

“Doing Science” Workshops

Dr. Felix E. Rivera-Mariani

Reef Polling™

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- En que idioma será el “workshop” de hoy?
 - a) Inglés
 - b) Español
 - c) Ambos

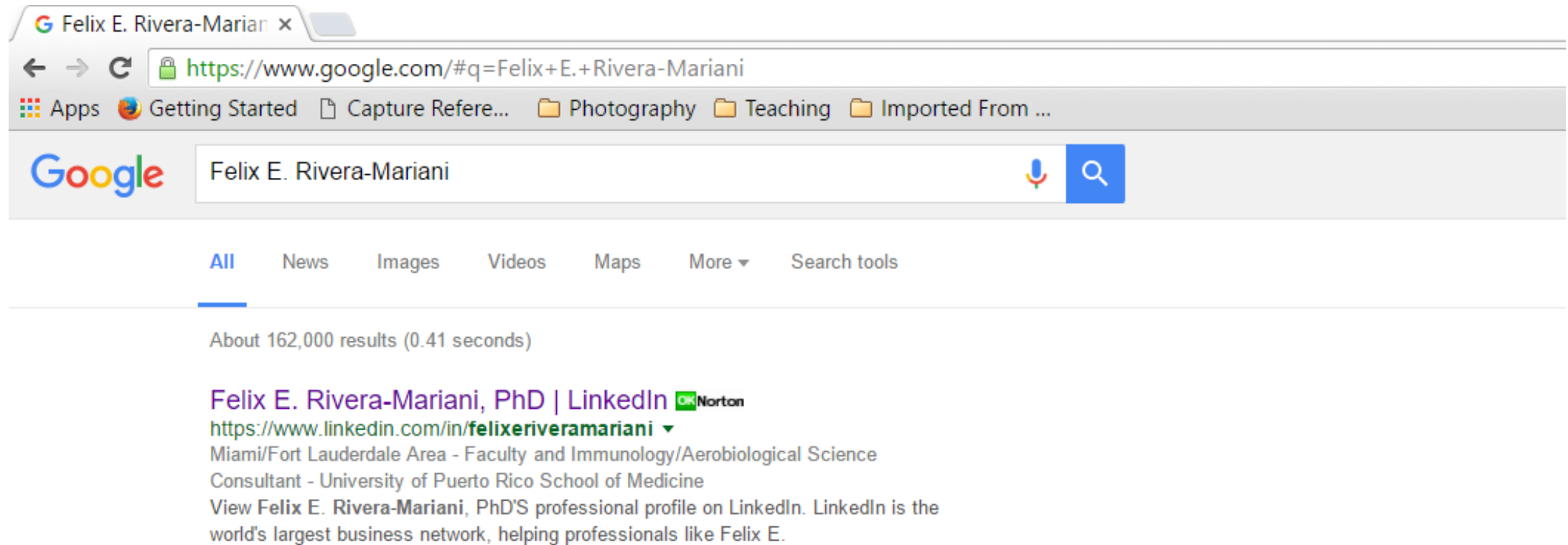
Who we are?

- Name
- What grade are you in?


Who am I?

- Bachelors in Biology (Southeastern Louisiana University)
- PhD in Microbiology (University of Puerto Rico – Medical Sciences Campus)
- Postdoctoral Fellowship (Johns Hopkins University School of Public Health)
- Science Teaching Fellowship (American Society of Microbiology)
- Certifications Statistics, Data Sciences, and Genomic Data Science (Johns Hopkins University)
- Consultant (Aerobiology, Immunology, Computational Image Analysis, Data Science)
- Adjunct Professor (Biology, Microbiology, Biochemistry, Immunology)
 - Miami Dade College
 - University of Puerto Rico – Medical Sciences Campus

Who am I?



A screenshot of a web browser showing a Google search for "Felix E. Rivera-Mariani". The browser's address bar displays the URL "https://www.google.com/#q=Felix+E.+Rivera-Mariani". Below the address bar, there are several tabs: "Apps", "Getting Started", "Capture Refere...", "Photography", "Teaching", and "Imported From ...". The Google search bar contains the text "Felix E. Rivera-Mariani". Below the search bar, there are links for "All", "News", "Images", "Videos", "Maps", "More", and "Search tools". The search results show "About 162,000 results (0.41 seconds)". The first result is a LinkedIn profile for "Felix E. Rivera-Mariani, PhD | LinkedIn", with a URL "https://www.linkedin.com/in/felixeriveramariani". The profile description includes "Miami/Fort Lauderdale Area - Faculty and Immunology/Aerobiological Science Consultant - University of Puerto Rico School of Medicine" and a prompt to "View Felix E. Rivera-Mariani, PhD'S professional profile on LinkedIn. LinkedIn is the world's largest business network, helping professionals like Felix E."

Felix E. Rivera-Mariani, PhD | LinkedIn 

<https://www.linkedin.com/in/felixeriveramariani>

Miami/Fort Lauderdale Area - Faculty and Immunology/Aerobiological Science
Consultant - University of Puerto Rico School of Medicine

View Felix E. Rivera-Mariani, PhD'S professional profile on LinkedIn. LinkedIn is the world's largest business network, helping professionals like Felix E.

“Doing Science” Workshops

- What do you expect to learn from this series of workshops?

“Doing Science” Workshops

- Our next workshops
 - February 22th, 23th, 24th, 25th at 9 – 10 AM

“Doing Science” Workshops

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 - February 22th, 23th, 24th, 25th at 9 – 10 AM
 - **Workshops**: we are actually going to do “**work**”

Learning Objectives in the Workshop Series

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- Value the importance of team-work in the scientific process
- Understand, elaborate, and communicate with a scientific mindset

Learning Goals for Today

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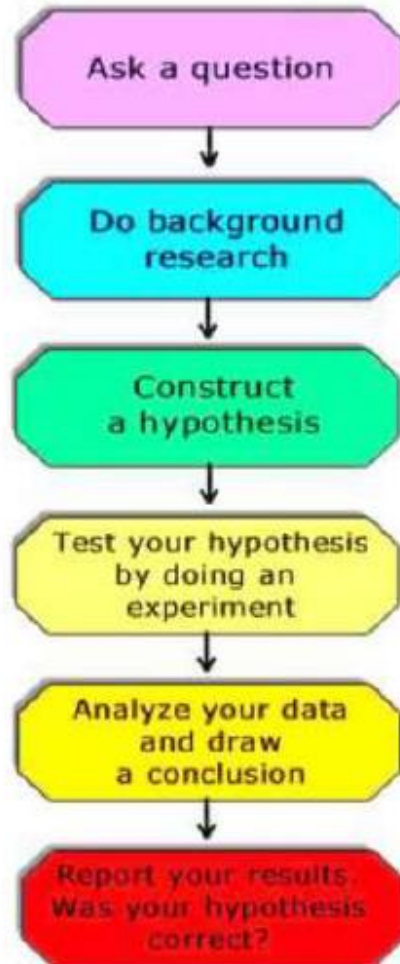
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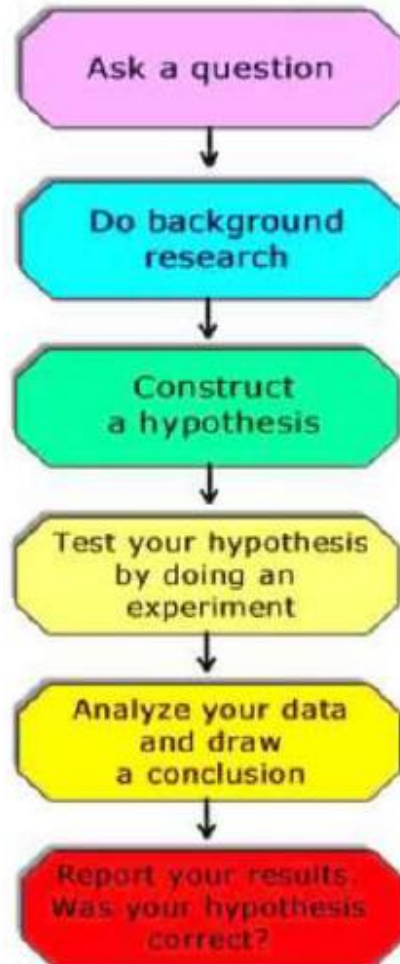
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Scientific method



Is this the “real”
scientific method?

