

University of Salahaddin – Erbil  
College of Science  
Physics Department



# *Prepare a Scientific Research*

## Lecture 5

Assist. Lecturer. Safa Gh. Hameed

[Safa.hameed@su.edu.krd](mailto:Safa.hameed@su.edu.krd)

*1Year – Physics  
2023-2024*





## *Lecture (5)*

---

### **➤ *Scientific Research***





# Scientific Research

*Is the organized search of scientific **theories and hypotheses**, allows us to develop new technologies, solve practical problems, and make informed decisions.*

*is defined as a study of a wide and deep detail one of the **old** or **new** scientific principles.*





## Who Does Researcher?

### ➤ Individual

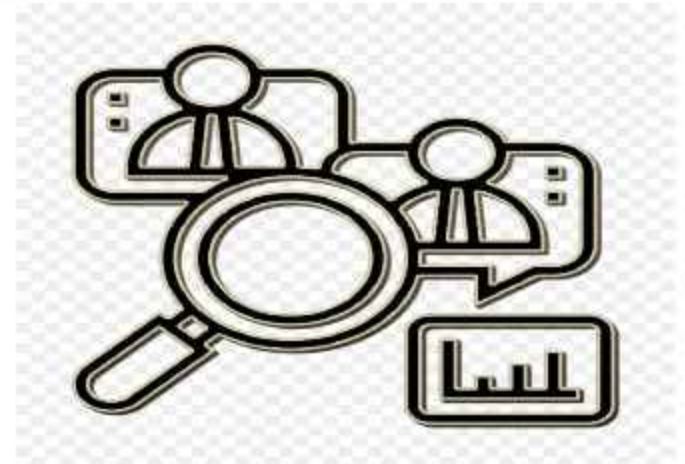
*studies are done to discover **new information** or to answer a question about **topic** by one **person**.*



STUDENT

### ➤ Teams

*by a team and each **member takes a role**.*



➤ *Teams always make the process easier*



# *Selection topic*

*Choosing your topic is the **first step** in the report writing process.*

- Be aware that selecting a **good topic may not be easy** .*
- It must be narrow and focused enough **to be interesting***
- Broad enough **to find information** about it .*





## *Topic formulation*

*A researcher needs to refine the topic and clearly state what is intended **to be searched about the topic.***

*This is called formulation of the research problem (topic ) which involves :-*

- Narrow a broad field of research into a specific research topic*
- Determine the objectives of the topic .*





# ***What is a Good Topic for a Report ?***



***Definite***



***Inventive  
(creative)***



***Specific***





## What is a Good Topic for a Report ?



**Definite**

*is the subject that has **limits** and is **clear in meaning** .*

*When you chose a topic for your report :-*

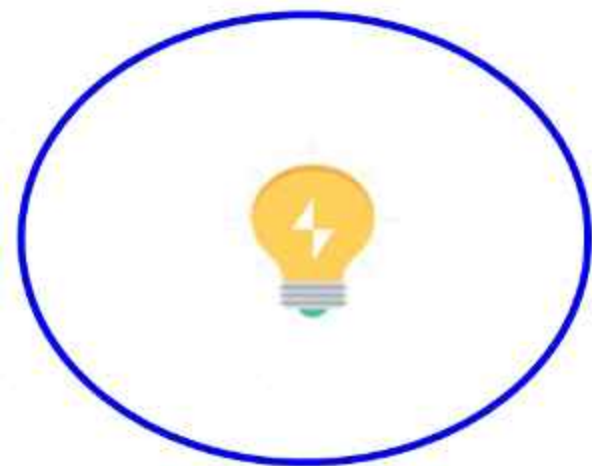
- *be sure that it is **clear**.*
- *A reader should be able to **understand its purpose right away** .*
- *If the topic is **not clear to the reader**, then you **did not choose the topic well** .*







## What is a Good Topic for a Research?



**Inventive  
(creative)**

*is not only **creating something new** and also **improving something that already exists**.*

**Do**

- ***Choosing an old topic and adding something new (data, information) to it.***

**Don't**

- ***Choose an old topic and rewrite it without any change, that's a bad choice***





## What is a Good Topic for a Research?



**Specific**

is to focus on **one important** concept and then search for **references related to it**.

- *The report must contain correct **numbers or information**.*
- *focus on correct **data**.*





## **A good topic**

- ***Is not too broad***
- ***Is not too narrow***
- ***Has research source***
- ***Interests you.***





## Limiting your subject / choosing a topic

- Once you have a **general subject** that you are interested in .
- Next step is to narrow the subject to a **specific topic** that can be treated in a research report.



