# UDAAN

## 2025

# Control and Coordination

Biology | Lecture - 06

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# Topics to be covered

1. Human endocrine system Revision
2. Feedback mechanism
3. Control and coordination in plants
4. MCQ practice and Homework

Question

Which gland is not present in pair ?

A Testis

B Ovaries

C Thyroid gland

D Salivary gland

Q. Think and answer

Thyroid gland

#Q. Which of the folllwinf is required for the formation of Thyroxine ? ($T_4$)

#H.Q

A Calcium

B PTH

C Iodine

D Phosphorus

Q. Think and answer

#Q. Master gland of endocrine system ?

A Hypothalamus

B Pituitary gland

C Pancreas

D Adrenal gland

# Question of the Day

Example of gaseous plant hormone

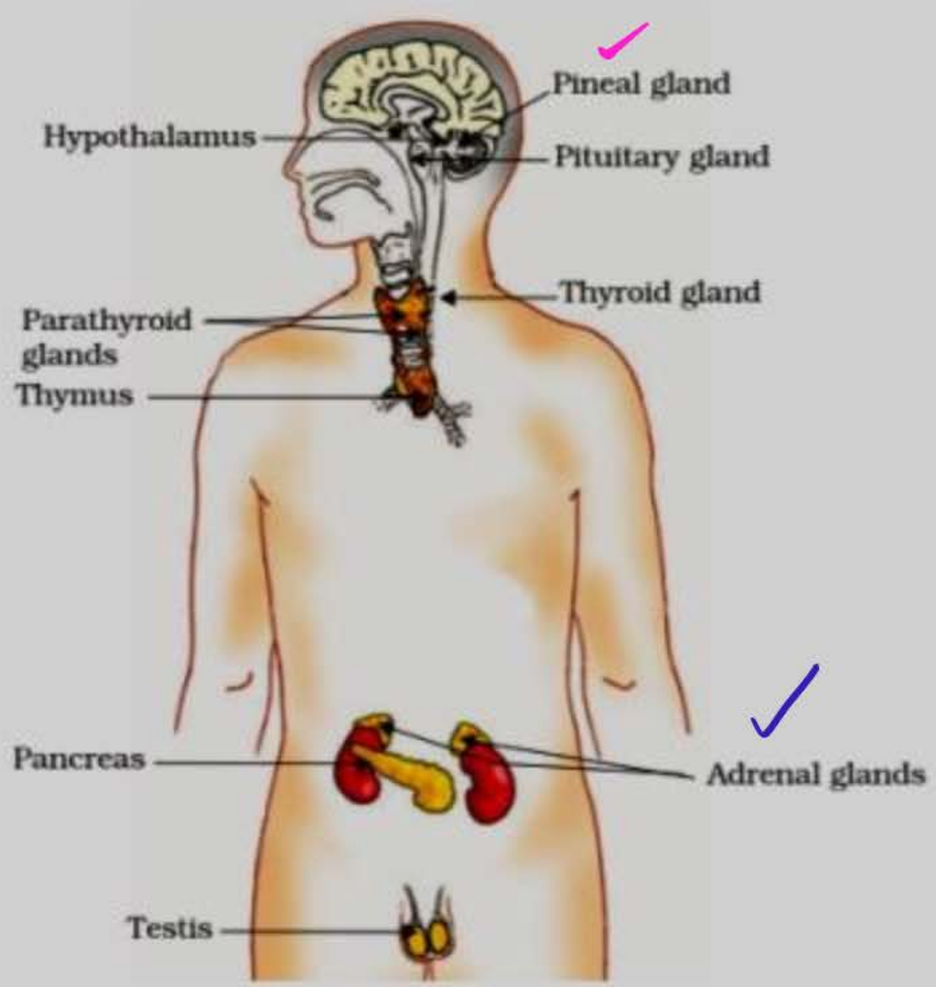
→ Ethylene

| Endocrine Gland | Hormone | Functions |
|---|---|---|
| Hypothalamus | Releasing hormones | Stimulates pituitary gland to release hormones. |
| Pituitary gland | Growth hormone (GH) | Promotes normal growth and development in body. |
| Thyroid gland | Thyroxine (T4 ) (Iodine) | Controls metabolism of carbohydrates, proteins and fats in our body. |
| Parathyroid gland | Parathormone (PTH) | Regulates level of calcium and phosphorus in blood |
| Thymus | Thymosin | Helps in maturation of T lymphocytes |
| Pineal gland | Melatonin | Helps to regulate sleep wake cycle |

# Pancreas → Alpha Cells → Glucagon
→ Beta Cells → Insulin → deficiency → "Diabetes"

# Testis → Testosterone

# Ovary → Oestrogen
→ Progesterone



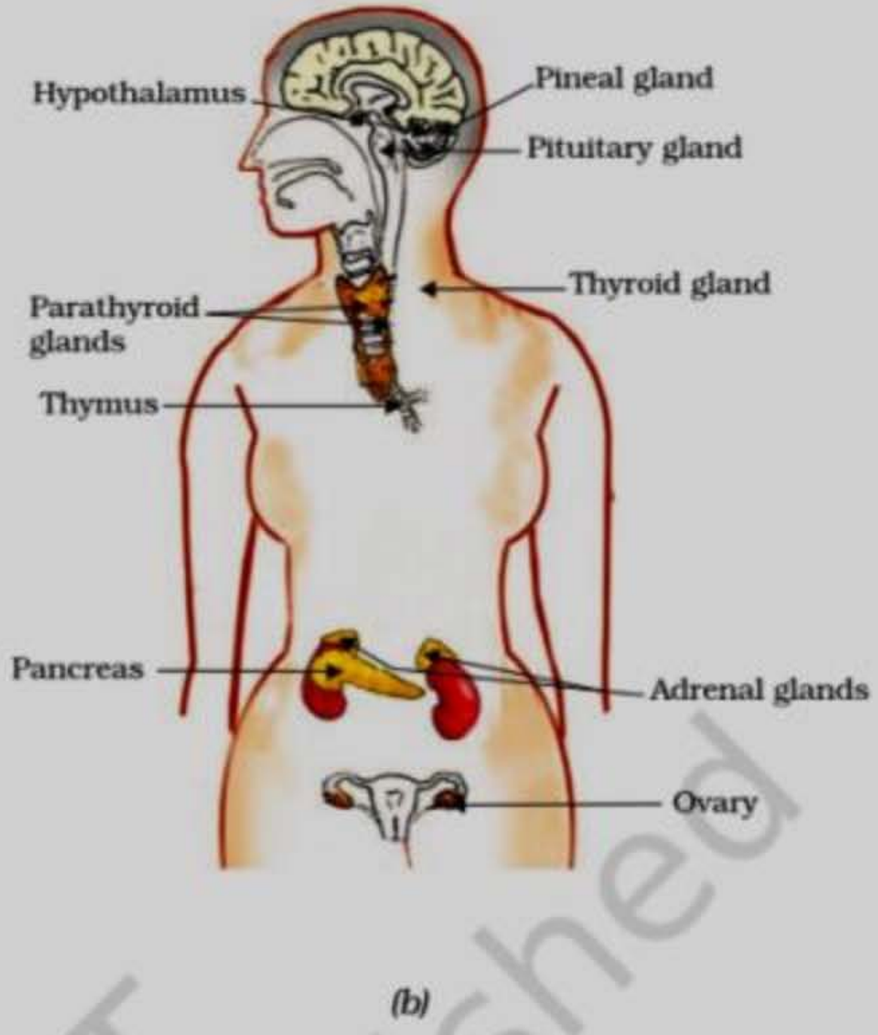
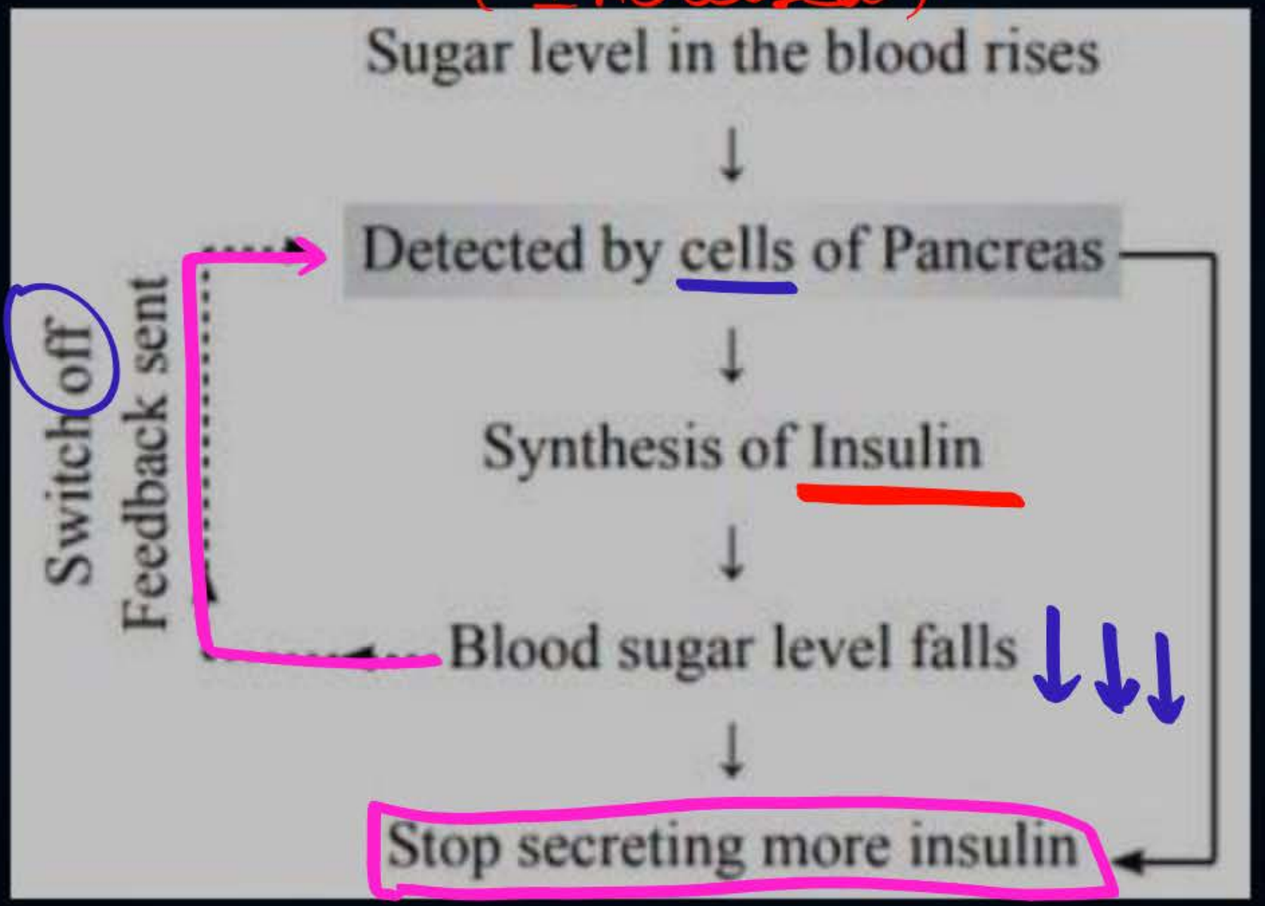