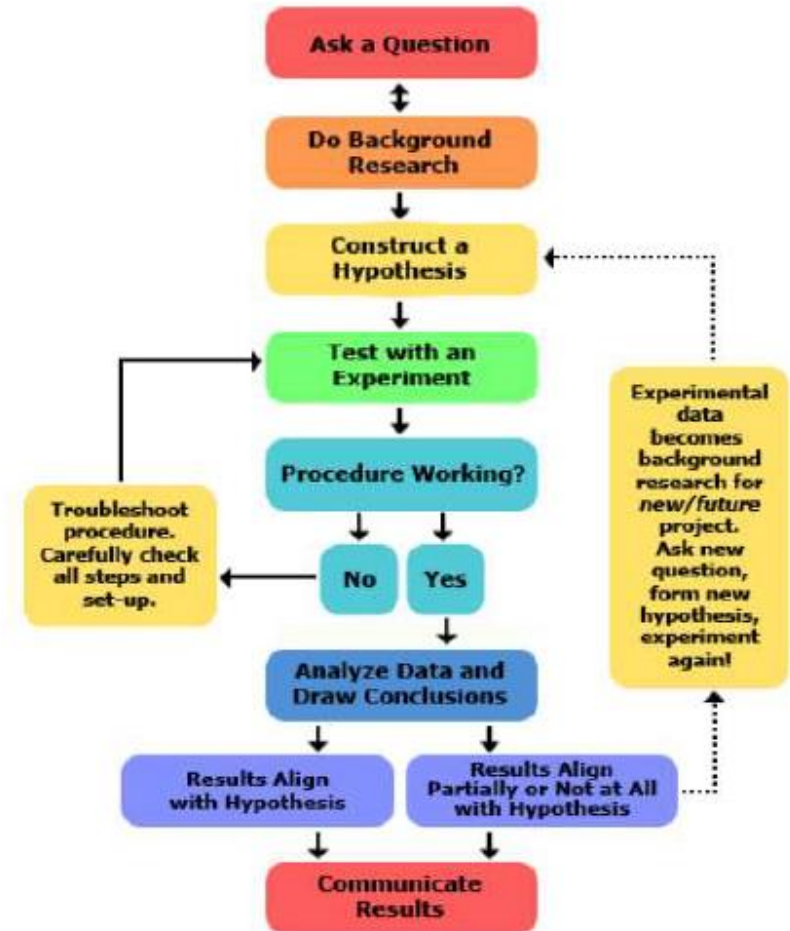
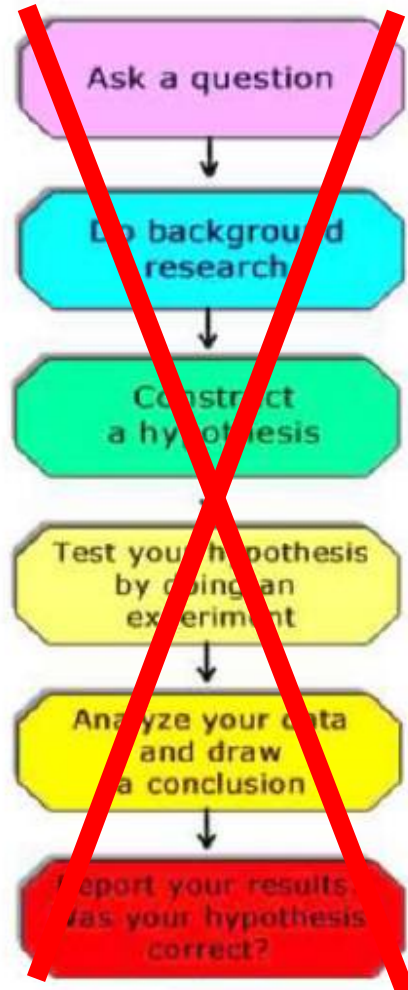
Scientific method

