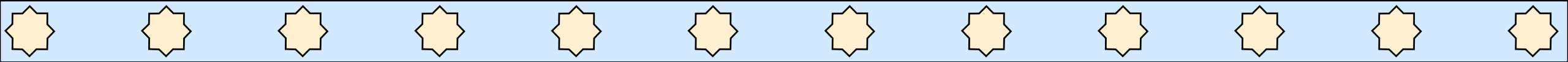


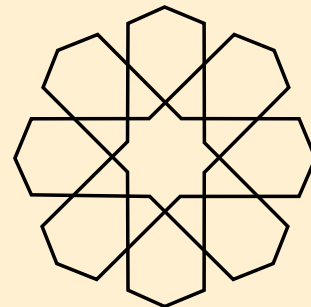
# Scientific Method for Wikimedians

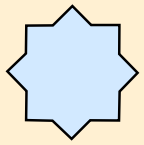
## Research Methodology



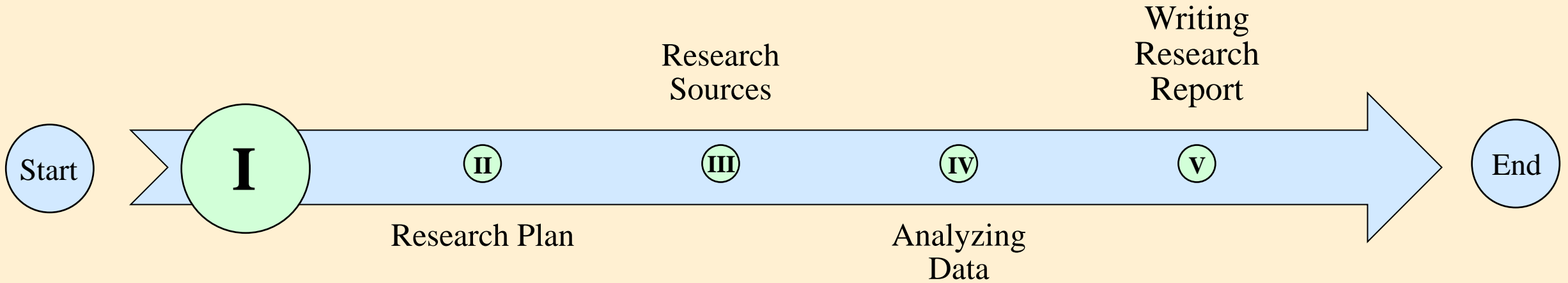
**Michel BAKNI**

**2023**





# Course Structure



## Part I: Knowledge & Scientific Method

**Chapter 1:** Knowledge & its types

**Chapter 3:** Research Methodology

**Chapter 2:** Scientific facts

**Chapter 4:** Scientific Methods

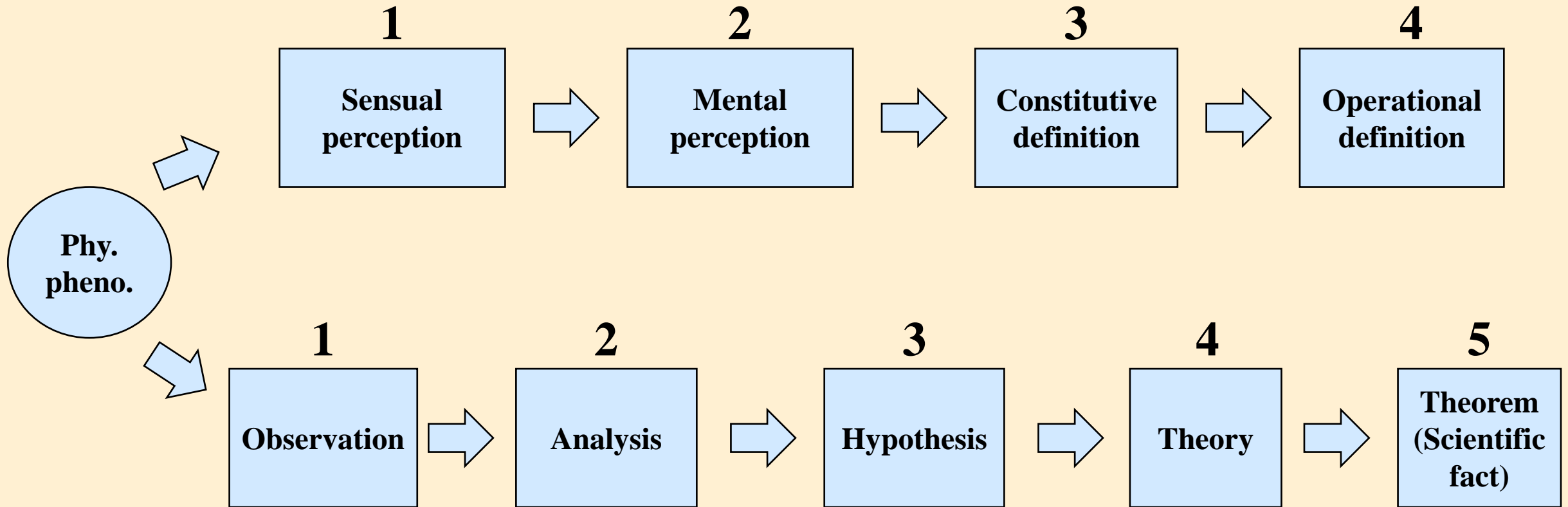
**Chapter 5:** Research Question



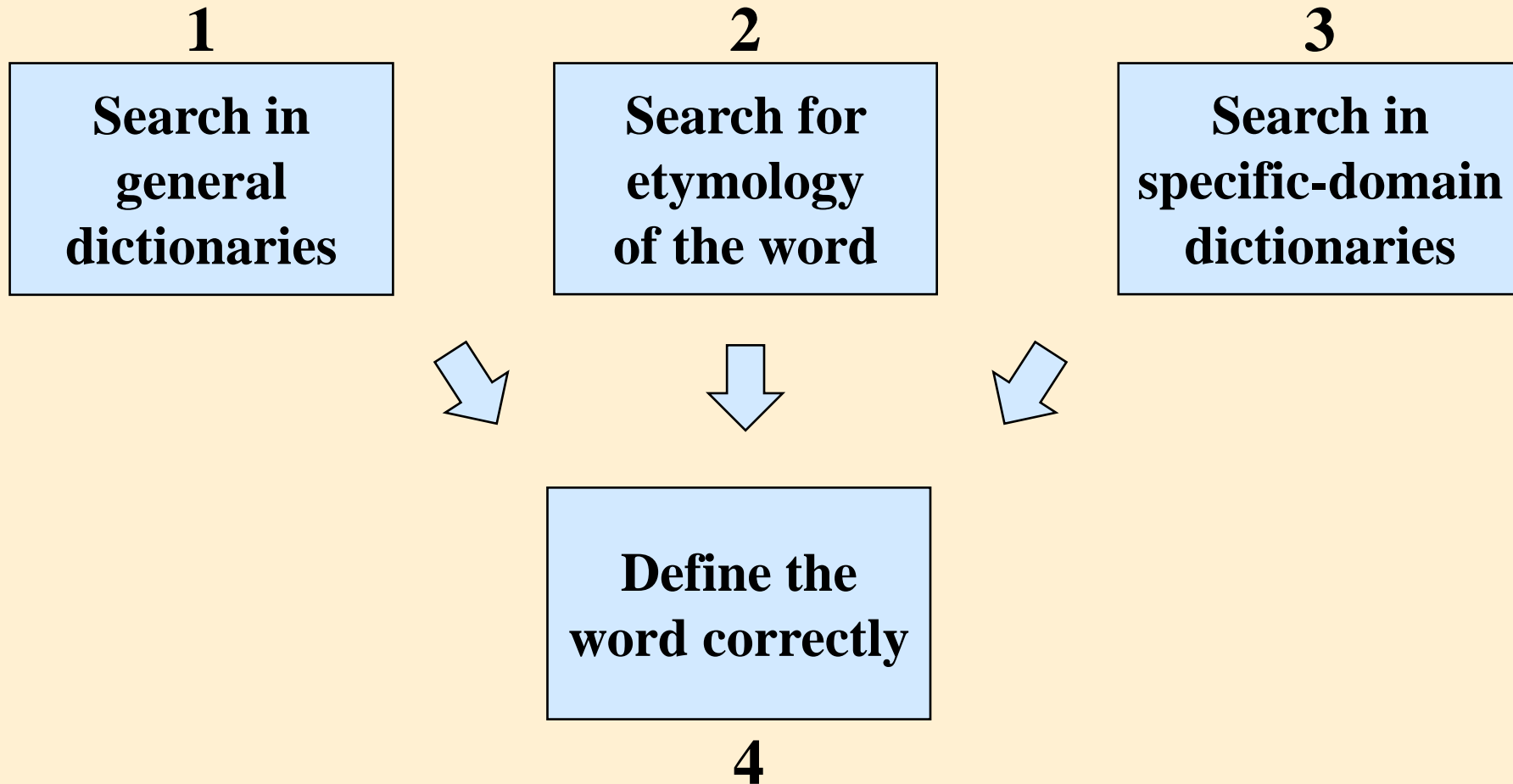
# Outlines

- ★ **Method vs. methodology**
- ★ **Classification of research methods**
- ★ **Styles of methods**
- ★ **Notes on research method & methodology**

# I Method vs. Methodology: Reminder



# **I** Method vs. Methodology: Reminder





# **I Method vs. Methodology**

**Method (Common sense):**

**“ Particular way of doing something ”**

Oxford Learner’s dictionaries

**“ Particular way of doing something ”**

Cambridge dictionary