# PHYSICS

## Classical Physics

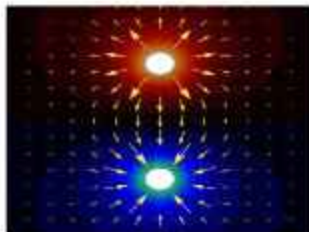
### MECHANICS



### THERMODYNAMIC



### ELECTROMAGNETIC

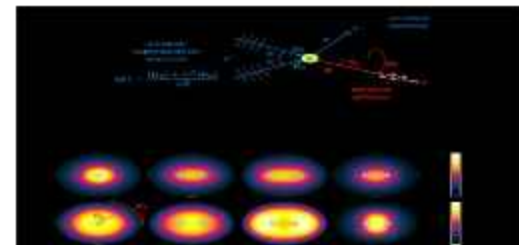


### Optics

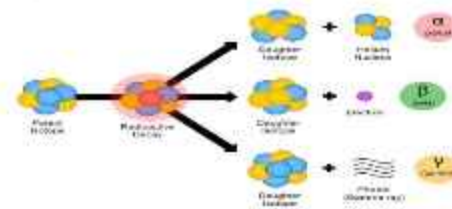


## Modern Physics

### QUANTUM



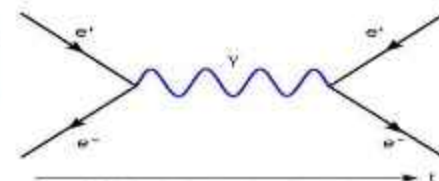
### Nuclear



### RELATIVELY



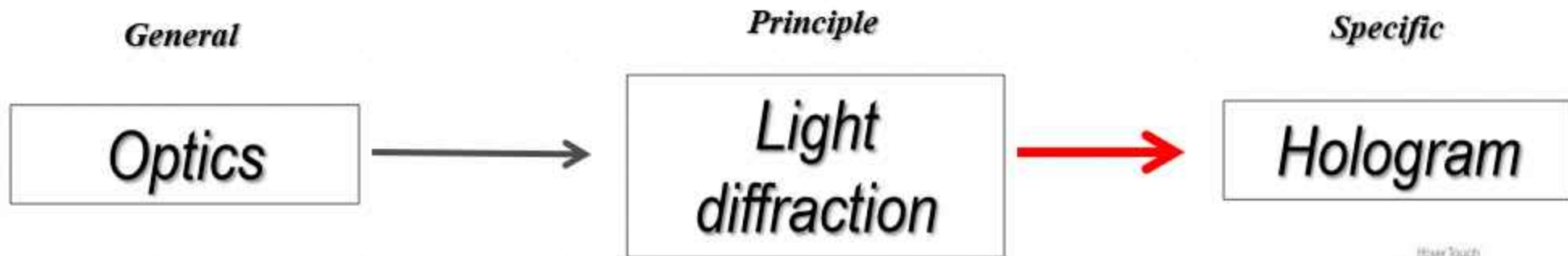
### ELECTRODYNAMIC





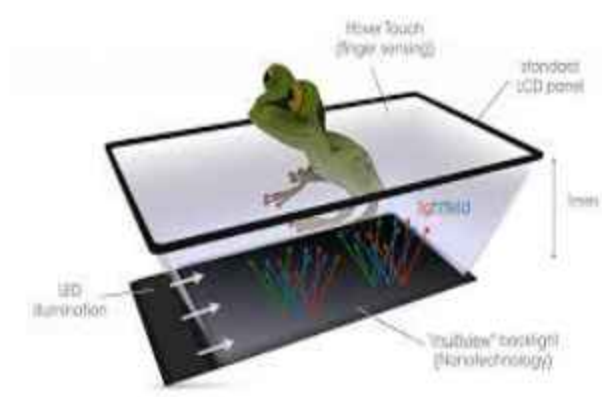
## Limiting your subject / choosing a topic

- Once you have a general subject that you are interested in .
- Next step is to narrow the subject to a specific topic that can be treated in a research report. For Exp. \*Rayan shno



