



# Creating Personalized Learning Pathways through Authentic Scientific Research



**Dr. James P. Fry**  
*Malvern Preparatory School*  
*Malvern, PA*



# The questioning begins...



Sometimes  
change is  
what we  
**need.**  
unknown  
[livelifehappy.com](http://livelifehappy.com)



# Malvern Prep Campus

- 100 acre campus
- 15 buildings
- 10 athletic fields
- 2 naturally occurring ponds





# On Campus Research





# Black Friar Pond

← Marine Biology

×

## BREEN'S GROUP

Date- 9/11

Time- 1:27 PM

Location- Lower pond

Water Depth- 6 in

Some slow moving current

Sky Condition- Clear

Some Leaves and Feathers Scattered

Salinity- 8

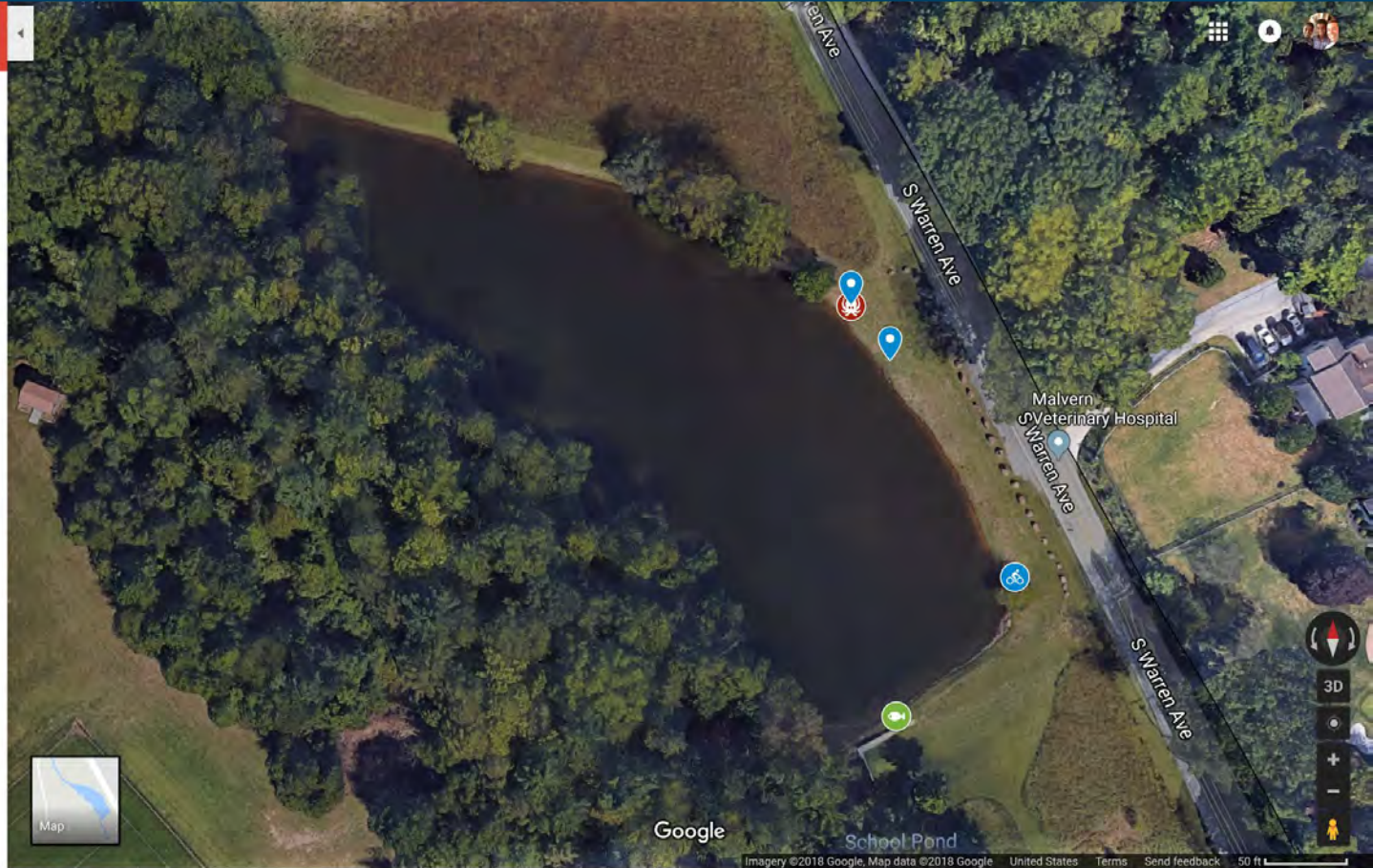
Water Density- 1.004

Dissolved Oxygen- 5

Ammonia: 0- Ideal

Nitrite: 0- Safe

Nitrate: 0-Safe



Google

School Pond

Imagery ©2018 Google, Map data ©2018 Google United States Terms Send feedback 50 ft