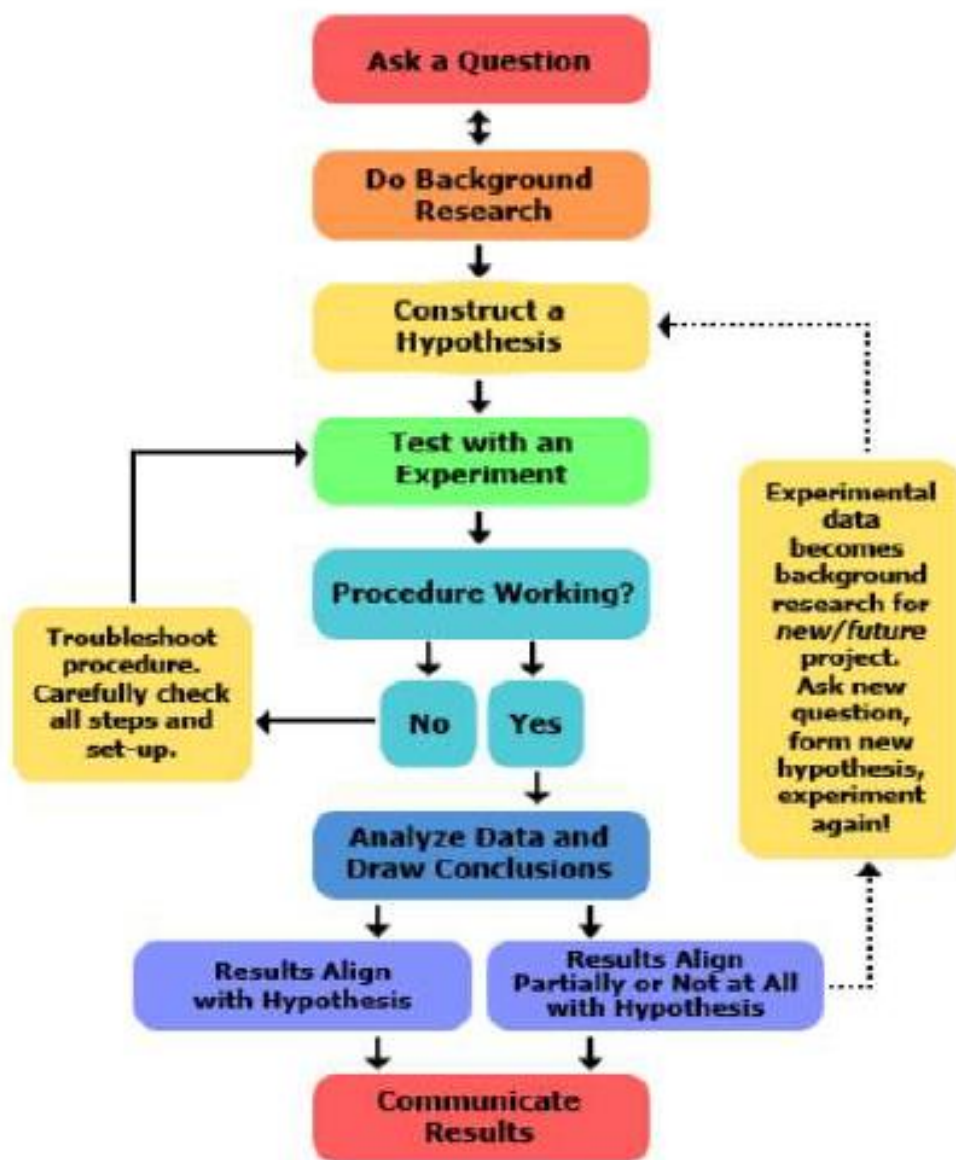


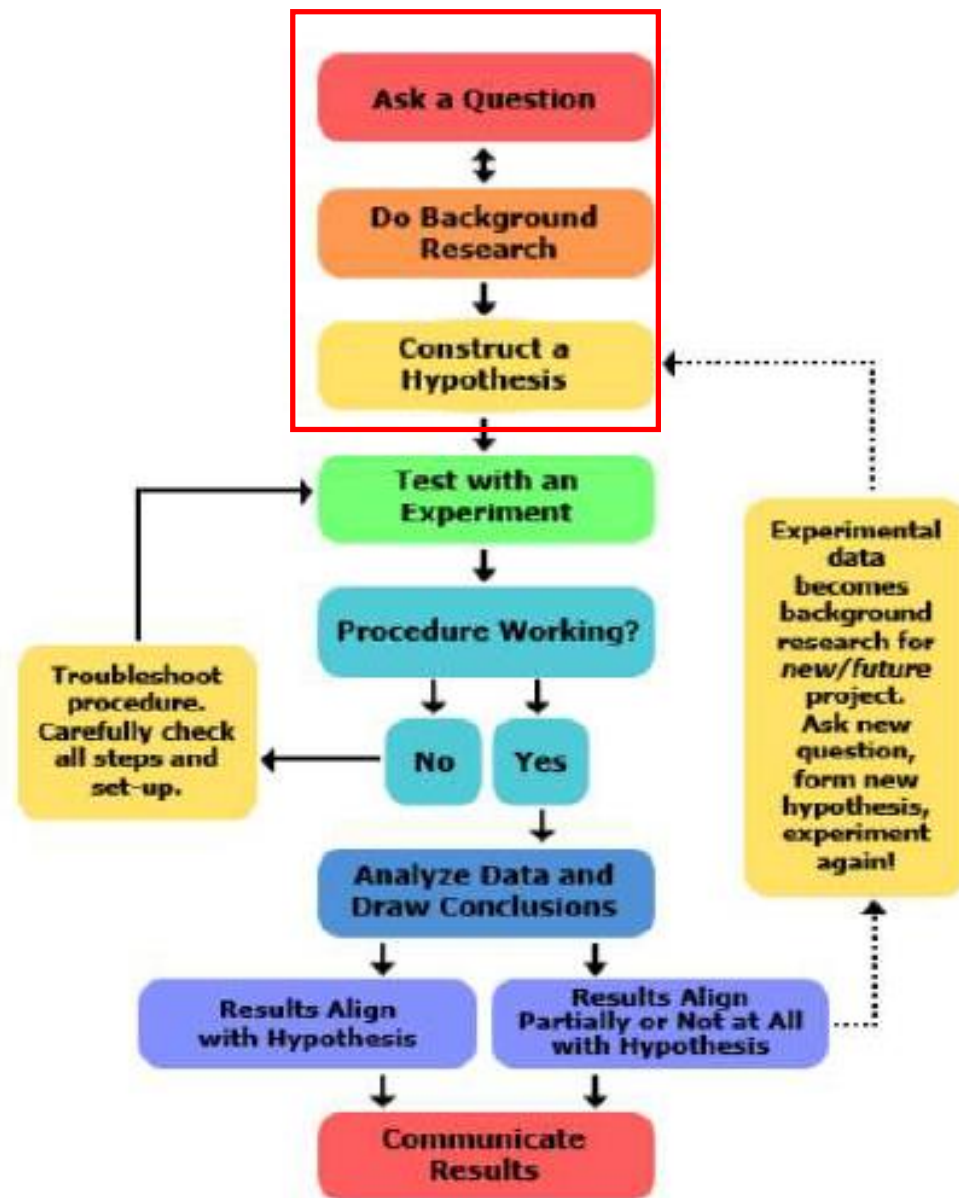
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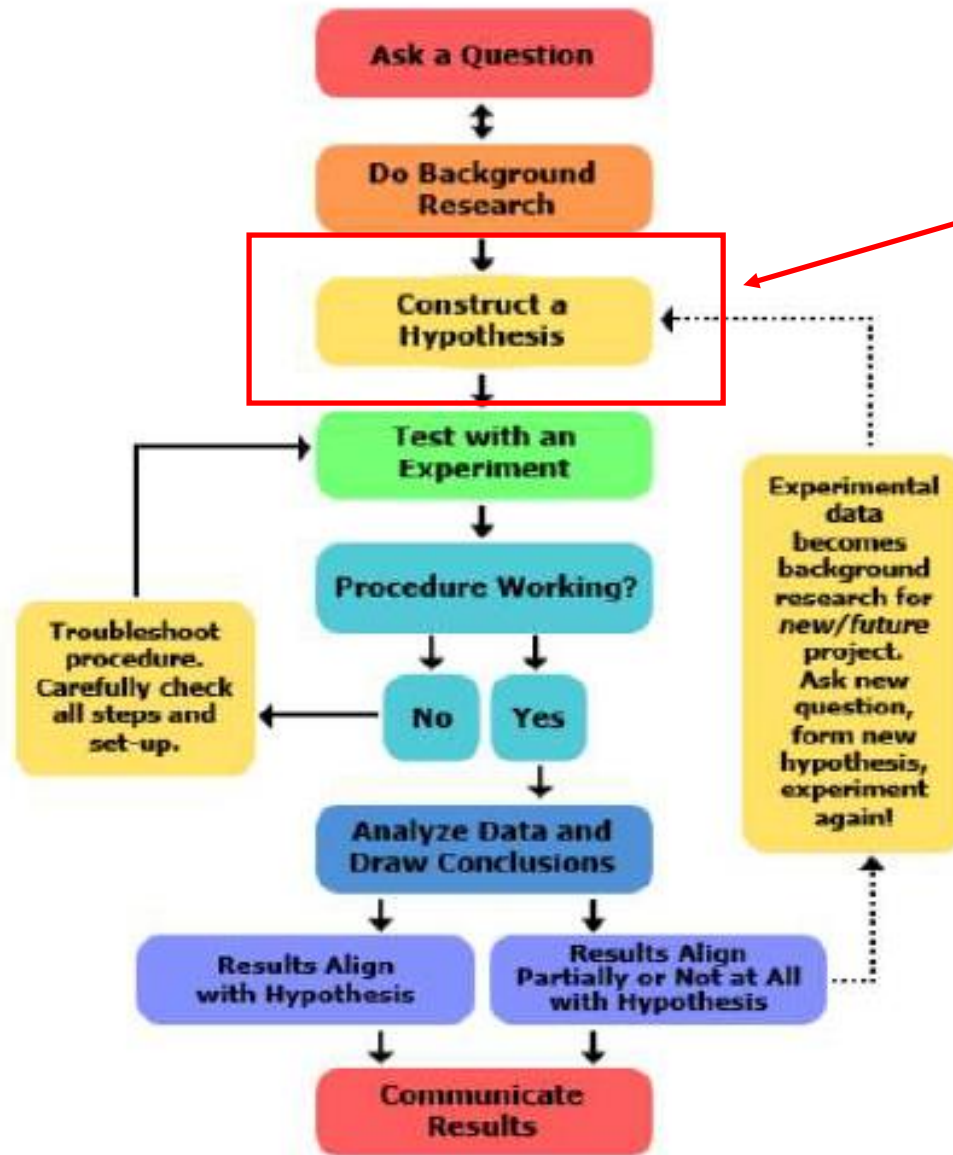
No