**“ Way, technique, or process of or for doing something ”**

Merriam webster dictionary

# I Method vs. Methodology

method → { Early 15<sup>th</sup> century | Regular, systematic treatment of disease  
Late 17<sup>th</sup> century | System or complete rules set for attaining end



Methodus\* → “inquiry, investigation”

Latin



methodos → “Pursuit, a following after”

Greek

meta “in pursuit | quest of”  
metaphor

hodos “system | way”  
manner

Exodus

Episode

Diode

# **I Method vs. Methodology**

## **Methodology (Common sense):**

**“Set of methods and principles used to perform a particular activity”**

Oxford Learner’s dictionaries

**“System of ways of doing, teaching, or studying something”**

Cambridge dictionary

**“Body of methods, rules, and postulates employed by a discipline”**

Merriam webster dictionary



# I Method vs. Methodology

methodology\* → méthodologie (French) → methodologia (Latin)

1800 | branch of logic that shows how abstract logical principles are to be applied to the production of knowledge

Methodology  
↙ ↘  
Method -ology

“ branch of knowledge ”  
science

Biology Geology Egyptology



# I Method vs. Methodology

## ★ What is the exact definition of a research method?

- ◆ **Research methods are the strategies, processes or techniques utilized in the collection of data or evidence for analysis in order to uncover new information or create better understanding of a topic.**

**Research guide  
University of Newcastle\***

## ★ What is the exact definition of a methodology?

- ◆ **The branch of philosophy of science that explores the methods by which science arrives at its posited truths and critically explores rationales for these methods**

**p. 820  
The Cambridge dictionary  
of philosophy (2015)  
ISBN 1-107-01505-7**

## II Classification of Research Methods

★ **Descriptive** describe objects scientifically

◆ **Documentary** → Historical, taxonomy & religion ...

◆ **Contemporary** → cartography, astronomy ...

★ **Deductive** General laws ==> simple, specific

→ Humanities, law, linguistics ...

★ **Inductive** Simple, specific ==> general laws

◆ **Mental** → Philosophy, logic, mathematics ...

