

Tasia Wells  
Milton High School

## ***Description of Project***

### **Standards**

SC.912.L.16.3: Describe the basic process of DNA replication and how it relates to the transmission and conservation of the genetic information.

SC.912.L.16.4: Explain how mutations in the DNA sequence may or may not result in phenotypic change. Explain how mutations in gametes may result in phenotypic changes in offspring.

SC.912.L.16.5: Explain the basic processes of transcription and translation, and how they result in the expression of genes.

SC.912.L.16.9: Explain how and why the genetic code is universal and is common to almost all organisms.

### **Lesson**

Introduction: Students will view the YouTube clip: Amoeba sisters' DNA replication and complete the accompanying handout.

Activities: Students will use the DNA model and Ribosome model kits from [mystemkits.com](http://mystemkits.com) to model the processes of DNA replication, transcription, and translation. They will then draw out and narrate in writing the processes. The teacher will then lead a whole group discussion of what would happen if the process went wrong at multiple points throughout the process.

Closure: originally planned: Students will be asked to complete a "Claim, evidence, reasoning" writing project answer the question "During which phase: DNA replication, transcription, or translation would a mutation be the most likely to affect the phenotype of the organism?" Changed due to time constraints: Students were evaluated with an individual test on all materials covered.

### **Strengths and Weakness**

Strengths: This project taught these difficult concepts exceptionally well. Students were actively engaged. It showed an increase in the number of student interest in science and an increase in the value placed on science by students.

Weaknesses: Took much longer than originally planned for. The time 3d printing the materials also took longer than originally allotted due to pieces breaking or misprinting.

### **Changes I might make**

I would look at breaking this activity into chunks, perhaps with me directly leading the first part and then allowing students to take over. I also plan to provide a visual of what a quality final product should look like. I allowed too much freedom with the final project and my students felt overwhelmed.

### **Future Plans**

I do plan to use this lesson and the materials supplied by this grant in future years. I plan to make minor modifications as discussed in the weakness and changes sections above.



## *Pre and Post Student Surveys measuring attitudes toward STEM education*

### **Pre-survey**

Question:	Percent responding 1 (never)	Percent responding 2	Percent responding 3	Percent responding 4	Percent responding 5 (all the time)	Total:
The topic of STEM has been discussed at my school.	22%	37%	34%	5%	2%	100%
I feel comfortable using STEM concepts and technology in my classes at school.	13%	23%	37%	17%	10%	100%
I believe STEM is important in my Education.	6%	12%	30%	37%	15%	100
I will use STEM concepts in my career after I graduate from high school.	17%	14%	27%	19%	23%	100

### **Post Survey**

Question:	Percent responding 1 (never)	Percent responding 2	Percent responding 3	Percent responding 4	Percent responding 5 (all the time)	Total:
The topic of STEM has been discussed at my school.	5%	12%	9%	14%	67%	100%
I feel comfortable using STEM concepts and technology in my classes at school.	1%	14%	40%	32%	13%	100%
I believe STEM is important in my Education.	2%	6%	29%	56%	7%	100
I will use STEM concepts in my career after I graduate from high school.	8%	11%	14%	14%	33%	100



