1. This Quiz covers lab on Photosynthesis. We used pH indicator Phenol Red – red in color at pH = 7 or above and yellow in color at pH = below 7. If CO₂ is added, respiration or fermentation, to a system it combines with water to form H₂CO₃, Carbonic acid which yields H⁺ ions leading to lowering of pH and color changes from red to yellow. The reverse happens when CO₂ is taken, photosynthesis, out of a system, H⁺ ions are removed and pH is raised – color changes from yellow to red.

2. Photosynthesis: 6CO₂ + 6H₂O + Sunlight → C₆H₁₂O₆ + O₂. The 2 photosystems, having Chlorophyll and other pigments, present in leaves, use the energy of sunlight to produce Glucose. It means removal of CO₂ from a system or addition of O₂ to a system indicates occurrence of photosynthesis. Removal of O₂ or addition of CO₂ indicates cellular respiration.

3. 1st Lab: Hypothesis: Green parts of Coleus leaf – have chlorophyll and perform photosynthesis leading to synthesis of glucose and starch. Yellow parts lack chlorophyll, therefore no photosynthesis no starch. Experiment: We break cell membranes by boiling the leaf in water and transfer it to alcohol which extracts the pigments and make the leaf white. On pouring iodine the parts having green colors originally, turn black, indicating presence of starch and photosynthesis. Originally yellow parts turn brown indicating absence of starch and photosynthesis. Conclusion – Chlorophyll is necessary for photosynthesis.

4. 2nd Lab: When you blow your breath in phenol red addition of CO₂ lowers the pH and changes the color from red to yellow. The half yellow phenol red having an Elodea twig changes back its color to red because Elodea performs photosynthesis and removes CO₂ from the solution. The other half keeps its red/pink color. Conclusion - Photosynthesis uses CO₂ to synthesize glucose.

5. 3rd Lab: Hypothesis – You didn’t do this lab experiment.

6. 4th Lab: Search google images for ‘paper chromatography of plant pigments’ and you can get some nice images. Memory aid is bax-c. At the bottom is Chlorophyll b, Chlorophyll a, Xanthophyll (yellow)and Carotene (red) at the top. Some of you correctly noted yellow going above green of chlorophylls. The different pigments have different structure and move at different speeds when passing through the channels of chromatographic paper. Therefore different pigments get separated.
Separation of plant pigments by Paper Chromatography

Carotene
Xanthophyll
Chlorophyll a
Chlorophyll b
Charge
Solvent