**Figure 7.7** *Endocrine glands in human beings (a) male, (b) female*

# Feedback Mechanism

#Ch!



# Coordination in plants

Can Sense Stimulus in their Surroundings ?

Yes

# Stimulus ⟶ Response.

## Venus fly trap

- Stimulus [Touch]

↓

Response [Closing of leaves]

(No growth observed)

- Mimosa pudica
- Touch-me-not plant
- Sensitive plant
- Chui-Mui

→ Touch

↓

Closing of leaves

(No growth involved)

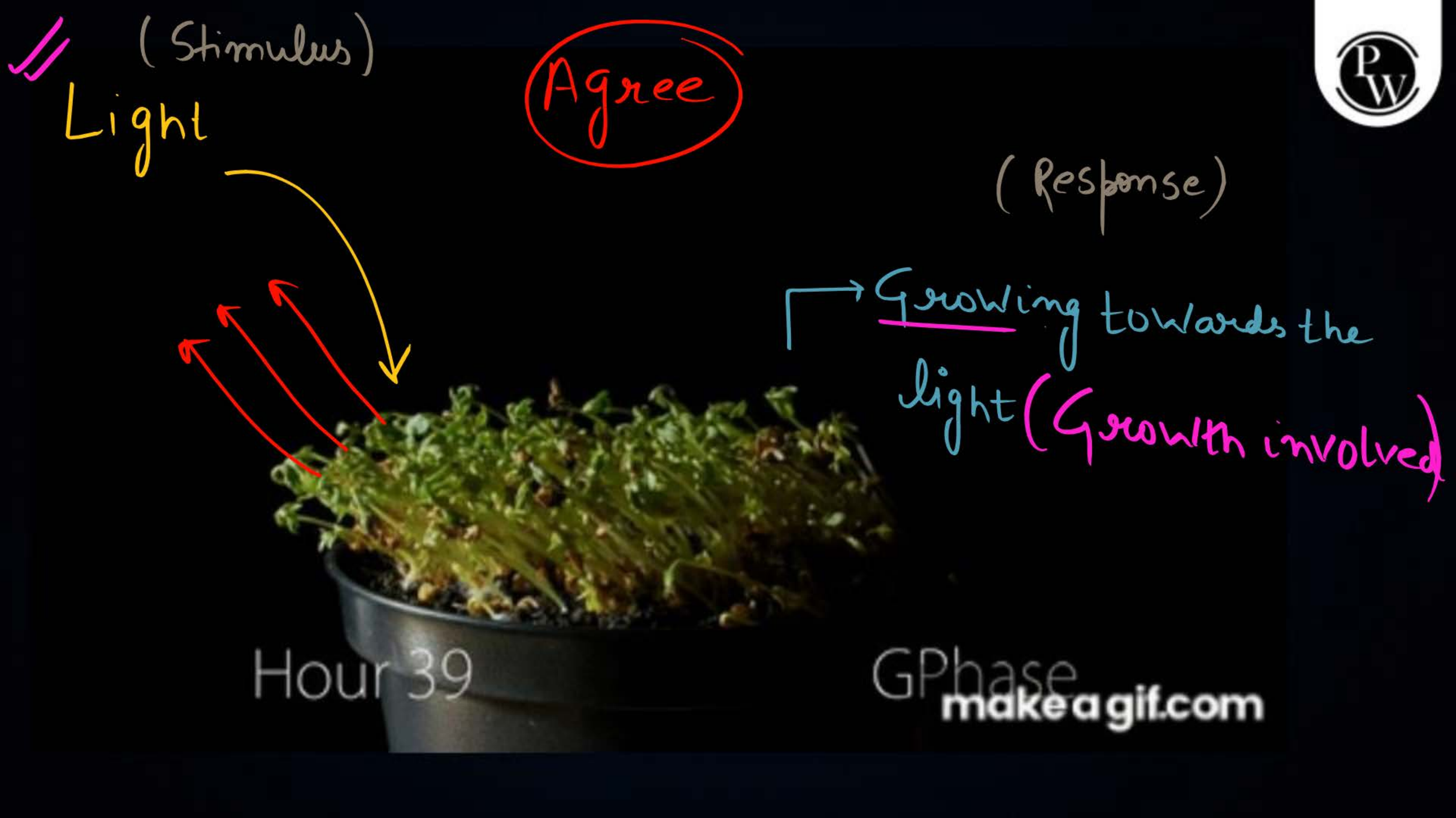
(Stimulus)

Light

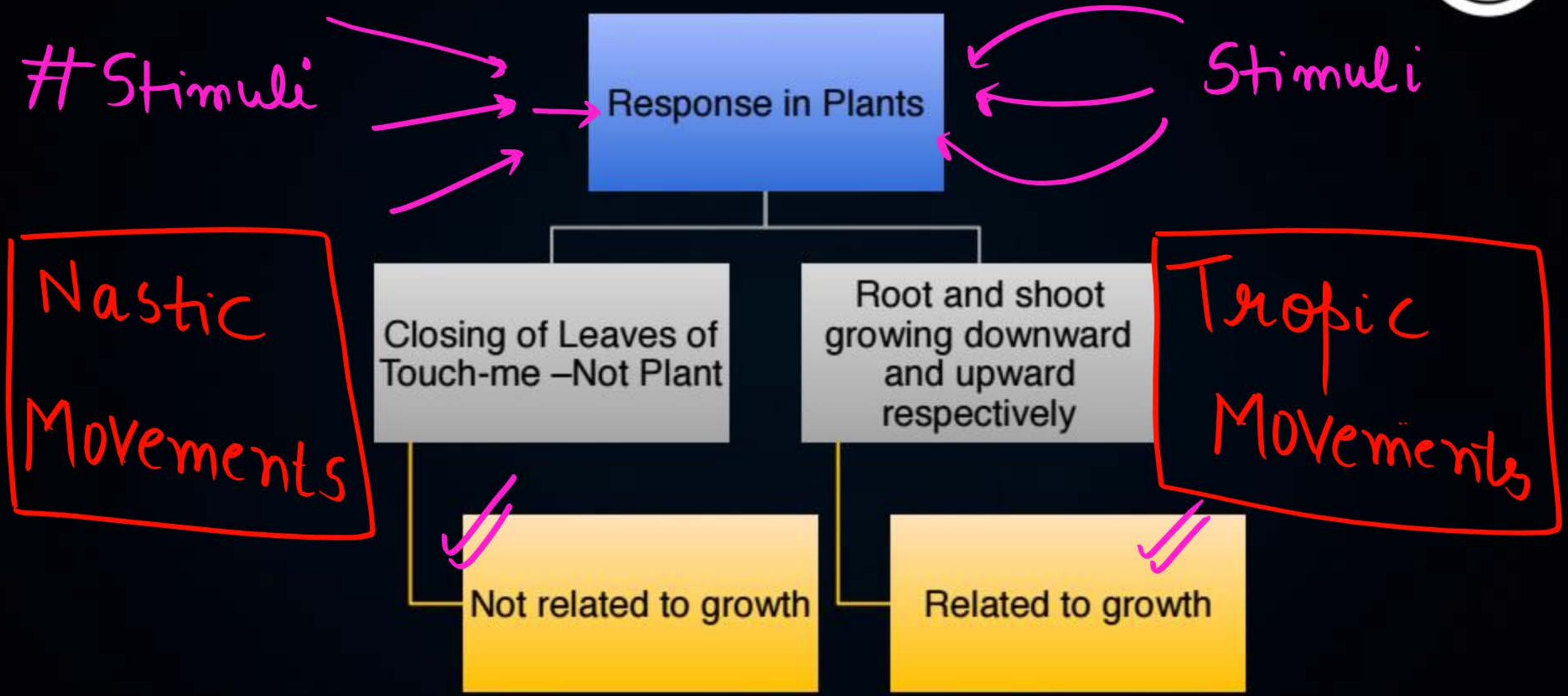
Agree

(Response)