***“Tell me and I forget, teach me and I may remember,  
involve me and I learn.” - Benjamin Franklin***







*“Learning opportunities which are designed to provide visual information in a hands-on fashion work best.”  
(Abigail James and Joseph Cox)*



# Marathon, FL

← Florida Keys 2018



## WATER TESTS JB,GM,JH

Location: Middle dock | Time: 4:30 | Water depth: 2.5 feet |  
Tide&Current: no tide | Water Temp: 76 degrees Fahrenheit |  
Sky conditions: Grey skies, just rained | Algae&Plants:  
Mangroves | Salinity: 1.027 ppt, 36 pop | Dissolved oxygen: 5  
ppm | pH: 7.9 | Nitrite: 0 ppm | Nitrate: 5 | Ammonia: 0 pph



Imagery ©2018 Google, Map data ©2018 Google United States Terms Send feedback 50 ft

# Looe Key Reef - National Marine Sanctuary

← Florida Keys 2018



## GOLIATH GROUPER

Surovcik, Gabriel, Rodgers



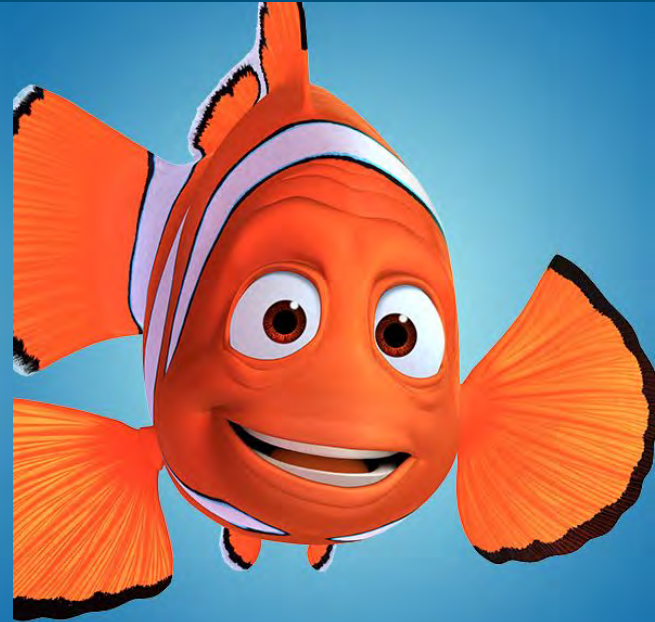
Imagery ©2018 Google, Map data ©2018 United States Terms Send feedback 500 ft