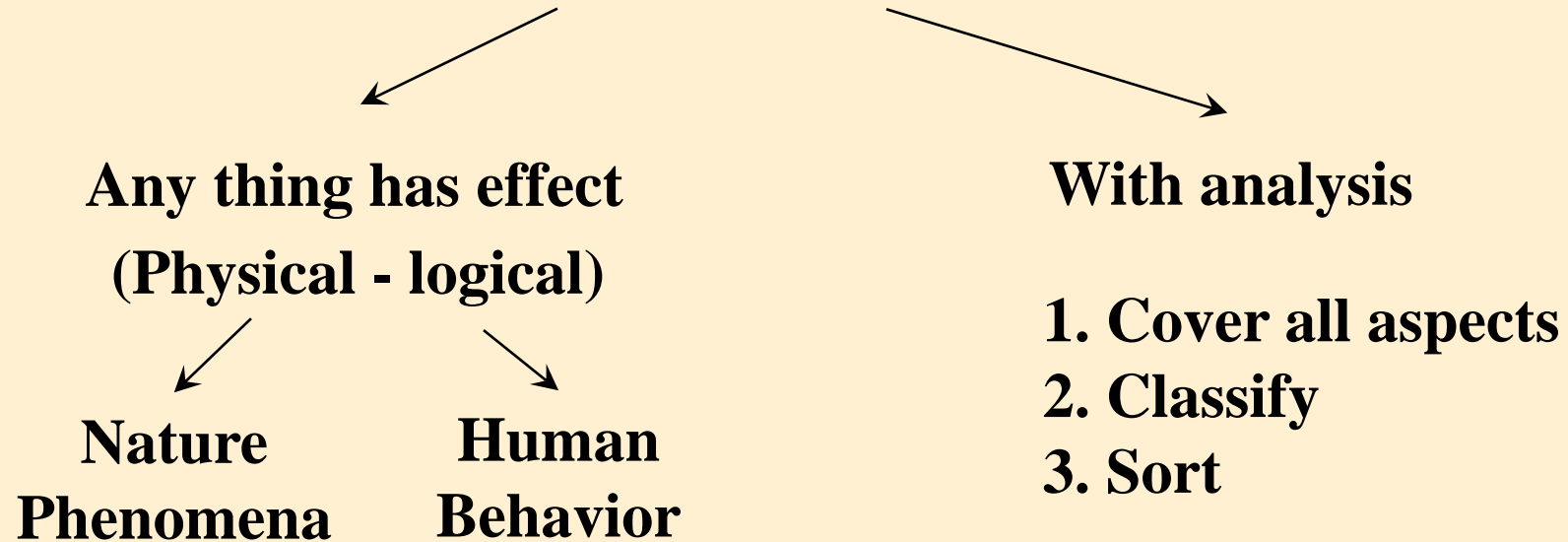
◆ **Sensory** → Applied sciences: Physics, chemistry & engineering ...

**Not a strict  
classification!**

## II Classification of Research Methods

### ★ Descriptive methods

★ Objective: describe objects scientifically



★ Can include inductive steps, but overall descriptive

## II Classification of Research Methods

### ★ Descriptive methods subclassification

- ★ **Documentary:** describe what happen as it is using objects of past
- ★ **Contemporary:** describe what is happening as it is using objects of present

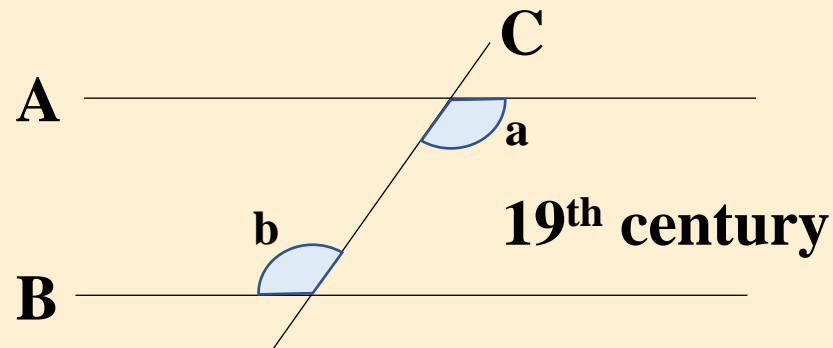
### Example 1: Religious - Hadith studies

Study what is believed  
Prophet words

Strict & clear System

Set of postulates

?Postulates?



No problem having  
postulates

Clear from beginning

Not created to  
manipulate results

## **II Classification of Research Methods**

### **★ Descriptive methods subclassification**

- ★ Documentary: describe what happen as it is using objects of past**
- ★ Contemporary: describe what is happening as it is using objects of present**

### **Example 2: Historical Method**

**Validate objects & events**

**Find original shape & story**

**History is not telling story**

**Example: How do we know that Alexander the Great or Bilbo Baggins did exist?**

**1. Physical remains**

**2. Remaining object**

**3. Contemporary sources**

## II Classification of Research Methods

### ★ Descriptive methods subclassification

- ◆ **Documentary:** describe what happen as it is using objects of past
- ◆ **Contemporary:** describe what is happening as it is using objects of present

### Example 3: Taxonomy

Classify life forms

Based on functions, shapes ...

Build a Classification system

Are bats birds?



[NPS PD]

Are whales fishes?



[Howcheng CC BY SA 2.0]

Are fungi plants?

