

Cell Biology

Types of stations observed:

1. Stages of mitosis & meiosis
2. Cell cycle
3. Differences between prokaryotic & eukaryotic cells
4. History of cytology
5. Types of microscopes -light vs electron - uses, capacities, limits
6. Methods of studying cells
7. Measuring size of cells
8. Identifying cell types
9. Identifying tissue types - structure, function, chemical mechanisms
10. Electron micrographs of organelles - function, identification of parts, chemical mechanisms.
11. Viruses - structure, reproduction, genetics, retroviruses
12. Effects of viruses on other cells
13. DNA structure & replication - Ozarkian fragments
14. Kinds of RNA - transcription, exon & interons
15. Translation - amino sequence
16. Prokaryotic cell reproduction and DNA operation
17. Plasmids and restriction enzymes
18. Techniques for biotechnology as electrophoresis, DNA probes
19. Identification of key organic chemicals and their role in cell operation.
20. Osmosis, diffusion and cell transport
21. Immunology mechanisms
22. Control of cell size - cell shapes
23. Photosynthesis & cell respiration
24. Enzymes and their role in cell activities
25. ATP
26. Cell differentiation

NOTE: CELL BIOLOGY HAS BEEN CHANGED TO INCLUDE MORE PROCESS SKILL ACTIVITIES INTO THE EVENT. THE STATIONS WILL NOW USE QUESTIONS AND TASKS THAT TEST BOTH THE UNDERSTANDING OF THE STUDENTS KNOWLEDGE AND THE PROCESS SKILLS INVOLVED IN CELL BIOLOGY.

**SAMPLE TOURNAMENT
CELL BIOLOGY**

SCHOOL NUMBER _____
SCHOOL _____
STATE _____

STUDENT NAMES: (PLEASE PRINT)

1. _____
2. _____

RAW SCORE _____
RANK _____
POINTS _____

BE SURE TO INCLUDE APPROPRIATE UNITS WITH ALL ANSWERS!!!

STATION A:

1. _____
2. _____
3. _____
4. _____
5. _____

STATION F:

26. _____
27. _____
28. _____
29. _____
30. _____

STATION B:

6. _____
7. _____
8. _____
9. _____
10. _____

STATION G:

31. _____
32. _____
33. _____
34. _____
35. _____

STATION C:

11. _____
12. _____
13. _____
14. _____
15. _____

STATION H:

36. _____
37. _____
38. _____
39. _____
40. _____

STATION D:

16. _____
17. _____
18. _____
19. _____
20. _____

STATION I:

41. _____
42. _____
43. _____
44. _____
45. _____

STATION E:

21. _____
22. _____
23. _____
24. _____
25. _____

STATION J:

46. _____
47. _____
48. _____
49. _____
50. _____

Station A:

Use the experimental setup with carrots and the diagrams of cell in beakers to answer the following questions.

1. What process will occur to cause the carrots to swell or shrink?
2. In which jar will the carrots swell the most?
3. In which jar will the carrots shrink the most?
4. Examine the of cells in beakers lettered A - E and indicate the letter(s) of the beaker(s) which contain hypotonic cells.
5. Indicate the letter from the diagram of the beaker(s) which illustrate an increase in turgor pressure.

Station B:

Examine the data and diagrams provided regarding the cell cycle.

6. In which phase does a cell spend most of it's life? (Give the name from the data table and the letter from the diagrams.)
7. In which phase does a cell spend the smallest amount of time? (Give the name from the data table and the letter from the diagrams.)
8. How many minutes does it take a normal chicken stomach to complete the cell cycle?
9. How many minutes does it take a cancerous chicken stomach cell to complete the cell cycle?
10. During which phase is the time most greatly reduced in the cancerous cells and which processes are probably most greatly affected by this reduction?

Station C:

Examine the diagrams of the microscopes and the photos taken using these microscopes.

11. Give the letter of the diagram which illustrates the operation of a light microscope.
12. Give the letter of the diagram which illustrates the operation of a scanning electron microscope.
13. Give the letter of the diagram which illustrates the operation of a transmission electron microscope.
14. Which photo (top, middle, or bottom) was taken using the transmission electron microscope?
15. Which photo (top, middle, or bottom) was taken using the scanning electron microscope?

Station D:

Examine the graphs regarding enzymes and chemical reactions.

16. Give the letter of the graph that would illustrate the type of chemical reaction involved in photosynthesis? (C or D)
Justify your answer.
17. Give the letter of the graph that would illustrate the type of chemical reaction involved in respiration? (C or D)
Justify your answer.
18. What is the optimal pH for pepsin?
19. What is the Human optimal temperature?
20. What is wrong with the graphs concerning pH and temperature affecting the rate of reactions?

Station E:

The nitrogen base sequence along the coding strand of DNA is
GAATTCATGCC

21. What will be the sequence of bases along the mRNA produced by this coding strand of DNA?
22. What will be the sequence of anticodons on the tRNA that will attach to this mRNA?
23. What will be the first amino acid in the sequence?
24. What will be the last amino acid in the sequence?
25. What are the stop codes for DNA?