Scientific method

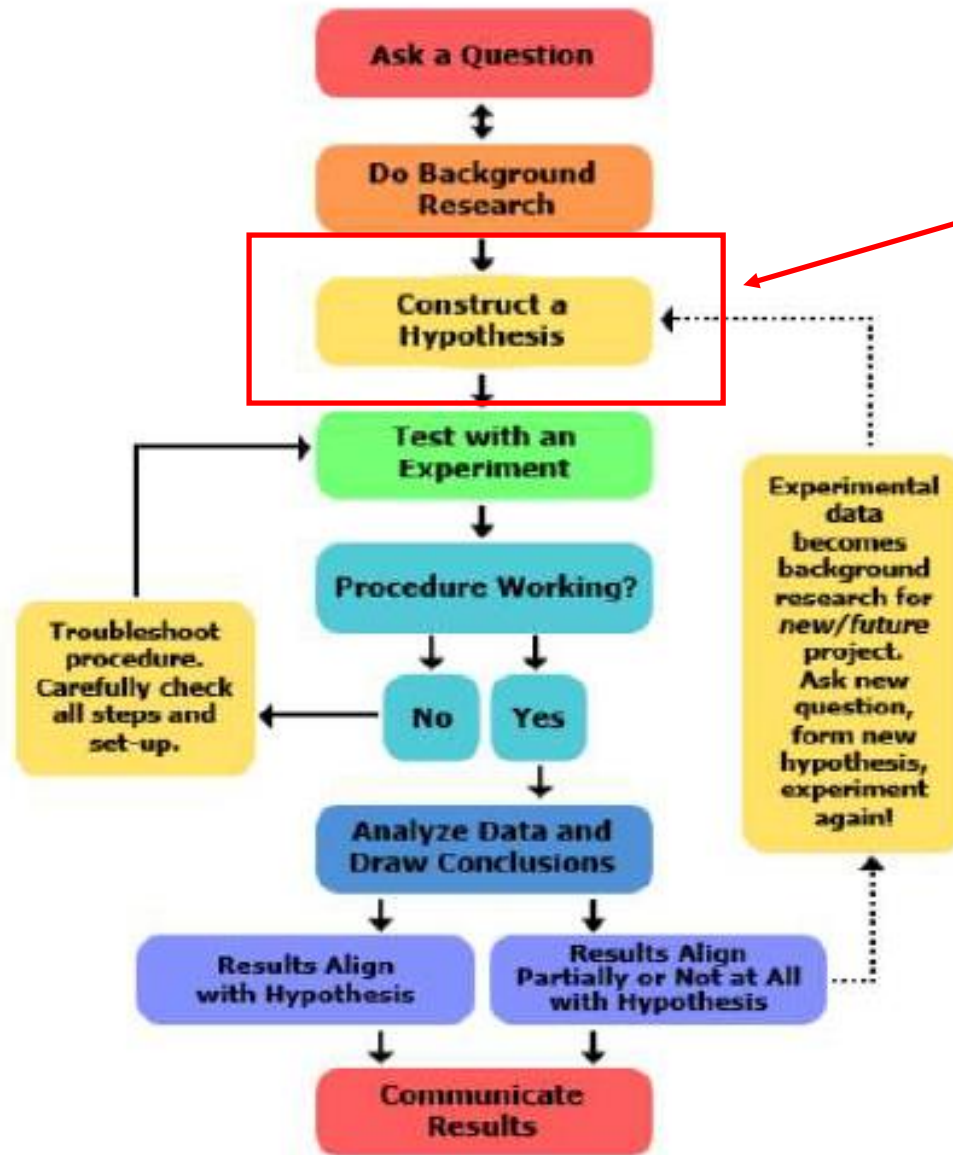






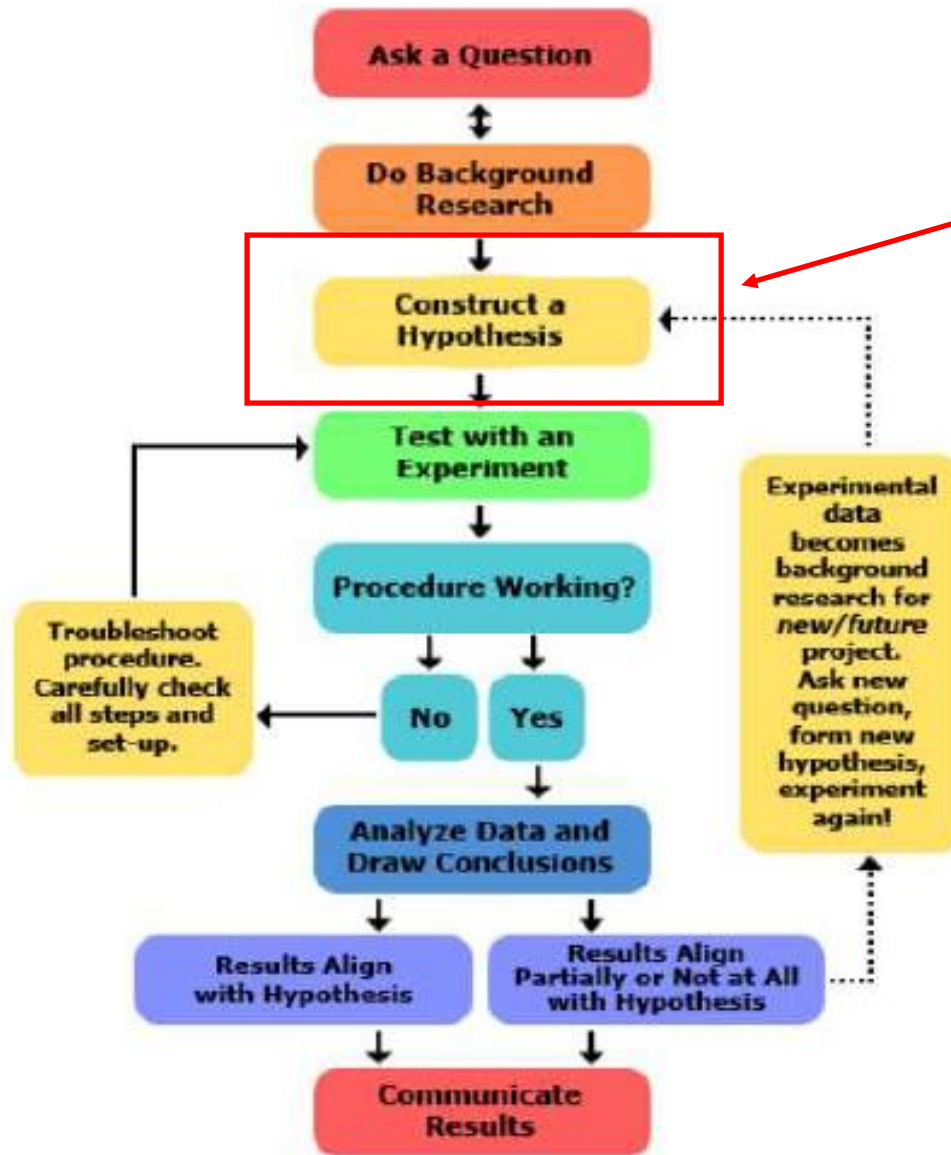


What is a hypothesis?



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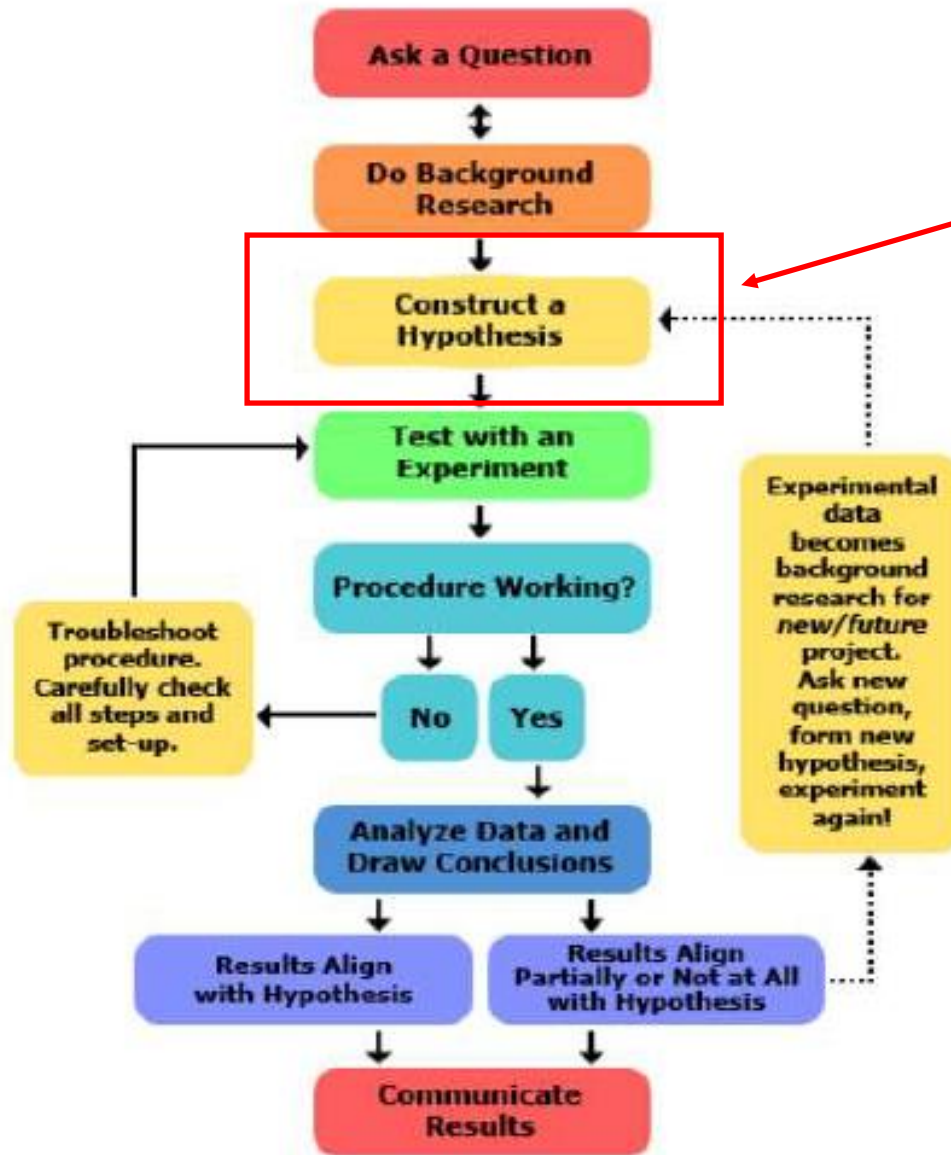
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“educated” because we know something (even a “little”) about what we are trying to answer

