


Faculty of Agriculture, Cairo University 

Scientific Thinking and Writing (201 AGR)

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Scientific Thinking and Writing

Monday	Lecturer	Lecture Title
3/10/2016	Prof. Hosam Safaa	Introduction
10/10/2016	Dr. Fatma Mohamed	Interview and discussion skills
17/10/2016	Prof. Hosam Safaa	Thinking and Scientific Thinking
24/10/2016	Prof. Hosam Safaa	Communication: Theory and Application
31/10/2016	Dr. Fatma Mohamed	Time management
7/11/2016	Dr. Fatma Mohamed	Team management
14/11/2016	Dr. Osama Galal	Midterm exam
21/11/2016	Dr. Osama Galal	CV writing
28/11/2016	Dr. Osama Galal	Presentation skills
5/12/2016	Dr. Osama Galal	Poster preparation
12/12/2016	Prof. Hosam Safaa	Scientific Writing
19/12/2016	Prof. Hosam Safaa	Types and Evaluation of Scientific Writing

WHAT IS SCIENTIFIC THINKING?

- Is scientific thinking can be for any relevance outside of science?

Definitions:

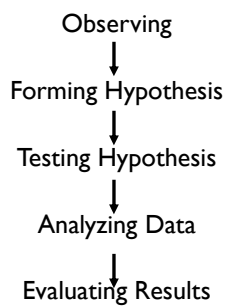
- Scientific thinking is that mode of thinking in which the thinker **improves the quality** of his thinking by taking the structures inherent in thinking and imposing **intellectual standards** upon them.
- Certain techniques for **investigating** phenomena, **acquiring** new knowledge, or **correcting** previous knowledge

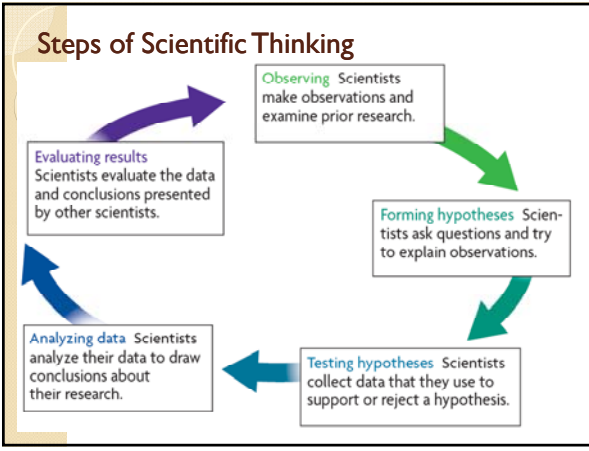
The Result:

A well cultivated scientific thinker:

- **Raises** vital scientific questions and problems, formulating them clearly and precisely.
- **Gathers and assesses** relevant scientific data and information, using abstract ideas to interpret them effectively.
- **Comes to** well-reasoned scientific conclusions and solutions, testing them against relevant criteria and standards.
- **Thinks open mindedly** within systems of scientific thought.
- **Communicates** effectively with others in proposing solutions to complex scientific problems.

Steps of Scientific Thinking

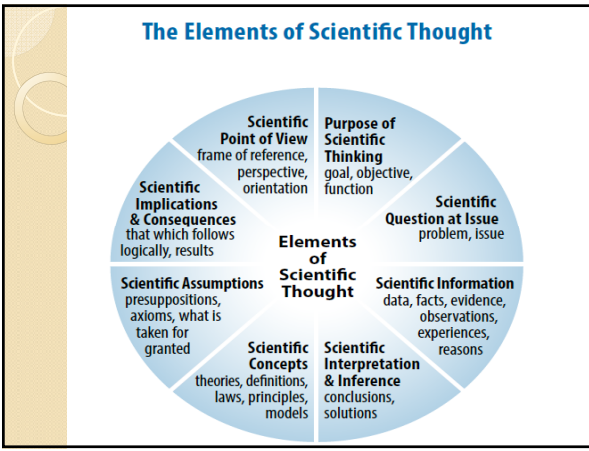


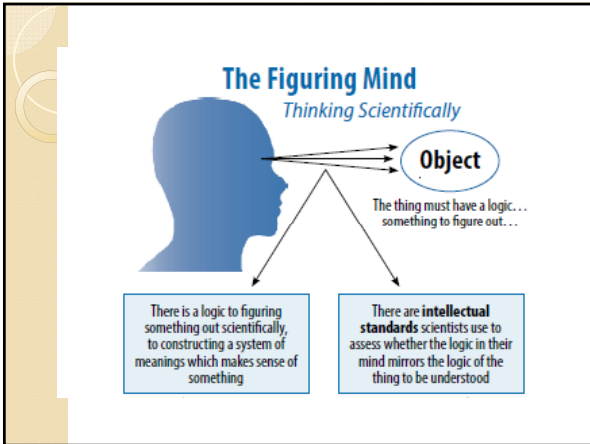


Group Activity?

Working within your group and give an example of a natural phenomena which has been observed and studied scientifically by researchers.

Try to explain your example based on the steps of scientific thinking.





- Intellectual standards:**
(Characteristics of scientific thinking)
- Clarity
 - Precision
 - Accuracy
 - Depth
 - Breadth
 - Logic
 - Fairness
 - Flexibility

- A Checklist for Scientific Thinking**
- 1) **All scientific thinking has a PURPOSE.**
- Take time to state your purpose clearly.
 - Distinguish your purpose from related purposes.
 - Check periodically to be sure you are still on target.
 - Choose significant and realistic scientific purposes.
- 2) **All scientific thinking is an attempt to figure something out, to settle some scientific QUESTION, to solve some scientific problem.**
- State the question at issue clearly and precisely.
 - Express the question in several ways to clarify its meaning and scope.
 - Break the question into sub-questions.

3) All scientific thinking is based on ASSUMPTIONS.

- Clearly identify your assumptions and determine whether they are justifiable.

4) All scientific thinking is done from some POINT OF VIEW.

- Identify your point of view.
- Seek other points of view and identify their strengths as well as weaknesses.

5) All scientific thinking is based on DATA, INFORMATION and EVIDENCE.

- Search for information that opposes your position as well as information that supports it.
- Make sure that all information used is clear, accurate and relevant to the question at issue.
- Make sure you have gathered sufficient information.

6) All scientific thinking is expressed through, and shaped by, scientific CONCEPTS and IDEAS.

- Identify key scientific concepts and explain them clearly.
- Make sure you use concepts with precision.

7) All scientific thinking entails INTERPRETATIONS by which we draw scientific CONCLUSIONS and give meaning to scientific data.

- Interpretate only what the evidence implies.
- Check inferences for their consistency with each other.

8) All scientific thinking leads somewhere or has IMPLICATIONS and CONSEQUENCES.

- Search for negative as well as positive implications.
- Consider all possible consequences.

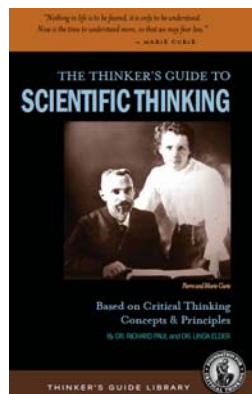
Each one has to search for a research paper (Library, internet) and briefly extract the following information:

- 1- Title
- 2- Purpose or objective
- 3- Research question or problem
- 4- Main idea of the work
- 5- Conclusion
- 6- Implications



Submission deadline: the research paper with the extracted information till **24th October 2016**
Submit by hand or send by email with your name and Student ID to: 201agr.en@gmail.com

Reference:



THANKS FOR ATTENTION



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