

Using Storylines to Increase Student Performance in the Chemistry Classroom

Background

A storyline refers to the sequence of events through which a unit surrounding an anchoring event or phenomena unfolds. For my capstone project, I assessed the effect of using storylines on student performance in the chemistry classroom. I chose to pursue this topic due to my desire to align my curriculum and instruction to the three dimensions of learning called for by the Next Generation Science Standards. My capstone project researched the use of storylines in the classroom as a way to increase the level of content understanding among students. Sub questions looked at perceived levels of preparedness among students and potential changes in student attitude towards chemistry as a result of using storylines.

Data Collection

	Data Source	Data Source	Data Source
Focus Question Does the use of storylines in the science classroom increase the level of content understanding among students?	Pre- and Post-Assessment	End of Unit Self-Assessment	Student Interview Questions
Sub Question #1 Do students perceive themselves as more prepared for the unit assessment if provided the opportunity to connect unit content to real life scenarios using storylines?	End of Unit Self-Assessment	Student Interview Questions	End of Unit Feedback Form
Sub Question #2 Do students who are exposed to the storyline approach report positive attitudes towards chemistry more often than students who are not taught with the storyline approach?	End of Unit Self-Assessment	Student Interview Questions	End of Unit Feedback Form

Intervention

Students in both the treatment and comparison group received the same unit pre-assessment. Students in the treatment group then took part in a unit on bonding, which incorporated a storyline. Students in the comparison group participated in the same unit without a storyline. All instruction with the exception of the storyline was the same throughout the unit for both groups of students. At the end of the unit, students in both groups took the same unit post-assessment. Students from both groups also took a self-assessment survey, participated in student interviews, and completed an end of unit feedback form.

