

Go to the "Class Activities" page on Mrs. Bundren's website. Click the CancerQuest link under today's date. Read each section of the CancerQuest website and use the information to complete the following questions.

**Introduction to Cell Division:** Read the information and answer the questions below.

1. Not all cells move through the cell cycle at the same rate. List two types of cells in the human body that can reproduce throughout life.
2. Explain why each cell listed above would need to reproduce throughout life.
3. What is the process of cell reproduction called? \_\_\_\_\_
4. What is the goal of this process? \_\_\_\_\_
5. In order for this process to occur, what three things have to happen first?

**The Cell Cycle:** Read the information, watch the animation and answer the questions below.

6. What do G1 and G2 stand for? What is happening during these stages?
7. What does S stand for? What is happening during this stage?
8. What are G1, S, and G2 collectively known as? *(you should know this from your notes)* \_\_\_\_\_
9. What two processes make up cell division, or M phase? *(you should know this from your notes)*

**Normal Cell Division:** Read the information and answer the questions below.

10. Cells have several internal regulators, or checkpoints, to control if and when the cell divides. List three things that the cell will check for before entering mitosis.
11. Cells also respond to external regulators that speed up or slow down the cell cycle. List two types of external regulators.
12. *Turn the volume on the computer as low as possible for you to hear information but not disturb your classmates. Watch the video "Control of Cell Division".* How are cancer cells different from normal cells?

**Cancer Cell Division:** Read the information, watch the animations and answer the questions below. Also, watch Cancer Video 1 & 2 on Mrs. Bundren's website.

13. List three reasons cancer cells "break the rules" *(the bold points)*.
14. What is contact inhibition? Explain contact inhibition in normal cells.

15. Explain contact inhibition in cancer cells.
16. How do cancer cells evolve and become increasingly abnormal?

*Use the IUPUI, NIH, and Chemotherapy links on Mrs. Bundren's website to complete the following questions.*

#### **Unusual Features of Cancer Cells**

17. Errors in DNA (mutations) can cause a normal cell to be transformed into a cancer cell. List three environmental factors or toxins that can cause errors in DNA.
18. What is the p53 gene? What link does this gene have to human cancers?
19. What is the BRCA 1 gene? What happens if BRCA 1 is mutated?
20. What is the difference between a benign tumor and a malignant tumor?

#### **Chemotherapy**

21. Some chemotherapy drugs work by stopping DNA replication. How do they do this?
22. Other chemotherapy drugs work by stopping mitosis. How do they do this?
23. Chemotherapy is very effective in killing cancer cells, but it also affects normal cells such as bone marrow. What side effects are caused by this?
24. Why does chemotherapy cause hair loss?

**HeLa Cells:** *Use the HeLa cell link on Mrs. Bundren's website to complete the following questions.*

25. Why do scientists use laboratory-grown human cells?
26. These human cell lines are "immortal". What does this mean?
27. What is the first immortal human cell line called? When was it created? Who did it come from?
28. Why are HeLa cells so important? What scientific discoveries have used HeLa cells?