I. SCIENCE, RESEARCH & SCIENTIFIC METHODS

CHAPTER I
SCIENCE, RESEARCH & SCIENTIFIC METHODS

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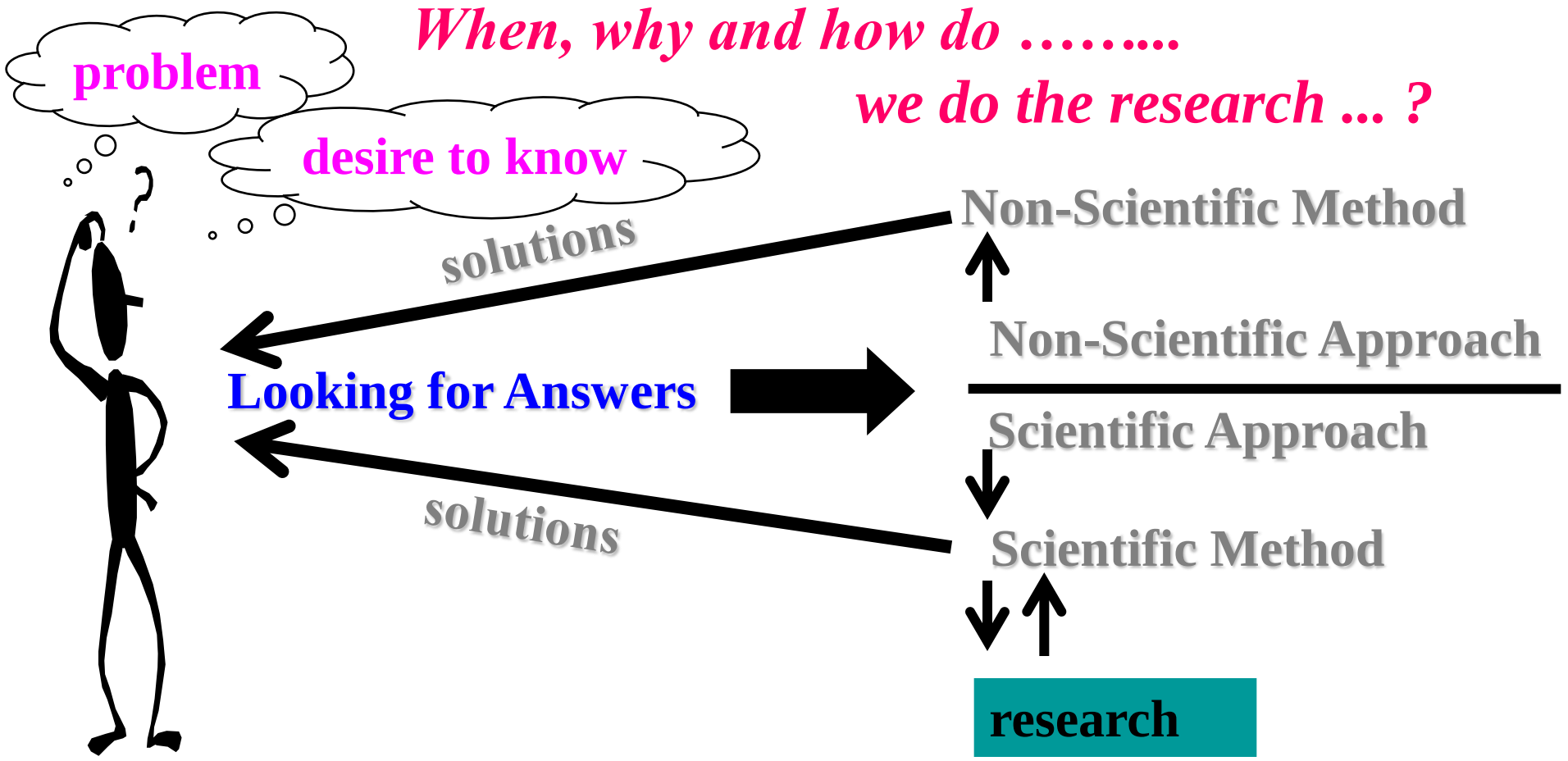

Example :

"Amir stomach ache for a week"

Scientific approach:

- Search for data in the field
  is Amir eat?
- See a doctor
- laboratory tests
- treatment
- conclusion:
  Amir Poisoning

Non-Scientific approach:

- Go to the shaman
- healing
- conclusion:
  Amir hit hexes of friend / enemy

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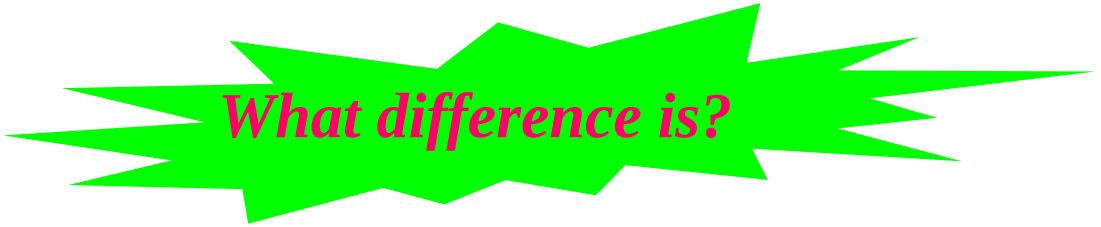
Scientific approach:

- **Formulation of clear and specific problems**
- **Problem is things that can be observed and measured empirically**
- **Answer to the problem based on the data**
- **The process of collecting and analyzing data, and making decisions based on correct logic**
- **Conclusion ready / open to be tested by others**

example:

- **Use of the Scientific Method**



Non-Scientific Approach:

- Vague formulation or abstract
- The problem is not always empirically measured and can be supernatural / dogmatic
- The answer is not obtained from data observation in the field
- The decision is not based on the collection and analysis of data logically
- Conclusions are not made to be retested by others

example:

- The use of common sense, prejudice, intuition, discovery by chance and trial and error,
- opinion of scientific authority and critical thinking

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What Is The Science ?

Science:

- **Building or accumulation of knowledge gained throughout the history of human knowledge**
  - ➔ Science considered as a "product"
  - ➔ Example: Einstien with his theory of relativity
    Newton's theory of style etc.

- **The knowledge gained through scientific procedures (Scientific Method)**
  - ➔ Science considered as a "process", derived logically (basic and rational deductive reason) to explain the symptoms and tested empirically so is open
  - ➔ Example: The birth of computer science and technology

What is "Scientific Method" ?

Scientific method is a mechanism or a way to get the knowledge
with based procedures on a logical structure
that consists of two phases of work:

- ❑ the need for objective
- ❑ formulation of the problem
- ❑ collection theory
- ❑ formulation of hypotheses
- ❑ collection of data / information / facts
- ❑ data analysis
- ❑ conclusion

➔ called ***logic-hypothetic-verification*** cycle

Nature of Scientific Method:

- Efficientcy of resources use (labor, cost, time)
- Open (can be used by anyone)
- Tested (logical procedure in obtaining a decision)

Mindset of the Scientific Method:

- **Inductive**

  Making the conclusion of a case that is specifically into general conclusions

- **Deductive**

  Making the conclusion of a general nature to be the case of a special nature

Example

Inductive :

	Plants will die		(special)
	Animals will die		(special)
	Humans will die		(special)
conclusion	:	All living things will die	(general)

Deductive:

	All humans will die		(general)
	Aris is a human		(special)
Conclusion	:	Aris will die	(special)

