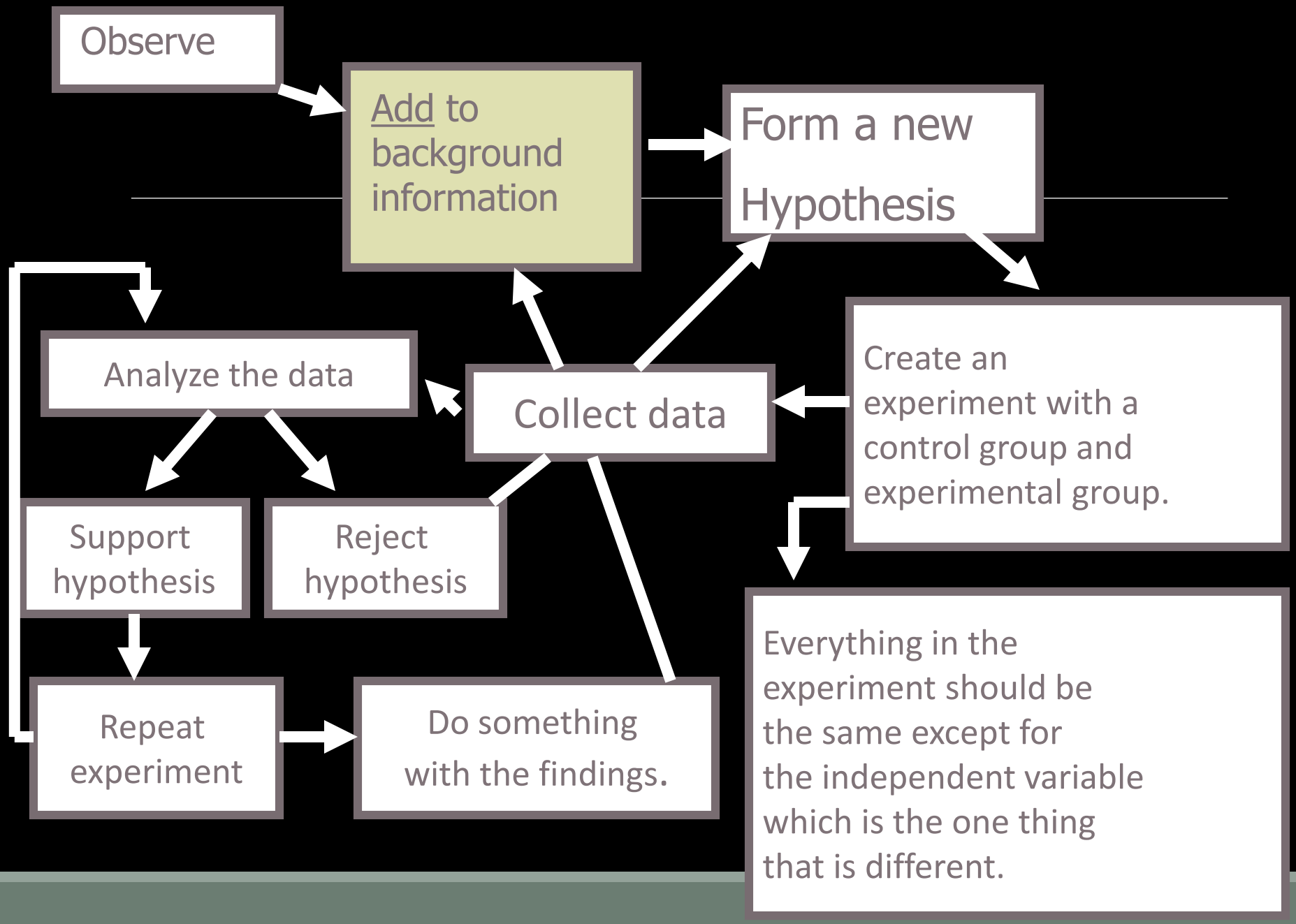












Experiments search for cause and effect relationships in nature.

These changing quantities are called variables.

Variable: Changing quantity of something.

- -Independent Variable: The variable you have control over, what you can choose and manipulate.
- -Dependent: (Observe) What you measure in the experiment and what is affected during the experiment.