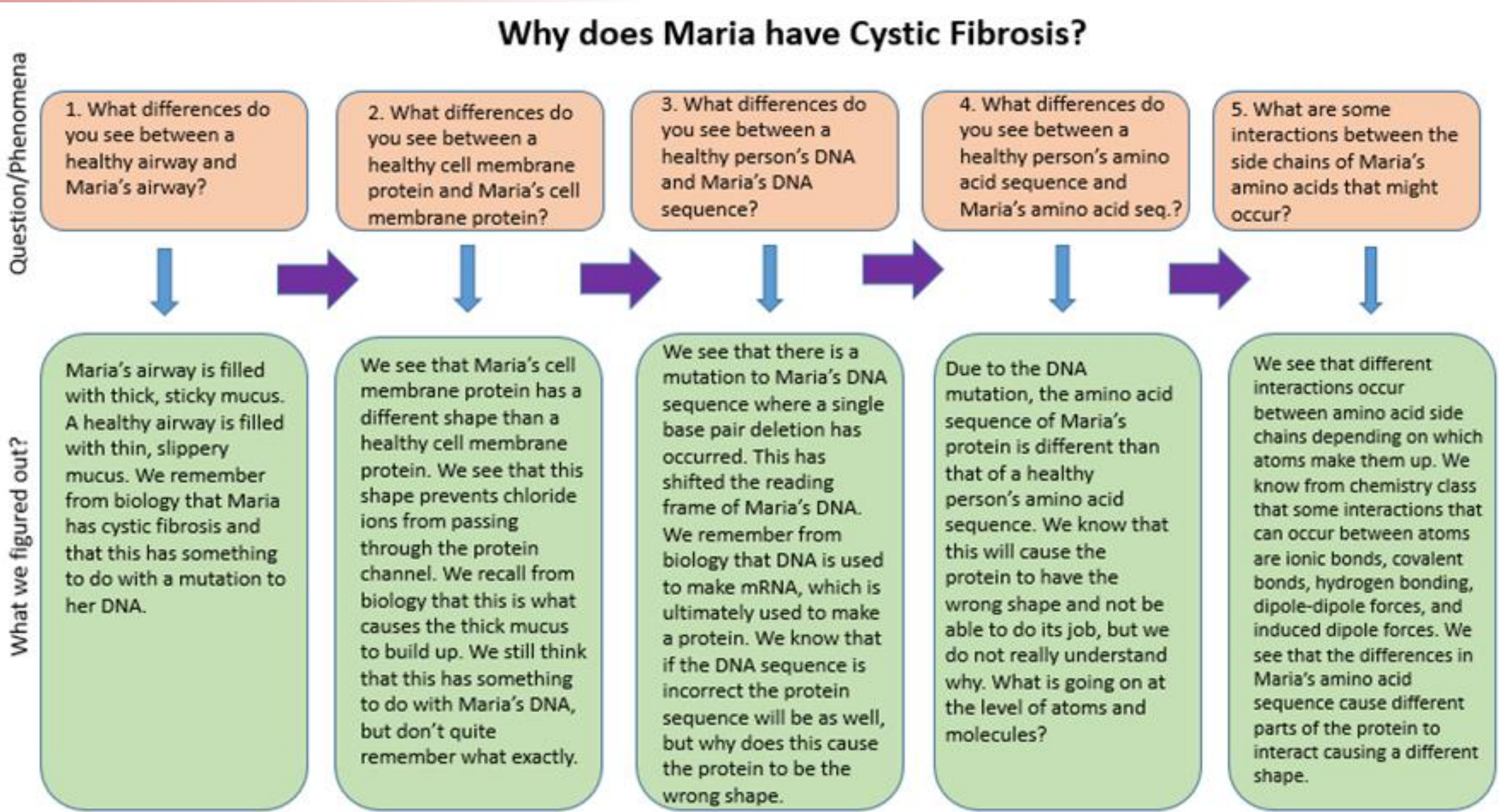


Figure 1: Maria Storyline



Data and Analysis

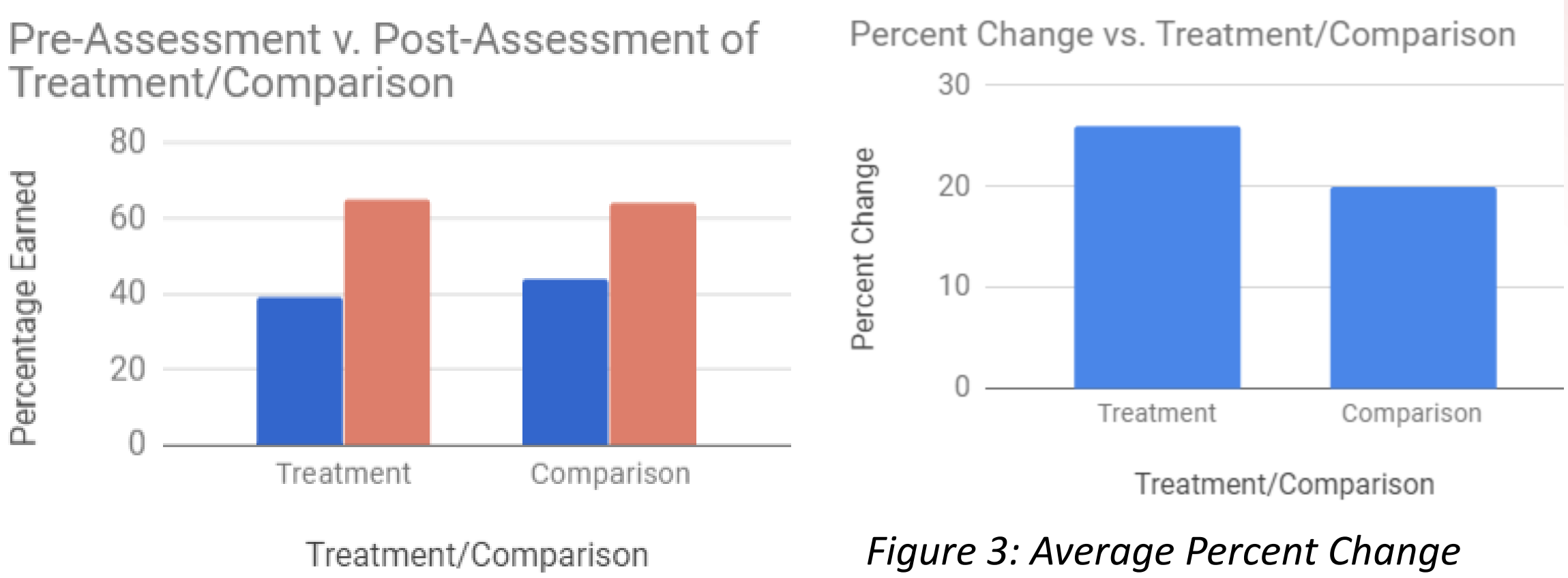
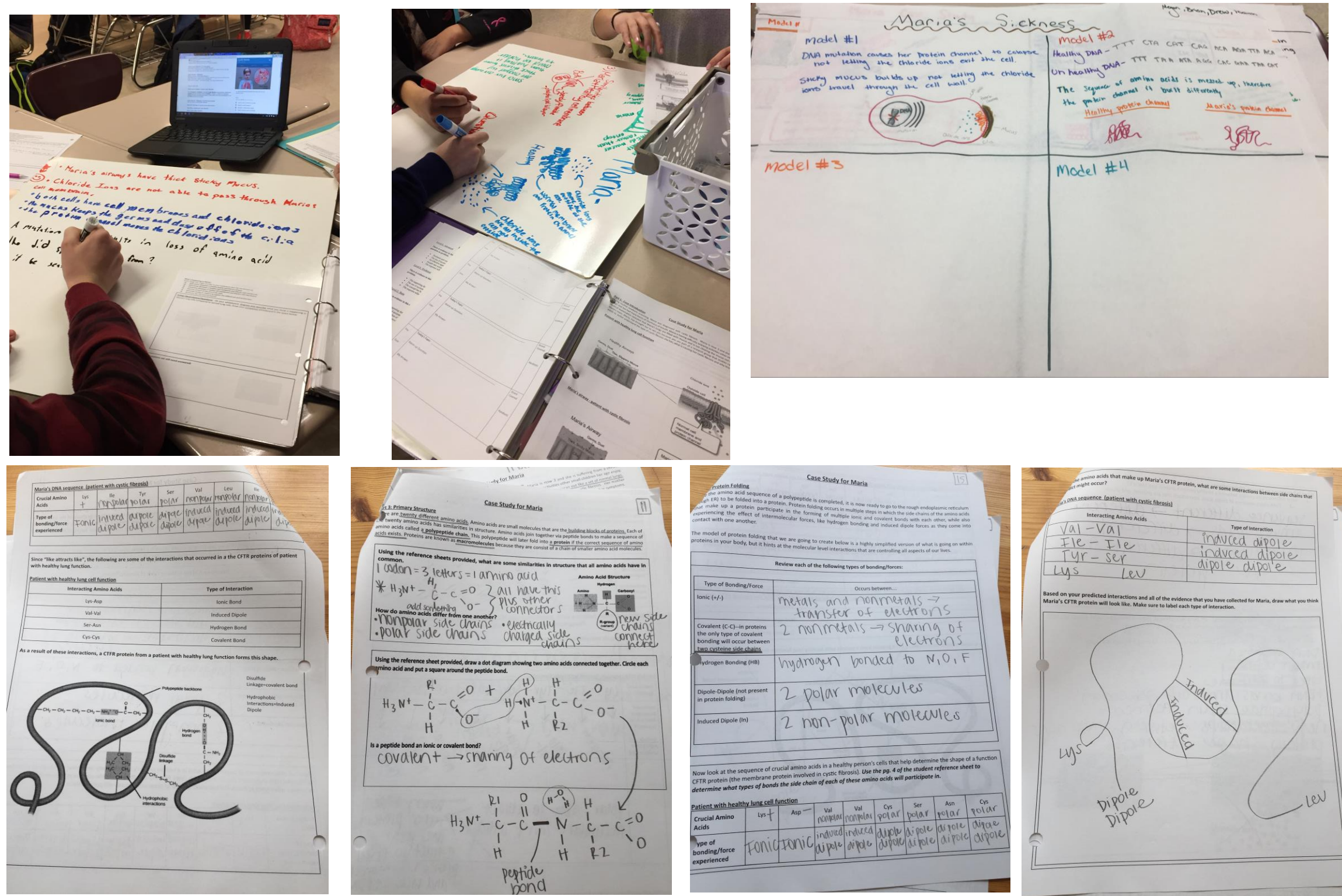


Figure 2: Pre- and Post-Assessment Average Scores for Treatment and Comparison Group (N=38, N=22)

Figure 3: Average Percent Change from Pre- to Post-Assessment for Treatment and Comparison Group



Results

Content Understanding

Data collected shows that the treatment group did experience a greater percent change between pre- and post-assessment. However, it is likely that this is due to their lower pre-assessment scores. Post-assessment averages were similar for each group. Therefore, it is likely that no overall increase in student understanding resulted from the use of the Maria Storyline.

Perceived Preparedness

Students reported similar perceived levels of preparedness regardless of having been exposed to the Maria Storyline. Students who were interviewed indicated that they thought the Maria storyline was not as helpful as previously used storylines in aiding in their overall understanding.

