



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2018 PROJECT SUMMARY**

<b>Name(s)</b> <b>Christopher Kwok; Nicholas Kwok</b>	<b>Project Number</b> <b>J2013</b>
<b>Project Title</b> <b>R.I.P. Double Reeds: How to Delay the Decaying Rate of a Double Reed?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Our project is to discover how to delay the decaying rate of a double reed? Double reeds, belonging to the bassoon and oboe, are delicate, short term lasting mouth pieces that are essential for the sound and tone for its instrument. We preserved the reeds using cooling/freezing, heating, curing/pickling, and hydrogen peroxide. Our hypothesis is that hydrogen peroxide will increase the reed's lifespan most effectively. We discovered that enzymes in your spit is the cause for a double reed to decay as enzymatic reaction takes place on the canes of the reeds.</p> <p><b>Methods/Materials</b> We started with 10 bassoon reeds and 10 oboe reeds, each with decibel of 80. Then we tried to make the reeds as identical as possible. We followed the experiment by first taking the initial reed's decibel by blowing a constant stream of air and using a decibel meter. After, we soaked the reeds in spit for 2 hours to mimic a practice session. Next, we proceeded with each preservation method for the next 22 hours. We continued the 24 hour cycle of spit, preserving, and taking the decibel until the reed reached a decibel of 0 or unresponsive.</p> <p><b>Results</b> In result, heating was the best preservation method. With heating, the reeds lasted for 54 days for the bassoon reeds and 48 days for the oboe reeds. Compared to the control, it lasted for 28 days for the bassoon reeds and 23 days for the oboe reeds. This was almost a double in lifespan. Followed by heating, hydrogen peroxide worked the second best, then curing/ pickling, and lastly cooling/freezing that actually reduced the reeds average lifespan. Heating has the ability to increase a reed's lifespan and is capable in extending the longevity of a double reed.</p> <p><b>Conclusions/Discussion</b> Our data indicated that our hypothesis was wrong, and instead of hydrogen peroxide working the best, heating did. Heating was the best to increase a double reed's lifespan as the 100 celsius environment allowed the enzymes contaminating the reeds to denature itself successfully and actively. This delayed the enzymatic reaction. Next time, we would like to test if the full 22 hours under the heat lamp was necessary. This data could be used by double reeds musicians to help lengthen there most precious, fragile reeds.</p>	
<b>Summary Statement</b> Our project wants to discover how to delay the decaying rate of a double reed using different preservation methods such as cooling/freezing, heating, curing/pickling, and hydrogen peroxide.	
<b>Help Received</b> We received help from several sources including our music teachers, Wendall Hannah and Adrian Malley. They helped supplied and make the identical reeds that was conducted in the experiment. They helped make the mass quantity of reeds with special dimensions. Lastly, our support from our parents!	