



Submarine Survival Introduction

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Section 1 – Introduction

1.1 – Overview

This section provides background for the CREATE Junior game called *Submarine Survival*. This competition is for students primarily in the 4th and 5th grades. Students as old as 6th grade are allowed to participate as well as younger students who are ready for this level of engineering challenge.

1.2 – Introduction

Join the CREATE Foundation this year in an underwater adventure as you design, build and drive your robot in a quest for Submarine Survival.

The USS Nautilus (SSN-571) was the world's first operational nuclear-powered submarine. The vessel was the first submarine to complete a submerged transit to the North Pole on 3 August 1958. Sharing names with Captain Nemo's fictional submarine in Jules Verne's *Twenty Thousand Leagues Under the Sea*, and named after another USS Nautilus (SS-168) that served with distinction in World War II. Nautilus was authorized in 1951 and launched in 1954. Because her nuclear propulsion allowed her to remain submerged far longer than diesel-electric submarines, she broke many records in her first years of operation, and traveled to locations previously beyond the limits of submarines.

Since nuclear submarines can stay underwater for extended periods of time, life sustaining oxygen for the 140 crew members must be created on board. Oxygen is supplied from an oxygen generator, which extracts oxygen from water in a process known as electrolysis.

Electrolysis is the process of separating the two hydrogen atoms from the single oxygen atom that makes up water, or H₂O. Oxygen is then stored in oxygen tanks to be later used for breathing by the crew members and the highly explosive hydrogen is quickly vented outside the submarine and released into the ocean.

Your mission is to board the USS CREATE and split water molecules into hydrogen and oxygen. Then store the oxygen for later use and discard the dangerous hydrogen. This is the process that takes place on a real submarine. Your mission includes launching the diving bell. You can also raise the periscope and at the end of the match be sure to be parked on the periscope platform.

On the following pages are the rules of this fast paced challenge. Your team will have the opportunity of designing, building and testing your own robot to push, lift and drive beyond the competition. Good Luck and prepare for launch!