

# 8/9/17 Agenda

- 1.) Address any homework questions on notes taken from virtual simulation website.
- 2.) “Must Know Science ACT Test Taking Tips”, with Test 2 results, Questions 1-24
- You will take notes on a separate paper or word document.
- You will also need the paper copy of your test 2 to take notes.

# A.) Test Tip 1: Always refer back to the passage (Block Text)

- Read the passages to understand the gist and the data that is presented, but also move back to the passage to locate the information you need to answer. Memory alone will not suffice, and you may find it helpful to jot down a few short notes on each passage. Drawing arrows, underlining and circling important info is also a great idea

# Overall

- Step 1: Read Passage
- Step 2: Underline What's Important
- Step 3: Read Question then Reread Passage and Circle Information (that will help you answer the question)
- Step 4: Make Notes in Margin

# Let's Practice! Look at the 1<sup>st</sup> “Block Text” for question #1-8.

- Step 1 and 2: Read Passage and Underline What's Important
- A scientist wants to measure the amount of a dangerous gas, sulfur dioxide (SO<sub>2</sub>), in the air. She measures it in units of *concentration*, which is the amount of a substance in a set amount of air. The scientist has a sensor that measures concentrations of SO<sub>2</sub> by the turning of a dial, which is shown on the front of the sensor.
- Five gases with various SO<sub>2</sub> concentrations were chosen to test the sensor. All of the concentrations are measured in *ppb*, which stands for parts per billion; 1 *ppb* means 1 out of every million molecules in the air is SO<sub>2</sub>.

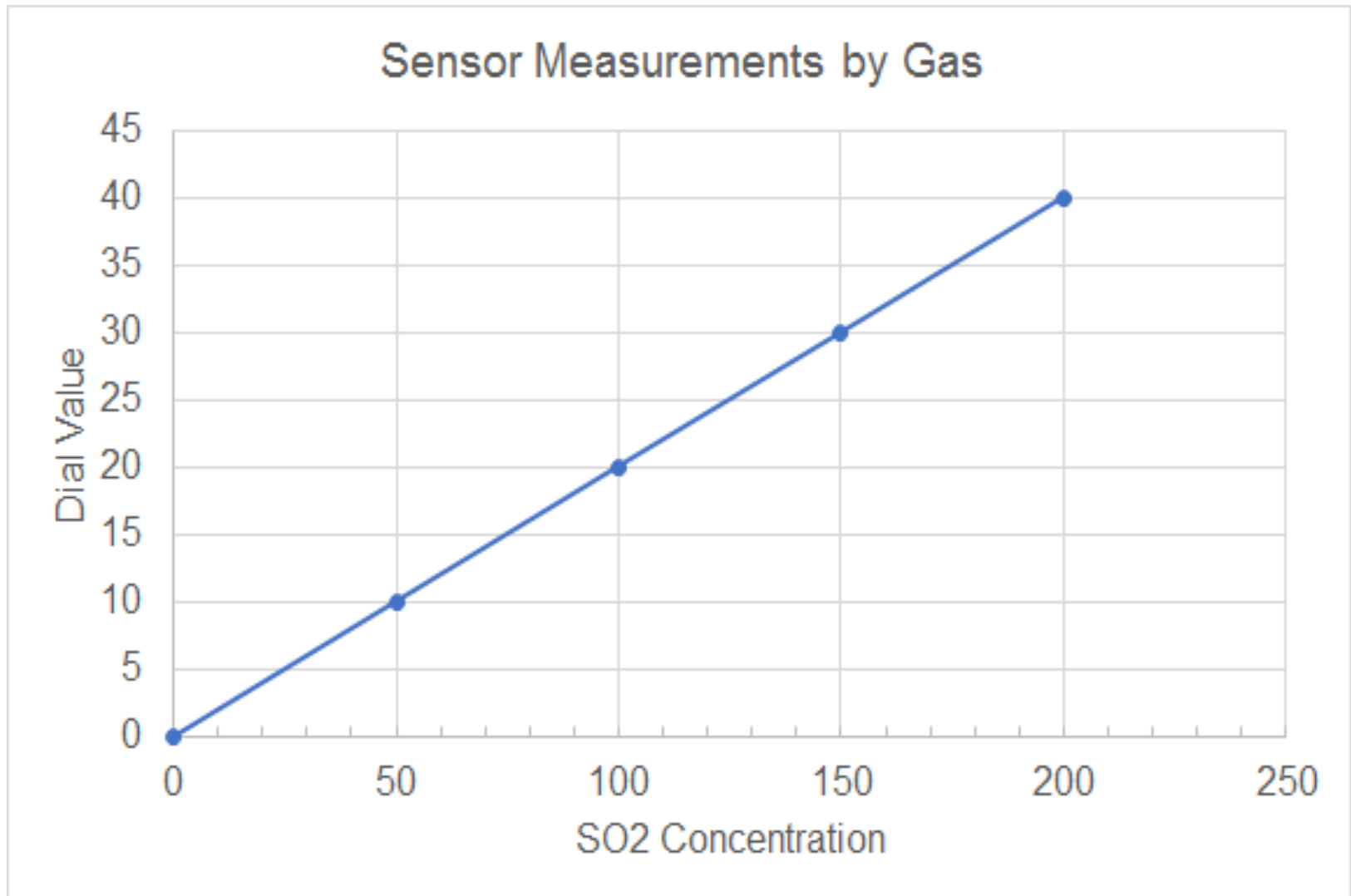
# Table 1

## *Experiment 1*

The scientist pumps all 5 gases (A-E) into the sensor box, and records the sensor reading for each gas. The results are plotted in the graph below

Gas	SO <sub>2</sub> Concentration
A	0
B	50 ppb
C	100 ppb
D	150 ppb
E	200 ppb

**Figure 1: Sensor Measurements by different gases,  
A-E.**



The scientist also brings the sensor to 5 different locations to measure SO<sub>2</sub> concentrations. The sensor readings for each location are shown in the table below:

**Table 2**

Location	Sensor Readings
House	3 ppb
Forest	12 ppb
Bus	15 ppb
Coal plant	24 ppb
Volcano	35 ppb

# Step 3: Read Question then Reread Passage and Circle Information (that will help you answer the question)

Lets Practice! (As you read the question, underline important information!)

