

Common Methods of Acquiring the knowledge:

What is the Science ...?



By Mohsen Al-Saleh

S20944-23

Introduction: “The Story”

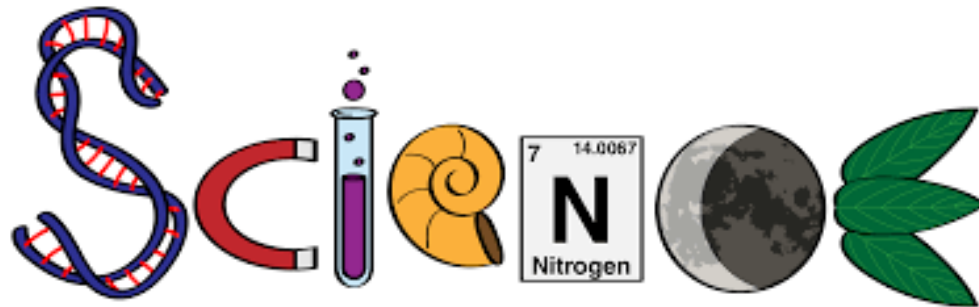
After Graduation: BSc. 2004

Started to work as real estate broker with capital of 3 OMR/months

Paper/GSM→PC (Database)→ Internet(Webserver)

In 2005: “ What is actual price value for a residential plot in Muscat/Seeb/Al-Khoudh/Phase 6 ? !” I asked

“How do people decide which price is valid”



- **What is the Science and Scientific Approach?**
- **Science** is the way of thinking (logic used), asking and answering the questions about the nature. (accumulative knowledge)
- **Science** is a process of gaining knowledge, it has its tools, limitation, precision
- **Science** is a process of formulating specific questions and then finding answers in order to gain a better understanding of nature

Science is a product of “research”

Tenacity: القدرة على تذكر او الاصرار

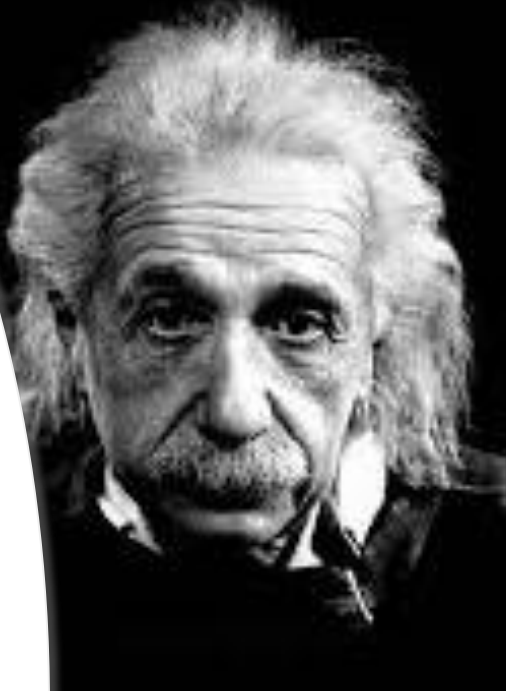
- A willingness to accept ideas as valid because they have been accepted for so long or repeated so often that they seem true. With no objections
- There is no demand to check for accuracy of the idea (Not logic)
- It has been always been so...
- **Examples;** Advertisements, Sales offers on TV, Political campaigning





Intuition: الحدس السريع او البديهية المفرطة

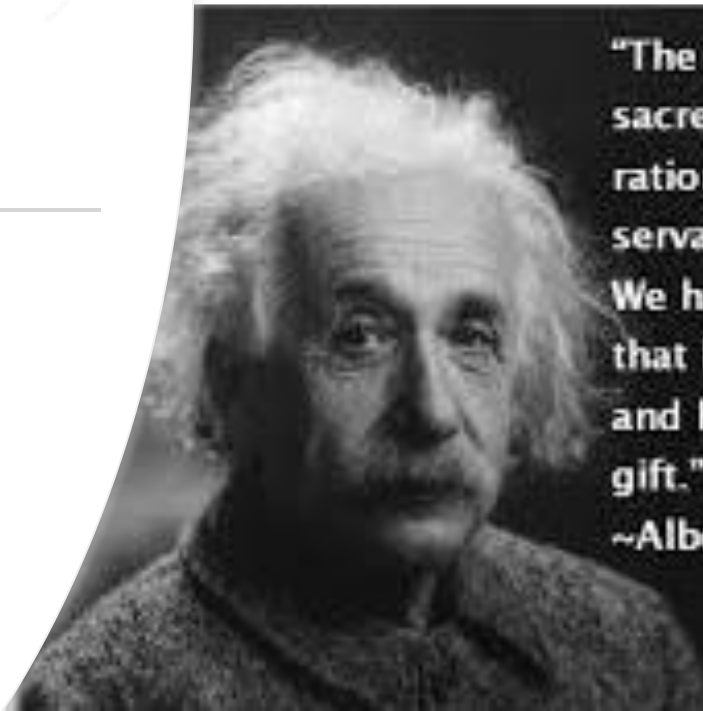
- Rapid assessment based on unexamined experience, attitudes, feelings and it can lead to errors
- It is good for questioning – because you “**feel**” it’s true
- Without sensory process or rational thoughts or examinations
- **Example;** police detective, extra-sensory perception, liking or disliking a person from first seen
- It uses hunches and guts feelings