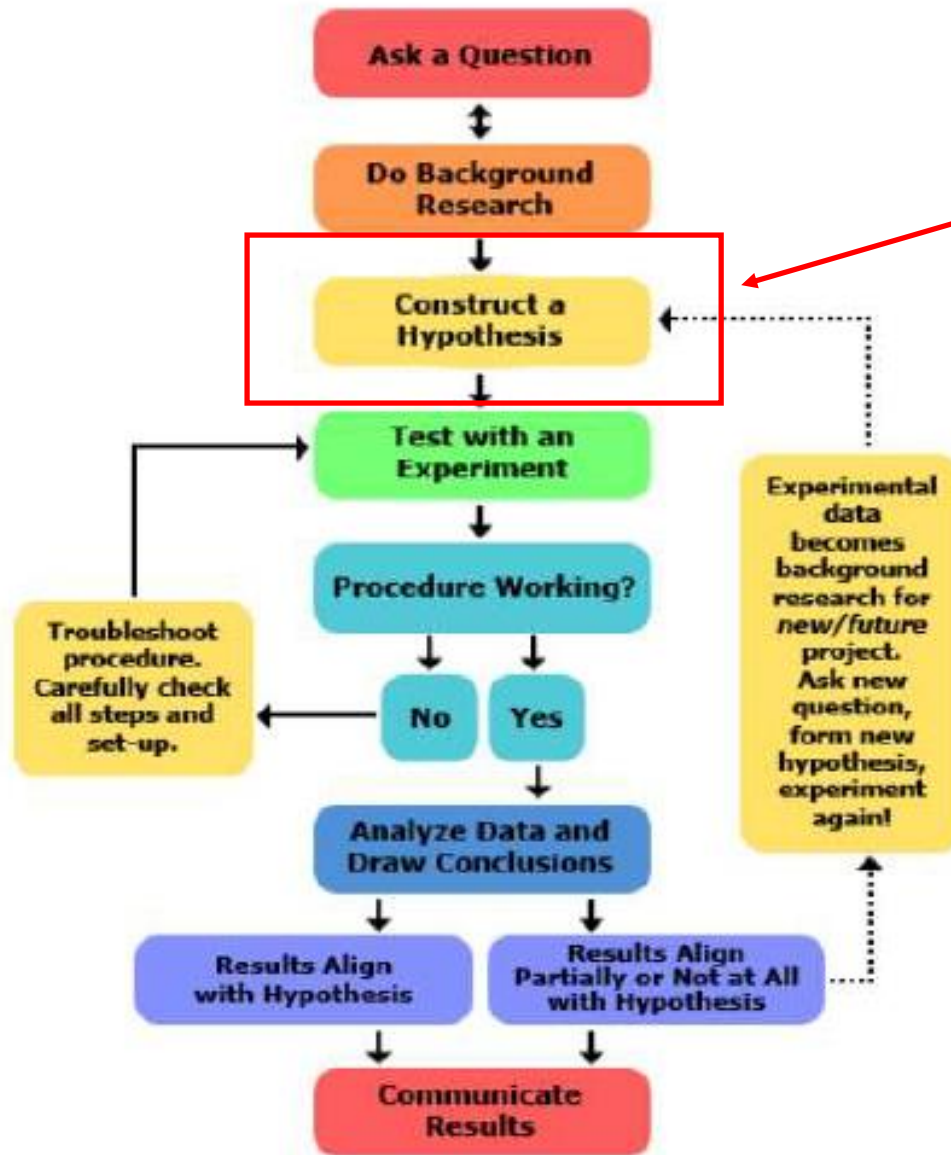


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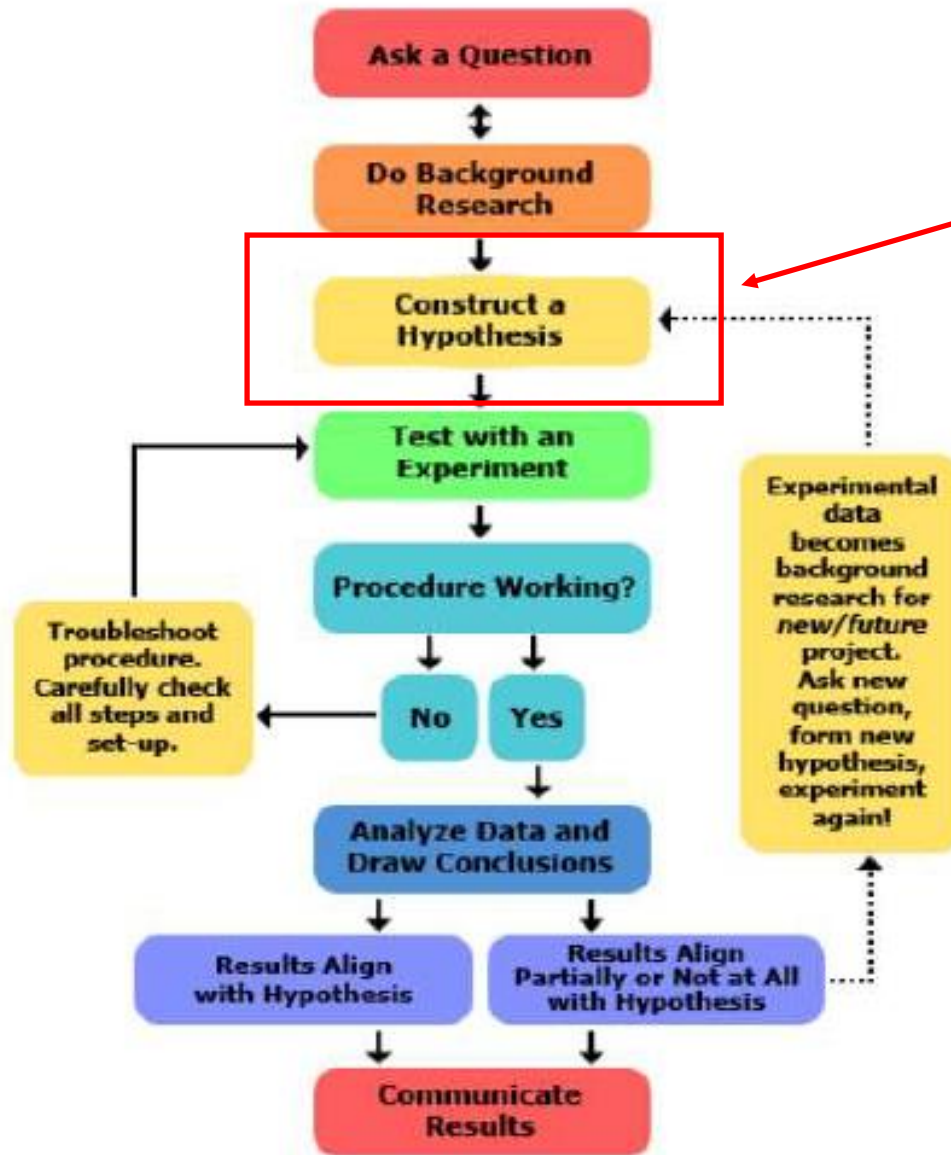
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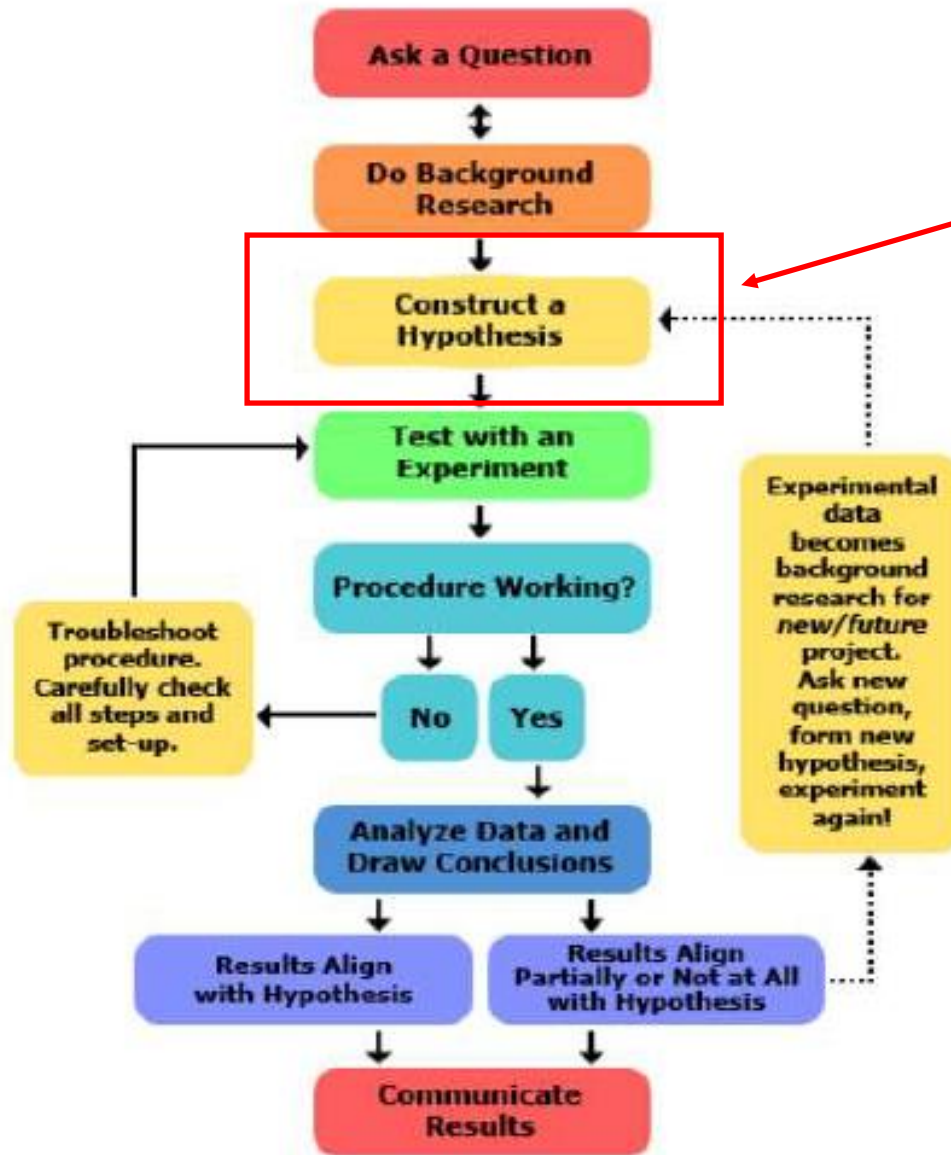
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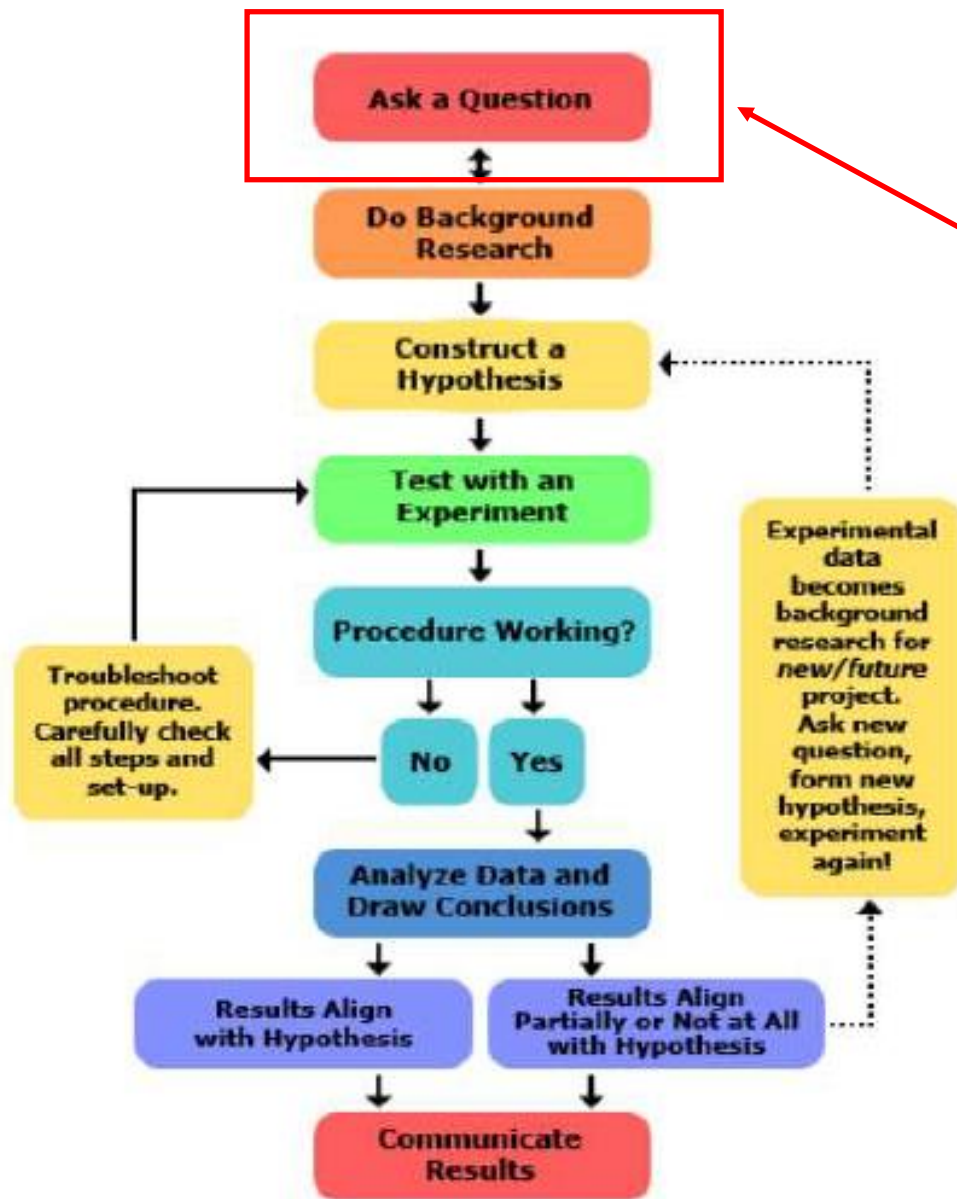
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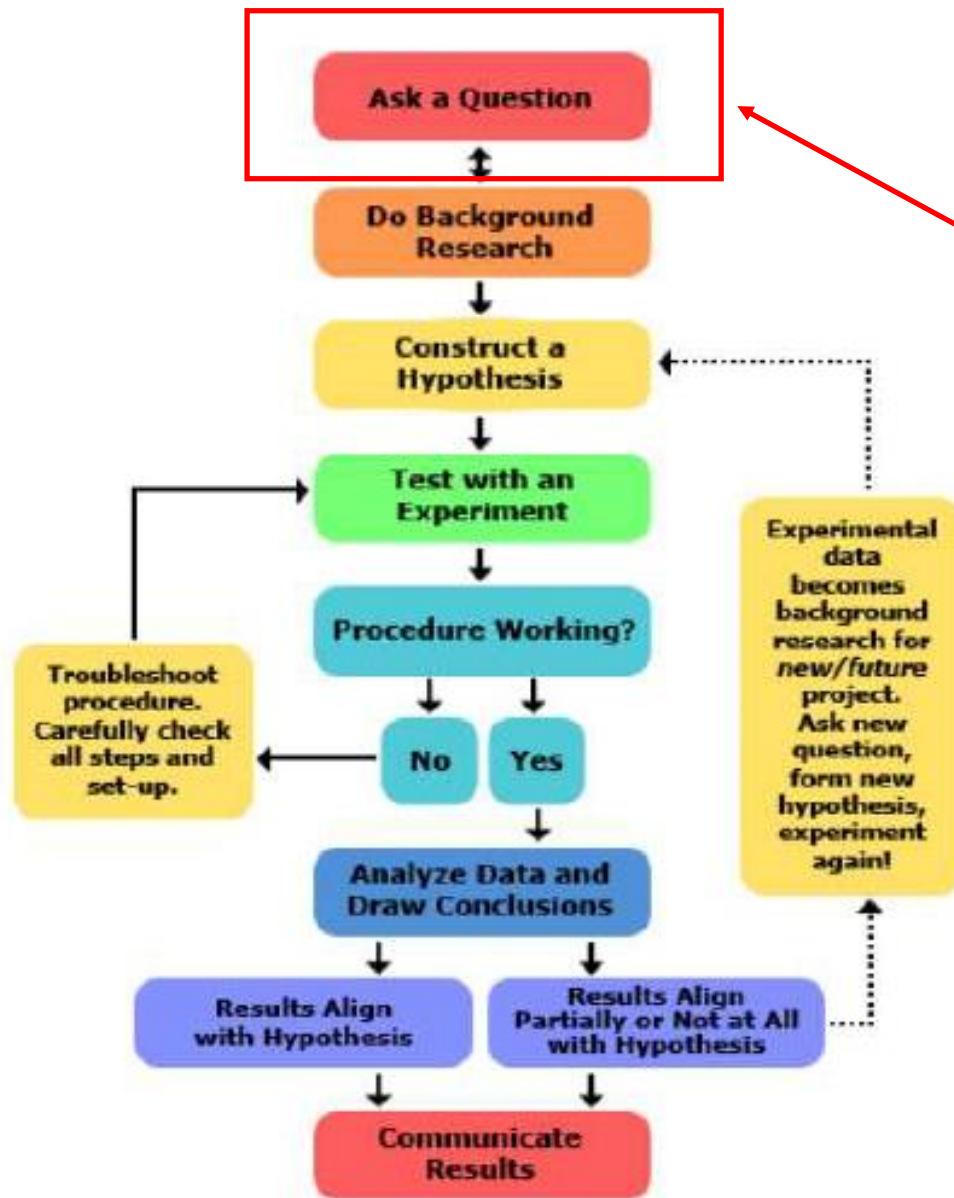
What are two importance characteristics of a hypothesis (your answer must be only two words)