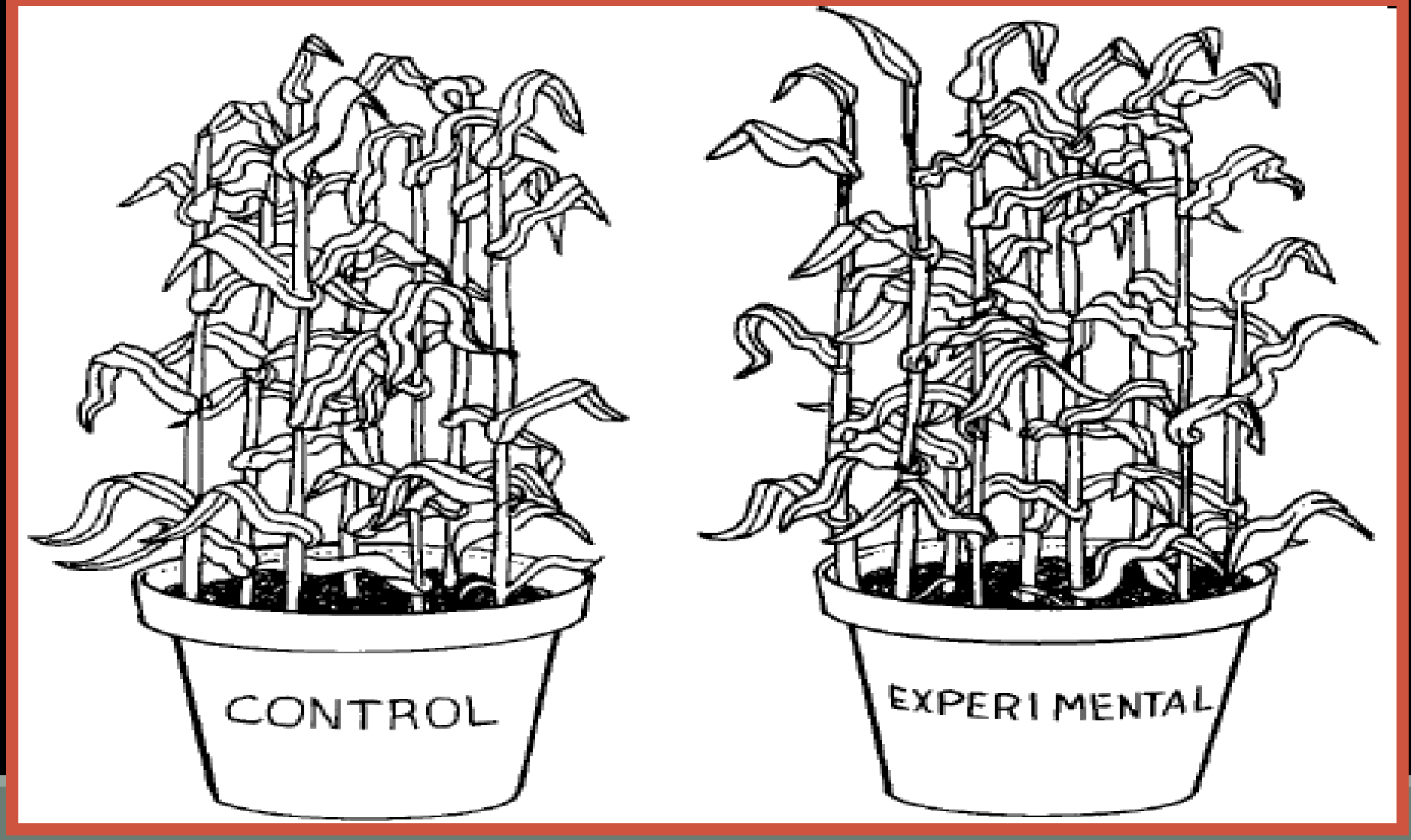
What is the independent variable in this case?

What is the independent variable in this case?

Fertilizer

What might the dependent variable be?

Control: (Same) Quantities that a scientist wants to remain constant so it's a fair test.



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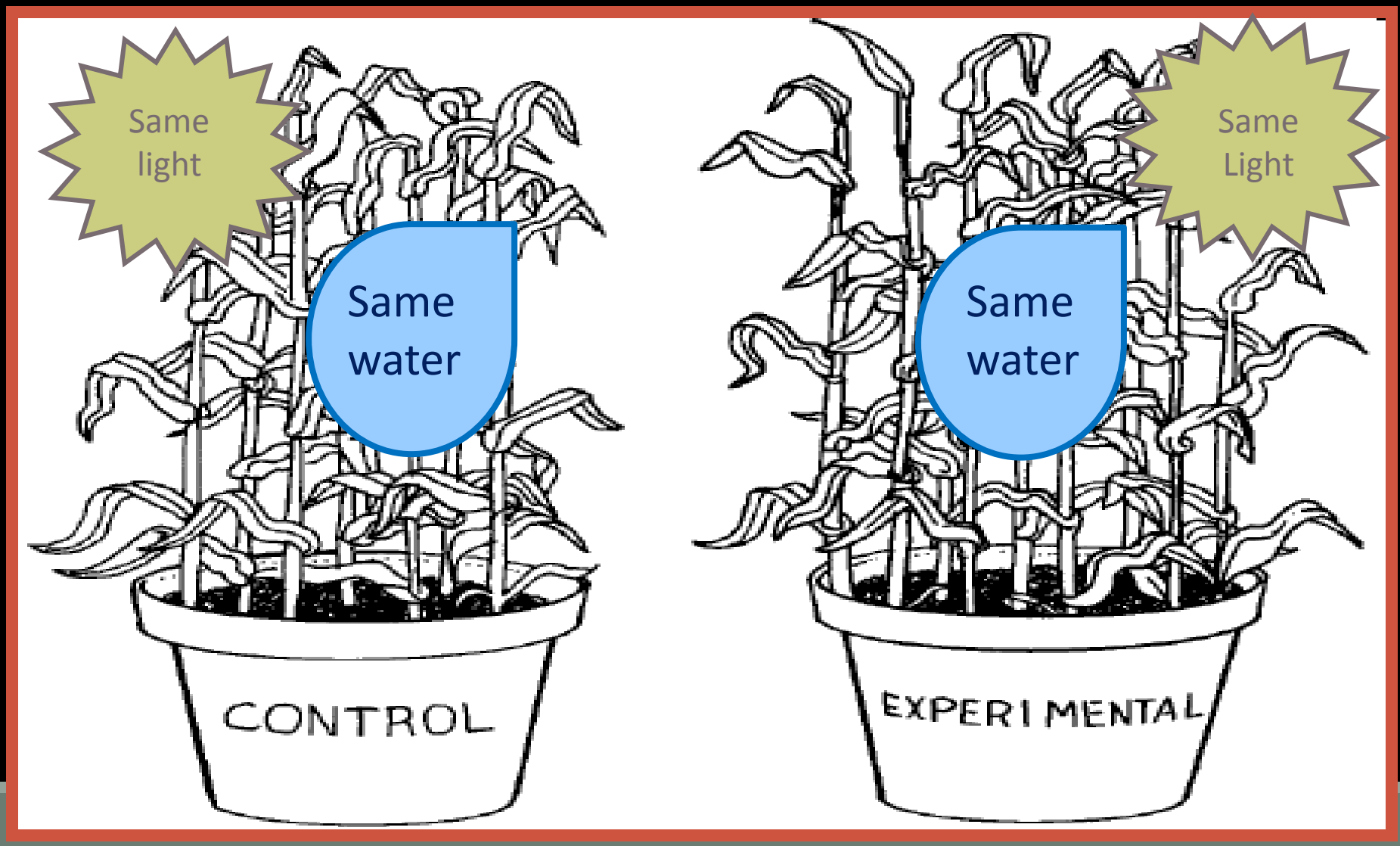

Control: (Same) Quantities that a scientist wants to remain constant so it's a fair test.