“The only
real valuable
thing is
intuition.”

-Albert Einstein

Intuition:



“The intuitive mind is a
sacred gift and the
rational mind is a faithful
servant.

We have created a society
that honors the servant
and has forgotten the
gift.”

~Albert Einstein~

Authority:

المرجعية

- Is the acceptance of an idea as valid knowledge because some respected sources
- **Examples;** Religious writing, Court order, President's degree, Pop, if they claim some things



*Leonardo da Vinci (1452-1519) was scientist, painter, musician ,and anatomist, Galileo, Charles Darwin (1809-1882)-Origin of Species, Alfred Russel Wallace(1823-1913)-Naturalist; **threatened the church!***

Tenacity, Intuition, and Authority

(1) Make few demands on information

(2) Require minimal process

(3) Easy to state or to claim

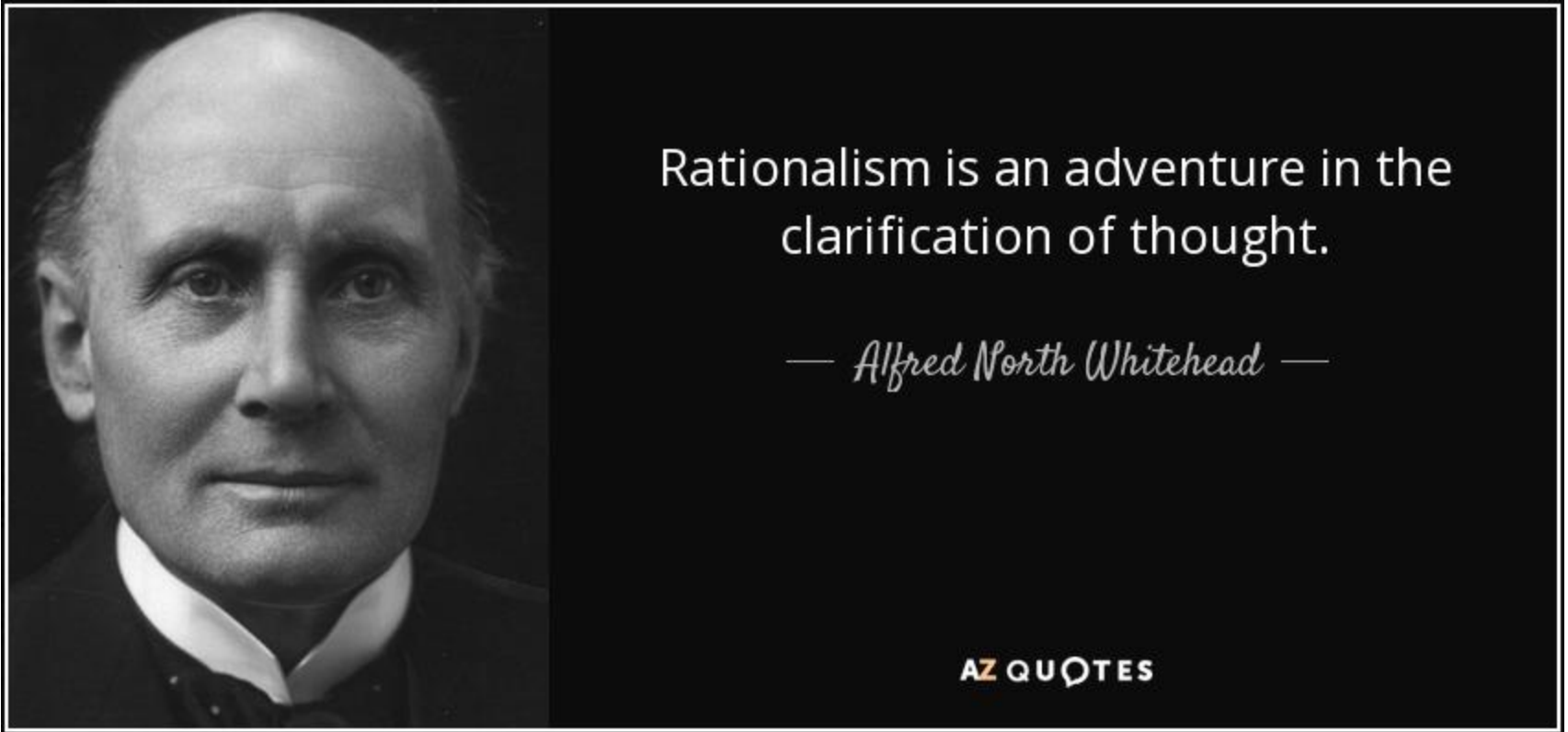
(4) All of them share an uncritical acceptance of the information and conclusions

