



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

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<b>Project Title</b> <b>Is Gaming Good or Bad?</b>	
<b>Abstract</b> <b>Objectives</b> In this study, I wanted to determine the effect of intense video gaming on school-aged students, by understanding the impact of the popular game, Fortnite, on students' academic performance, reflexes, pain awareness and reaction time to alarming sounds. A recent survey found that 35% of high school and college gamers admitted to missing school to play Fortnite, and on average, over 30% play at least 6-10 hours per week. The inspiration for this project came from hearing about the horrible mass shooting at a gaming convention in Jacksonville, FL in August 2018. Many gamers affected were not aware of their surroundings and did not realize the threat of gunshots immediately. Parents and children often disagree about the impact of video games on children, so I wanted to better understand the true effect. My hypothesis was that Fortnite would negatively impact academic performance, reflexes, pain awareness and reaction time. <b>Methods</b> To test the impact of Fortnite, I invited a few students who play Fortnite regularly to play the game with me, without them initially knowing that it was a study. I assessed different items before, during and after they played Fortnite. To test academic performance, I gave each student a grade-appropriate one-minute math test before and after they played the game and looked at test completion and accuracy. For reflex testing, I threw a lightweight rubber ball to them at random times before and while they played Fortnite. I also tested pain awareness before and during play by poking the student lightly with a toothpick and having them call out every time they felt a poke. Finally, to test reaction time, I played a loud, alarming sound, such as screaming, yelling or sirens on a loudspeaker before and during play, timing how long it took for them to react to the noise. I recorded all of the findings for each participant on a data collection tool that I created. Then, I entered all of the data into an excel spreadsheet in a de-identified format. <b>Results</b> Eight students participated in the study, ranging from ages 8-16 years old, 3rd grade - 11th grade. There were 6 boys and 2 girls in total - 4 of them played Fortnite at least 1-2 times a week, 1 played 3-4 times a week, and 3 played more than 5 times a week. Averages were calculated for each category. On average, subjects completed 44% of math facts before and 52.5% after playing Fortnite. They got 90% of completed math facts correct before playing but only 72% correct after. For reflexes, the mean number of ball catches before playing was 2.8 and while playing was 2. On average, subjects felt 9.5 out of 10 toothpicks before and 6.9 while playing. The mean reaction time to alarming sounds 3.1 seconds before playing and 16.3 seconds while playing.	
<b>Summary Statement</b> In this experimental study of school-aged children, I found that the popular intense video game, Fortnite, negatively affects students' academic performance, reflexes, pain awareness and reaction time.	
<b>Help Received</b> I designed the study and data collection tool myself and got some advice from my science teacher and parents on better ways to test the different measures. My science teacher also suggested ways to analyze the data.	