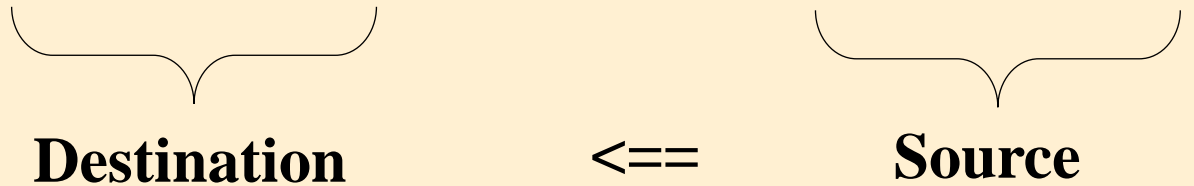


[Tbc PD]

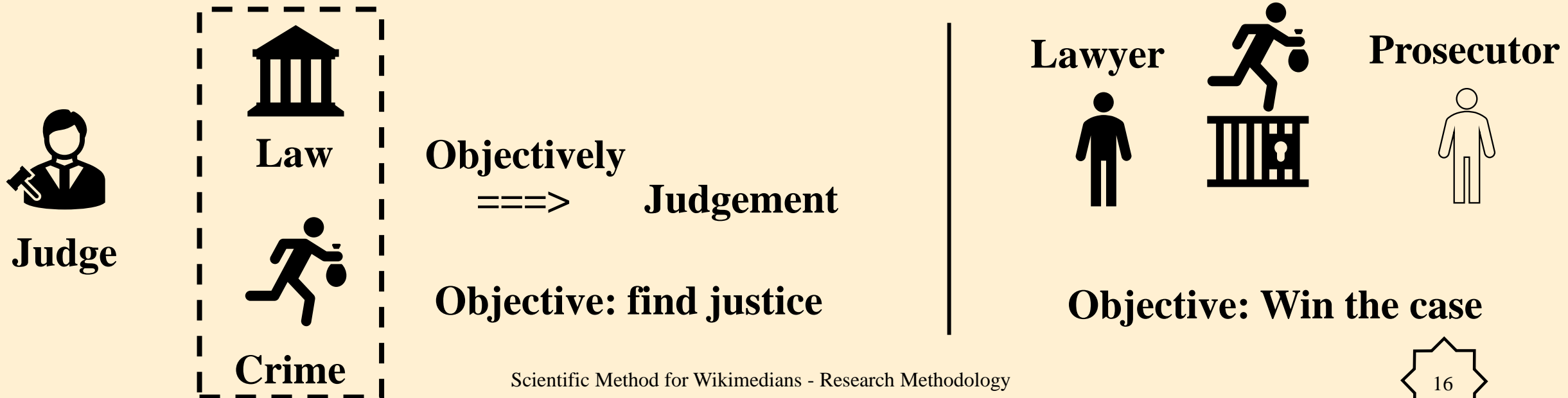
## II Classification of Research Methods

### ★ Deductive methods

★ Objective: Find a solution for a specific problem starting from general facts



### Example: Justice in modern courts

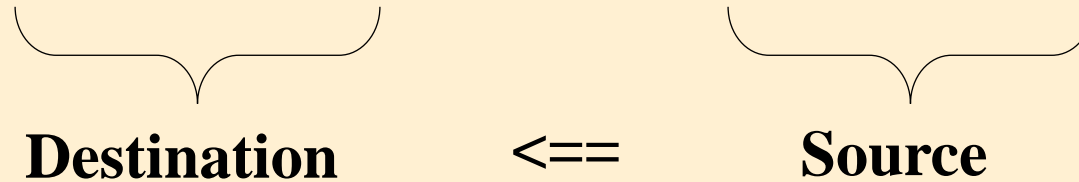




## II Classification of Research Methods

### ★ Inductive methods

★ **Objective: Find natural laws starting from simple facts**



### ★ Subclassification

★ **Mental inductive**    Mental effort | based on logic & reason

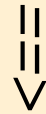
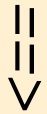
★ **Sensory inductive**    Physical effort | based on observation & experiment



# Classification of Research Methods

## Example 1: Mathematics

$$0 + 1 + 2 \dots n = \frac{n(n+1)}{2}$$



$n = 3$        $1+2+3 = 6$        $[3(3+1)]/2 = 12/2 = 6$

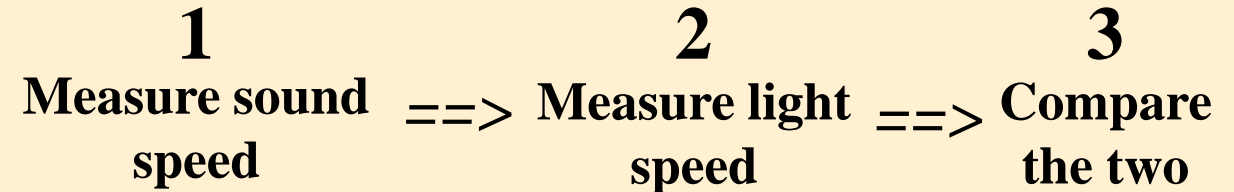
Correct for all  
natural values of n?

