UTI Instructions: Cells, Science & Questions

Introduction:
This activity introduces students to asking questions. Students examine pictures and video of unknown cells and processes and develop hypotheses or explanations for what they see. In teams, students refine their guesses. This activity makes a good introduction to the course.

Procedure:
1. Briefly introduce yourself to the class.
2. Explain to students that an important part of science is generating questions based on observations. To practice this they will make some observations of several cells. Students should examine the first cell shown and make some observations about the cell, recording these observations in the left column on the handout. Then they are to suggest a function for the cell based on structure. Note that formal language (terminology) isn’t important. Also note that their suggestion doesn’t have to be correct, but does have to be thoughtful. Allow about two minutes for them to record their thoughts.
3. Students should then pair with someone they don’t know. They should introduce themselves, share majors, most recent vacation, etc. Then, students should share their thoughts or reasoning about function and make a best guess in tandem with the partner. This best guess and the associated reasoning should be recorded in the center column on the handout. Allow about four minutes for pairs to make a joint suggestion. Circulate around the room, observing the interactions in the pairs. Reward meaningful suggestions or contributions with attention and/or praise. If a pair appears to be done before the allotted time, encourage that pair to think of alternatives and the associated support for the alternatives.
4. Student pairs should then find another pair of students to repeat the process of sharing and decision-making about possible function. Again, the team’s best guess and the associated reasoning should be recorded in the right column on the handout. Allow about four minutes for the teams to make a final decision on function. Again, circulate around the room, observing the interactions in the teams. Reward meaningful suggestions or contributions with attention and/or praise. If a team appears to be done before the allotted time, encourage that team to think of alternatives and the associated support for the alternatives.
5. Randomly select a team to share their decision and reasoning. Ask if any particular observation was especially important. Record the student responses on the board. Ask the class if any teams reach another conclusion. Record these suggestions as well. Note any important observations in these conclusions. Reward all meaningful suggestions, even if you know that the suggestion is “wrong”.
6. Repeat steps 2-5 for each cell type. As the students become more familiar with the process, the time required for each step will lessen.
7. Direct student attention to the video clips (play the same clip continuously). Explain that these clips depict different processes of cells. Students should examine the first video clip and make some observations as they did previously. This time, they should suggest what activity is being depicted. Note that formal language (terminology) isn’t important. Observations and reasoning should be recorded in the left column.
8. Repeat steps 3-5 for the first video clip.
9. Repeat steps 7-8 for the remaining video clips. Stop the activity with about 8 minutes remaining. Students should reflect on the day’s activity using the printed questions as a guide. They do not have to respond to every question, but their responses should be thoughtful.
10. Collect handouts before students leave.