

PST-cell-4: Banana cell Visual Microscopy Kit



This poster is a wet mount of banana cells (from the part we eat) that have been coverslipped in iodine. It shows three complete banana cells from an unripe banana at 400X. Specific items are indicated by each of the following arrows on this image:

- Indicates the cell walls around each cell
- ▶ Indicates cell membranes
- Indicates amyloplasts

Iodine turns dark (purplish black) in the presence of starch. An unripe banana contains a lot of starch within amyloplasts. Amyloplasts make and store starch, and are found in these cells instead of chloroplasts. When unstained, amyloplasts are clear.

The cell walls are very thin around banana cells. Occasionally, a small separation can be seen between the cell wall and cell membrane and this helps distinguish the two structures.

For all Cell Zone®, Inc. posters

General Instructions:

- Move from room to room or maintain in one location
- Hang on any permanent or removable hook by the grommet
- Use a dry erase marker on the frame; erase the same day to ensure clarity
- Store multiple posters by stacking so that the grommet cannot scratch the front of a neighboring poster

Advantages with using posters:

- Hanging real cell micrographs makes your classroom or lab space look like a place where real science is done
- The posters can be hung as art or for learning
- The posters can be paired with microscopy or used separately
- You will always have a good example of what you want your students to see

Lessons for this specific poster

1. In combination with the Dynamic Cell Models from Cell Zone®, Inc., any student or group of students can choose one cell from within this poster to model. Once they have assembled their banana cell model, they can then describe/defend their model to their classmates or to you.
2. Lessons when pairing the use of this poster with microscopy:
 - Put the microscope pointer on something within the microscope field and ask them to find something similar on the poster and identify it with their classmates.
 - Indicate an item on the poster by pointing or drawing on the frame with a dry erase marker and have your students find a similar thing in their microscope field; each student can do this or groups of students can do this and you can check.
 - Have students view very ripe banana cells coverslipped with iodine. Can they still see a lot of amyloplasts? They should no longer see many since the starch was broken down to sugar during ripening. (*see American Biology Teacher 77(8):620*)
3. Hand your students a dry erase marker and have them identify every part of a banana cell that they can see clearly in the photomicrograph by writing on the poster frame. Either leave it open ended (thus giving them an option to identify things that they cannot see like the ER or ribosomes) or give them a specific list.
4. Ask your students if these plant cells carry out photosynthesis. See if they can figure out that chloroplasts are needed for photosynthesis and that these cells lack chloroplasts. Finally, ask them why amyloplasts are needed in these cells (to store starch until ripening so that these cells can become sweet and attractive to animals to spread their seeds).
5. Have your students compare this image to the standardized drawing or model of a typical plant cell. Ask them if they look the same. Have them identify all the things that they can see in both and figure out why they cannot see so many of the items indicated in the drawing or model; the reason is that those other items are too small for light microscopy to resolve.