★ **Completely mental**

**Mathematical induction**

## Example 2: Physics

Which is faster,  
sound or light?



★ **Based on observation  
& experiments**

# **III Styles of Methods**

**★ Literary**    **Focuses on creativity**

→    **Writing, cinema, art ...**

**★ Scientific**    **Focuses on facts**

→    **Applied sciences, humanities ...**

◆ **Quantitative**    **Numerical data**

◆ **Qualitative**    **Nominal data**

**★ Promotive**    **Focuses on emotions & facts**

→    **Marketing, religious ...**

# III Styles of Methods: Literary

★ **Literary** → Focuses on creativity | Writing, cinema, art ...

- ◆ **Objective: Express feelings, moral lessons, effect human behavior**
- ◆ **Subjective: can be interpreted differently**
- ◆ **Address emotion & build on imagination**
- ◆ **Indirect & implicit**
- ◆ **Importance: take audience out of reality => changes based on the audience**

# III Styles of Methods: Scientific

★ **Scientific** → Focuses on facts | answer questions objectively | Applied sciences, humanities ...

★ **Address mind using logic & reason**

★ **Objective: follow facts = > interpreted same way**

★ **Importance: attract followers or clients | validity of the results**

★ **Qualitative:**

Data: lived experiences, emotions & behaviours

Objective: complex concepts, social interactions  
& cultural phenomena

Use: exploration how or why things occurred,  
interpreting events & describing actions

★ **Quantitative:**

Data: numerical data (ranked, measured & categorized)

Objective: discover patterns & relationships

Use: finding out how many, how much, how often, or to  
what extent.

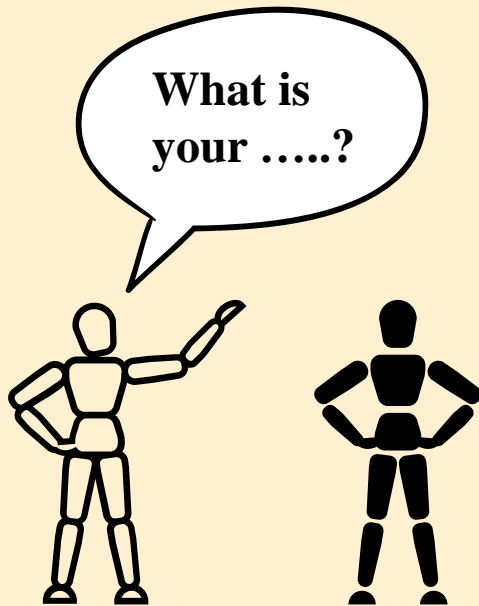
# III Styles of Methods: Scientific

## ★ Research tools: quantitative Vs qualitative:

Quantitative	Qualitative
<b>Surveys</b> Closed questions (set of answers) - large number - numeric data	<b>Interviews</b> Open questions & discussion - limited group - extract descriptive details
<b>Observation</b> Numbers, frequencies, statics	<b>Observation</b> Behavior, roles, needs
<b>Documents</b> screening: numerical data	<b>Documents</b> analysis: letters, diaries, emails & reports
<b>Experiments</b> physical tests	<b>life stories</b> Remembrances, memories & experiences

### III Styles of Methods: Scientific

★ Example: quantitative Vs qualitative: Information from a person



Quantitative	Qualitative
Age	Name
Weight	Gender
Height	Spoken languages
Shoes size	Personal status
Annual income	Learning paths

# III Styles of Methods

★ **Promotive** → facts & emotions | answer questions subjectively | marketing, religious

