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Period: _____

What's Stomata With You?

Objectives

In this lab, you will learn about leaf stomata, form hypotheses, and count the number of stomata on each side of a leaf.

Pre-Lab Questions

1. Use the word bank to fill in the blanks. Each word will be used only once.

WORD BANK

carbon dioxide (CO ₂)	open	water (H ₂ O)
close	oxygen (O ₂)	turgid
epidermis	flaccid	transpiration
guard cells	pores	

Stomata are microscopic _____ pores _____ in the _____ epidermis _____ of leaves where _____ carbon dioxide _____ enters and _____ oxygen _____ exits during photosynthesis. _____ water _____ also exits the leaf through stomata due to evaporation in a process called _____ transpiration _____.

Specialized cells called _____ guard cells _____ control the opening and closing of stomata. When these cells fill with water, they become _____ turgid _____ and the stoma _____ open _____. When water leaves these cells, they become _____ flaccid _____ and the stoma _____ close _____.

What's Stomata With You?

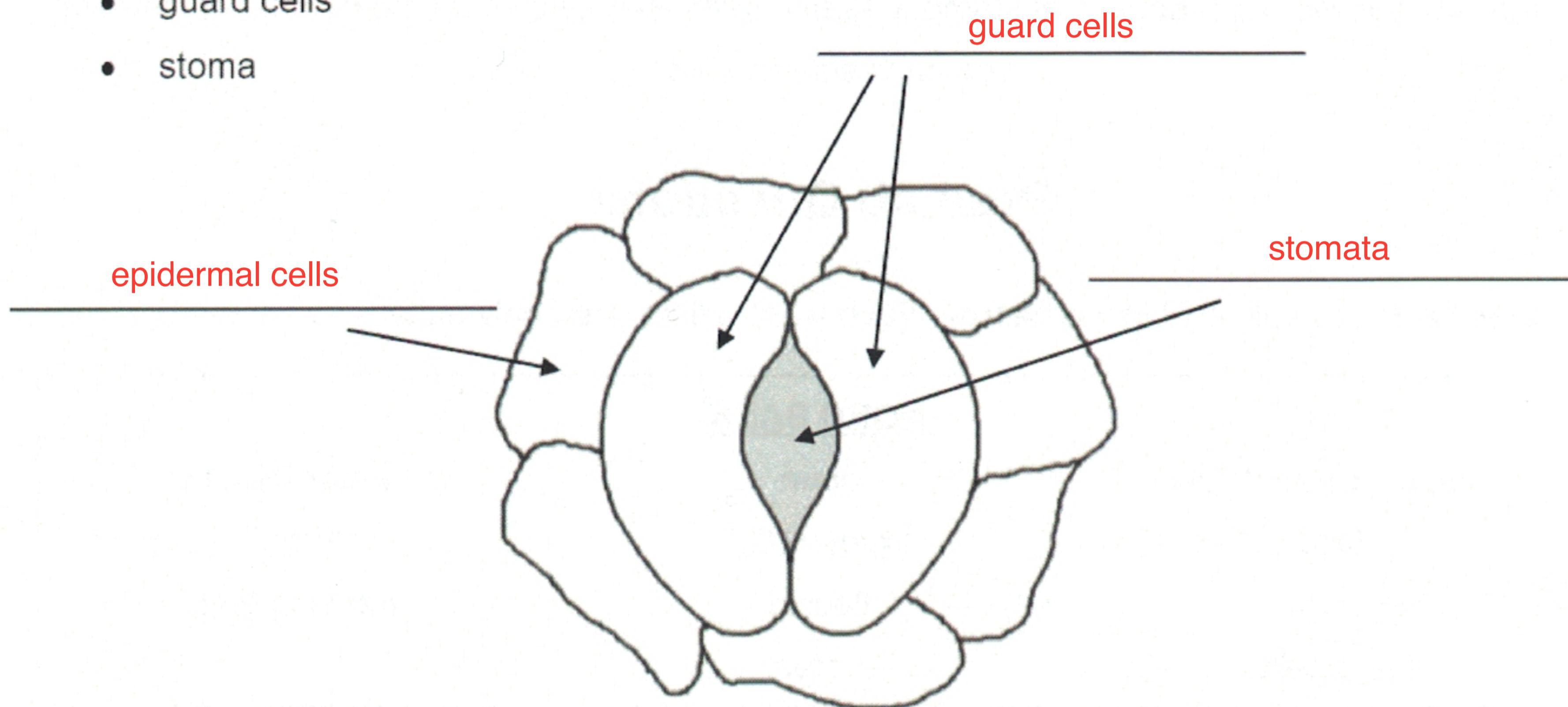
2. The two major functions of stomata are:

1) _____ facilitate gas exchange that occurs during photosynthesis

2) _____ facilitate transpiration according to environmental circumstances

3. On the drawing below, label the following:

- epidermal cells
- guard cells
- stoma



4. Name five factors that cause stomata to open or close.

1) _____ relative humidity

2) _____ temperature

3) _____ soil water

4) _____ light

5) _____ wind

What's Stomata With You?

5. What challenge do plants face that might affect their stomata?

challenges that plants face when it comes to their stomata is the balance between water loss and gas exchange because they need the stomata to be open if they want to produce sugars and undergo photosynthesis but if the stomata are open then transpiration will most likely occur and initiate water loss.

Activity: Leaf Impressions

Materials

- *Tradescantia zebrina* plant
- Forceps
- Microscope
- Microscope slides
- Slide coverslips
- Beaker of water with dropper
- Temperature gun

What part of a leaf would be warmest and driest? Why? (Hint: Think about a very hot, sunny day.)

The side of the leaf facing the sun because it would gain a lot of heat from the sunlight

and the underside where the stomata would be losing water so that would dry up the surrounding areas

such as the side of the leaf facing the sun.

Form a **hypothesis** about stomata on the top and bottom of a leaf. Do you think one side has more stomata than the other, or that both sides are the same? Why?

If stomata on both sides of leaf are measured then the underside of the leaf would have the most

most stomata because it would have the most control over rate of water loss because the sun is

not directly heating it.