***The phenomena of Light Diffraction by Smartphone hologram***

***The Phenomena of Light Diffraction by Hologram***





# Limiting your subject / choosing a topic

**General**

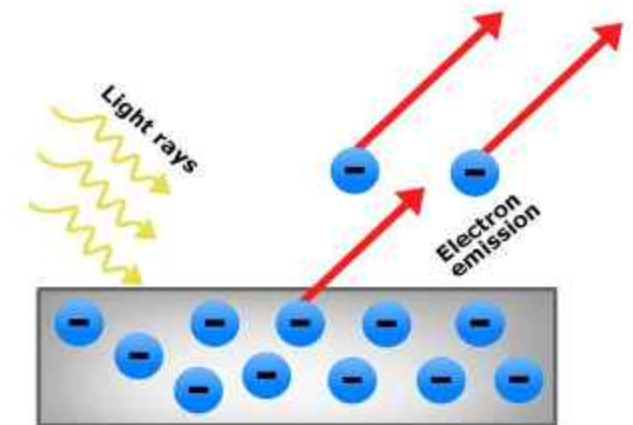
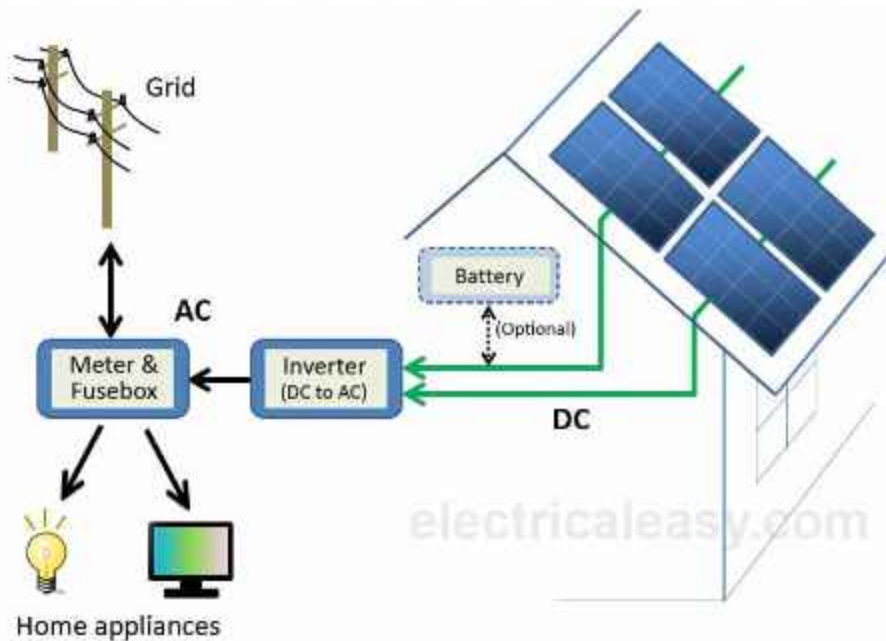
**ELECTRODYNAMIC**

**Principle**

**Photoelectric**

**Specific**

**Solar energy /cell**



electricaleasy.com





# Study the properties of solar cells and their applications

*General*

*Principle*

*Specific*

**ELECTRODYNAMIC**



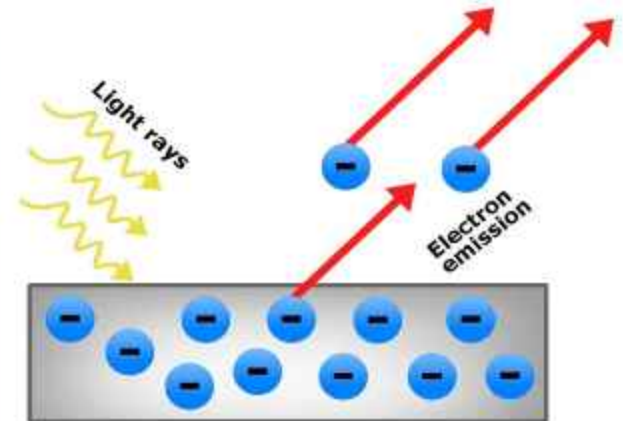
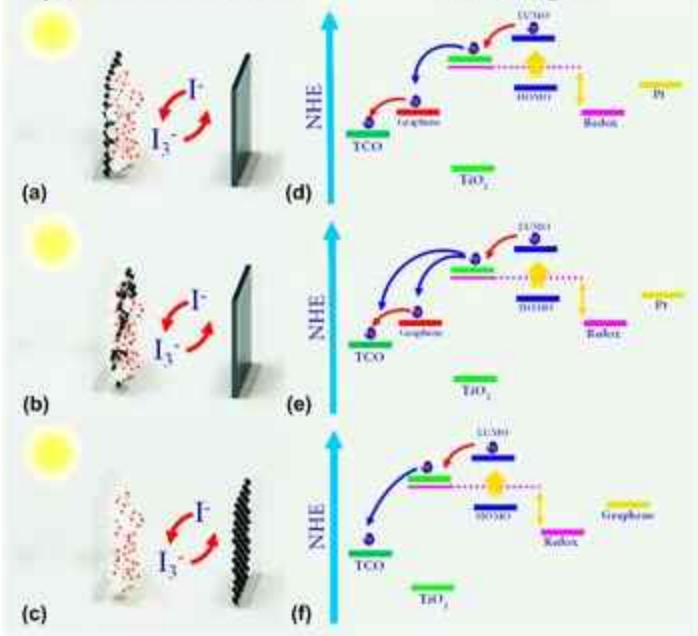
*Photoelectric*