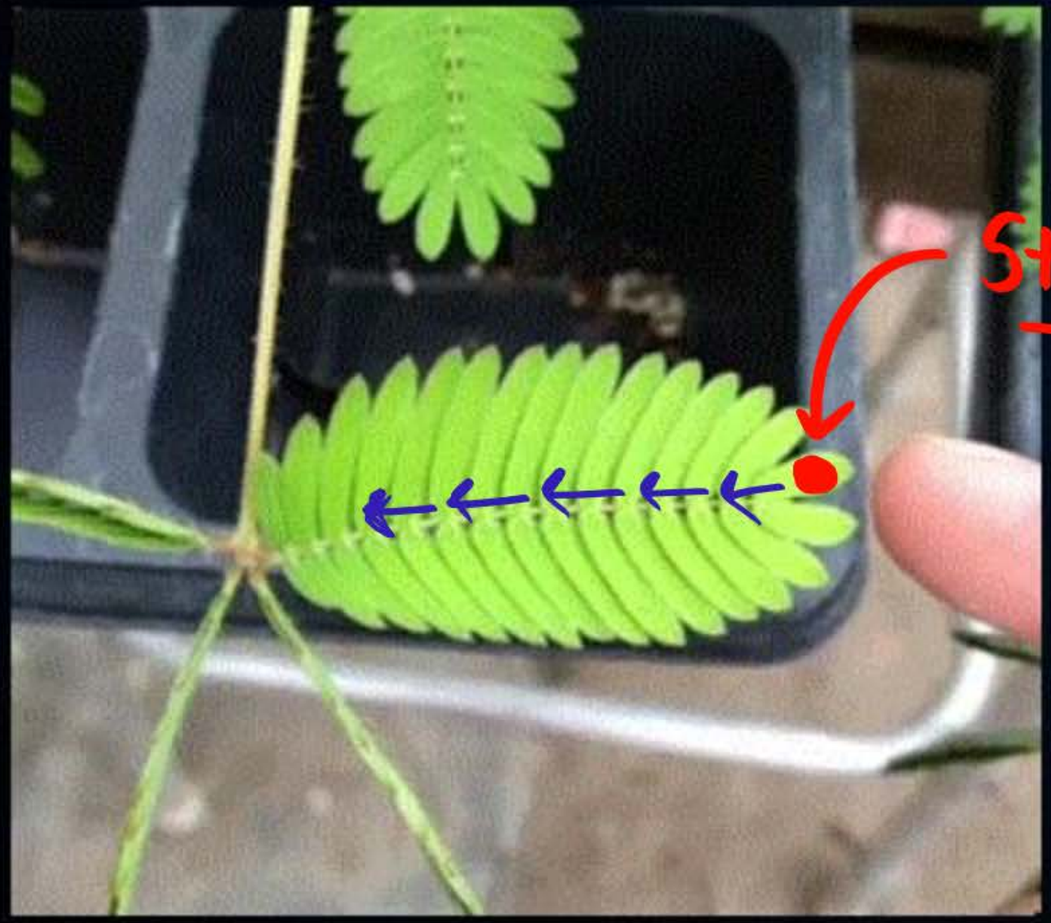
→ Growing towards the light (Growth involved)



# COORDINATION IN PLANTS

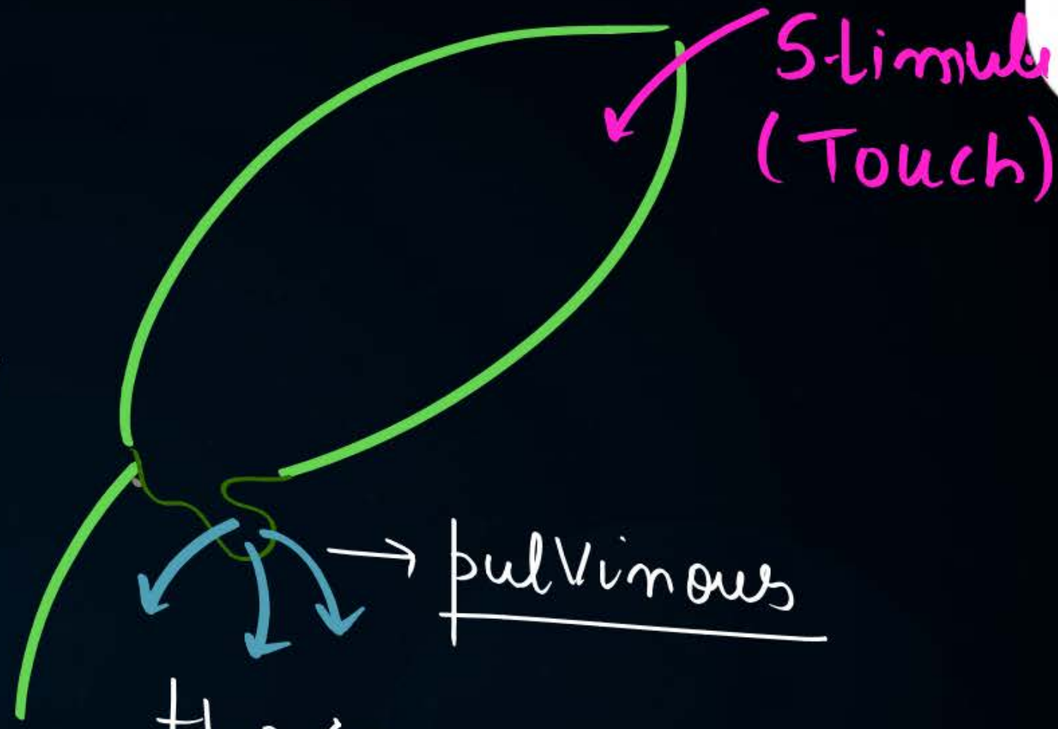


# All leaves fold up even though it is touched only at the tip. How is this possible?




- Like in animals, plants also have **electrical-chemical** means to convey the information of this stimulus (touch).

- The movement takes place as **plant cells change their shape by shrinking or swelling** .This change is due to a change in the amount of water in them.



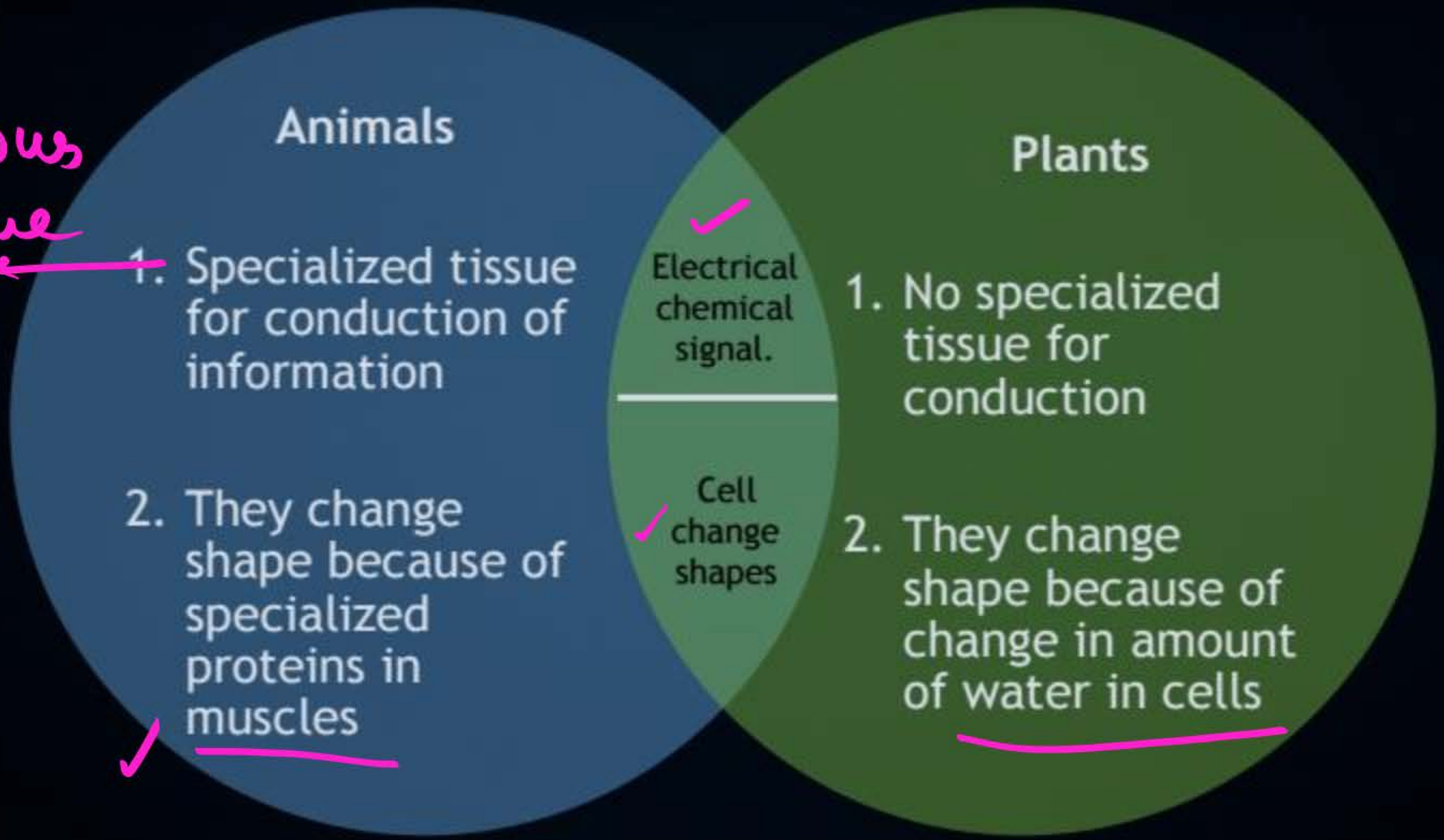

$+H_2O$ comes out

↓

Shrink → Leaf closes ✓

(Change in Cell Shape)