# Final Exam Time

---



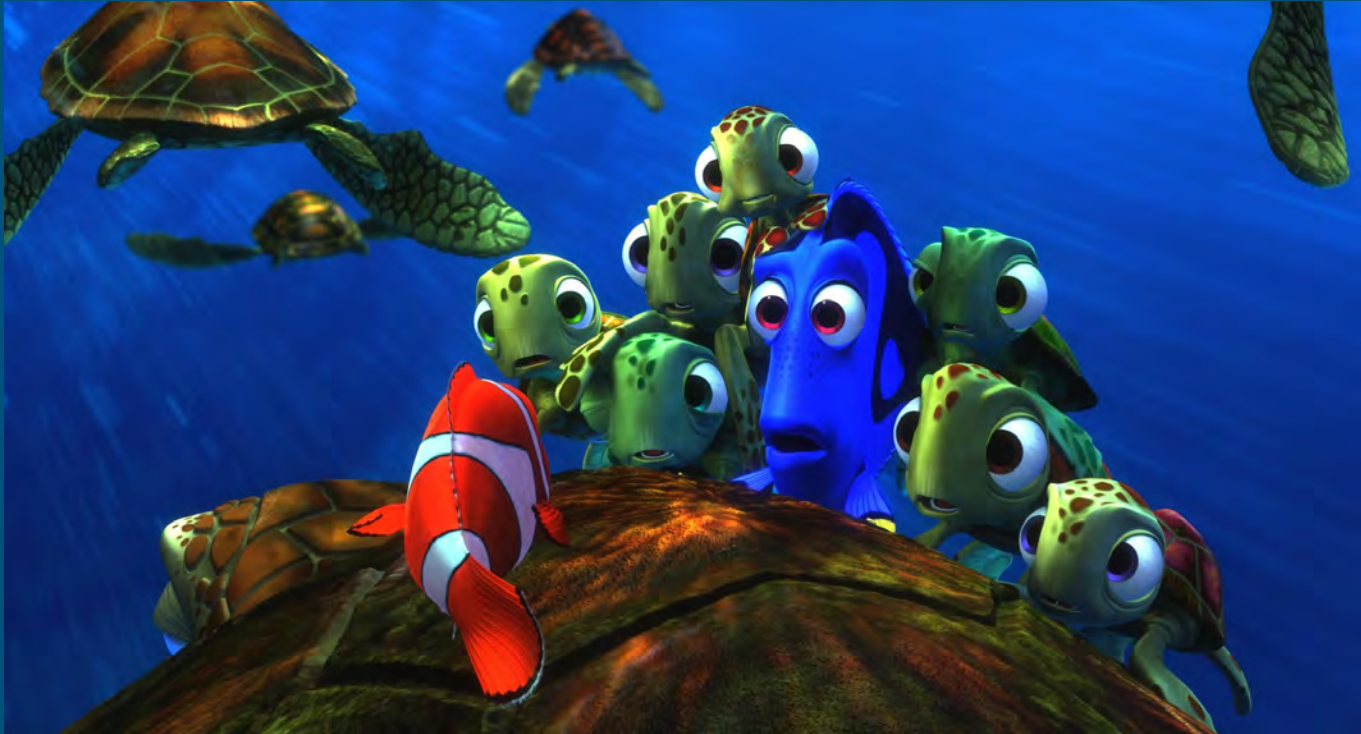
Write down 2-3 marine organisms, ecosystems, or current events that you are interested in learning about.



What is it about those topics that you find so interesting?



# Tell your story - TPS





# The Process

---

1. Topic Identification (question v. title)
2. Literature Review (becoming the expert)
  - a. Connect with experts (ie. FWC, Wetlands Institute, Rutgers, Plymouth)
  - b. Consider alums and parents
3. Experimental Design (procedures and what to do if?)
4. Data Collection (Qualitative v. Quantitative)
5. Data Analysis (What does the data tell us?)
6. Conclusion (further studies, limitations, applications)

*“Learners need endless feedback more than they need endless teaching.”*

*-Grant Wiggins*



# Student Feedback

---

**“The doctoral students asked thought-provoking questions that helped me expand my research.”**

**“It was great being able to ask and answer questions from people that were truly interested in my project.”**

**“The organisms that we talk about in class, I get to study right here. I really enjoy this type of learning.”**

**“Since we are gathering almost a full school year of results from our experiments, we are receiving constant feedback, and I can improve or adjust if something is not working or I did something wrong.”**



Success!!



Questions???