**The Virus Project**

**Task:** As a virologist employed by a governmental public health agency, you will use your scientific knowledge to investigate a mysterious virus. Then, craft a slideshow to inform the general public of your findings and recommendations based upon the evidence you have. This project is broken down into 6 different parts, each of which will draw upon big ideas in biology such as macromolecules, cellular biology, genetics and evolution.

**Instructions:**

Create a slideshow **(A PowerPoint template will be provided for you)** following the outline below. You will need to use your resource cards, your assigned “mystery virus” research cards as well as materials from your biology class (such as a textbook and/or notes).

If you use additional sources when creating your slideshow, please cite them according to your teacher’s instructions. **Remember all definitions and explanations should be in your own words.**

**Make sure you cite the “SOURCE” or webpage where you received your information.**

Title your slides according to the outline below and include a title slide with your name. If you need an additional slide to answer the required questions, you may include a “continued” slide. Here’s an example:

Slide 1: Living vs. Nonliving

Slide 1 Continued: Living vs. Nonliving

You may choose to include images and clip art on your slides to help illustrate your explanations.

Note: The mystery virus that you are assigned is based upon a real-life virus.

THE QUESTIONS BELOW ARE TO BE ANSWERED ON THE POWERPOINT SLIDES.

YOU CAN WORK ON GETTING THE QUESTIONS ANSWERED ***BEFORE*** PUTTING IT ON THE SLIDES.

USE THIS PAPER TO ANSWER YOUR QUESTIONS AND THEN TRANSFER IT TO THE POWERPOINT TEMPLATE.

MAKE SURE YOU READ THE RUBRIC SO YOU GET THE MAXIMUM POINTS!!!

**Part I. The Viral Particle**

Explore the information given on the resource card for part 1 as well as your viral research cards. Then, create 3 slides that answer the following questions:

**Slide 1 (Living vs. Nonliving)**

1. What exactly is a virus?

2. Do you think viruses are alive or not alive? Why or why not? (Make sure to reference the characteristics of life when answering this question.)

**Slides 2 + 3 (Nucleic Acids Overview)**

1. What type of genetic material is present in the mystery virus? What is DNA? What is RNA?

2. What are 3 similarities between RNA and DNA? What are 3 differences?

**Part 2. Entry into Cells & Hijacking Cellular Machinery**

Explore the information given on the resource card for part 2 as well as your viral research cards. Then, create 3 slides that answer the following questions:

**Slide 4 (Cellular Membrane)**

1. How is the mystery virus gaining entry into cells?

2. What is the composition of animal cellular membranes? (Be sure to include the macromolecules present.) What is the fluid mosaic model?

**Slide 5 (Cellular Transport Overview)**

1. What is osmosis?

2. What is passive transport? What is active transport? How are they different? (Give 2 examples.)

3. What are endocytosis and exocytosis? When are they used?

4. Highlight which process (if any) that the mystery virus is using to gain entry into the cells.

**Slide 6 (Cellular Processes Overview)**

1. List the organelles (at least 8) that are typically found inside an animal cell and include their function.

2. Highlight the organelles that a cell would normally use for the processes of transcription and translation (i.e. where these processes take place).

**Part 3. Viral Replication & Further Infection**

Explore the information given on the resource card for part 3 as well as your viral research cards. Then, create 3 slides that answer the following questions:

**Slide 7 (Viral Replication)**

1. What is the central dogma? Does the virus follow the central dogma when replicating?

2. Include a diagram (or flowchart) illustrating how genetic material is able “make” proteins.

**Slide 8 (Proteins)**

1. What is a protein?

2. Give 3 examples of proteins that are critical to an animal cell (note: this may include enzymes).

3. How does the virus use proteins?

**Slide 9 (Viral Spread)**

1. How does the virus “leave” a cell to infect other cells?

2. What is the relationship between cells, tissues and organs?

3. Which types of cells, tissues and/or organs are most affected by the virus?

**Part 4. Infection of the Body**

Explore the information given on the resource card for part 4 as well as your viral research cards. Then, create 2 slides that answer the following questions:

**Slide 10 (Homeostasis)**

1. What is homeostasis?

2. Give 2 examples of homeostasis in the human body.

**Slide 11 (Disruption of Homeostasis)**

1. How does the body disrupt homeostasis during infection?

2. Which body systems are found to be affected by this virus?

**Part 5. Evolution**

Explore the information given on the resource card for part 5 as well as your viral research cards. Then, create 2 slides that answer the following questions:

**Slide 12 (Genetic Basis for Evolution)**

1. How is it possible that a single mutation could allow a person to be “resistant” to this virus?

2. How do viruses evolve?

**Slide 13 (Overview of Evolution)**

1. How do mutations occur in genetic material?

2. Are all mutations good or bad?

3. Explain the process of natural selection.

**Part 6. Recommendations for Antivirals & Avoiding Infection**

Explore the information given on the resource card for part 6 as well as your viral research cards. Then, create 1 slide that answers the following questions:

**Slide 14 (Recommendations)**

1. How could scientists design medicines that would prevent a severe infection by this virus? Assume that in a severe infection the virus replicates a lot, infecting many cells. (Get creative!) Explain your thinking on this slide and make sure it is evidence-based.

2. What precautions can people take in general to avoid infections? Explain your thinking and make sure it is evidence-based.

**The Virus Project Scoring Guide**

\_\_\_\_\_\_Title slide with name – 1 point

\_\_\_\_\_\_Slide 1 (Living vs. Nonliving) – 5 points

\_\_\_\_\_\_Slides 2 + 3 (Nucleic Acids Overview) – 9 points

\_\_\_\_\_\_Slide 4 (Cellular Membrane) – 5 points

\_\_\_\_\_\_Slide 5 (Cellular Transport Overview) – 10 points

\_\_\_\_\_\_Slide 6 (Cellular Processes Overview) – 10 points

\_\_\_\_\_\_Slide 7 (Viral Replication) – 5 points

\_\_\_\_\_\_Slide 8 (Proteins) – 5 points

\_\_\_\_\_\_Slide 9 (Viral Spread) – 5 points

\_\_\_\_\_\_Slide 10 (Homeostasis) – 5 points

\_\_\_\_\_\_Slide 11 (Disruption of Homeostasis) – 5 points

\_\_\_\_\_\_Slide 12 (Genetic Basis for Evolution) – 4 points

\_\_\_\_\_\_Slide 13 (Overview of Evolution) – 5 points

\_\_\_\_\_\_Slide 14 (Recommendations) – 6 points

\_\_\_\_\_\_Overall Accuracy: organization & **detail** give to explanations, pictures and **SOURCES** -20 points

\_\_\_\_\_\_/**100 total possible points**

**THE POSSIBLE VIRUSES ARE: Hepatitis B, Rotavirus, Influenza, Rabies, HIV, Adenovirus**