Attitude

In general, students reported that they enjoyed engaging with storylines. Especially, if the storyline involved an active component or challenge. However, many students in the treatment group reported that the Maria Storyline was repetitive, boring, and occasionally confusing.

Statement: I felt prepared for this unit assessment.	Strongly Agree	Agree	Disagree	Strongly Disagree	Total # of Responses
Treatment Group	7	23	6	2	38
Comparison Group	4	12	4	2	22

Table 1: Perceived Level of Preparedness for Post Assessment Among Students in Both the Treatment and Comparison Groups

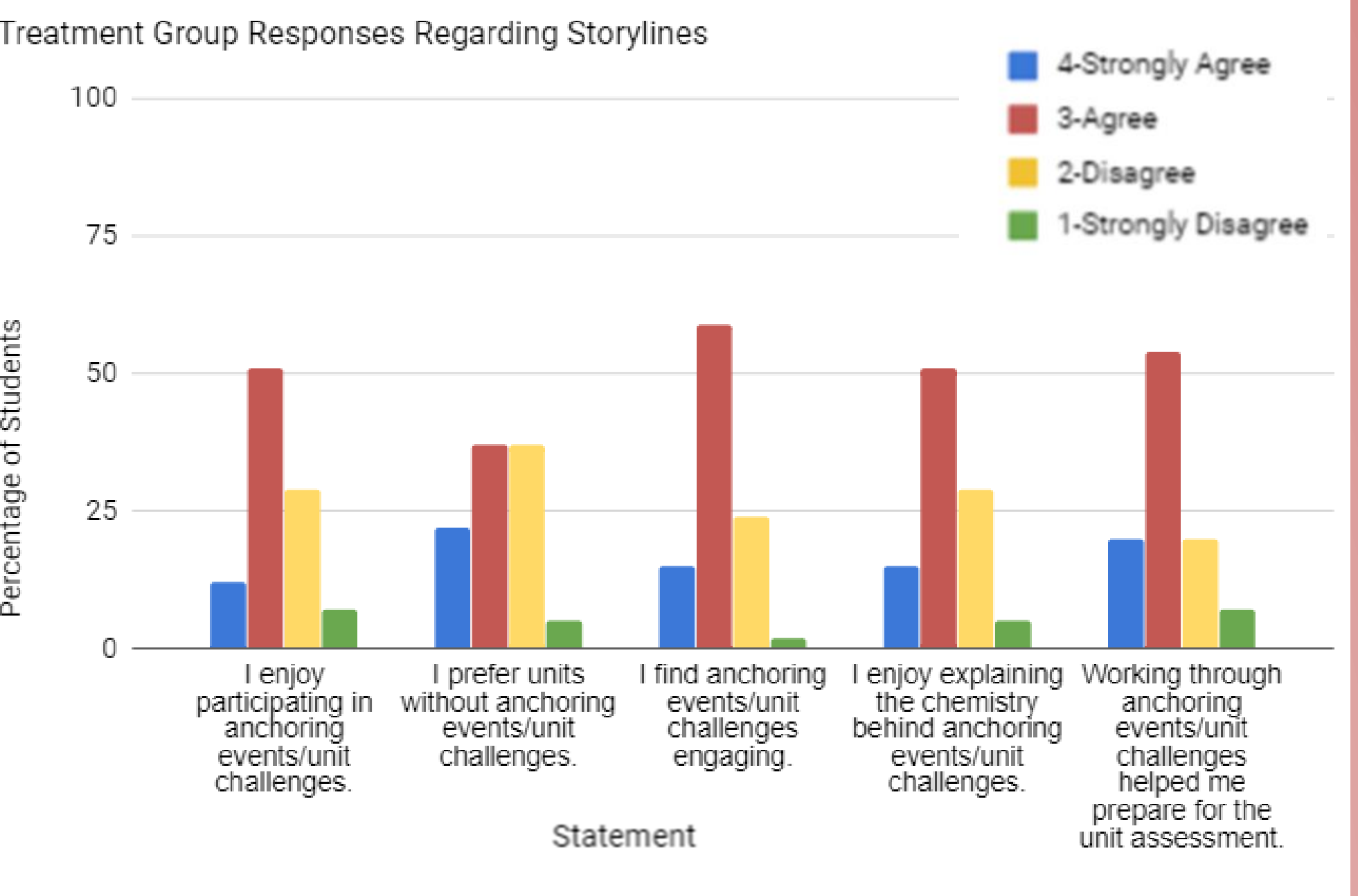


Figure 4: Treatment Group Responses Regarding Storylines

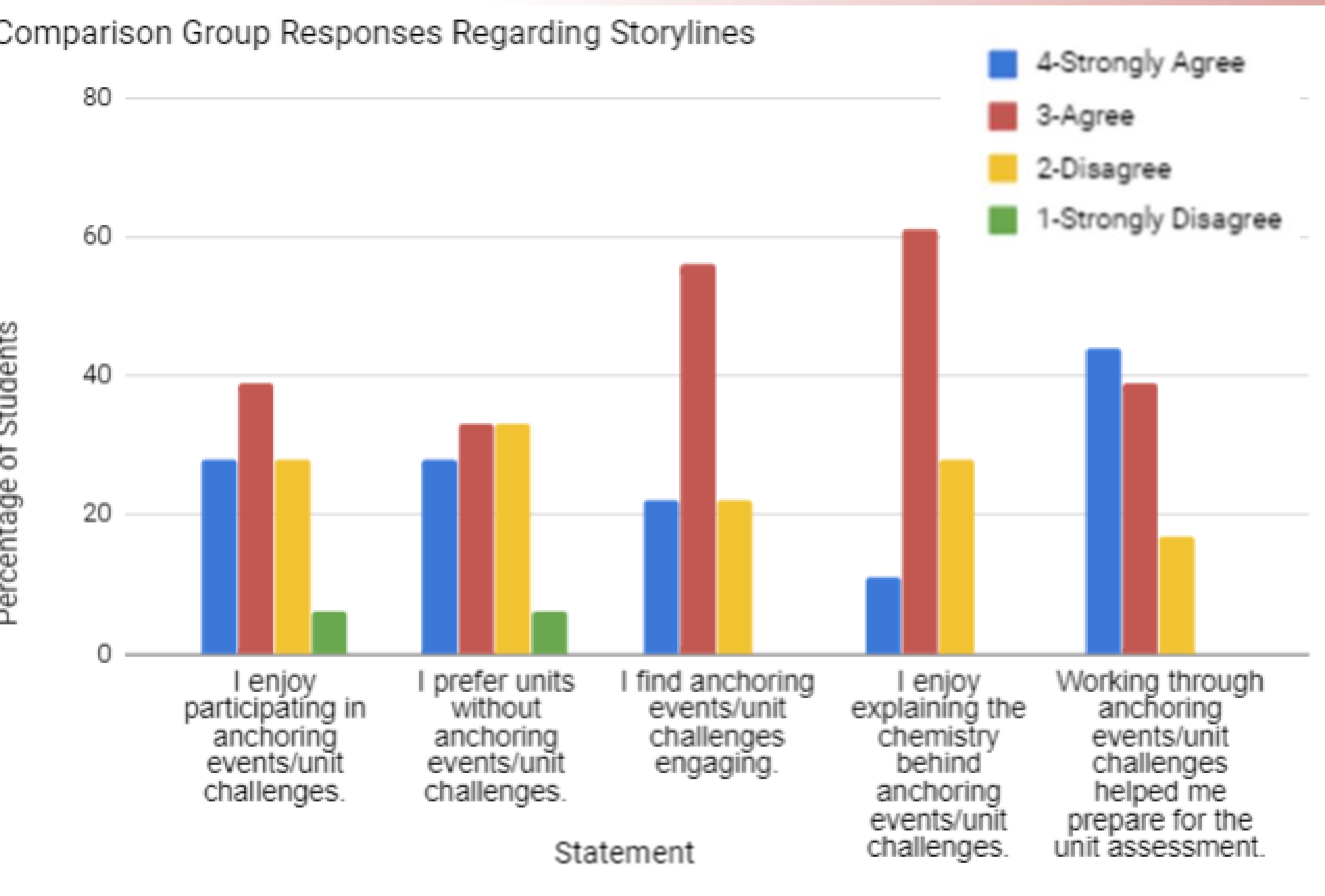


Figure 5: Comparison Group Responses Regarding Storylines

Value

Despite the lack of success of the storyline used in this classroom research project in terms of increasing student academic performance, it was clear from feedback form responses and student interviews that students do enjoy and benefit from the use of storylines. Students reported that some of the storylines used earlier in the year were more engaging and helpful due to their hands-on nature. They also reported liking the fact that these storylines had less structure and could be approached in multiple ways.

In the future, I plan to incorporate more hands-on, challenge-based storylines as a way to anchor lessons and further incorporate the three dimensions of the NGSS into my chemistry classroom.