- 1) Testable → be able to be tested with feasible experiments
- 2) Falsifiable → be able to proven “true” or “false”



What is a hypothesis?

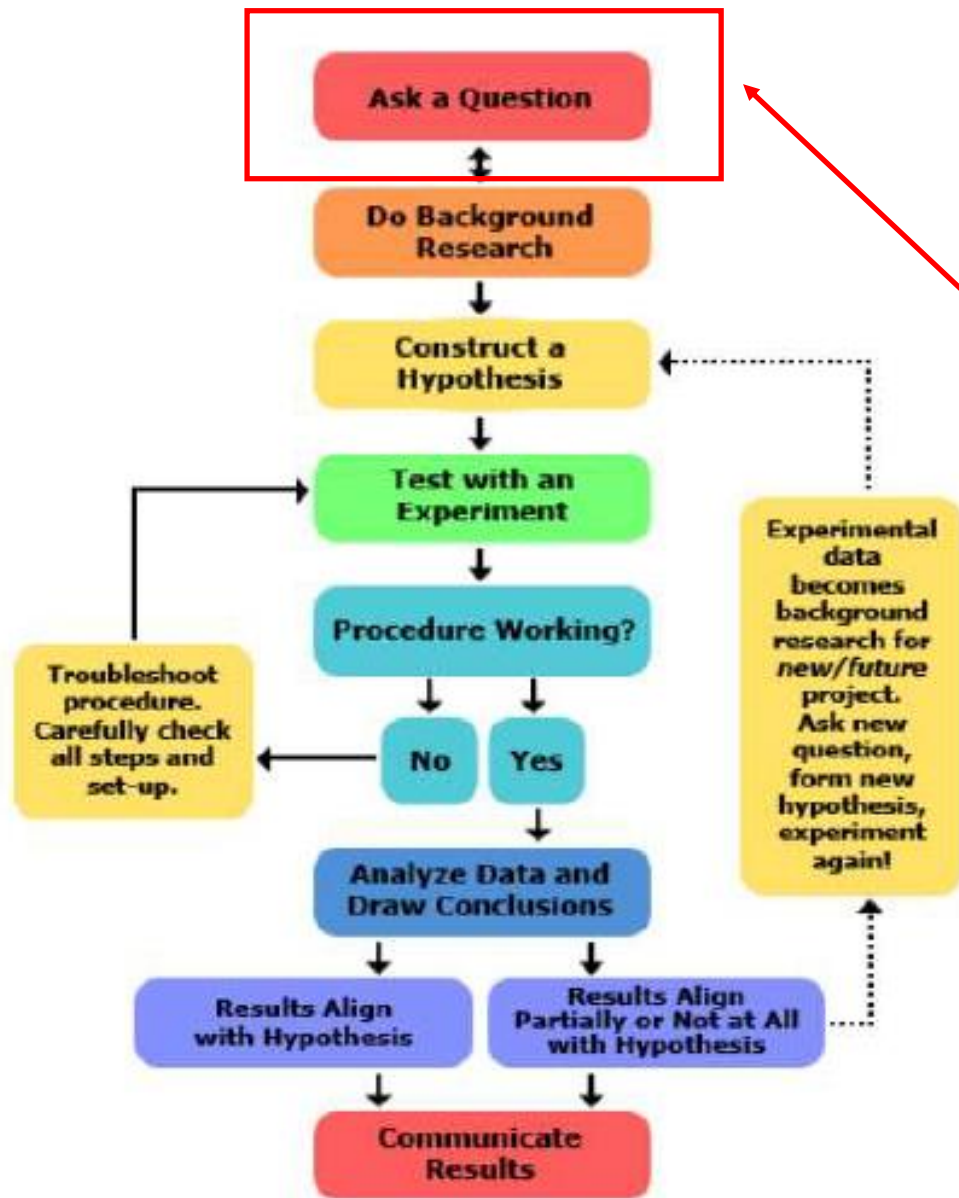
What is a purpose?



What is a hypothesis?

What is a purpose?