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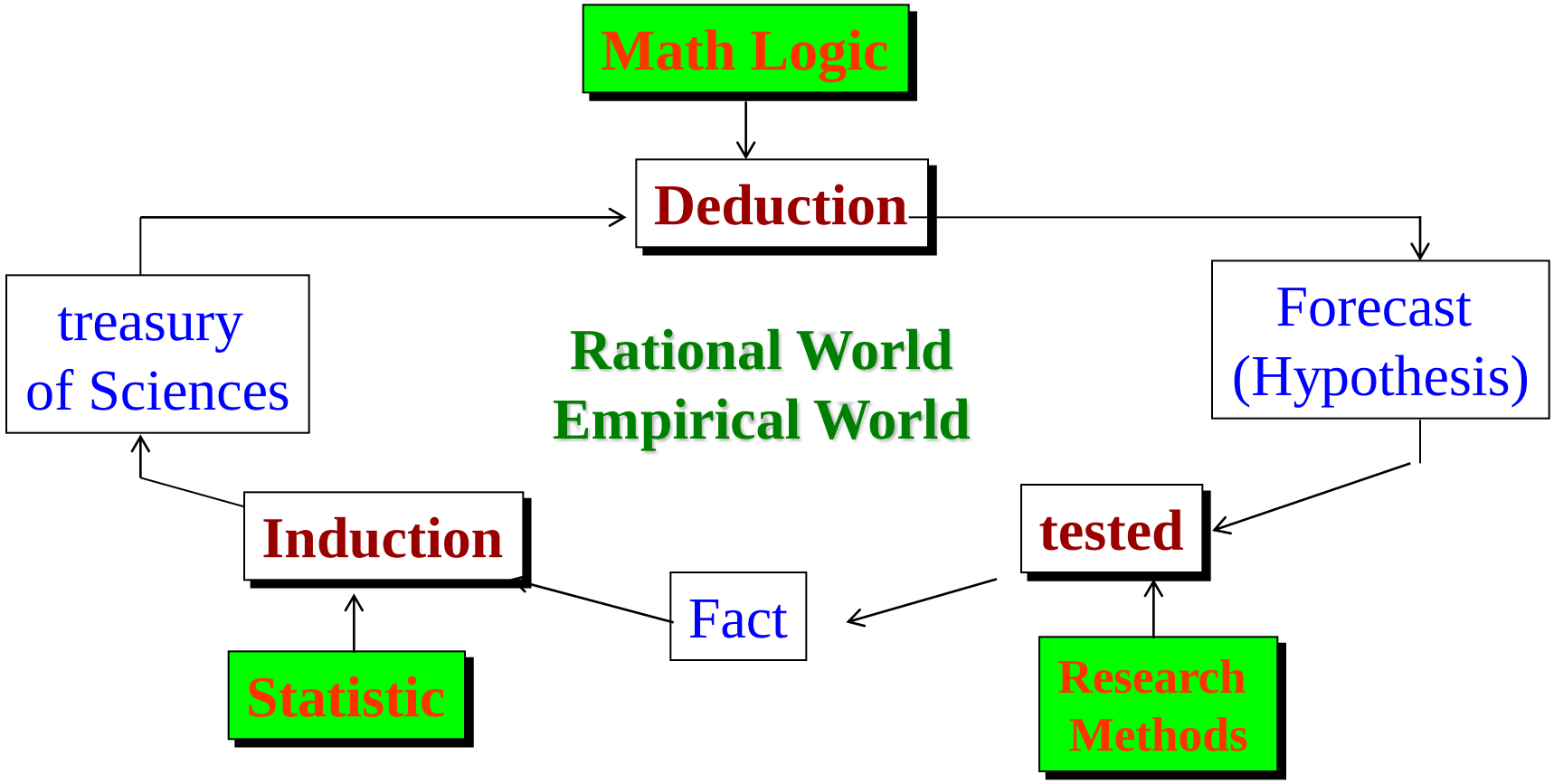
Scientific Thinking Means



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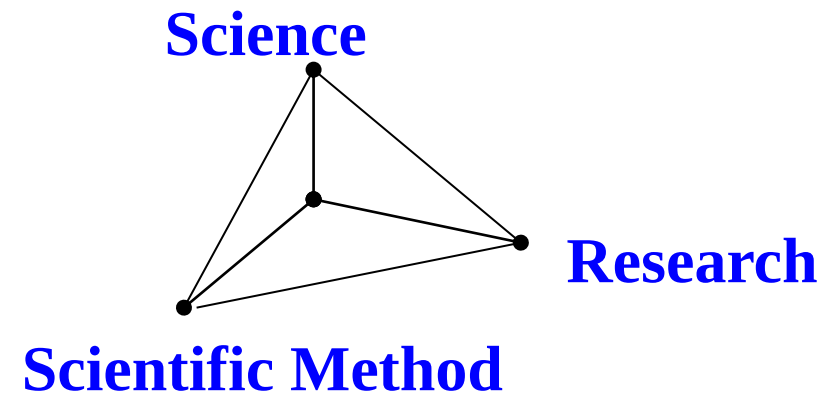
Conclusion :

Scientific method into the basic framework of research activities, which in the study will include the application of the scientific method



linkage Chart
Science, Research & Scientific Methods

I. SCIENCE, RESEARCH & SCIENTIFIC METHODS

Science and research tasks:

1. Entered a description
   Illustrates clearly and carefully the things in question
2. Explain / explanation
   Describe the conditions that underlie events or symptoms
3. Constructing Theory
   Finding and formulating laws concerning the relationship between the conditions with one another or relationship events with one another
4. Making Prediction / Forecasting
   Make predictions, estimates and projections about the events that might happen or symptoms that will appear
5. Perform Control
   Take steps to control the events or symptoms