

# Virulent

*Protein Transcription*

<b>TERM</b>	2013
<b>LOCATION</b>	G+L+S
<b>PROGRAM</b>	VideoGames and Learning

**Overview of Lesson** In the Virulent level entitled “We Transcribe”, LP proteins (polymerase) are introduced as being valuable for RNA transcription. Transcription is the process by which RNA is created from a DNA template, and it is the first step in replication. Students will be asked to model the processes by which transcription takes place using art supplies and the option of stop-action animation.

**Materials Needed** Various art supplies (pipe cleaners, zippers, markers, paper, modeling clay, pom-poms, etc.)  
Biology textbooks  
OPTIONAL: iPads or iPods equipped with the Stop Action Studio app

**Content of Lesson** Begin by reviewing the process of transcription (by which RNA is created from a DNA template; the first step of replication). During this process, polymerase (or, in gameplay, LP Proteins - a combination of the proteins L and P) move from the Ribosome (where they're produced) to attach to Genomes to start the replication process, transcription of mRNA. Remind your students of the moment within the game where they clicked the genome to create mRNA, and ask them to hypothesize as to how that happened.

Next, students will be divided into pairs and given access to the art supplies. They will be asked to model the process of transcription with their partner using whatever materials they see fit, with the knowledge that they will attempt to teach the class using their model upon completion.

OPTIONAL: If the classroom has access to the Stop Action Studio app on the iPad or iPod, students will have the option of using their art supplies to model the process of transcription via a stop action film.

If students appear to be struggling with the facts of transcription, invite them to reference their textbooks or review the concept by watching the following video:

<http://youtu.be/YJZlVGI7Jnc>

Once the entire class has completed their models of transcription, have the partnered pairs teach/review with the class by demonstrating what they've created.

OPTIONAL: Have those students who chose to use stop action animation play their films for the class.

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Make photographs and videos of the models available on the class website as a handy review tool for tests and quizzes.

**Vocabulary** Transcription  
Polymerase  
Proteins  
RNA  
DNA  
Replication

**Learning Objectives** Students will gain an understanding of how proteins are created from DNA using the process of transcription.

Students will be able to model this process and explain to other students how polymerase transcribe DNA to make mRNA.

### Educational Standards

- (MS-LS1-1.)** Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.
- (MS-LS1-2.)** Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function
- (MS-LS1-3.)** Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

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**(MS-LS1-5.)** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

**(HS-LS1-1.)** Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.