

Virtual Lab 5 Photosynthesis

http://www.phschool.com/science/biology_place/labbench/lab4/intro.html

1) Define photosynthesis

2) Define chlorophyll

Click *4-I Chromatography* on the left side of the page

3) What is the paper chromatography used for?

4) What are the 3 factors that affect how far a molecule migrates up the paper?

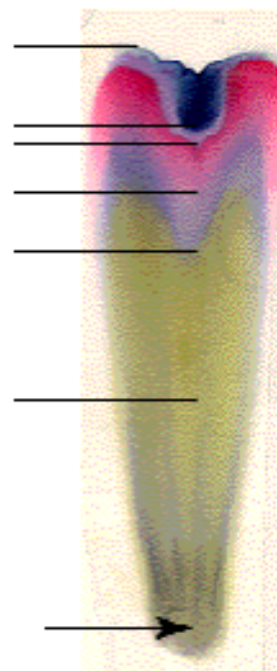
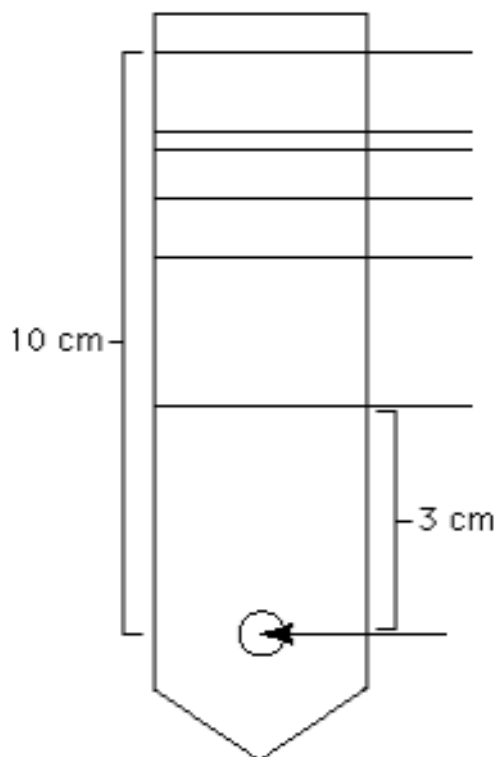
I.

II.

III.

5) Label the diagram below

Separation of black ink pigments



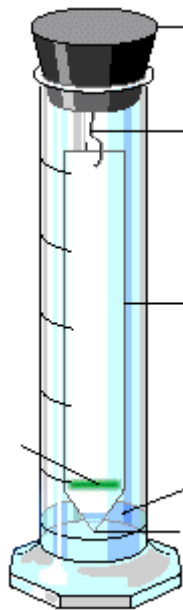
6) Define pigment

7) Define chloroplast

Click *Next*

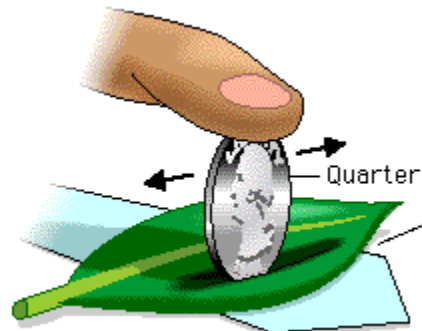
8) What is going to carry the pigments found in chloroplasts up the paper?

9) Fill in the diagram below



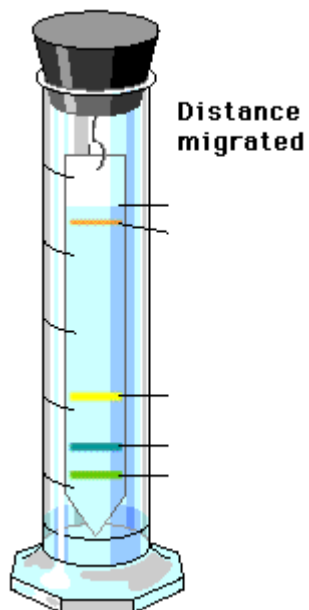
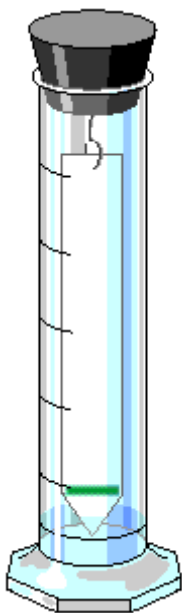
Click *A Closer Look*

10) Fill in the diagram below



Click *Next*

11) Fill in the diagram below



Click *Next*

12) Why do we need to calculate the R_f ?

13) What is the equation for the R_f value?

14) Calculate the R_f value for the green ink from question #5. Show your work!

