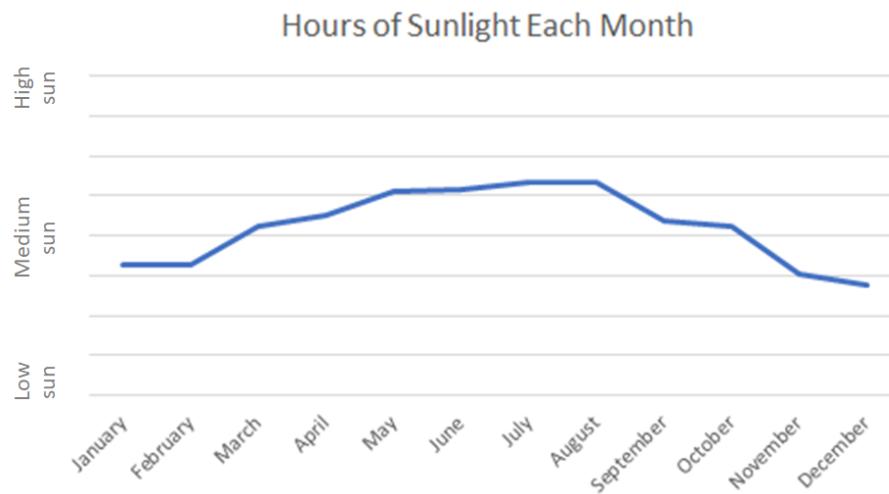


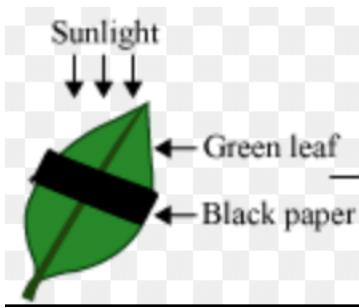
Amount of Sunlight at Passion Puddle

Around Passion Puddle there are instruments that can measure the amount of sunlight hitting the water. Here are the measurements of sunlight from each month during the year in which there was an algal bloom (too much algae):



Plants in Sunlight

Plants are producers. This means they produce their own food (sugar) using sunlight energy. Scientists did an experiment to see what happens if only part of a leaf gets sunlight. They took a plant and selected five big green leaves. They then covered half of each leaf with a piece of aluminum foil, to hide that half from the sun, like the diagram below.



After a couple of days, they picked the leaves off the plant and tested each section of the leaf to see if it made sugar. They found sugar only in the parts of the leaves that were left out in the sun. There was no sugar in the parts that were covered.

Fertilizer and Plants

Part A: Fertilizer for Water Lilies



The football field at Penn State is not used much during the spring. This is when the Penn State gardeners add fertilizer to the field. One of the gardeners took a photo to show what the grass looks like at the end of football season (January) and what it looks like in the spring after it has been fertilized in March.

Field in January Before Fertilizer



Field in Spring After Fertilizer



Penn State also has a wonderful lotus pond with water lilies. The gardeners wondered if the same amount of fertilizer would work for increasing the beautiful water lilies. They added the fertilizer and the water lilies grew a lot, but the algae in the pond grew, too. Instead of becoming more beautiful, the pond became green and mucky!

Before Fertilizer



After Fertilizer



Part B: Fertilizer and Algae

Oh no! That's not good for the gardens! The visitors thought it looked gross!

The gardeners decided to test how much fertilizer made the algae grow so that they could put in just enough to help the water lilies, but not so much that the pond gets full of algae.

They took four jars of pond water. They did not add any fertilizer to the first jar. In the second jar they added 2 drops of fertilizer. In the third jar they added 6 drops of fertilizer. In the fourth jar they added 12 drops of fertilizer.

They observed the jars after one month to see what happened to the algae. Here are their results:

Jar 1	No fertilizer
Jar 2	2 drops of fertilizer
Jar 3	6 drops of fertilizer
Jar 4	12 drops of fertilizer



Air in Aquariums

In the Adventure Aquarium in New Jersey, aquarists (aquarium experts) wanted to try a new machine that adds dissolved air into the water, to see if they should buy it for more tanks.

To find out, they put two tanks side by side. They planted the same plants in each of them. Then, in one tank, they connected the machine so that it would add dissolved air into the water so that it had lots of dissolved air. In the other tank they did not do anything: whatever dissolved air was already in the water stayed, but they did not add any new air.

They took photos of the tank every 10 days for a month. They also posted the pictures on their website so that members of the public could see the experiment. The photos are below:

Day	Without added dissolved air	With added dissolved air
Day 1		
Day 10		
Day 20		
Day 30		

The aquarists also wanted to show visitors what happens when plants are put in a vacuum machine. They put a plant in a vacuum machine and turned it on. The machine sucks the air out of the jar. They filmed it for six hours and sped it up into this video that they posted on the website:



(Video here: <https://www.youtube.com/watch?v=H3oyYEp7eTo>)

Name: _____

5A

or

5B

Date: _____

SEEDS Y2 L4

Reading Fertilizer Labels

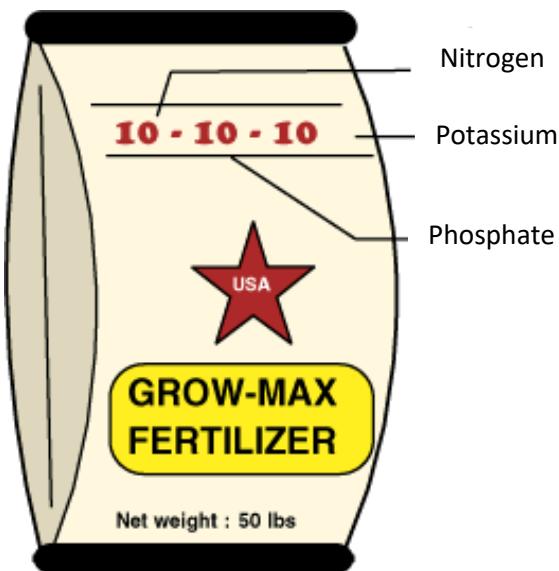
Fertilizers usually have three numbers on their labels, like this:



Many people do not know what these numbers mean. Do you?

A Homeowner's Guide to Fertilizer

Understanding the Fertilizer Label



All fertilizer labels have three bold numbers. The first number is the amount of nitrogen, the second number is the amount of phosphate and the third number is the amount of potassium.

These are the three nutrients that all plants need: nitrogen - phosphate - potassium.

Different kinds of plants need different mixes of the three nutrients.

Name: _____

5A

or

5B

Date: _____

SEEDS Y2 L4

Lake Erie Algal Blooms

Lake Erie is a big lake in the United States. It is surrounded by farmland. The farmers fertilize their fields in early spring.

In the springs of 2017 and 2019 there were large storms near Lake Erie and it rained for many days.

In 2017 the rains came in April after the farmers had fertilized their fields.

However, in 2019 the rains came in March, and the farmers did not have a chance to fertilize their fields before it rained.

The photos below show what happened in the lake in the spring of 2017 and 2019 after the big rains:



Rain washes dirt from fields into the lake and makes the lake brown. However, after a few weeks the dirt settles and the lake water becomes clear again.

In both 2017 and 2019 dirt washed into the lake, but there were algal blooms only in 2017.

Scientists studying Lake Erie took water samples from the lake right after it rained in 2017 and 2019. They found that there were a lot more nutrients in the water in 2017 than in 2019