# Topic : Comparing Response to Stimulus in Animals and Plants




Nervous Tissue

# PLANT MOVEMENTS

- Nastic Movements
  - "Growth not involved"
- Tropic Movements
  - "Growth involved"

# Nasties or Nastic Movements

- Non-directional movement in plant in response to stimuli is called nastic movement.
- Nastic movement does not involve growth .
- In nastic movement, whatever be the direction of stimulus, all the parts of the plant equally move in the same direction.
- This type of movement is generally seen in leaves, flower petals etc.movement.

- When we touch the leaves of a sensitive plant like ***Mimosa pudica***, they fold.

Thigmo nasty
↓ ↓
Touch nastic Movement

- When insect comes in contact with modified leaf of **Venus fly trap**, it closes.

Thigmo nasty


- petals of moonflower close in the morning and open in dark at night.

- petals of dandelion flower open in the morning and close in the evening.

Photonasty

↓ Light

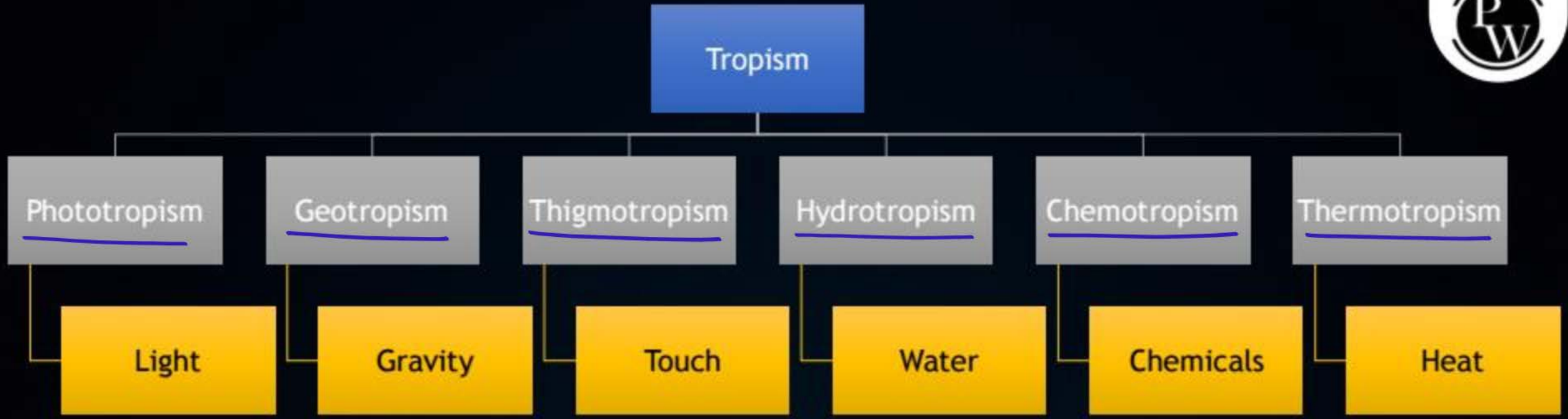
↓ nastic Movement

# Tropic Movements

Directional Movements

- Growth related plant movements that take place along a particular direction are called **Tropic movements.**

- These movements can be **towards the direction of the stimulus or away.**


Tropism
Phototropism
Geotropism
Thigmotropism
Hydrotropism
Chemotropism
Thermotropism
Light
Gravity
Touch
Water
Chemicals
Heat

# Tropic Movements/ Tropism

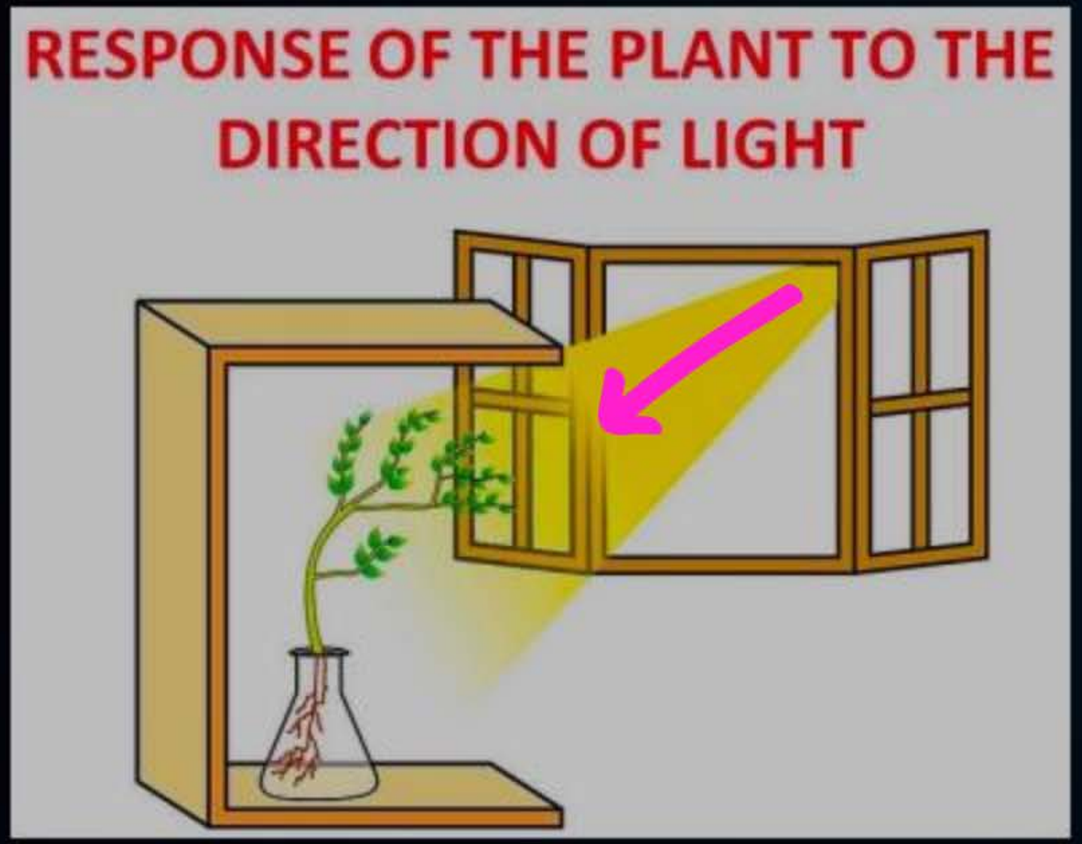
## Positive Tropism

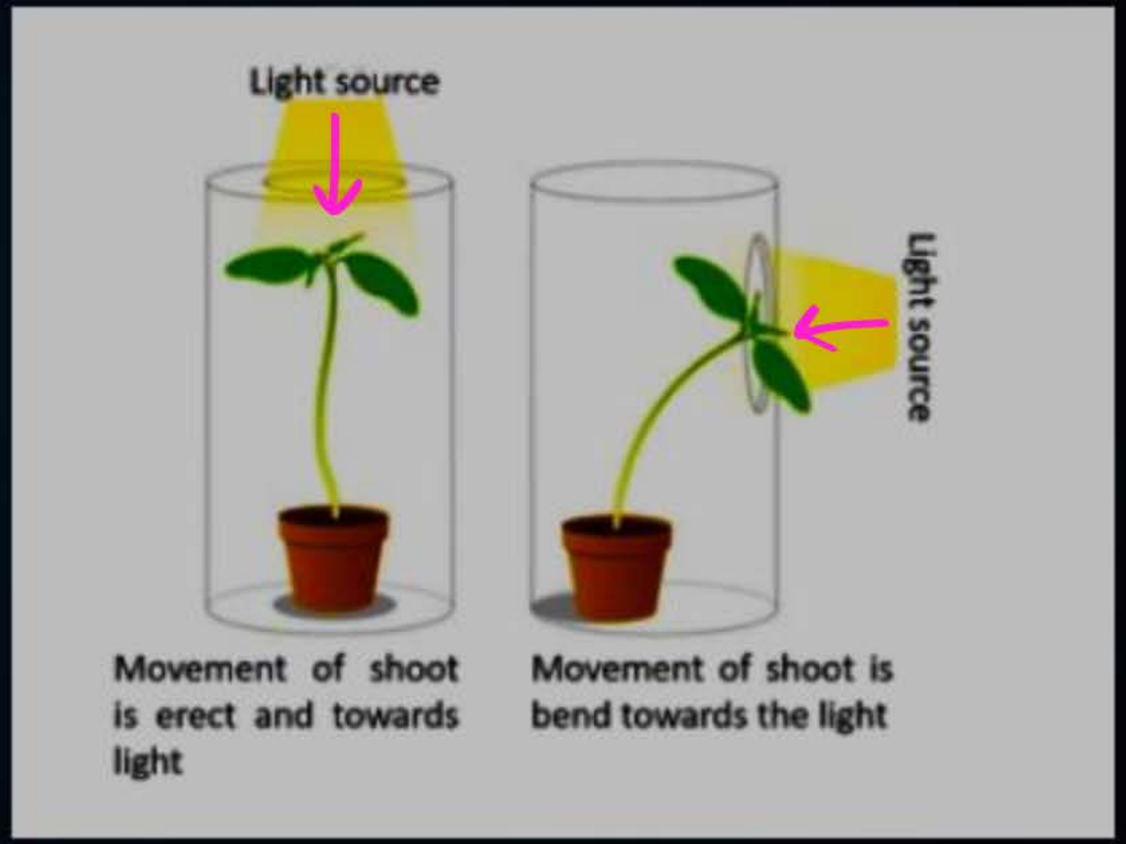
- If the growth of a plant is in the direction of stimulus, it is called positive tropism.