★ **Objective: call people to adopt an idea**

✧ Buy a product

✧ Follow a religion

✧ Support a political party

★ **Address both mind & emotion**

★ **Importance: attract followers or clients | validity of the promotion**





# IV Notes on Research Method & Methodology

✦ **Method  $\neq$  Methodology**

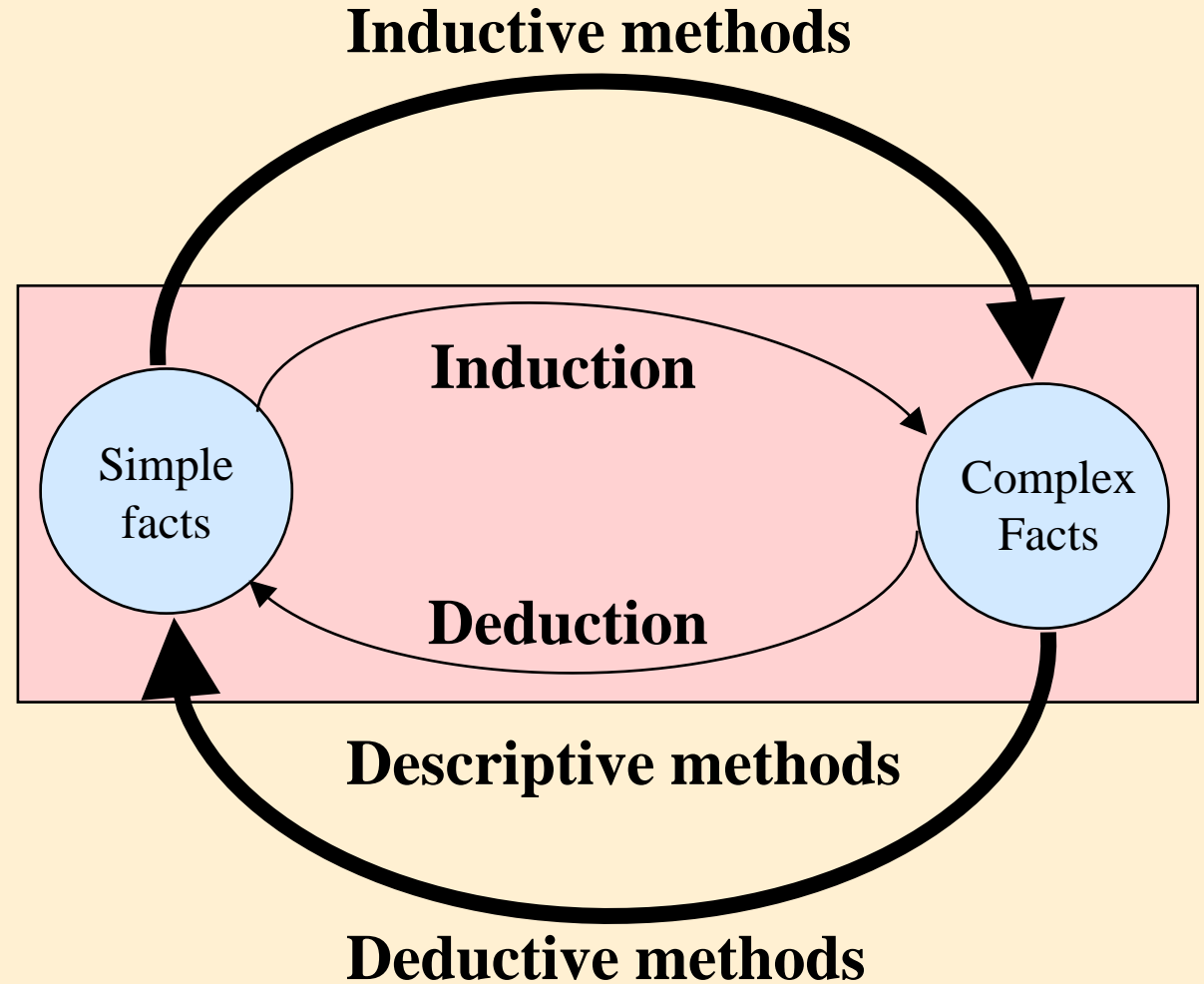
✦ **Not fully independent methods**

✦ **Not all styles are suitable**

✦ **Literary** ✗

✦ **Promotive** ✗

✦ **Scientific** ✓



**Course Title:** Scientific Method for Wikimedians

**Course Creator:** Michel BAKNI

**Video Title:** Research Methodology

**Film Editing :** Sandra HANBO

**Date:** February 2023



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