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Topic: Intro to Cancer Webquest

Summary: Students will use an animation to be introduced to cell division checkpoints and cancer.

NGSS Standards: *HS-LS1-4.* Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

Time Length: 30 minutes

Prerequisite Knowledge: Students understand that mutations in DNA can cause a change in the protein that is made.

Materials:

- Device with Internet access
- Handout of the project

Procedures:

1. Students will need to have access to the following website and their device needs to be able to view the animation. *Check this functionality before assigning to students.*
2. <http://www.hhmi.org/biointeractive/eukaryotic-cell-cycle-and-cancer>

Accommodations: Give students with a modification IEP questions 1-6. Students with an IEP can take the handout home if they need extra time. You may choose to group students in two to share a computer.

Editable DOCX File and Answer Key:

Available at www.ngsslifescience.com

Intro to Cancer Webquest

<https://media.hhmi.org/biointeractive/click/cellcycle/>

Click on the “Background” tab on the right side.

1. Cells divide, differentiate, or die. What is differentiation? _____

2. Circle the function of apoptosis. cell divides, differentiates, or dies

3. What are cell cycle regulators? _____

4. If cell cycle regulators don't function properly, what two things result?

_____ or _____

Click on the center section labeled “Cell Cycle Phases” and read the overview.

5. Specialized proteins called “cell cycle regulators” or _____
regulate the _____

Click on the red G1 checkpoint.

6. The main goal of the G1 (restriction point) checkpoint is to: _____ or _____

Click on the center section labeled “Cell Cycle Regulators” and read the regulators overview.

7. What type of genes code for stimulating proteins? _____

8. What type of genes code for inhibitory proteins? _____

9. What enzyme (protein) is the most important cell cycle regulator? _____

10. Since CDKs are always present, what activates them? _____

11. When CDK is bound to a _____, the cell cycle is stimulated (progresses to the next stage in the cell cycle).

Click on the cancer overview at the top of the overview and read the 5 slides.

12. An analogy of oncogenes is _____

13. An analogy of tumor suppressor genes is _____

14. Mutations in proto-oncogenes cause a _____ and are dominant or recessive. *Circle the correct answer.*

15. Mutations in tumor suppressor genes cause a _____ and are dominant or recessive. *Circle the correct answer.*

Click on the red stop sign in the G1 section and read the overview.

16. What protein is very important to the G1 (restriction point) checkpoint? _____

17. What is p53's main function? _____

18. What is the Rb protein's main function? _____

19. Genes that encode the p53 protein and Rb protein are called _____ because they _____

20. Using what you learned about key vocabulary, **compare and contrast** oncogenes and tumor suppressor genes. *Include at least 3 items per section.*