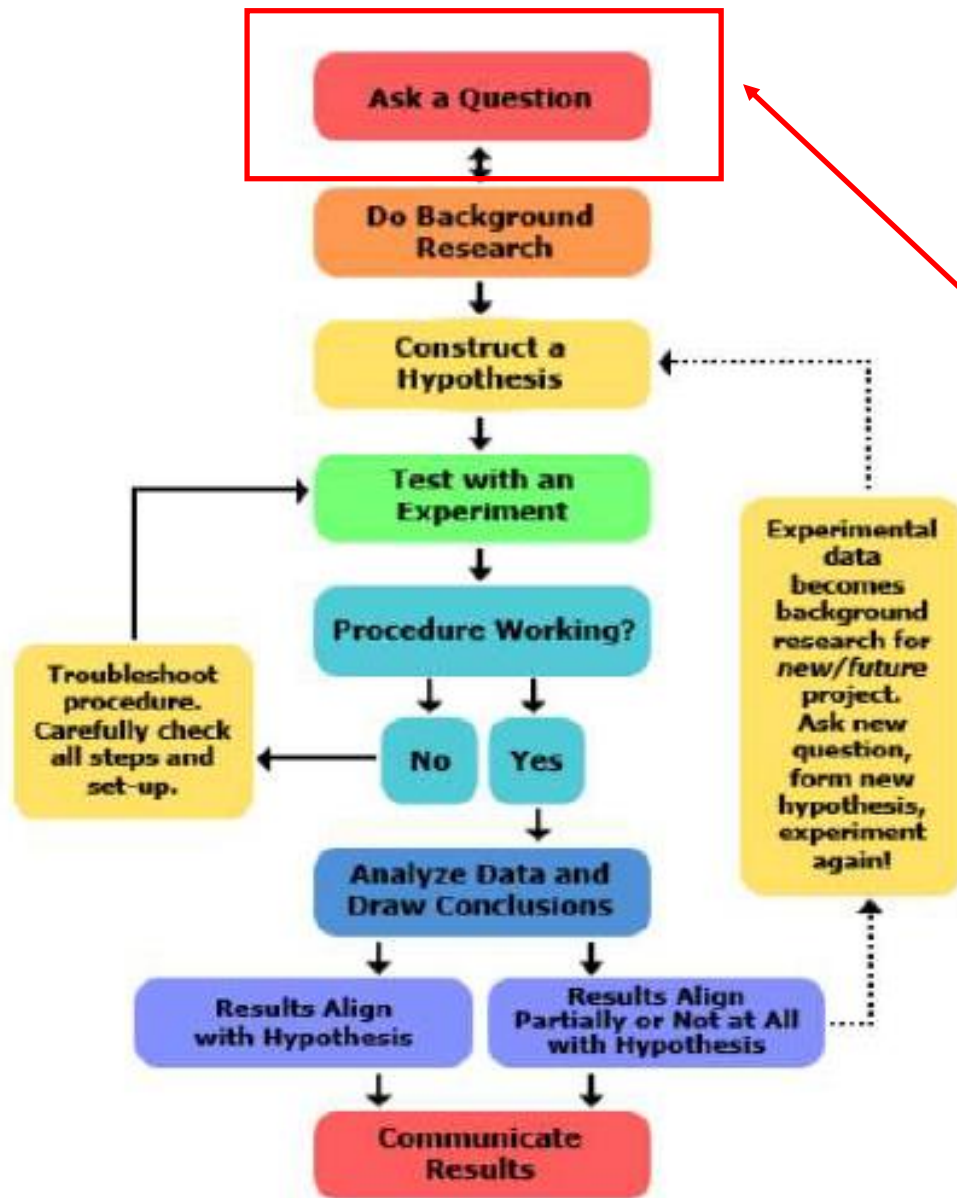
When we are trying to discover something, but we don't know anything about what we are trying to discover



What is a hypothesis?

What is a purpose?

What is a question?

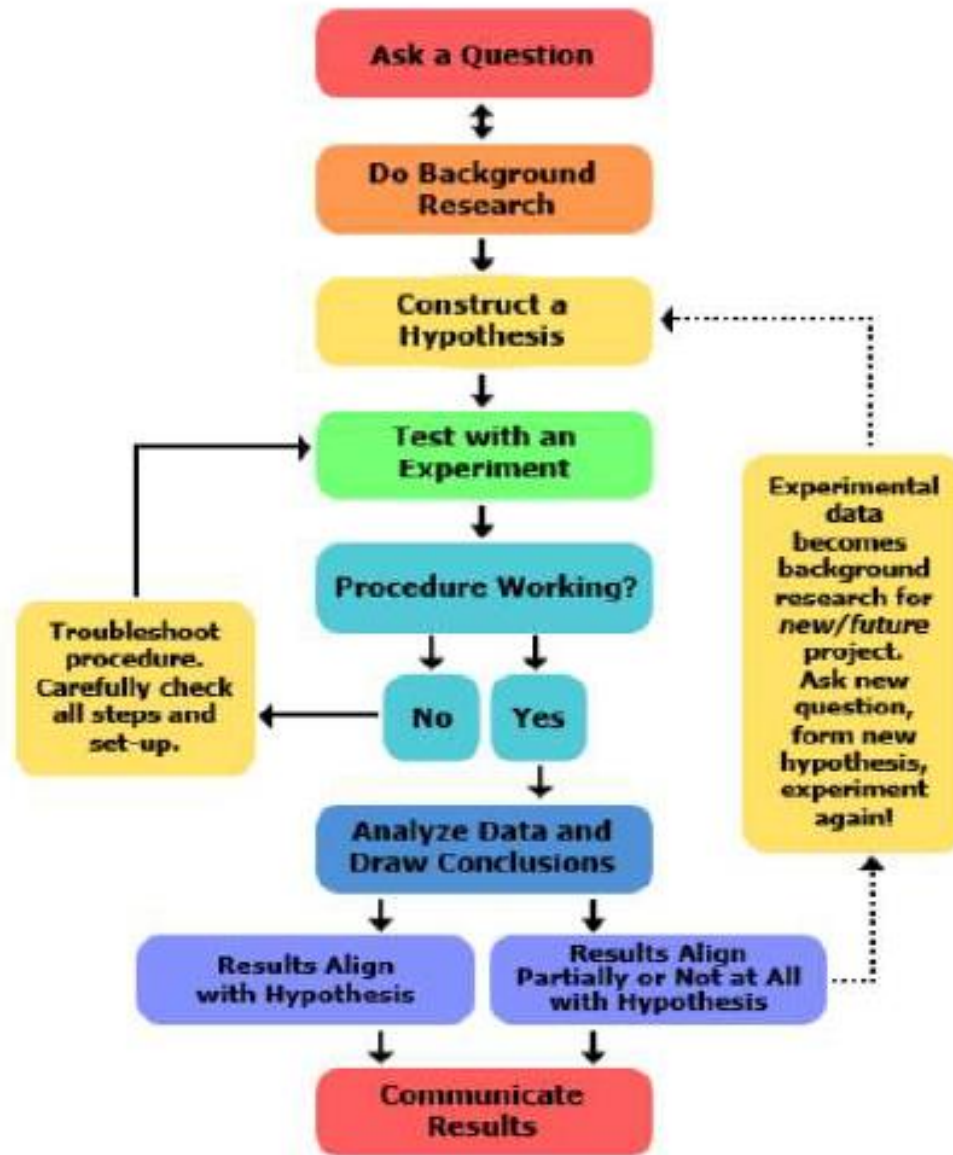


What is a hypothesis?

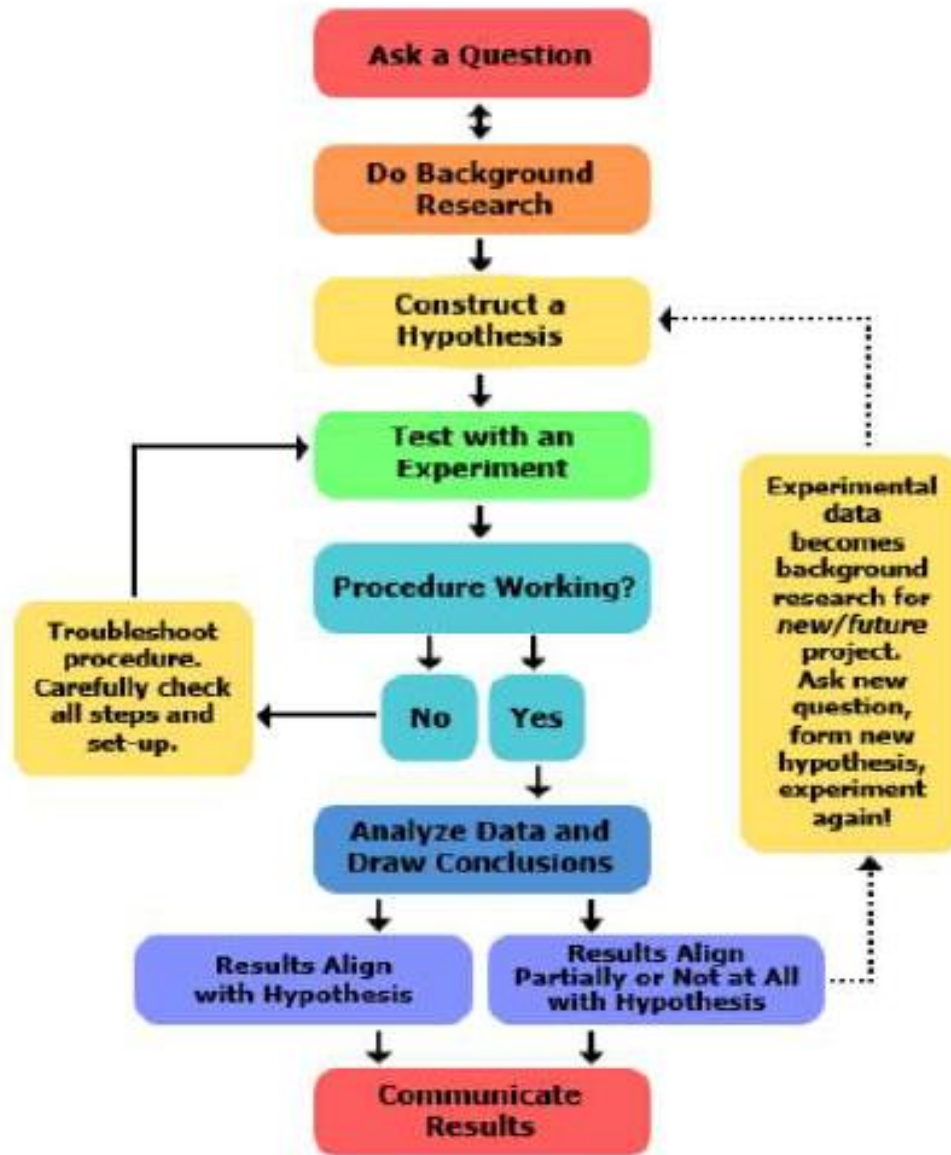
What is a purpose?