Click on *Self Quiz*

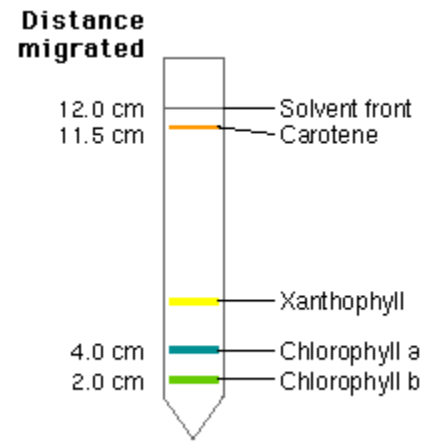
15) What is true about the chromatogram to the right?

16) Explain your answer to the question above

17) If a different solvent were used for the chlorophyll chromatography described earlier, what results would you expect?

18) Explain your answer to the question above

19) What is the R_f value for carotene calculated from the chromatogram above? Show your work!



Click *4-II Photosynthesis* in the left side menu bar

20) Define pigment

21) Photons of light excite electrons found in what plant pigment?

22) What do the excited electrons do?

23) Define thylakoid

24) What captures the energy in the excited electrons?

Replay the animation a few times

Click *Next Concept*

25) What is the role of DPIP in this experiment?

26) What molecule is DPIP replacing (go back to the previous animation if necessary)?

27) What happens to the color of DPIP when it is reduced (accepts electrons)?

28) Explain why color change in DPIP can be used to measure the rate of the light reactions of photosynthesis

Click *Next Concept*

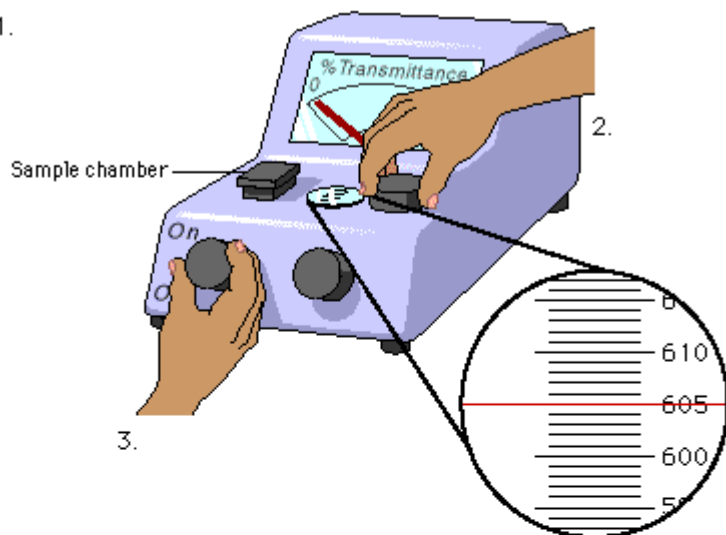
29) What is a spectrophotometer?

30) Explain how a spectrophotometer works

31) Fill in the diagram below

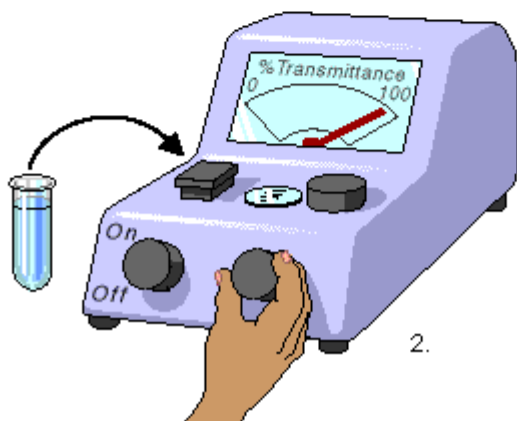
A.

1.



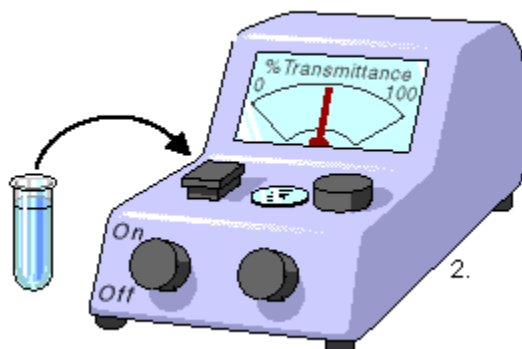
B.

1.



C.

1.



Click *Next*

32) What range do pigments absorb in?

