

NAVIGATOR CLASS: *MATE Floats! 2023*

MATE Floats! 2023 is inspired by the National Science Foundation (NSF)-funded GO-BGC Project. The goal of GO-BGC is to help build a global network of profiling floats with chemical and biological sensors to monitor circulation, chemistry, biology, and overall ocean health. Scientists, engineers, and technicians are using NSF grant funds to build and deploy 500 robotic ocean-monitoring floats around the globe.

- **Adopt-a-Float**
- **Recover the float**
 - **Simulate the float ascending to the surface by pulling a pin - 10 points**
 - **Recover the float to the surface side of the pool - 5 points**
- **Analyze float data**
 - **Graph water temperature versus depth**
 - **Graph is plotted using a computer program - 15 points**
 - **Graph is plotted on graph paper - 10 points**

Product Demonstration Notes:

Prior to the competition, NAVIGATOR and SCOUT class companies are encouraged to [Adopt-a-Float](#). Companies will not receive points for adopting a float, but the MATE ROV Competition will use data from floats adopted by NAVIGATOR and SCOUT class companies in this *MATE Floats! 2023* mission task. Companies that adopt a float should submit their float name and number, as well as their competition class, team name and regional they are planning to attend to the [2023 MATE ROV Competition NAVIGATOR/SCOUT Adopt-a-Float Information Submission Form](#). Adopted floats will be chosen at random and data collected by those floats will be used for this task. Companies whose floats are chosen will be recognized on the information sheet that displays the data.

Companies must recover the GO-BGC float. The float will be constructed from 1 ½-inch PVC pipe and will be positively buoyant. The float will be located on the bottom of the pool, attached to, and floating above a weighted PVC framework. Companies must pull a [pin](#) to release the float, simulating the float ascending from the bottom. Companies will receive 10 points when they successfully pull the pin. Successfully pulling the pin is defined as the pin no longer in contact with the PVC pipe or rope holding the GO-BGC float. After pulling the pin, companies may leave it on the bottom or return it to the surface. The pin is not considered debris.

Once companies have pulled the pin and the float has ascended to the surface, they must return the float to the surface, side of the pool. Companies will receive 5 points when they successfully remove the float from the water. Successfully removing the float is defined as the float completely out of the water and placed on the pool deck.

Once companies have successfully recovered the float at the surface, they must analyze the float data and create a graph plotting water temperature versus depth. A laminated sheet will be located inside

the 1 ½-inch pipe of the float. This laminated data sheet will include water temperature and depth data, as well as the name and number of the specific GO-BGC float that collected the data (one of the floats adopted by a competition team). The data will consist of 10 water temperature readings (in °C) taken at 10 different depths (in meters). For example:

Float Name: Atlantis

Float Number: 5906508

Water Temperature °C	Depth (meters)
1.88	-1970
2.44	-1235
2.61	-937
2.86	-756
3.01	-552
3.88	-331
4.38	-176
4.55	-108
6.21	-71
6.21	-2

Companies will receive 15 points when they successfully graph the data using a computer program, or 10 points when they successfully create a graph on paper. Successfully graphing the data is defined as plotting depth on the Y axis and temperature on the X-axis and showing the resulting graph to a station judge. All dots should be linked by a line. Companies may use Excel or another computer programs to plot their data points. Companies graphing the data points on paper will receive fewer points. MATE will not provide computers or graph paper at the mission station; companies must provide their own method for graphing the data. All graphs must have their axes labeled. An example of a graph plotting the above data points is represented below:

Depth (meters) versus Water Temperature (°C)