What is a question?

Helps us in the start the thought process and to decide if we'll perform scientific discovery through a purpose or hypothesis

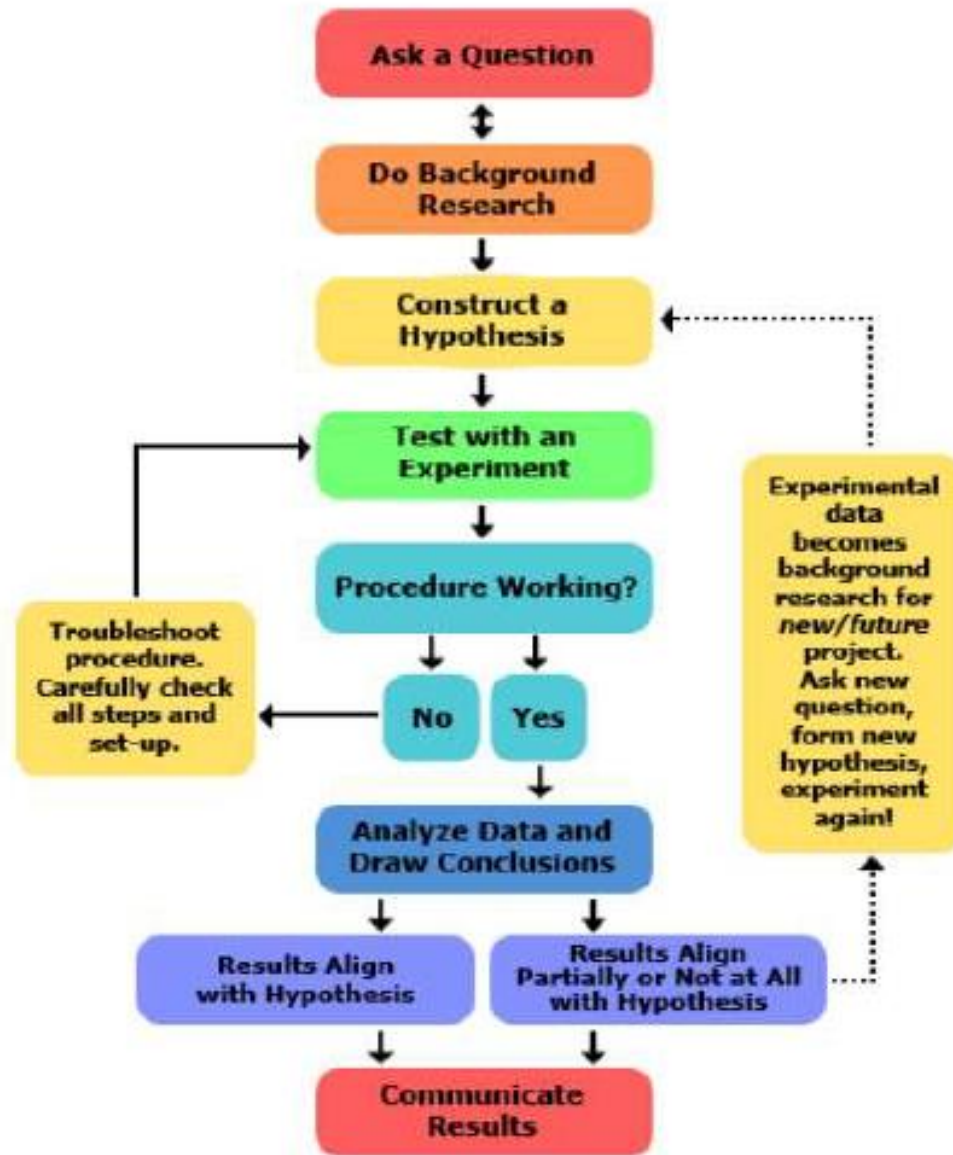


What is a characteristic that a purpose, question, and hypothesis must share in the scientific thought process?



What is a characteristic that a purpose, question, and hypothesis must share in the scientific thought process?

Must be as specific as possible.



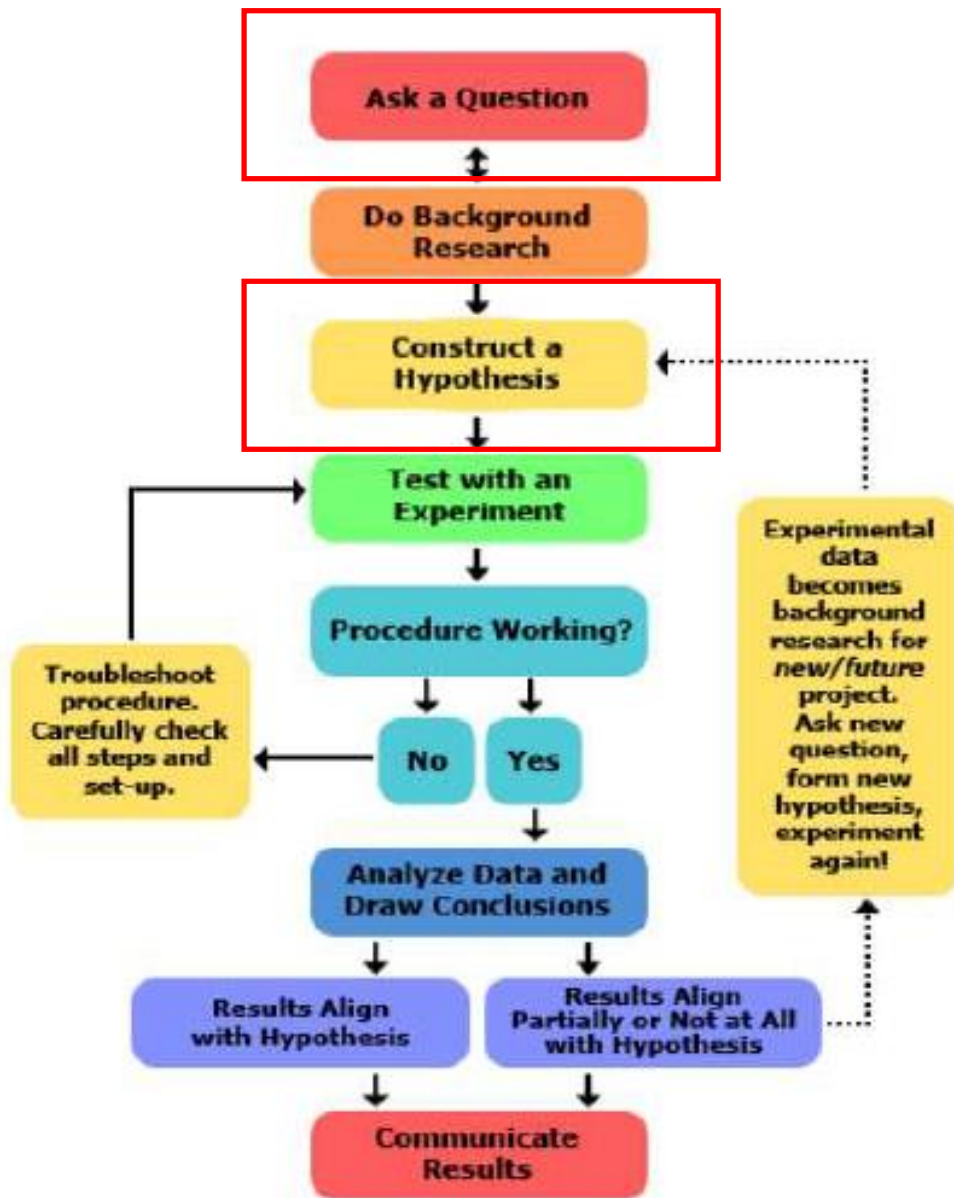
Between a purpose, hypothesis, and question, which one is usually the most difficulty to come up with?

Which is a hypothesis, which is a purpose?

- Determine whether the mountain waves can carry microbes into the stratosphere.
- The concentration of microbes will be 95% less in the stratosphere compared to ground level.

Which is a hypothesis, which is a purpose?

- Determine whether the mountain waves can carry microbes into the stratosphere. **purpose**
- The concentration of microbes will be 95% less in the stratosphere compared to ground level. **Hypothesis**



Design the following:

- a) A **hypothesis** related to today's workshop?
- b) A **purpose** related to today's workshop?
- c) A **question** related to today's workshop?