Rationalism: العقلانية

- Developing valid ideas by using existing ideas and principles of logic
- Knowledge is developed **through reasoning** and information is carefully stated and logical results are followed to arrive at acceptable conclusion
- The hypothesis is tested empirically but built up by rationalism with correct conclusion, **reasoning process**, and **accuracy of premises** = hypothesis
- To make sense of it is in your mind but it has limitations



Rationalism: العقلانية

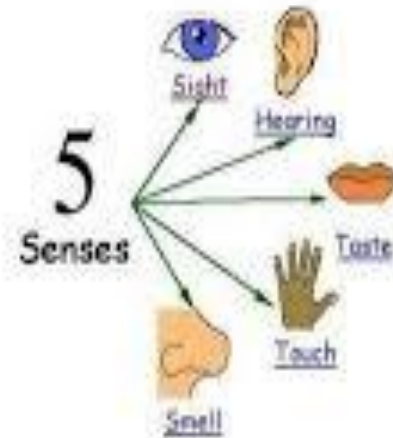


Socrates and his followers used highly develop system to ask the questions? Over 2400 yrs ago

Empiricism: التجربة العلمية

- Gaining knowledge through observation by experiencing and using our senses
- Has limitations and as old as civilization
- **Example;** I won't believe unless I see it- all old scientist applied this form of method, Arabs were leaders/pioneers on that
- Empiricism needs to be integrated with rational thought
- There are Naïve and sophisticated empiricism
- Experimentation is the best way to prove

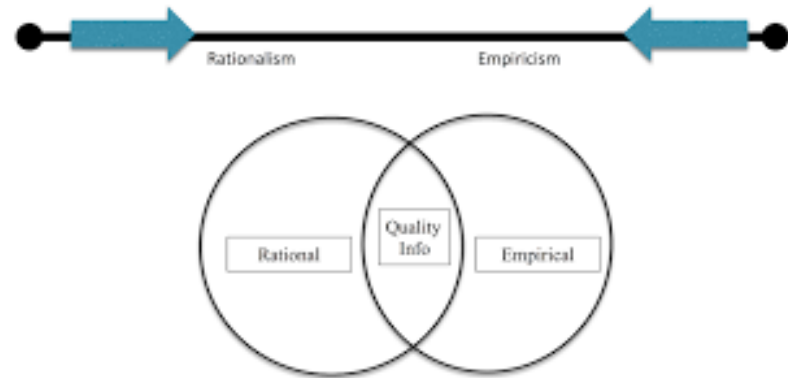
Empiricism



Ideas and knowledge develop in our minds as a result of our sensory experiences.

Science: العلم

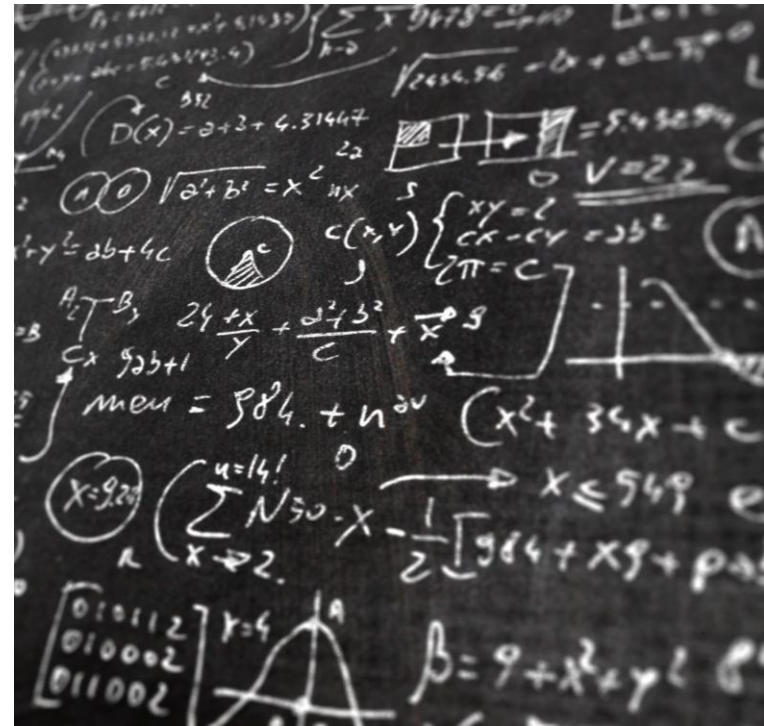
- A process that combines the principles of **rationalism** with process of **empiricism** using rationalism to develop theories and empiricism to test the theories.



