$\qquad$
PLANTS FORM \& FUNCTION ACTIVITY \#5

DATE $\qquad$ HOUR__-_

## Control Systems in Plants

Hormones

## Mechanism for Hormone Action



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## Control of Cell Elongation



## Control of Apical Domi nance



## Рhоtotropism

|  |  |
| :---: | :---: |
|  |  |
|  |  |

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## GRAVI TROPISM

|  |  |
| :---: | :---: |
|  |  |
|  |  |

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## Control of Flowering: Short-day Plants



## Control of Flowering: Long-day Plants



## Questions:

1. Listed below are the production sites and effects of the seven classes of plant hormones. Identify the hormone described. Use the key provided to indicate your answers.

| ABA | $=$ | Abscisic acid | IAA | $=$ |
| :--- | :--- | :--- | :--- | :--- |
| B | Auxin |  |  |  |
| C | Brassinosteroids | Cytokinins | G | $=$ |
| Gibberellins |  |  |  |  |
| E | $=$ Ethylene |  | $=$ | Oligosaccharins |

$\qquad$ Produced by cells in the apical meristem of the shoot, embryo of the seed, and young leaves
$\qquad$ Produced by actively growing tissues in roots, embryos, and fruits
______ Produced by cells in meristems of apical buds and roots, young leaves, embryos
______ Produced by cells in leaves, stems, roots, green fruit
$\qquad$ Produced by tissues of ripening fruits, nodes of stems, aging leaves, and flowers
______ Found in cell walls
$\qquad$ Produced by cells in seeds, fruits, shoots, leaves, and floral buds
$\qquad$ Required for normal growth and development
$\qquad$ Trigger defense responses against pathogens; regulate growth, cell differentiation and flowering
$\qquad$ Inhibits cell division
$\qquad$ Helps prepare plant for winter; stimulates leaf primordial to form scales
$\qquad$ Stimulates the onset of seed dormancy
$\qquad$ Causes stomata to close when plant begins to wilt
$\qquad$ Causes fruit to ripen
$\qquad$ Inhibits growth when auxin levels are high
$\qquad$ May stimulate aging in plants
$\qquad$ Stimulates formation of abscission layer that leads to loss of leaves
$\qquad$ Causes Thompson grapes to grow larger and farther apart
$\qquad$ When applied to dwarf plant, causes plant to grow to normal height
______ Causes bolting in plants
_____ Stimulates flowering and fruit development
$\qquad$ Promote seed and bud germination
$\qquad$ Anti-aging hormone
$\qquad$ Inhibits branching in roots
$\qquad$ Stimulates growth of axillary buds
$\qquad$ Stimulates cell division
$\qquad$ Promotes growth of fruit
$\qquad$ Promotes formation of adventitious roots
$\qquad$ Promotes cell division in vascular cambium
$\qquad$ Stimulates cell elongation
2. Cytokinins work with auxin. Varying the ratio of auxin to cytokinins in tissue culture produces different effects. Describe the effect on plant growth in each of the following.

| RATIO | EfFECT ON PLANT GROWTH |
| :---: | :---: |
| Only auxin |  |
| Only cytokinins |  |
| Equal concentration of <br> auxin and cytokinins |  |
| More auxin than <br> cytokinins |  |
| More cytokinins than <br> auxin |  |

3. What must happen to the levels of ABA and gibberellin in a seed in order for it to germinate?
$\qquad$
$\qquad$
4. What are tropisms?

$\qquad$
5. If a plant part exhibits a positive tropism, it curves $\qquad$ the stimulus.

If a plant part exhibits a negative tropism, it curves $\qquad$ from the stimulus.
6. What type of tropism is shown in each picture below? Be sure to indicate if the tropism is positive or negative.
Indicated by Arrow
7. Why do cells on the shaded side of a stem have a higher rate of cell elongation that the cells on the sunny side?
$\qquad$
$\qquad$
$\qquad$
8. Explain why tendrils curl around an object.


9. Describe the rapid leaf movement in the Mimosa plant.
$\qquad$
Explain how this occurs.
$\qquad$
10. Define the following terms.

| Circadian rhythms |  |
| :---: | :--- |
| Photoperiodism |  |

11. Under what photoperiod conditions will:

Short-day plants flower? $\qquad$
Long-day plants flower? $\qquad$
12. What is phytochrome?
$\qquad$

What is its role in triggering plant responses?
$\qquad$
$\qquad$
$\qquad$
13. Use the drawings below to complete the statements that follow.

$\qquad$ would probably flower in June.
$\qquad$ would flower in autumn.
$\qquad$ would flower at any time during the growing season.
$\qquad$ produces the right amount of hormone for flowering when the days get shorter.
$\qquad$ produces the hormone needed for flowering when long periods of light occur.
$\qquad$ does not depend on a certain amount of light to make the needed amount of hormone for flowering.
14. On the diagram below, indicate whether a short-day or a long-day plant would flower under each of the light conditions shown.


| Condition | Would <br> short-day <br> plants <br> flower? | Would <br> long-day <br> plants <br> flower? | Condition | Would <br> short-day <br> plants <br> flower? | Would <br> long-day <br> plants <br> flower? |
| :---: | :---: | :---: | :---: | :---: | :---: |
| A |  |  | D |  |  |
| B |  |  | E |  |  |
| C |  |  | F |  |  |