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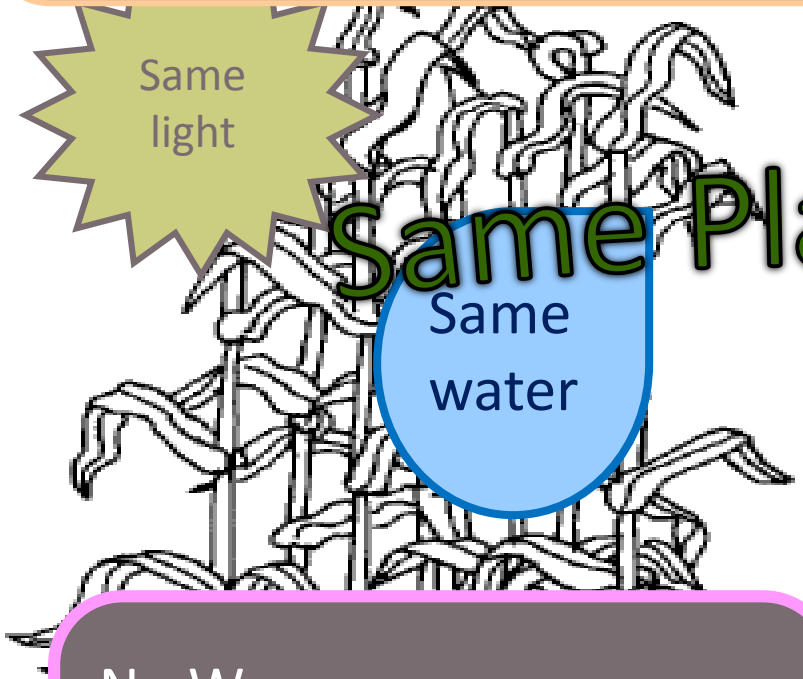
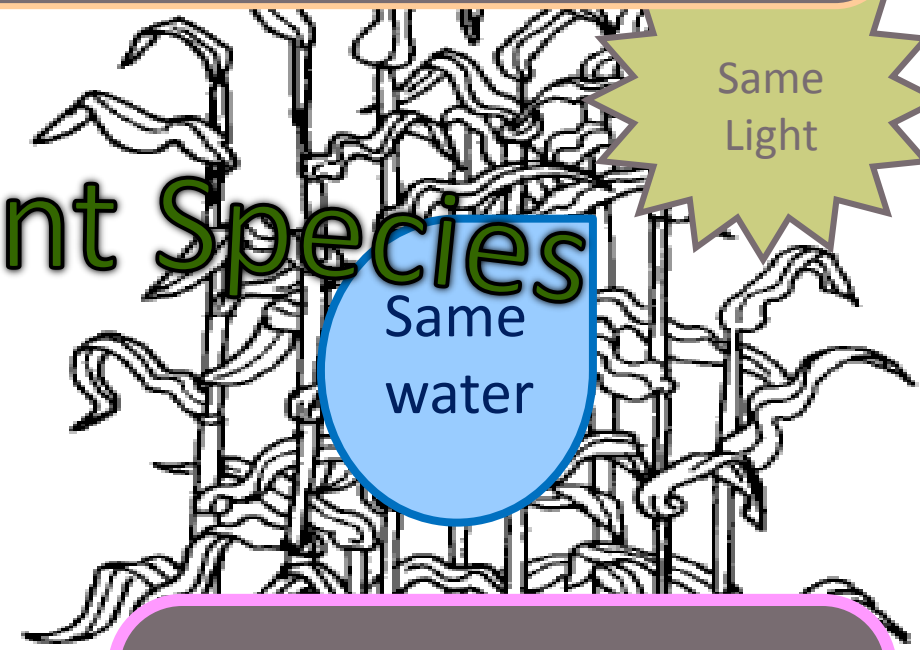
What was the Independent Variable?

No Worms

Worms

What was the Independent Variable?



