



Lab Notebook

Guppies' behavior to wavelengths

@FindingGuppy

Monday February 6th

Morning - wet lab

Preparation of the main aquarium. For the guppies, we need an aquarium containing water at room temperature (between 18 and 30 °C), and with a pH between 6 and 8. Salinity is not important because guppies easily adapt to salinity. We also need a water plant. Elodea is highly recommended for fishes well-being as they can be eaten as well as serve as a hiding spot. The aquarium must contain a male/female ratio of 1 to 3.

This morning in the lab, we prepared the aquarium by putting approximately 15 L in an aquarium of dimensions : $39,4 \times 20 \times 24,5 = 19\,306\text{ cm}^3 = 19,3\text{ liters}$. We let it warm in the room until water got to room temperature. We put an air pump in the water in order to oxygenate the water. We measured the pH of the water with pH paper: the water had a pH of approximately 7.5.

Monday February 6th

Afternoon - open lab

Preparation of the LEDs. We tapped into the fact that we didn't have the guppies to create the LED device in order to light our aquarium. We need 4 different of LED color : Red, Blue, Green, and White. Each of those LED has a different

voltage forward. Thanks to the [Calculator Website](#), we found the resistors needed to have the correct Tension / Intensity.

The aquarium was not big enough for the number of fish we wanted.

Tuesday February 7th

Morning - wet lab

Buying the necessities. On Tuesday morning, Nicolas and Daphné went to Truffaut in order to buy the necessities for the aquarium. We bought 4 guppies (1 male, 3 females), guppy food, Elodea (a waterweed in which guppies can play or hide), a net, and bacteria (they allow the fishes to accommodate to the water more quickly).

NB - if you plan to do experiment with more fishes, as we initially planned to, you should buy your fishes way beforehand. Indeed, when you start an aquarium, you can only introduce 1 to 5 fishes maximum or they won't accommodate and die after a week in the aquarium. In order to keep your fishes alive, you will need to buy a small amount and buy the rest 2 to 3 weeks later.

Preparing the main aquarium. Once we were back in the lab, we prepared the aquarium. When introducing fishes to a new environment, you will need to let them in the water you bought them, and put the bag they're in in the aquarium water for about 30 minutes, so they water they're in and the aquarium water are at the same temperature. In the meantime, you can put the waterweed and the bacteria in the water.

Meanwhile, Nina went to LeroyMerlin to buy plexiglass that will allow us to build the «test» aquarium.

Tuesday February 7th

Morning - open lab

Preparing the «test» aquarium. When Nina was back, we used the laser cutter to cut the plexiglass according to the blueprint. Once the parts were cut, we assembled them in order to build our DIY aquarium. The dimensions were 25*25*20.

Tuesday February 7th

Afternoon - open lab

The parts fit together perfectly but sadly it wasn't quite waterproof. We decided to tape the pieces together to avoid any leaking but the scotch tape wasn't sufficient. We then decided to glue gun the parts together from the inside hoping it would help reduce the leaking. It did help reduce it but it still wasn't completely waterproof. We then took the scotch tape off and glue gun the outside of the box as well.

Meanwhile Nicolas took care of coding the Arduino.

Wednesday February 8th

Morning - open lab

Sadly, the glue wasn't sufficient and a side of the aquarium was still leaking. Our final hope was to seal our device with joint. While we waited for the joint to dry, we started to write the blogpost.

We taped the LEDs to the aquarium and put cardboard on the sides of it so the natural light wouldn't disturb the experiment.

Wednesday February 8th

Afternoon - wet lab

Collecting data. During the afternoon, we started our experiment. First we filled the test aquarium with the main aquarium water so that the fish accommodates to the water more easily. Then we took a fish out of the main aquarium, using a jar full of water and transferred it to the test aquarium. We let it accommodate for 5 minutes. Then we recorded the movements of the fish for 2 minutes when there was no light turned on. We measured the amount of time the fish spent in each zone. After 2 minutes, we switch on the LEDs and observe the fish's behavior and how long it spends in each colored zone. We recorded the results in a CSV file. We did 3 repetition of the «off - on» pattern for each fish, and did the experiment with 4 fishes (3 females and a male).

Then, we analyzed the data we had collected.

Thursday February 9th

Morning - wet lab

This morning, we repeated the experiment we did yesterday afternoon. We wanted to observe if the guppies' behavior would change at a different moment of its cycle (afternoon VS morning). We also fed our fishes.

Thursday February 9th

Afternoon - wet lab

During the afternoon we once again repeated the experiment. We wanted to see if the behavior from the previous day would be repeated or if guppies' behavior was totally independent one measurement from the other.

Friday February 10th

Morning - wet lab

This morning, we only went to lab to feed our fishes. We separated one of the female fish from the other as she didn't seem well.