- 1.) Based on Experiments 1 and 2, which of these is closest to the  $\text{SO}_2$  concentration on the bus?
- A.) 150 ppb
  - B.) 75 ppb
  - C.) 15 ppb
  - D.) 5 ppb



# Step 4

## Let's Practice

- Make notes in the margin of the text and mark any graphs/ tables based upon what the question is asking! Refer back to question.

1.) Based on Experiments 1 and 2, which of these is closest to the  $\text{SO}_2$  concentration on the bus?

- A.) 150 ppb
- B.) 75 ppb
- C.) 15 ppb
- D.) 5 ppb

# Answer

- Answer: B
- Table 2 shows that the sensor reading on the bus was 15. From Figure 1, we can see that a sensor reading of 15 corresponds to an SO<sub>2</sub> concentration of 75. B is the correct answer.

# Now try the same method by yourself!

- 2.) If SO<sub>2</sub> is a dangerous gas, which place would be the safest?

A.) House

B.) Forest

C.) Coal Plant

D.) Volcano

Remember the steps! You don't have to do Steps 1 and 2 since it's the same passage, but read the question, underline the important information in the question, and then circle and take notes on anything from the text that will help you answer the question

- Answer: A
- Because  $\text{SO}_2$  is dangerous, the safest place would have the lowest  $\text{SO}_2$  concentrations. From Table 2, we can see that the house has the lowest  $\text{SO}_2$  readings.

## B.) Test Tip 2: What type of passage did you read?

- **ACT science passage types**
- **1.) Data Representation**: presents information about a topic
- **2.) Research Summary**: presents a series of experiments
- **3.) Conflicting Viewpoints**: discusses different theories about a single topic

Reread passage for the first block text for questions #1-8. Come to a consensus with your partner on the passage type. Write down which you chose and why with one example from the text.

# Research Summary: Why?

- Passage Type: Presents an Experiment!
  - Examples from the text
- “A scientist wants to measure the amount of a dangerous gas, sulfur dioxide (SO<sub>2</sub>), in the air.”
- “Five gases with various SO<sub>2</sub> concentrations were chosen to test the sensor.”

# Try on your own!

- Now determine the type of passage for Block Texts pertaining to questions #9-16 and #17-24.
  - Remember the types:
    - **Data Representation**: presents information about a topic
    - **Research Summary**: presents a series of experiments
    - **Conflicting Viewpoints**: discusses different theories about a single topic
  - Underline parts of the text that back up your decision

# #9-16: Research Summary

- Students used bacterial culture to grow colonies of the bacteria *prochlorococcus*. The bacterial culture consisted of a large glass bottle containing the bacteria, as well as nutrients, which are necessary for the bacteria to grow.



# #17-24: Research Summary

- Students planted sunflower seeds in soil in a pot and placed it in a window. They measured the height of the sunflowers daily over 84 days, and also watered the plant every day. Shown below is the graph of plant height over time.

# C.) Test Tip 3: What type of question did you read?

## **Know the ACT science question types**

- **1.) Figure Interpretation** – examine tables & graphs
- **2.) Patterns** – describe the relationship between the variables, plot data from the table, or describe the shape of a curve
- **3.) Scientific Reasoning** – understand the reasons behind an experimental setup

# What type of question and why?

1.) Based on Experiments 1 and 2, which of these is closest to the SO<sub>2</sub> concentration on the bus?

- A.) 150 ppb
- B.) 75 ppb
- C.) 15 ppb
- D.) 5 ppb

## Reminder:

- **1.) Figure Interpretation** – examine tables & graphs
- **2.) Patterns** – describe the relationship between the variables, plot data from the table, or describe the shape of a curve
- **3.) Scientific Reasoning** – understand the reasons behind an experimental setup

# #1: Figure Interpretation

- The question is asking you to go back to both the tables and graphs to calculate the answers!
- Now try to identify the type of question for #2 on your own. Explain your answer!

# #2: Figure Interpretation

- If  $\text{SO}_2$  is a dangerous gas, which place would be the safest?
- House
- Forest
- Coal Plant
- Volcano

# Extended Practice:

- Let's Practice what we learned, in total, with question 4!

4.) Further experiments find that the sensor reading for each experiment varies based upon many factors, including wind. These experiments find that any sensor reading can vary both above and below the value recorded in *Experiment 2* by 4. Which two sensors could possibly record the same value in future experiments, according to this variation?

- A.) House and Forest
- B.) Forest and Coal Plant
- C.) Bus and Volcano
- D.) Bus and Forest

# Answer Explanation

Each sensor has a range of values it can take, which varies from the values recorded in *Experiment 2* by -4 or +4. Thus, the range of values each location have is:

House: 0-7

Forest: 8-16\*

Bus: 11-19\*

Coal plant: 20-28

Volcano: 31-39

- In order for two locations to show the same value in the future, their possible range of values must overlap. The only two locations whose possible values overlap are the forest and bus, as the numbers 11 - 16 are present in both ranges. Option D is the correct answer.