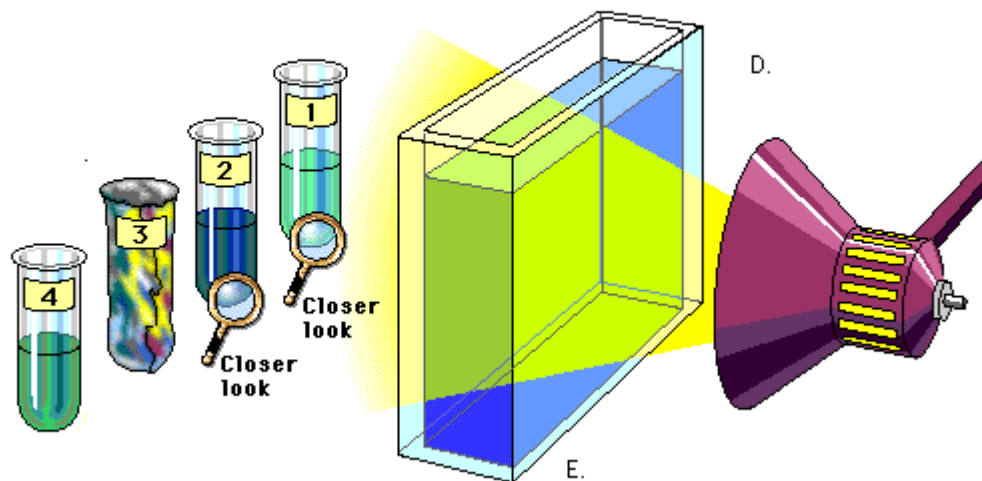
33) What is the spectrophotometer going to measure?

34) Fill in the diagram below

A.

B.

C.



35) Describe the color of DPIP when it is in its oxidized state

36) Will transmittance be high or low?

37) Excited electrons from the light reactions carried out in the thylakoid membranes of chloroplasts will reduce DPIP. Will transmittance be high or low if photosynthesis is high?

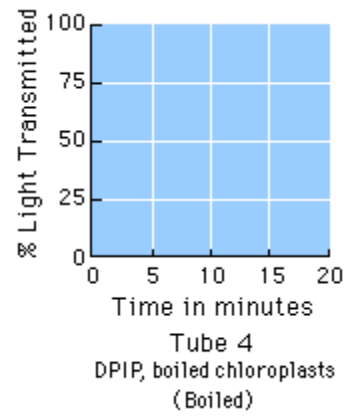
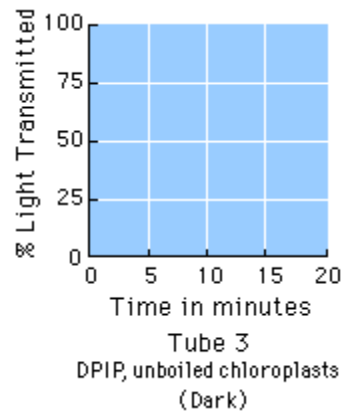
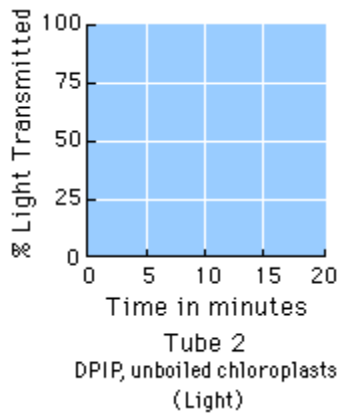
38) Explain your answer to the question above

39) What is in the "blank"

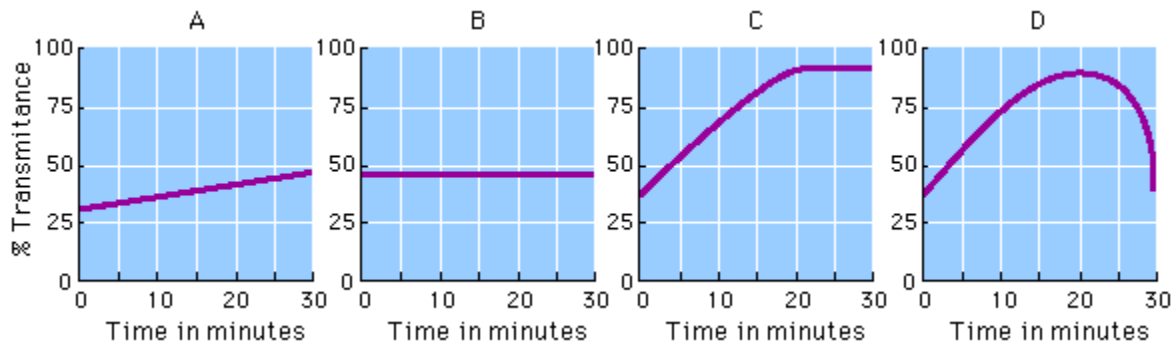
40) What is the purpose of having a "blank"?

41) Following the procedures described above, expose the tubes to light and make an initial spectrophotometer reading, followed by readings at 5, 10, and 15 minutes.

Print the graphs below and, based on your understanding of the light reactions of photosynthesis, draw in the approximate shapes of the curves you predict. Bring the graphs to class with you.



Click *Self Quiz*



42) Which graph above would be the most likely result of performing the photosynthesis experiment using fresh chloroplasts placed in light and DPIP?

43) Explain your answer to the question above

44) What is the best explanation for graph B above?

45) Explain your answer to the question above

46) What effect would adding more DPIP to each experimental tube above have on these results?

47) Explain your answer to the question above

48) What is the role of DPIP in this experiment?

49) Explain your answer to the question above