



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

Name(s) Natalia N.Q. Marshall	Project Number 38450
Project Title Ice Killer: CO2's Effect on Solid H2O	
Objectives/Goals The objective of this experiment was to determine if blocks of ice exposed to air with increasing levels of carbon dioxide will melt faster than a block of ice exposed to air with an average level of carbon dioxide without air temperature being a factor.	
Abstract Methods/Materials A block of ice, a container and press and seal wrap, balloons with air from lungs, car exhaust, and pure CO2. I collected gas of various CO2 concentrations in balloons and emptied the balloons into a sealed container with a block of ice. I measured the rate of ice melting over the next 24 hours.	
Results In the experiments I ran blocks of ice exposed to pure CO2 melted 24 minutes quicker than the block of ice exposed to normal air. This was in spite of the fact that normal air block of ice 388.681 cm ³ larger than CO2 block of ice.	
Conclusions/Discussion Blocks of ice exposed to air with increased levels of CO2 melted faster than the block of ice in a normal air environment. This is likely due to the weakening of the structure of the ice crystals caused by CO2 interfering with the hydrogen bonding of the water molecules. In the environment filled with pure CO2 the block of ice melted 24 minutes quicker even though it was larger by 388.681 cm ³ than the normal environment block of ice. At the 2 hour mark, the CO2 environment block of ice was 30.9% melted while the block of ice in the normal air environment was 13.3% melted. At the 22 hours mark, the block of ice in the CO2 environment was 94.1% melted while the block of ice in the normal air environment was 92.6% melted.	
Summary Statement As measured by the increased melting rate of blocks of ice, ice exposed to air with increased levels of carbon dioxide melted faster than a block of ice exposed to normal air.	
Help Received I designed the experimental procedure and collected the data myself, but I need help from my father purchasing the materials, collecting car exhaust, and sawing the blocks of ice.	