**How does a NORMAL cell become Cancerous; Can nearby cells be Affected?**

***Directions***: Go to <http://www.pbs.org/wgbh/nova/cancer/grow_flash.html>. While you are reading and following this online activity, please respond to the questions below.

***Questions***: (if extra space between questions, you will move on to next animation)

1. Where, in the human body depicted in this activity, do you find epithelial cells?
2. Describe a carcinoma:
3. What happens to DNA when the parent cell has to divide?
4. Describe the mutation that occurred in the DNA shown:
5. Think back to the normal/abnormal cell models, was a mutation demonstrated? How?
6. What is the result of the first mutation (what is different in these cells)?
7. How long can it take before any obvious change is detected with this kind of abnormal cell division/tissue growth?
8. How can further mutation (2nd mutation) “show” itself?
9. With normal cell function, what happens to cells that are irregular?
10. What does the third mutation allow the cell to do?
11. Describe how the more aggressive cells can escape their parent tissue.
12. Define angiogenesis:
13. Why is angiogenesis necessary for tumors to continue growing? (to elaborate, what is delivered to cells via the blood stream?)
14. Describe how cancer cells can spread throughout the body:
15. Define metastasis:
16. Describe how tumor cells can eventually disrupt the bodies function and eventually cause death:

***Concept Connection*:** Think back to the “Faces of Cancer” Activity. What environmental influences may play a role in creating mutations in a cell’s DNA that could lead to cancer?

Answer Key:

1. *Lining of the body cavities and outer surfaces – or in many organs and glands.*
2. *Type of cancer that originates in body’s epithelial tissues.*
3. *DNA copies are also divided into resulting daughter cells.*
4. *One of the base pairs is different from the original.*
5. *Yes, cell “B” had a piece of its DNA changed (if DNA was the ribbon, then some of the ribbon of cell “B” had marks through it).*
6. *Cell replicated although new cells were not needed.*
7. *10 years of more before the tumor is the size of a pinhead (barely detectable).*
8. *Cells could then have an altered appearance.*
9. *Destroys themselves.*
10. *More rigorous growth.*
11. *Push through epithelial tissue’s basement membrane.*
12. *Recruitment of new blood vessels from neighboring vessels.*
13. *Without a blood supply and its nutrients, a tumor is unable to continue growing.*
14. *Individual cells can spread by way of newly formed blood vessels and get into the lymph system.*
15. *Establishing new tumor sites at other locations in the body.*
16. *Tumor cells can survive long enough to initiate new colonies of the cancer in other body tissues or organs, disrupting its function.*

*Concept Connection: drug abuse, diet, smoking, infections, x-rays, chemical exposure (answers will vary depending on character profiles in each student group)*