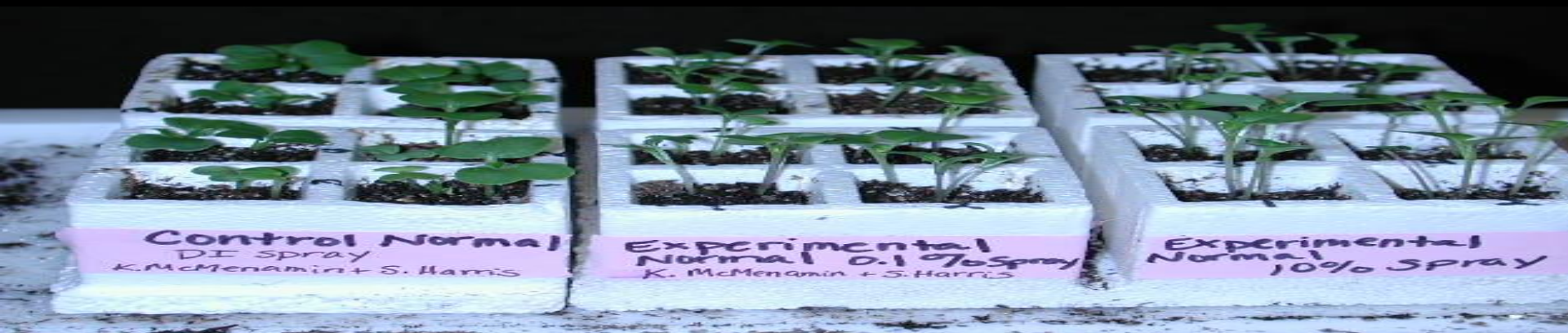


Same Plant Species

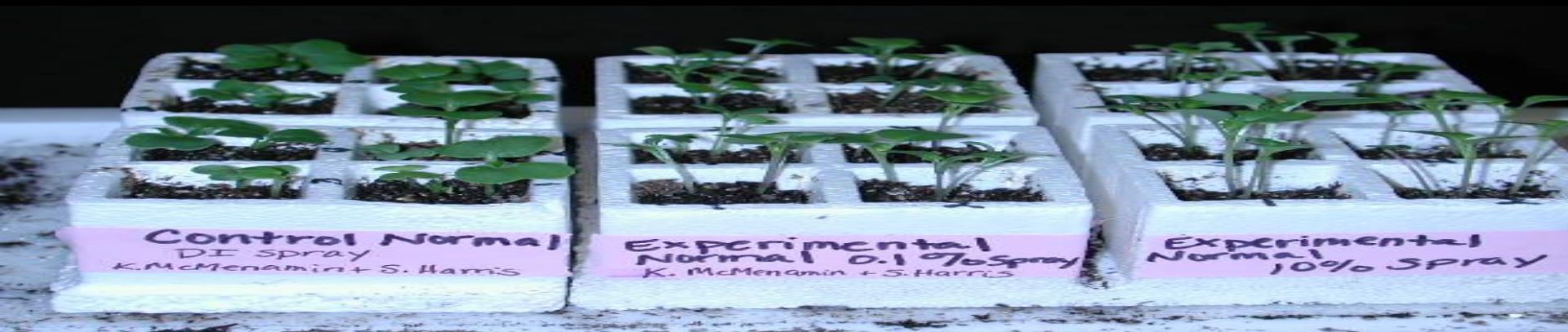
No Worms

Worms

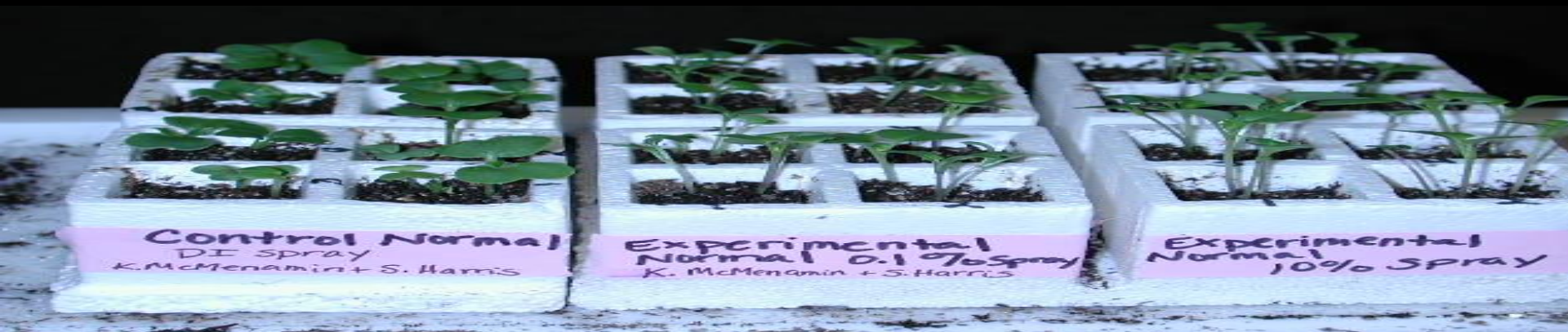
Problem			


Control Normal
DI Spray
K. McMenamin + S. Harris
Experimental
Normal 0.1% Spray
K. McMenamin + S. Harris
Experimental
Normal
10% Spray

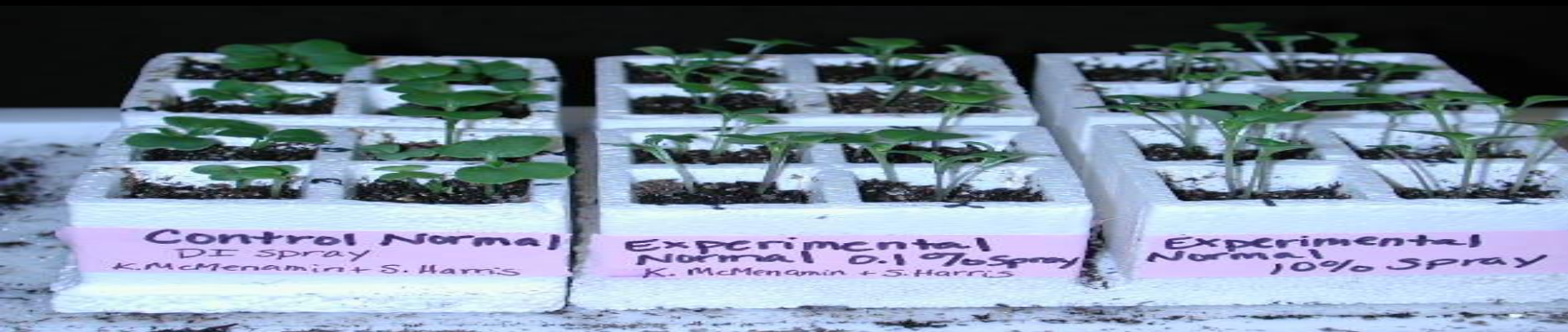
Problem			
Does fertilizer help a plant to grow?			