Thales (CA. 640-550) was the first Greek philosopher to combine an empirical-rational view of the universe and Known as father of Science.

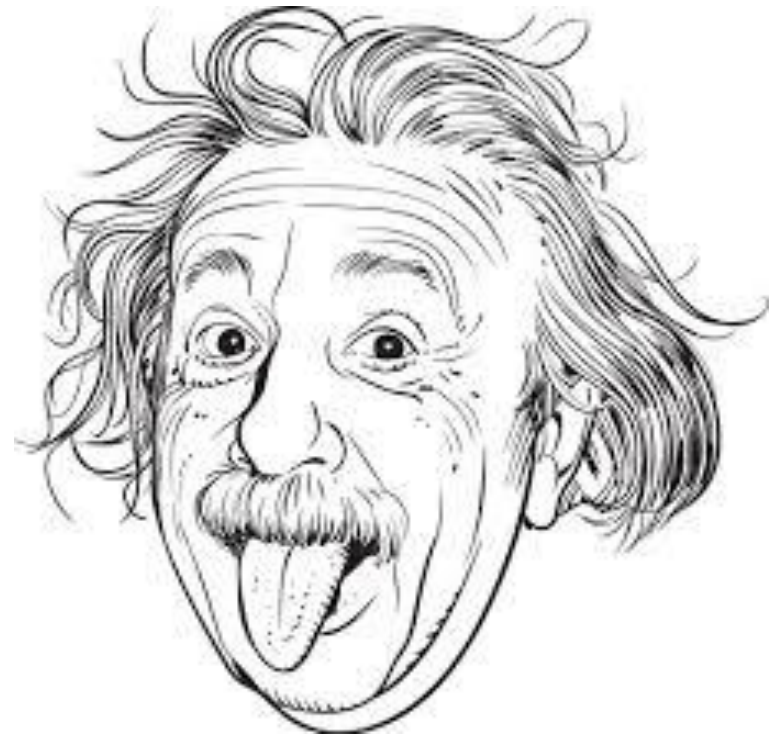
The Essence of Science

“The essence of the modern science is the way of thinking, the disciplined way in which questions are posed and answered in order to understand natural events. It is logical processes and demands for evidence, and **not** the technologies that characterize science. It is an intellectual process, and its ultimate goal is to understand the natural universe” (Staddon & Bueno, 1991).



Characteristics of a Scientist :

- **Curiosity**; may have killed the cat, according to the old saying, but curiosity sustains the scientists (J. Robert Oppenheimer (1956))
- **Skepticism**
- **Focus**. B. F. Skinner 1956 “When you run on to something interesting, drop everything else and study it”.
- **Creativity**
- **Tolerance of ambiguity** "تحمل الغموض"
- **Commitment to hard work**
- **Logical thinking**



Serendipitous

- Accidental discoveries
- **Anton Van Leeuwenhoek's** single most important discovery was the existence of single-cell organisms. While using a microscope to examine pond water in 1674, he observed dozens of protists, which he called 'animalcules,' as well as green algae
- Albert Szent-G. “Discovery is an accident meeting of a prepared mind”
- ASP (Acylation Stimulating Protein) discovered by chance via electrophoresis.
- **Louis Pasteur** = accidentally discovered penicillin.