## Negative Tropism

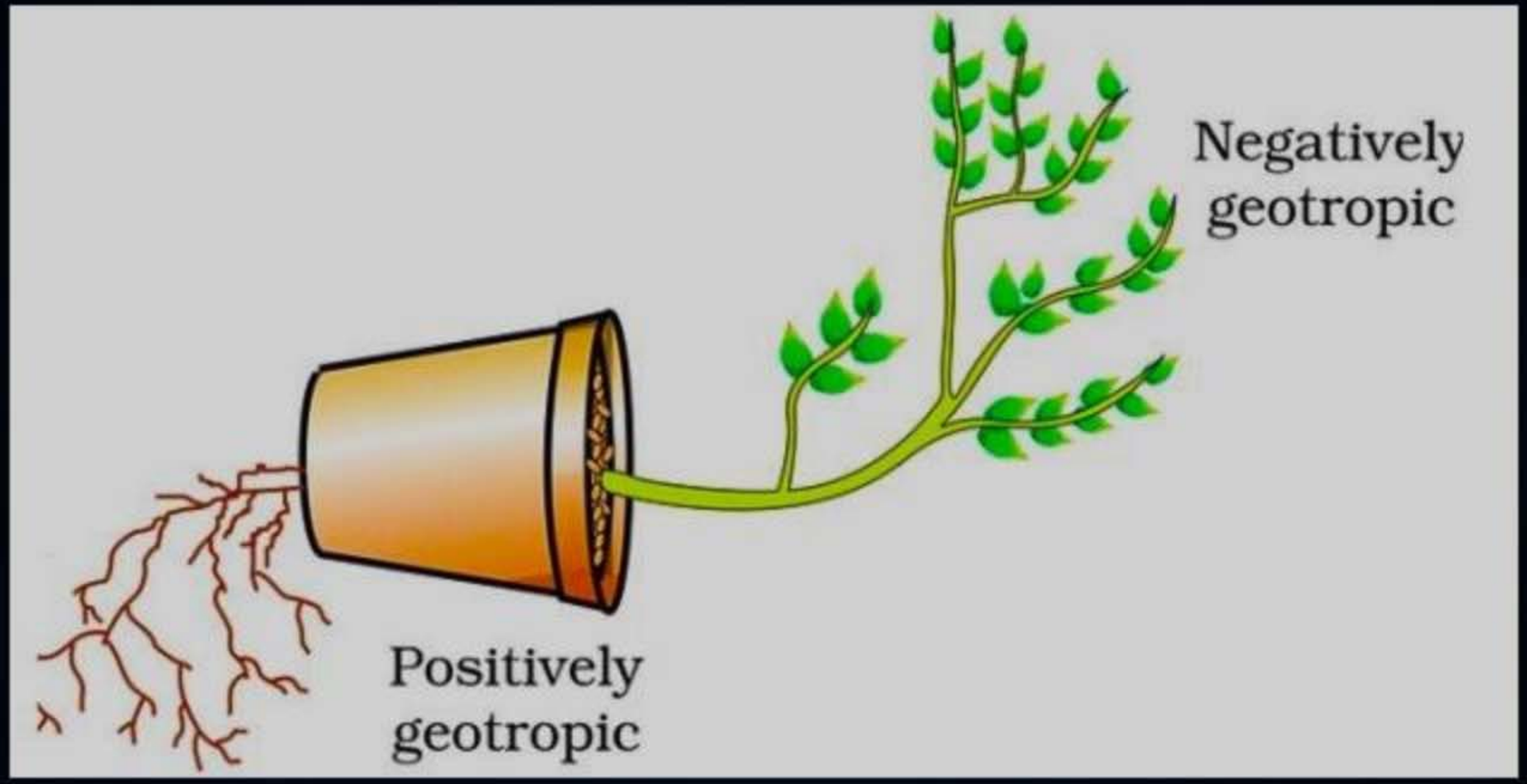
- If the growth of a plant is in the opposite direction or away from that of a stimulus, it is called negative stimulus.

Light ← **Phototropism** → Tropic Movement.