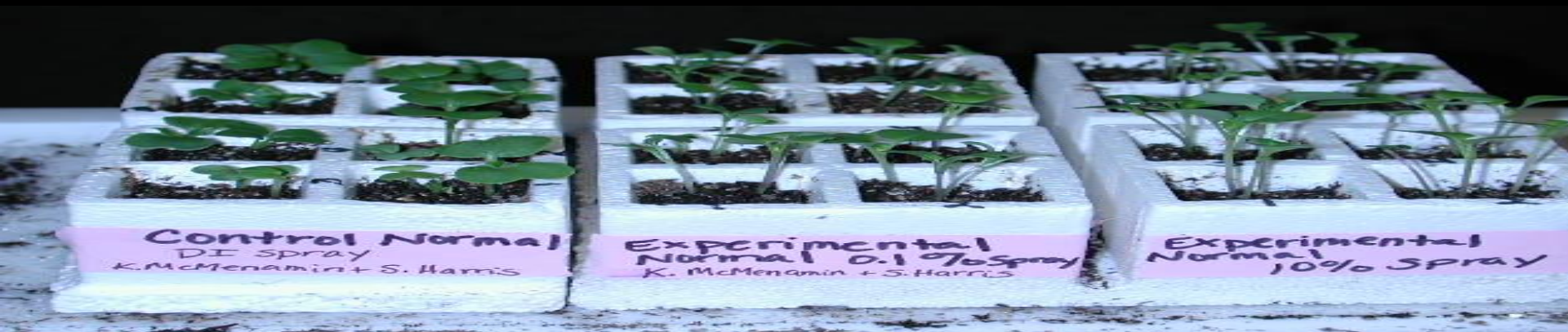
Problem	Independent Variable (Change)		
Does fertilizer help a plant to grow?			



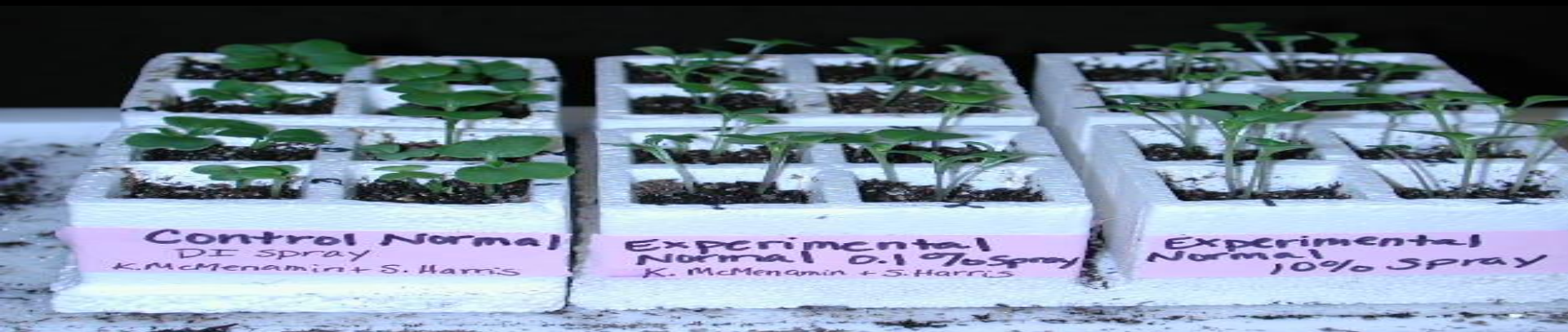
Problem	Independent Variable (Change)		
Does fertilizer help a plant to grow?	Amount of fertilizer (grams)		



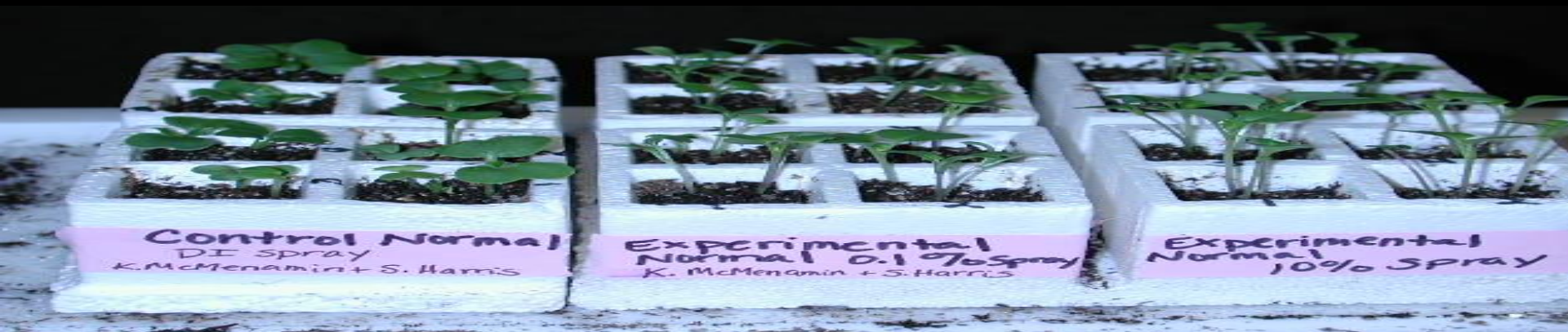
Problem	Independent Variable (Change)	Dependent Variable (Observe)	
Does fertilizer help a plant to grow?	Amount of fertilizer (grams)		