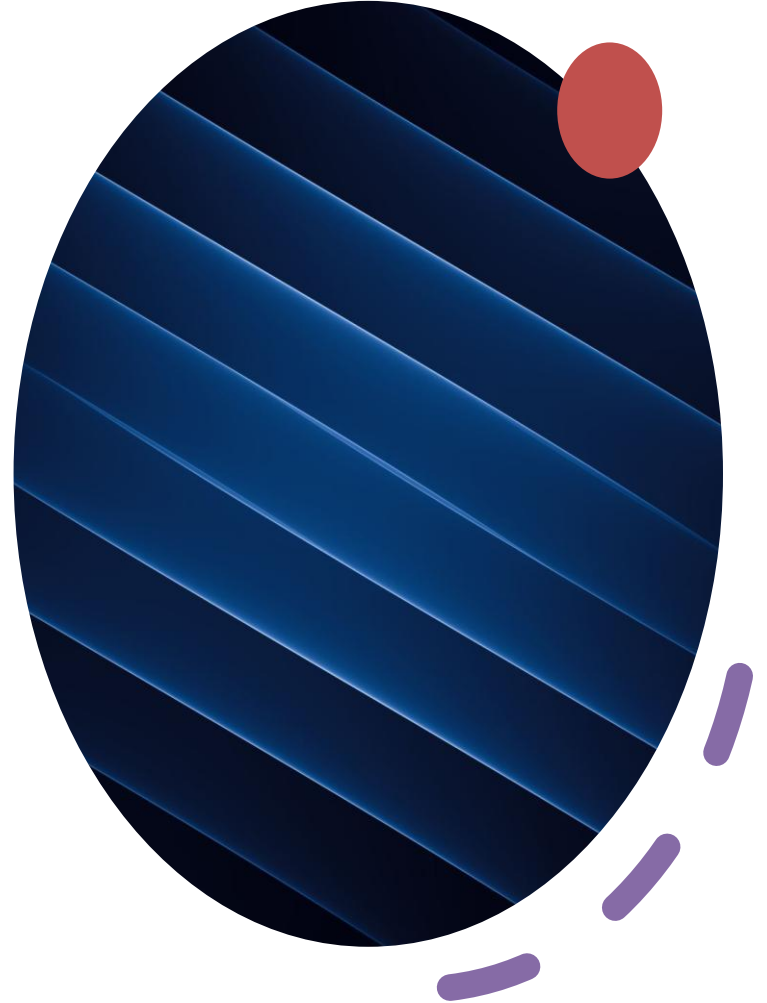


Orderliness belief (Whitehead 1925)

The universe operates in an orderly, lawful manner. If it did not or if we did not hold this belief there, **then could be no science**. If the universe were not orderly and predictable, it would not stay the same long enough to be studied and measured.

(وَهُوَ الَّذِي خَلَقَ اللَّيْلَ وَالنَّهَارَ وَالشَّمْسَ وَالْقَمَرَ كُلٌّ فِي فَلَكٍ يَسْبَحُونَ) - سورة الأنبياء الآية رقم 33

يعني الشمس والقمر والنجوم والكواكب والليل والنهار في فلك يسبحون أي يجرون ويسيروا بسرعة كالسباح في الماء . قال الله تعالى وهو أصدق القائلين : والسباحات سبحا ويقال للفرس الذي يمد يده في الجري سباح



Science & Nature

- Scientist share some basic assumptions about the nature:
 1. A true, **physical universe** exists
 2. While there may be randomness and thus unpredictability in the universe, it is primarily an **orderly system**
 3. The principles of this orderly universe can be **discovered**, particularly through **scientific research**
 4. Our knowledge about the universe is always incomplete. New knowledge can, and should, alter current ideas and theories. Therefore, all knowledge and theories are **tentative. (Theory of Falsification)**

Pseudo-Science:

- It uses unscientific methods, theories, assumptions, and conclusions that pretend to be scientific. You find it in a TV advertisers, books, manuals, tapes, computer programs, GSMs. **They are empty** or make-believe science.
- How to recognize the pseudoscience:
 1. What is the nature of evidence?
 2. In what form evidence is reported and made to public?
 3. Where this scientist is from?
- **Hippocrates (450 B.C.)** no exorcism, demons, or spirits caused the illness.



ST. DUNSTAN AND THE DEVIL.

Methods of Frauds in Scientific Research:

- **Hoaxing:** Publishing something which is never happened or exist. In 1788, there is animal new creature in Malta???! (Just want to publish!)
- **Forging:** Is someone who wants to gain reputation in science by recording observation which has never been made
- **Trimming:** Clipping off little bit here and there from observations – anything which is differ from the mean. Averages may remain the same, but he wants to gain accuracy in making observations
- **Cooking:** Producing a very big multitude of observations and out of these he/she selects those which only suit his/her interest.
- **Obfuscation:** This newly came in science field, and it's intended to make something obscure or to hide real information by making long paragraphs, long sentences, usage of difficult long words in English.