**Solar cell**

Dye Sensitized Solar Cells

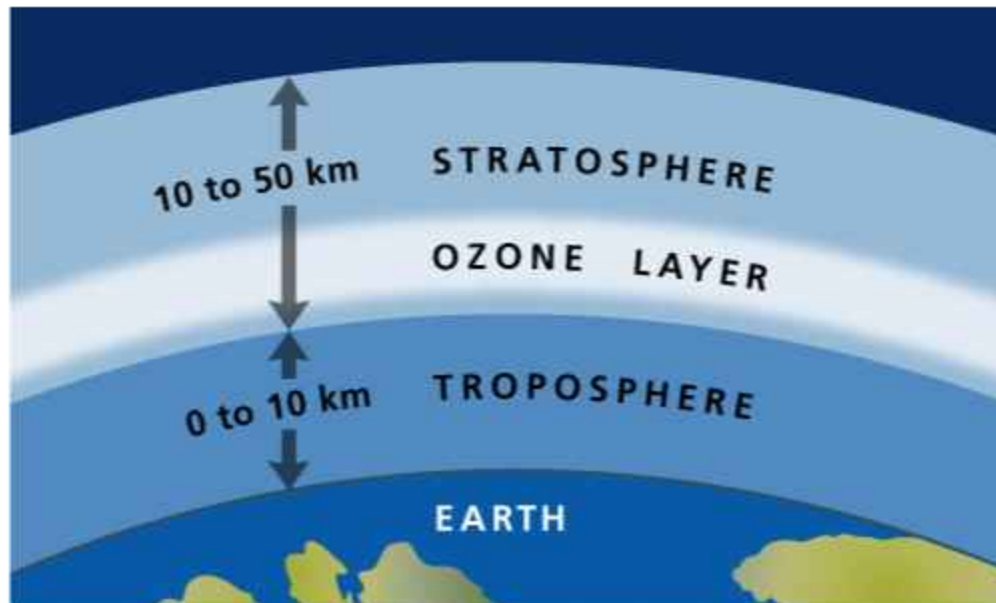
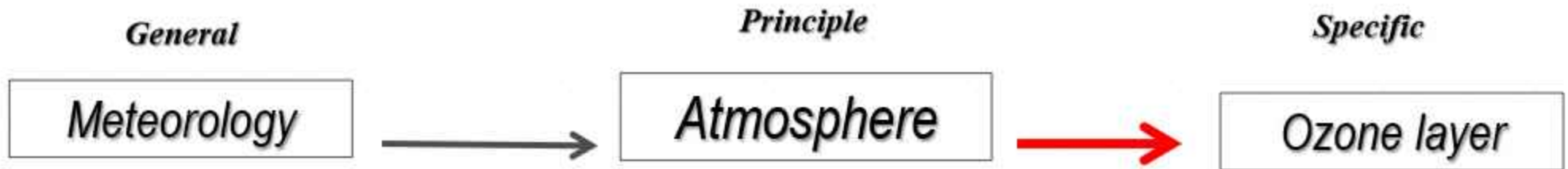
Band Diagram







# Limiting your subject / choosing a topic





## ***Limiting your subject / choosing a topic***

***General***

***Meteorology***



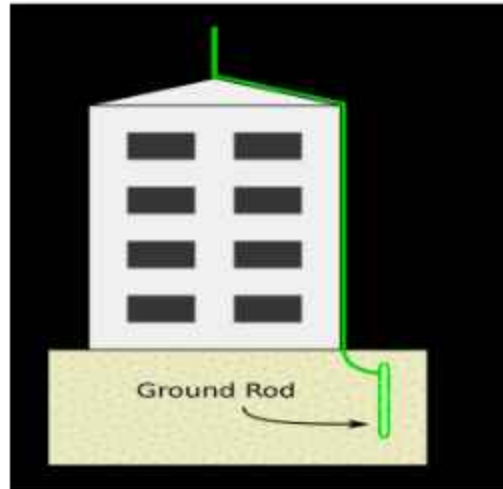
***Principle***

***Atmosphere***



***Specific***

***Lightning***



***Circuits and devices used for grounding and lightning arrester.***



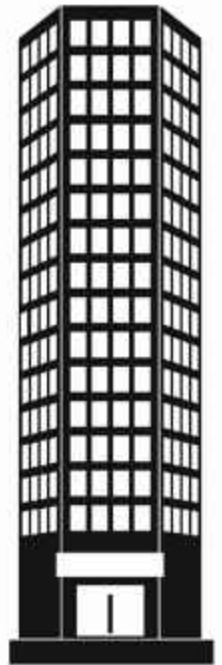
# Next lecture 6

## ➤ *Research Structure*

12 part

- Title page
- Abstract (sometimes)
- Table of content
- Introduction
- Finding (analysis)
- Discussion
- Conclusion
- Reference

=



***Thanks***