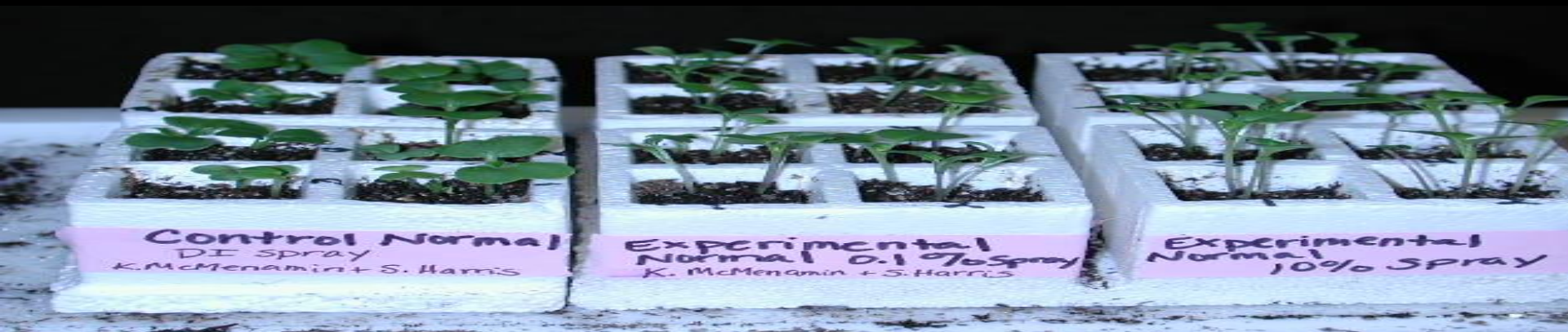
Problem	Independent Variable (Change)	Dependent Variable (Observe)	
Does fertilizer help a plant to grow?	Amount of fertilizer (grams)	Growth of the plant, Height, number of leaves, flowers, etc	

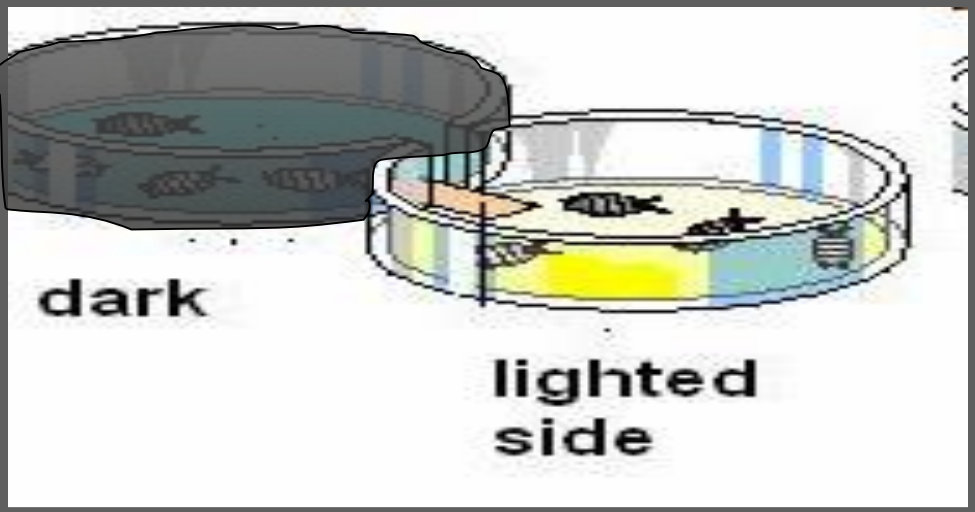


Problem	Independent Variable (Change)	Dependent Variable (Observe)	Control Variable (Same)
Does fertilizer help a plant to grow?	Amount of fertilizer (grams)	Growth of the plant, Height, number of leaves, flowers, etc	

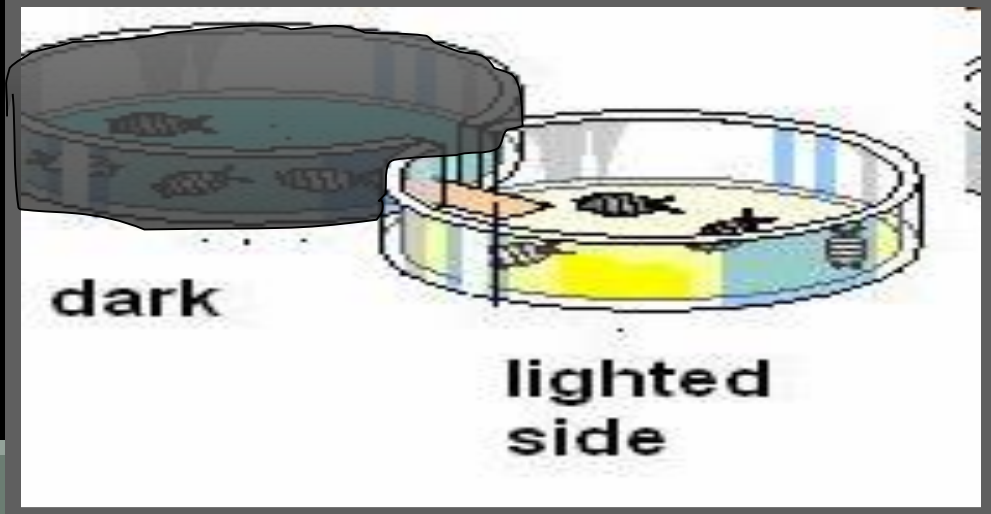


Problem	Independent Variable (Change)	Dependent Variable (Observe)	Control Variable (Same)
Does fertilizer help a plant to grow?	Amount of fertilizer (grams)	Growth of the plant, Height, number of leaves, flowers, etc	Same amount of soil, light, water, space, all the same.