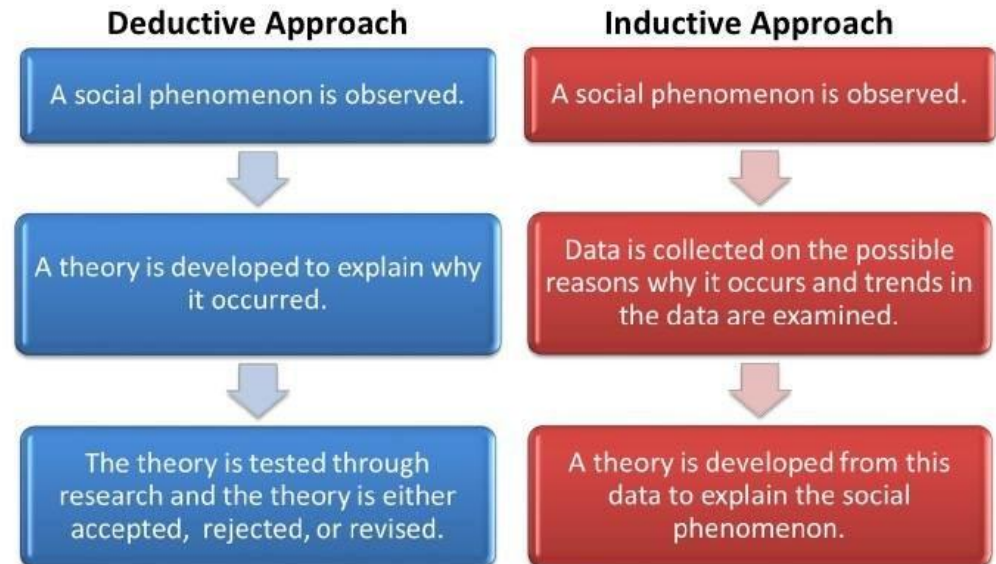
Declaration of Helsinki (1964)

- It's unethical to conduct research which badly planned or poorly executed
- Research should be based on generally accepted scientific principles
- Not to harm the environment and animals
- Should contain ethical considerations
- Not to kill animals just for research or to do clinical trials on human
- Reports or results of experimentation not match with the principle used should not be published
- Research should have predicable risks

Hypothetical deductive & inductive method

- Philosopher **Karl Popper** proposed that proper science is accomplished by deductive method.
- Deduction involves the process of **falsification**.

Deductive and Inductive Approaches



Popper's version of scientific method first begins with the postulation of a **hypothesis**. A hypothesis is an educated guess or a theory that explains some phenomenon. The researcher then tries to prove or test this scientific theory false through **prediction** or **experimentation**

Research Involves:

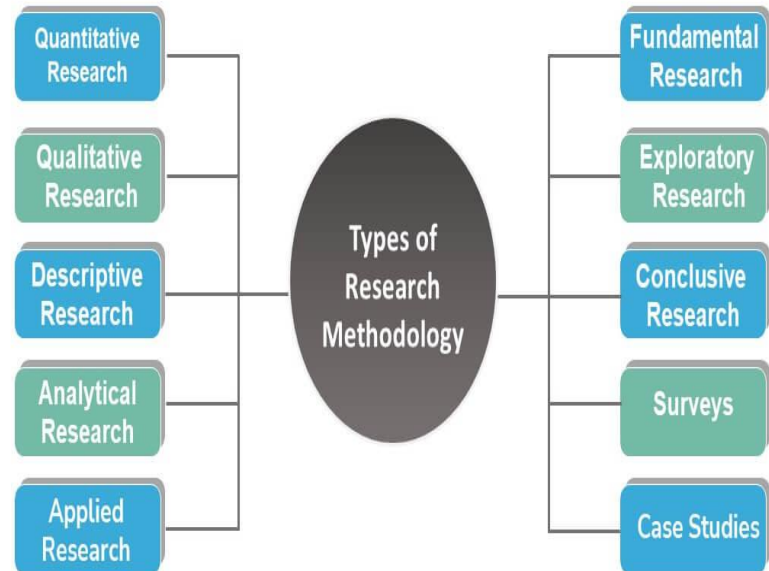
- Systematic
- Control
- **Empirical**
- Critical observation
- **Guided by theory**



Type of researches:

- 1. **Basic:** It's fundamental or pure. Which focus on new things by theoretical aspects, difficult to fund? Gravity if exist? Again.
- 2. **Applied:** to solve real life problems, easy to found, putting research on applications.
- 3. **Action:** No control involved and immediate.
- 4. **Replication:** two same research on different places to test generalization

Types of Research Methodology



*Not all research is scientific, what differ scientific research from other research is the using of both **rational** and **empirical** processes.*

Methods used to acquire information about the land prices in local market:

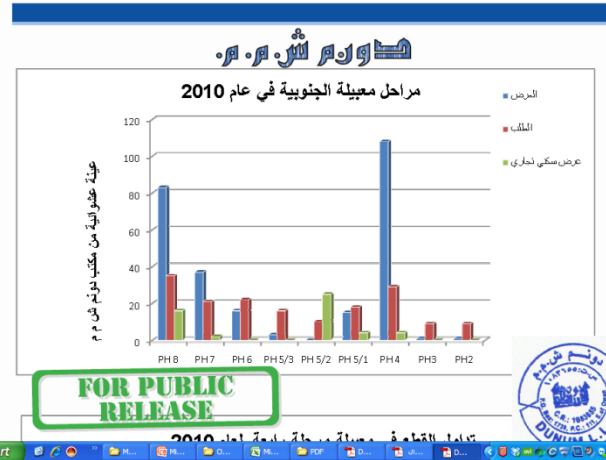
Methods	What it means	Who used it
Tenacity	A willing to accept ideas as valid because they have been there for so long or repeated so often that they seem true	Fresh or beginners' (buyers/sellers/Investors) who have no or little experience in the field
Intuition	Rapid assessment based on unexamined experience, attitudes, feelings	Mainly are brokers, agents who work in the field
Authority	Acceptance of an idea as valid knowledge because of some respected sources	Ministry, banks, finance companies or law makers
Rationalism	Developing valid Ideas by using existing ideas and principle of logic	Only very few experienced brokers , Very Basic approach
Empiricism	Gaining Knowledge through observation by experiencing and using senses	Concept of Database & algorithm

The Concept of Database

Serial Number	OBA (1)	OBA (2)	OBA (3)	Plot #	Size in (m)	Usage	Shape	MC%	Dunum Rat	Price in OMR	Price
1	بدر السبيعي	سليمان الصبحر		1152	600.000	Residential	Corner	3%	#####	8,500.000	OMR
2	بدر السبيعي			494	600.000	Residential		3%	#####	12,000.000	OMR
3	ابراهيم الوهبي			1512	600.000	Residential		3%	#####	9,000.000	OMR
4	خديجة بن مهنا المعصري	بدر السبيعي		516	600.000	Residential		3%	#####	12,000.000	OMR
5	حمدان النقيعي	اد محمد	جمال الرميح	431	600.000	Residential	Middle	3%	#####	10,500.000	OMR
6	حمدان النقيعي			653	600.000	Residential	Corner	3%	#####	11,000.000	OMR
7	هدال اليوسفي	هدال اليوسفي	حمدان النقيعي	152	600.000	Residential	Semi-Corner	3%	#####	8,500.000	OMR
8	حمدان النقيعي			89	774.000	Residential	At Angle	3%	#####	15,000.000	OMR
9	حمدان النقيعي			1515	600.000	Residential	Corner	3%	#####	10,000.000	OMR
10	علي عبدالامير			859	600.000	Residential		3%	#####	13,000.000	OMR
11	ابراهيم الوهبي			154	647.000	Residential	At Angle	3%	#####	9,200.000	OMR
12	يقر التواتي	جمال الرميح		102	600.000	Residential	Middle	3%	#####	10,500.000	OMR
13	سليمان الصبحر			197	600.000	Residential	Middle	3%	#####	11,000.000	OMR
14	جيس اليشمي			84	600.000	Residential		3%	#####	20,000.000	OMR
15	جمال الرميح	ابوسعود البلوشي		705	600.000	Residential	Corner	3%	#####	12,000.000	OMR
16	جعفر محمد جواد			50	600.000	Residential	At Angle	3%	#####	11,000.000	OMR
17	ابوسعود البلوشي	هدال		670	600.000	Residential	Middle	3%	#####	11,500.000	OMR
18	مازن الراشدي			243	600.000	Residential		3%	#####	11,000.000	OMR
19	ابوسعود البلوشي			709	600.000	Residential		3%	#####	10,000.000	OMR
20	خالد الحويش			1012	600.000	Residential		3%	#####	11,500.000	OMR
21	عامر الراشدي			1248	600.000	Residential		3%	#####	10,000.000	OMR
22	محمد البلوشي			620	600.000	Residential	At Angle	3%	#####	9,500.000	OMR
23	99367864			1091	675.000	Residential	Middle	3%	#####	8,000.000	OMR
24	جمال الرميح	ابو احمد عبدالله		1553	600.000	Residential		3%	#####	12,000.000	OMR
25	محمد البلوشي			16	600.000	Residential	Corner	3%	#####	20,000.000	OMR
26	جمال الرميح	هدال اليوسفي	عامر الراشدي	22	600.000	Residential	Middle	3%	#####	7,300.000	OMR
27	عامر الراشدي			404	600.000	Residential	At Angle	3%	#####	9,000.000	OMR
28	جمال الرميح			466	600.000	Residential		3%	#####	11,000.000	OMR
29	عامر الراشدي	بدر السبيعي		481	645.000	Residential	Semi-Angle	3%	#####	12,000.000	OMR
30	عامر الراشدي			221	600.000	Residential		3%	#####	10,000.000	OMR
31	عامر الراشدي	مرضى		950	600.000	Residential	Middle	3%	#####	9,500.000	OMR
32	عامر الراشدي			1104	600.000	Residential	At Angle	3%	#####	9,500.000	OMR
33	ابراهيم الوهبي			545	600.000	Residential	Middle	3%	#####	10,000.000	OMR
34	مرضى			981	600.000	Residential	At Angle	3%	#####	12,000.000	OMR
35	مرضى			1560	600.000	Residential	At Angle	3%	#####	12,000.000	OMR
36	بريت			612	600.000	Residential	Middle	3%	#####	10,000.000	OMR