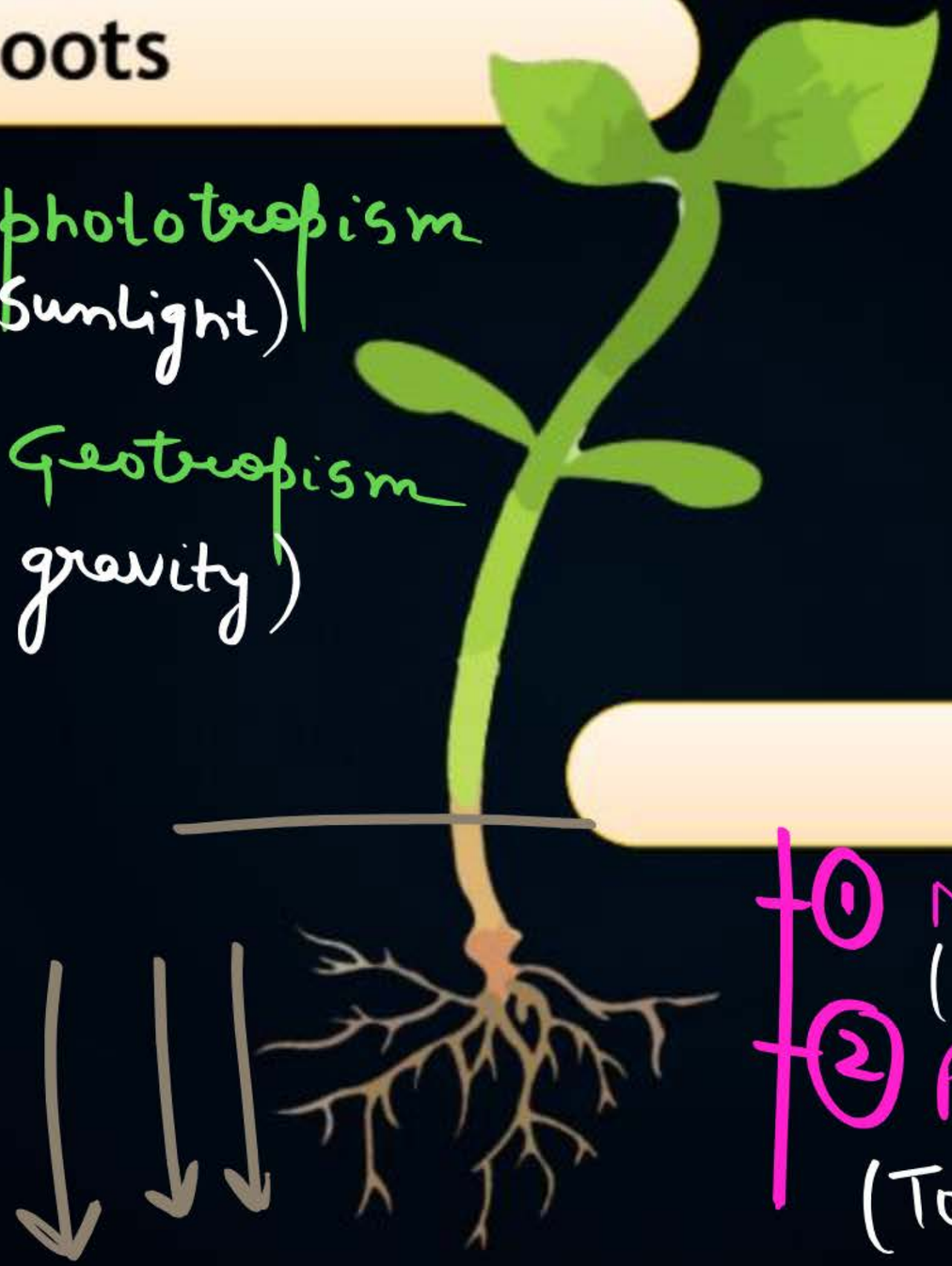



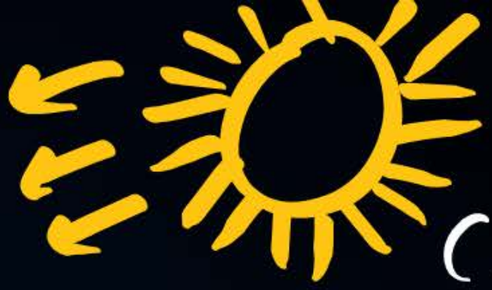
# Geotropism/Gravitotropism



## Shoots

1. Positive phototropism
   (Towards sunlight)
2. Negative Geotropism
   (Away from gravity)





(Sunlight)
↓
Stimuli

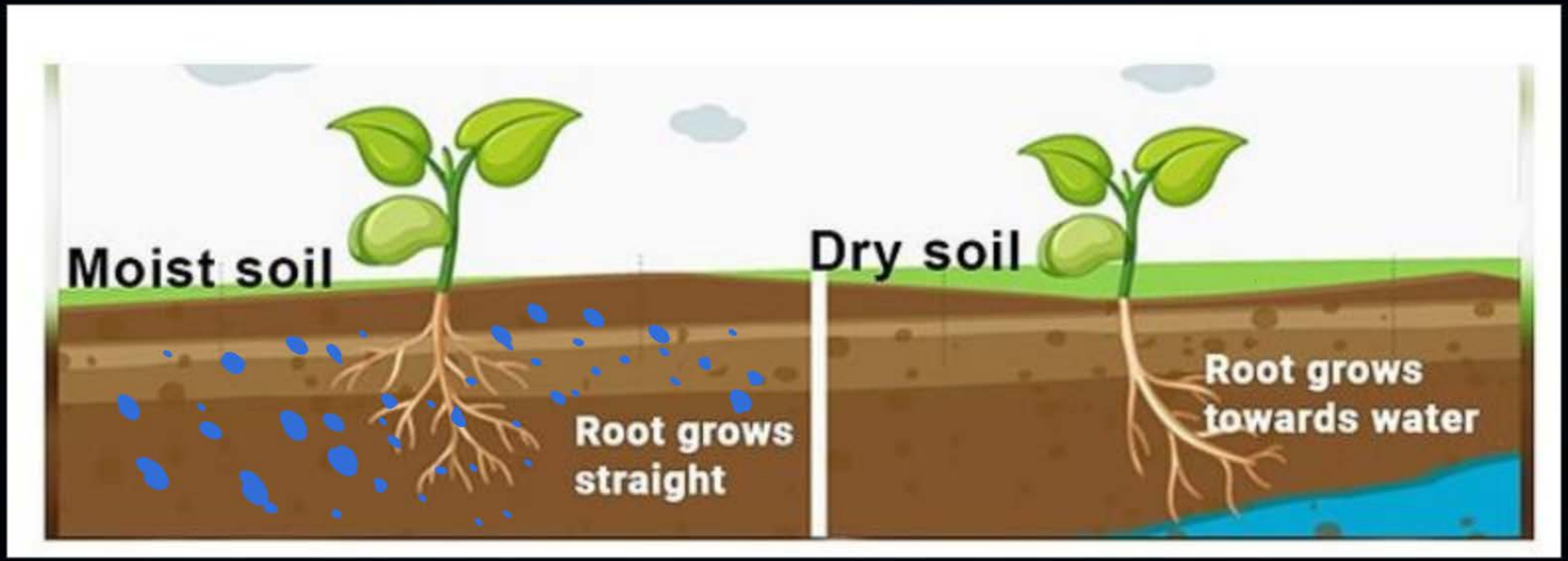
## Roots

1. Negative Phototropism
   (Away from sunlight)
2. Positive Geotropism
   (Towards gravity)

# Root → Positive Hydrotropism

## Hydrotropism

- Water
- Tropic Movement.