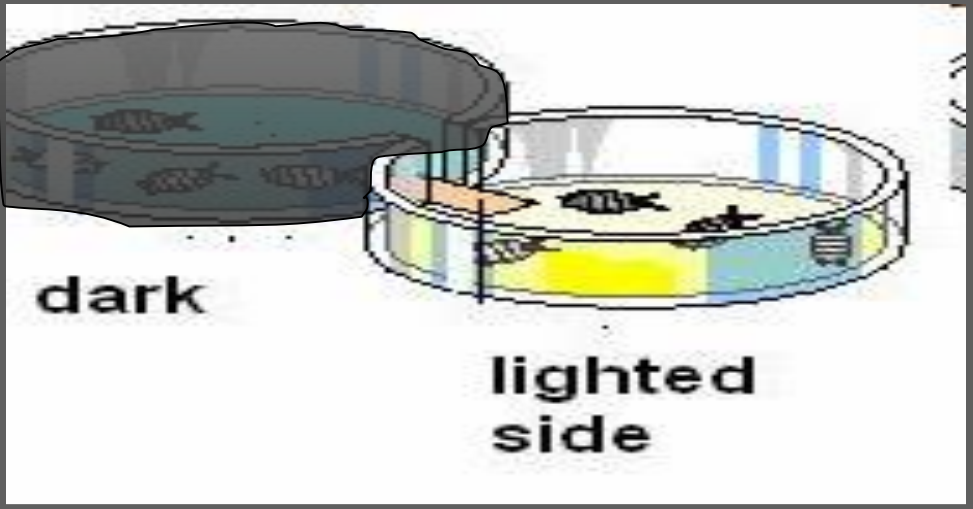



dark
lighted
side

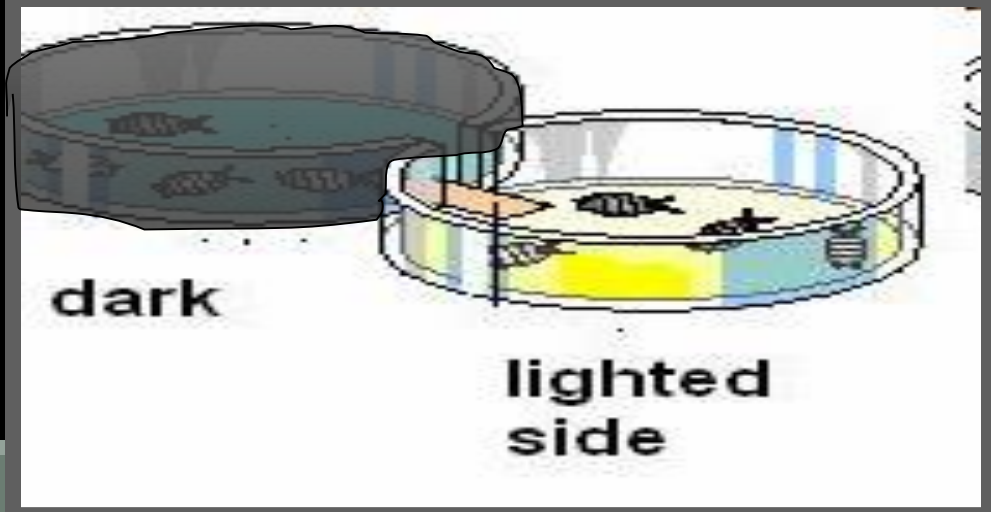
Problem?			



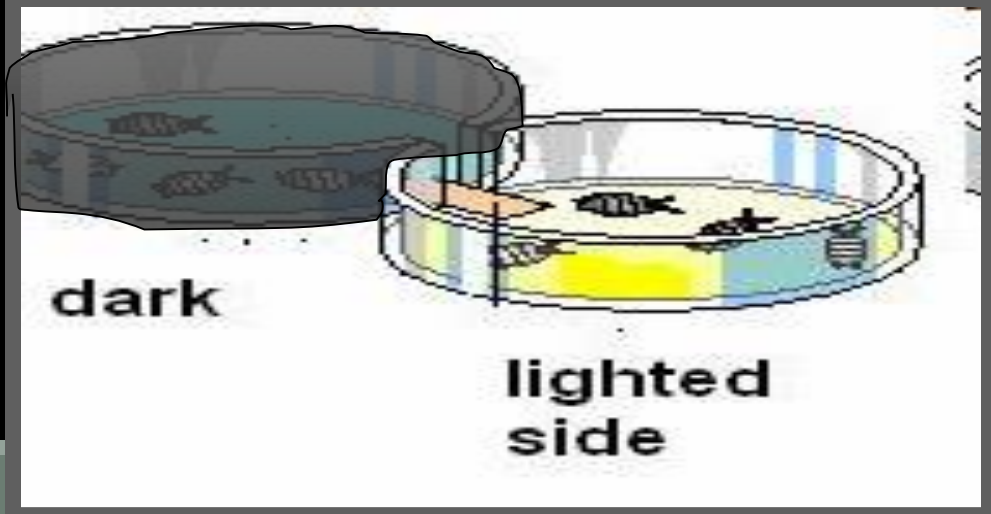
Problem?			
Do Pillbugs prefer a dark or light environment?			