“Opportunity comes to open mind”

In 2010, I have answered my question.



DUNUM L.L.C



دوم نيش. م. م.

We Know the History to plan for better future...

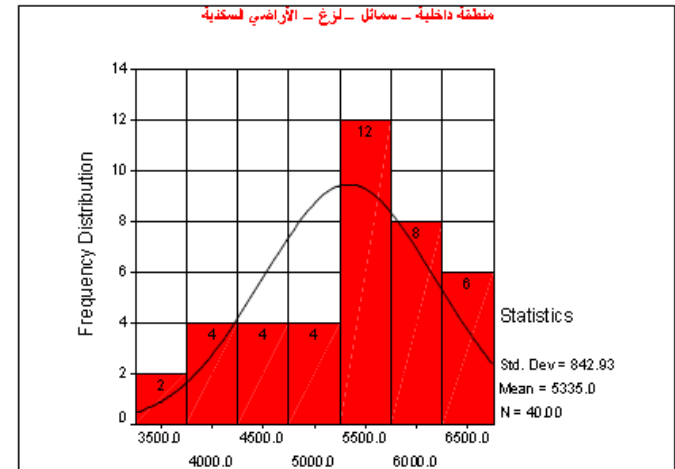
للأراضي السكنية	2010	2009	2008*	2007	2006
الولاية - المدينة	متوسط قيم الأسمار	متوسط قيم الأسمار	متوسط قيم الأسمار	متوسط قيم الأسمار	متوسط قيم الأسمار
مرافعات الممرات 9	10,000	9,000	19,500	20,000	بيانات غير متوفرة
مرافعات الممرات 1/8	10,500	9,000	25,500	بيانات غير متوفرة	بيانات غير متوفرة
مرافعات الممرات 8	17,500	16,000	35,500	37,000	17,000
مرافعات الممرات 7	9,500	15,000	27,250	25,000	12,000
مرافعات الممرات 6	7,750	10,000	17,200	22,000	12,000
مرافعات الممرات 5	9,500	11,750	27,000	24,000	14,000
مرافعات الممرات 4	15,000	17,000	30,000	14,000	14,000
مرافعات الممرات 3	12,750	10,000	23,000	25,000	بيانات غير متوفرة
مرافعات الممرات 2	13,750	13,000	27,000	27,000	بيانات غير متوفرة
مرافعات الممرات 1	16,250	18,000	29,000	27,000	15,000
الولاية - المدينة	متوسط قيم الأسمار	متوسط قيم الأسمار	متوسط قيم الأسمار	متوسط قيم الأسمار	متوسط قيم الأسمار
محيطة مرحلة 8	15,000	17,500	30,000	28,000	بيانات غير متوفرة
محيطة مرحلة 7	26,000	31,000	31,000	28,000	15,000
محيطة مرحلة 6	21,250	22,000	30,000	بيانات غير متوفرة	بيانات غير متوفرة
محيطة مرحلة 5/3	25,000	26,000	بيانات غير متوفرة	بيانات غير متوفرة	14,000
محيطة مرحلة 5/2**	50,000	48,000	100,000	60,000	بيانات غير متوفرة
محيطة مرحلة 5/1	30,500	31,500	31,000	20,000	15,000
محيطة مرحلة 4	18,000	19,000	30,000	28,000	12,000
الولاية - المدينة	متوسط قيم الأسمار	متوسط قيم الأسمار	متوسط قيم الأسمار	متوسط قيم الأسمار	متوسط قيم الأسمار
ركاء - حي عاصم	6,000	6,500	20,000	18,000	بيانات غير متوفرة

DUNUM L.L.C



دوم نيش. م. م.

منطقة داخلية - شمال - لزغ - الأراضي لسكنية



“hard work does not ensure success but make it more likely”

The End – Reference:

Linus Pauling 1981 “satisfying one’s own curiosity is one of life’s greatest sources of happiness”



Research Methods: (A Process of Inquiry): By Anthony M. Graziano & Michael L. Raulin