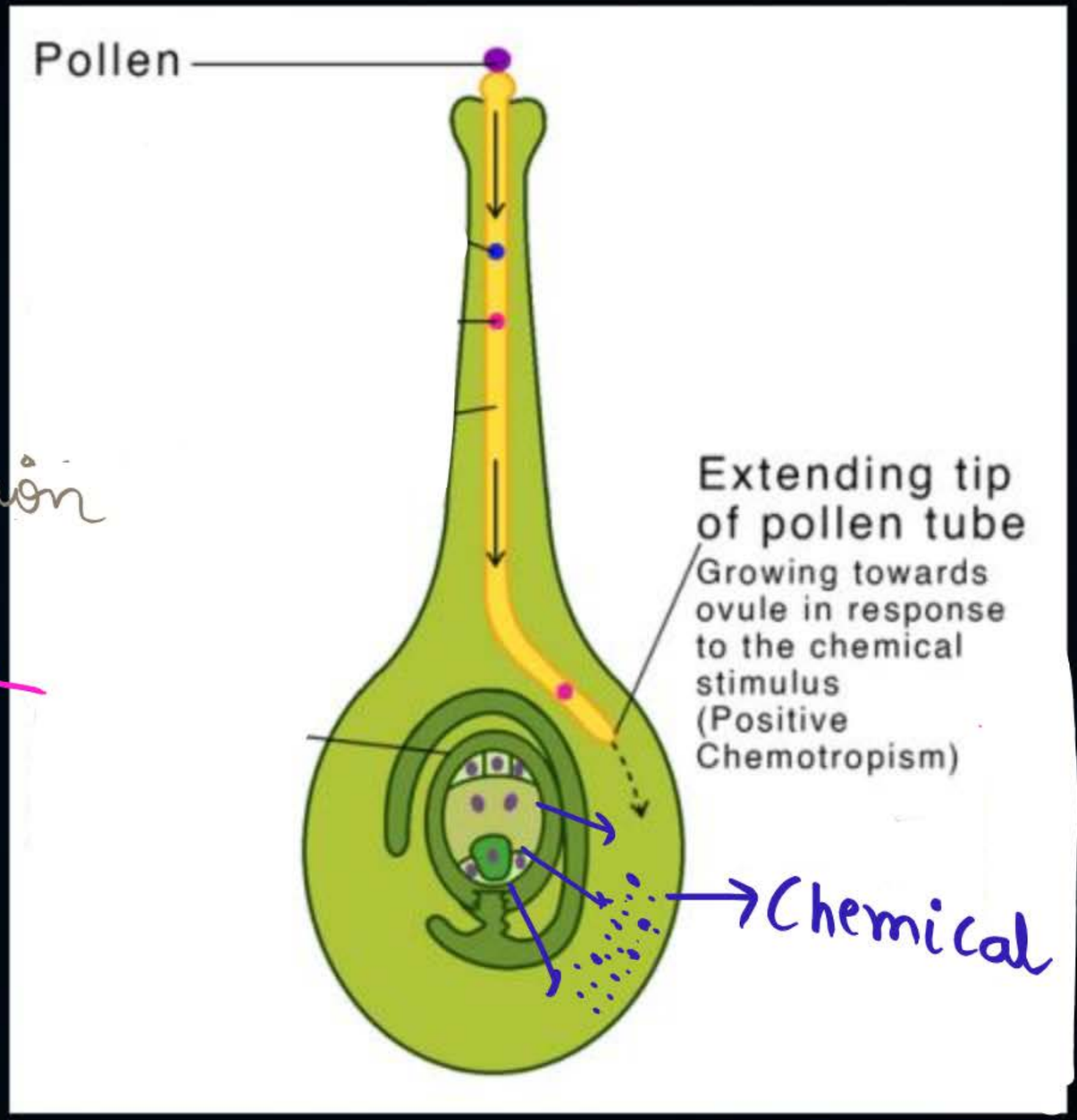
## Chemotropism

↓

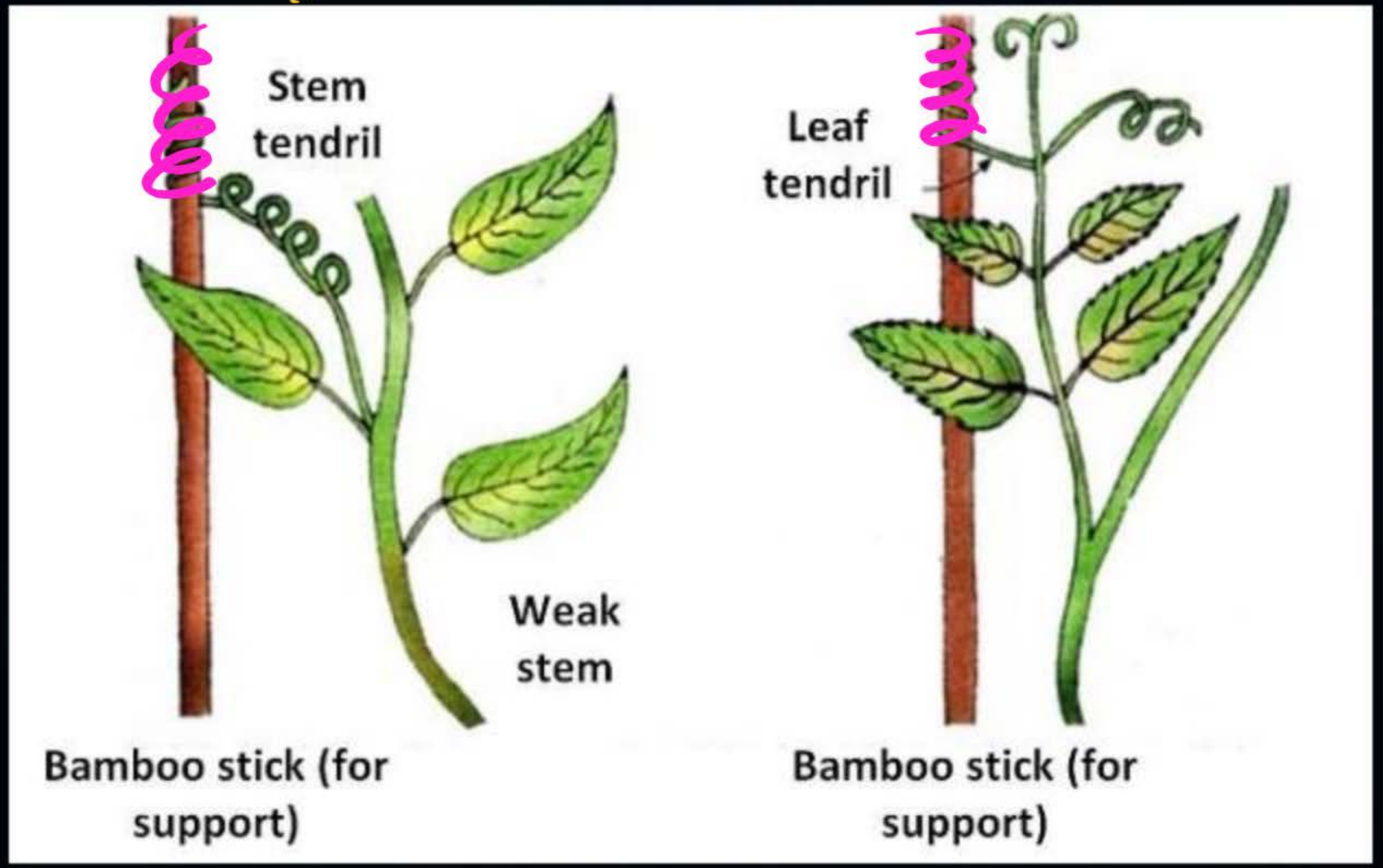
Chemical

# Pollen tube formation

+ve Chemotropism



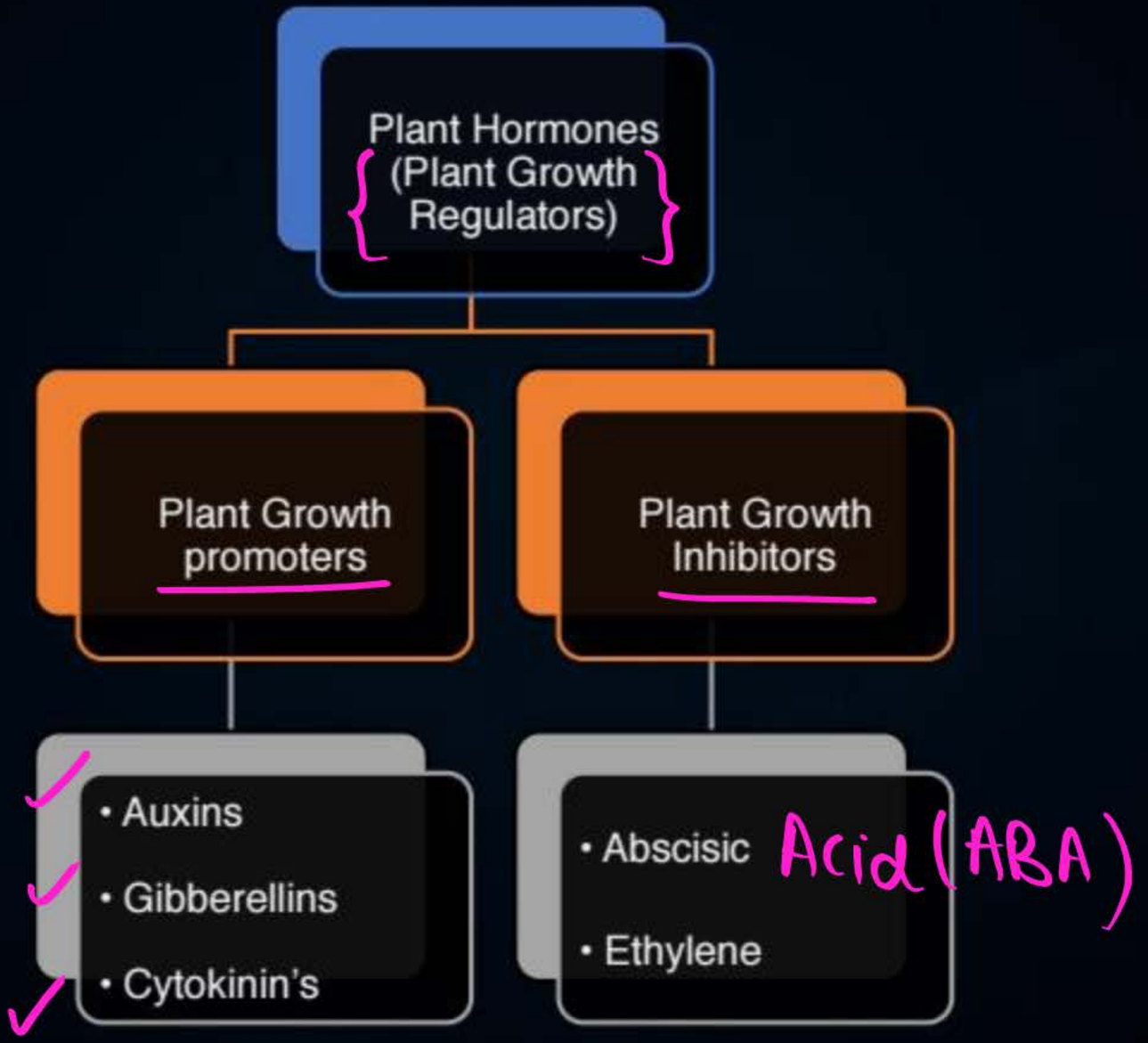
Touch ← **Thigmotropism** → Tropic Movement



# Differences between Tropic and nastic movements

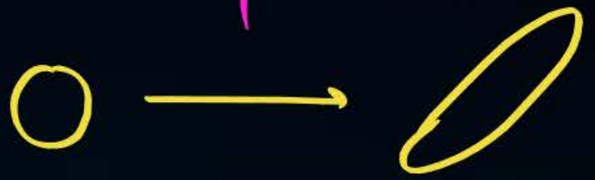
| Tropic movements | Nastic movements |
| --- | --- |
| • Growth dependent movements | • Growth independent movements |
| • directional movements with respect to stimulus | • Non directional movements |
| • More or less permanent and irreversible | • Temporary and reversible |
| • Found in all plants | • Found only in a few specialized plants |
| • Slow action | • Immediate action |

# Plant Hormones

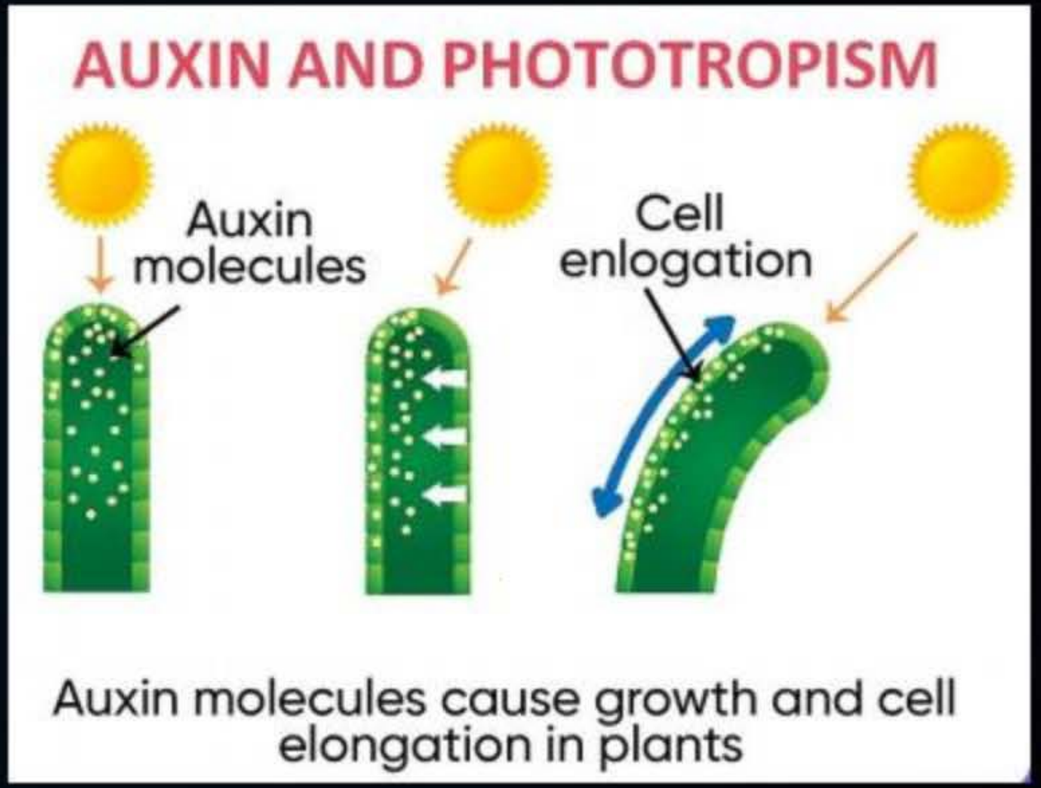


# Auxins

• First discovered plant hormone.