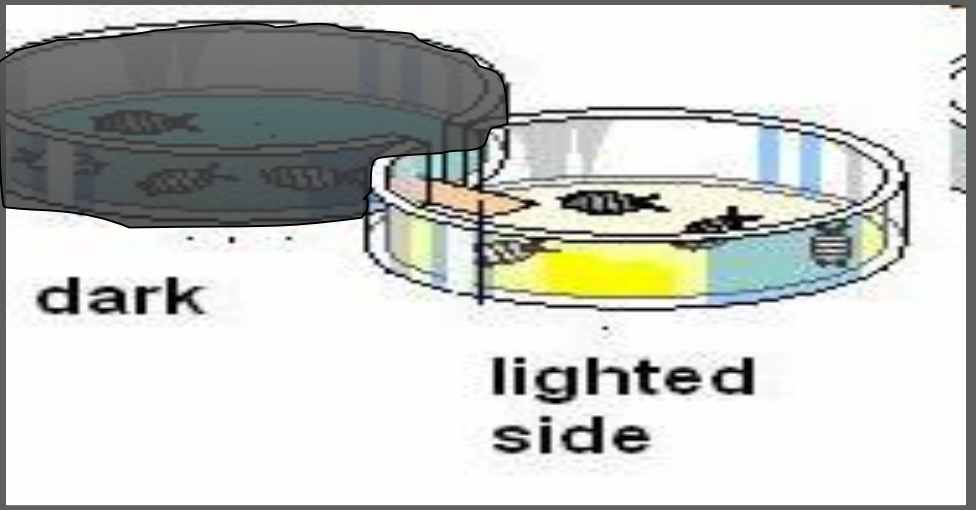
Problem?	Independent Variable (Change)		
Do Pillbugs prefer a dark or light environment?			



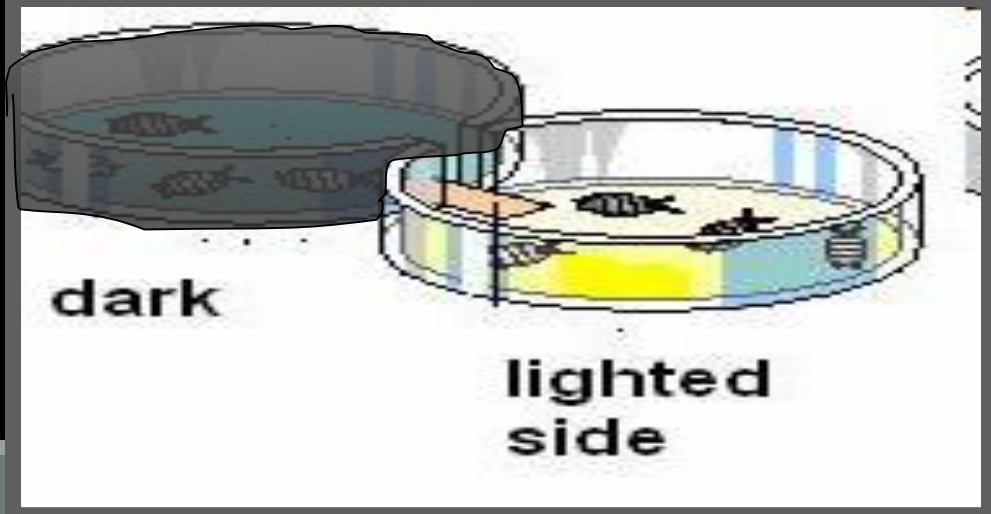
Problem?	Independent Variable (Change)		
Do Pillbugs prefer a dark or light environment?	One environment is dark, the other is light		



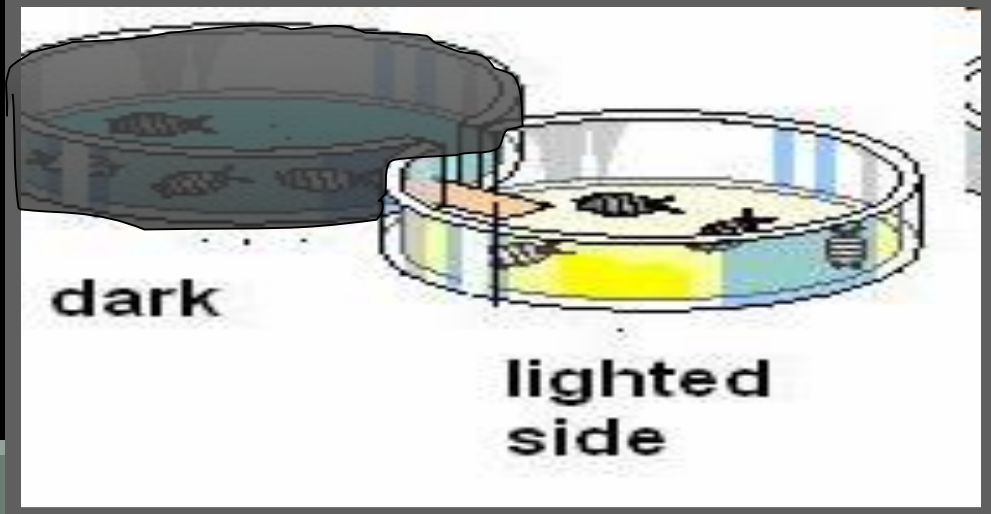
Problem?	Independent Variable (Change)	Dependent Variable (Observe)	
Do Pillbugs prefer a dark or light environment?	One environment is dark, the other is light		



Problem?	Independent Variable (Change)	Dependent Variable (Observe)	
Do Pillbugs prefer a dark or light environment?	One environment is dark, the other is light	Count the number of Pillbugs that enter dark chamber.	



Problem?	Independent Variable (Change)	Dependent Variable (Observe)	Control Variable (Same)
Do Pillbugs prefer a dark or light environment?	One environment is dark, the other is light	Count the number of Pillbugs that enter dark chamber.	



Problem?	Independent Variable (Change)	Dependent Variable (Observe)	Control Variable (Same)
Do Pillbugs prefer a dark or light environment?	One environment is dark, the other is light	Count the number of Pillbugs that enter dark chamber.	Moisture in both should be the same, temp, no food preference.