- Promotes cell elongation in shoots
- Controls phototropism/gravitropism
- Stimulates fruit development
- Delays aging of leaves and fruit



# Gibberellins → Gibberellic Acid → (GA)

- Stimulates stem elongation by promoting cell division and cell elongation

- Stimulates flowering, fruit development, and seed germination.


# Cytokinins

→ division of Cytoplasm [Cytokinesis]

- Stimulate cell division throughout the plant → GROWTH
- Delay ageing of leaves and flowers

## FUNCTION OF CYTOKININS ( PLANT HORMONE)

Cytokinins = More Mitosis

↓

More Mitosis = More Cells

↓

More Cells = Plant Growth

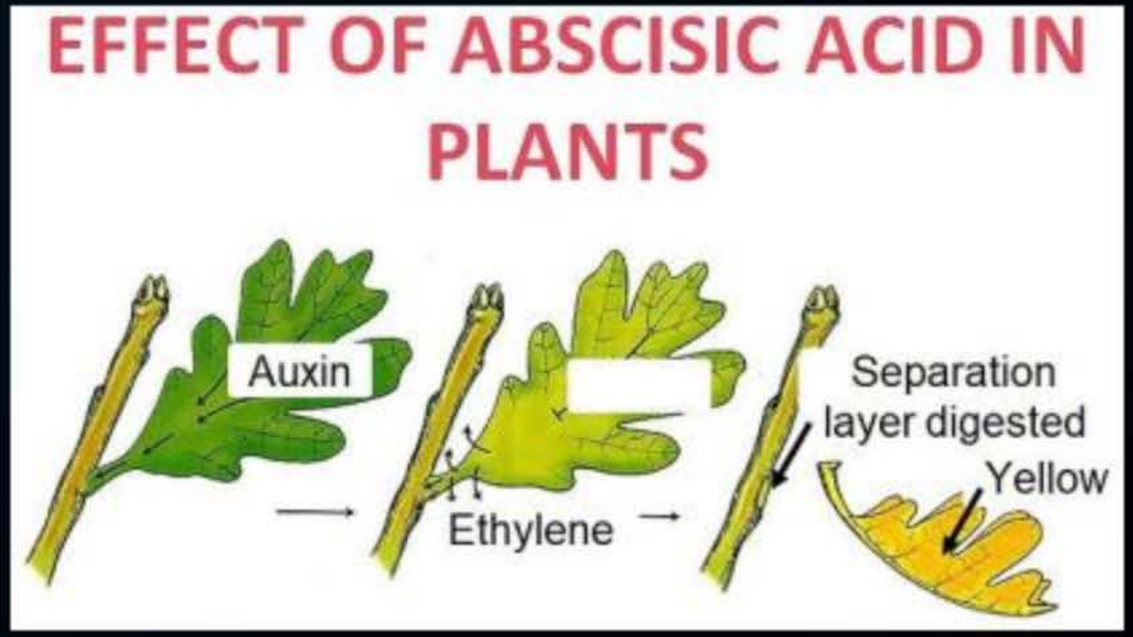
# Abscisic Acid

Stress hormone

- Cases stomata to close
- Inhibits stem growth and stimulates root growth in response to drought
- Maintains dormancy in buds and seeds

↓

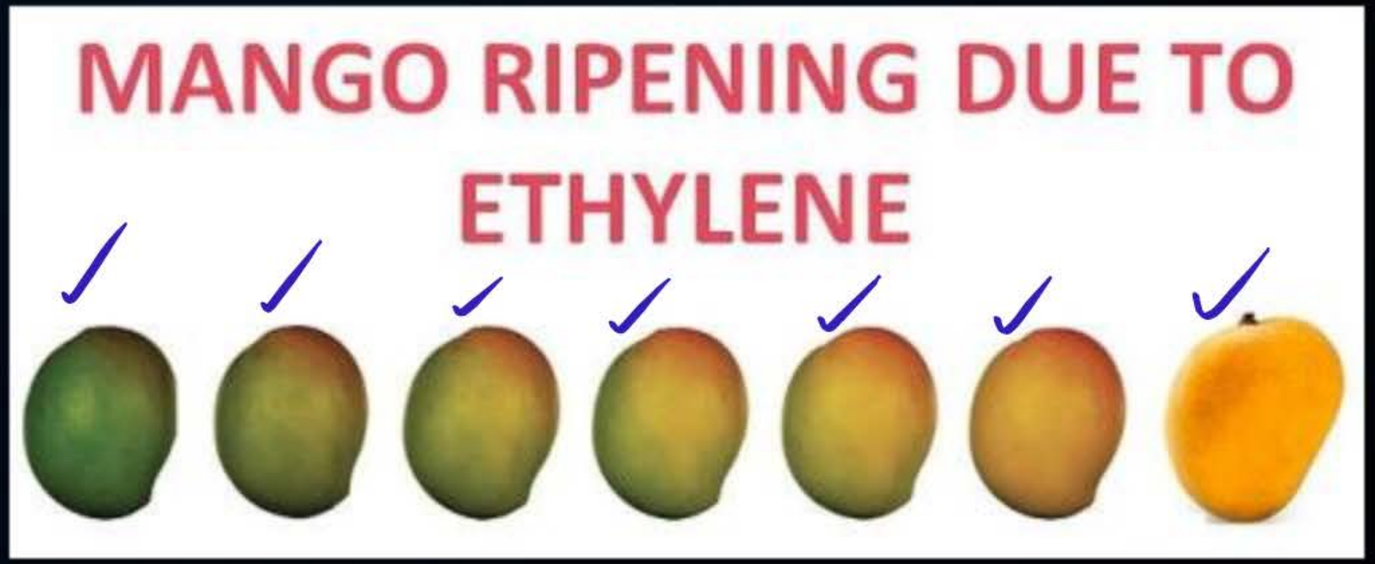
State of inactivity



# Ethylene

→ "gaseous hormone"

- Promotes ripening of fruits
- Promotes aging in leaves
- Promotes fruit and leaf drop



Question

Which type of movement is shown by touch me not plant ?

A Thigmotropism

B Thigmonasty

C Photo nasty

D Hydrotropism

Question

Which plants hormones induces ripening of fruit ?

A Auxin

B Ethylene

C Cytokinin

D Gibberellin

Question

Which plants hormones induces cell division ?

A Auxin

B Ethylene

C Cytokinin

D Gibberellin

Question

Shoots show

A Positive phototropism

B Negative geotropism

C Positive geotropism

D Both A and B

Question

#Q. Which of the following is not a plant hormone?

A. Auxin

B. Gibberellins

C. Cytokinin

D. Adrenaline

Question

#Q. Venus fly trap shows

A Photo nasty

B Photo tropism

C Thigmotropism

D Thigmo nasty

Question

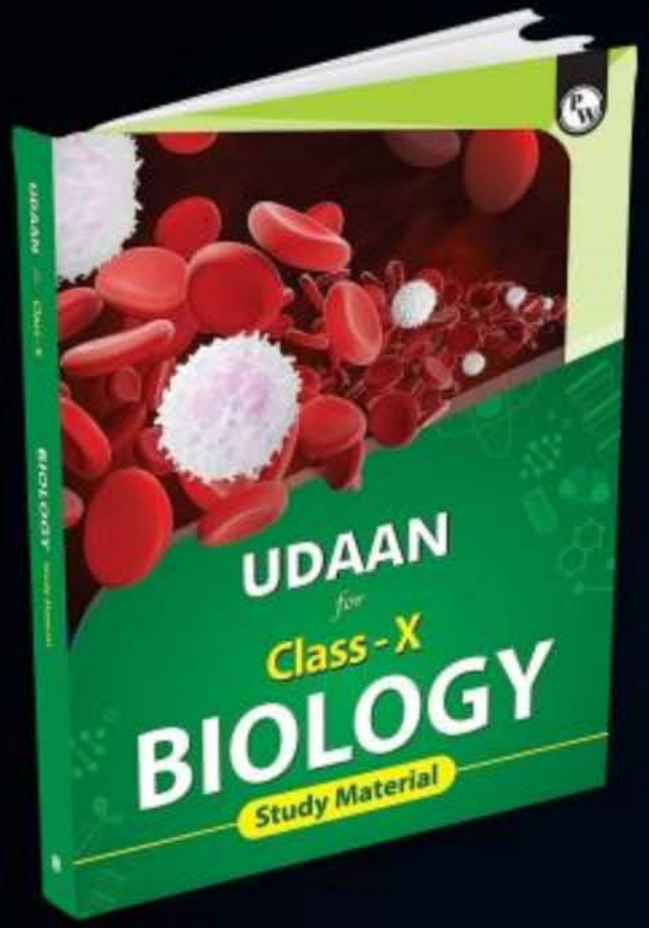
#Q. Phototropic and geotropic response of a plant is under control of following hormone :

A Auxin

B Gibberlin

C Cytokinin

D Ethylene




# Homework

FROM PW MODULE

( Udaan - CLASS 10 )

PAGE : 104 Q- 2 , Q- 3

# Joke/Meme of the Day


Mimosa pudica.

NCERT
Revise notes

# THANK YOU