



SUMMIT VIEW

The Newsletter of the Friends of Mt. Agamenticus

Fall 2023

Nature's Secret Code – The Fibonacci Sequence

Does Nature have a secret code that determines the number of petals on a flower, the spiral pattern of seeds in a sunflower and bracts on a pinecone? Does that code also determine the branching of trees, or the arrangement of leaves on plants? Does it apply to a nautilus shell, the uncurling of a fern, the double helix of our DNA, even the shape of galaxies?



For millennia, these patterns were observed to have followed a mathematical formula known in modern times as the *Fibonacci Sequence* – a sequence of numbers that often explain the patterns in Nature, the Universe, the Human Body, then followed to create Art and Architecture as far back as the Great Pyramids and the Parthenon.

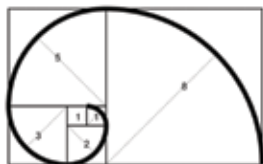
An Italian mathematician, **Leonardo**



Fibonacci, aka Leonardo of Pisa, born around 1170, is credited with the mathematical formula called the “Secret Code”, the “Divine

Proportion”, or “Golden Ratio”. Fibonacci’s historic 1202 Latin manuscript, “Liber abbaci” the “Book of Calculation”, introduced modern arithmetic and Arabic numerals to the Western world.

The Fibonacci sequence is a series of steadily increasing numbers in which each number (the Fibonacci number) is **the sum of the two preceding numbers**: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144 and on to infinity. The mathematical equation that describes it is: $X_{n+2} = X_{n+1} + X_n$.



The **ratio** between the numbers in the Fibonacci sequence is the **Golden Ratio** or Golden Number. It is an “irrational number”, Phi (ϕ).

Taking a number in the sequence above 5, and dividing it by the previous number, derives a number very close to 1.618. (e.g., Fibonacci numbers, 89 divided by 55 = 1.618).



Sunflowers are the most spectacular example, typically having 55 spirals one way and 89 in the other; or, in the finest varieties, 89 and 144. Sunflower seeds need to pack as closely and efficiently as possible without overlapping, with each seed growing at a slight angle away from the previous one. The perfect degree of turn needs to be an irrational number and the answer is the **Golden Ratio**.

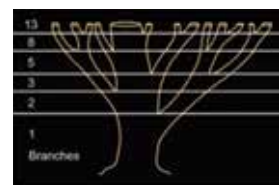
Small pine cones usually have 8 spirals one way and 13 the other. The pineapple – built from adjacent hexagons, have 8 spirals to the right, 13 to the left, and 21 vertically – a Fibonacci triple.



As the nautilus outgrows each chamber, it builds new chambers for itself, always the same shape. One can illustrate this by starting with a square of size 1 and successively building on new

rooms whose sizes correspond to the Fibonacci sequence. (use graph paper). Running through the centers of the squares, in order, with a smooth curve (use a compass) we obtain the nautilus spiral – the same as the sunflower spiral.

Some of the greatest scientists and mathematicians of all times, from ancient Greeks like Pythagoras and Euclid, the Renaissance astronomer Johannes Kepler, Leonardo da Vinci, Charles Darwin and present-day scientists like Professor Keith Devlin*, of Stanford University, have spent immeasurable hours over this ratio. Biologists, artists, musicians, historians, architects, psychologists, and mystics have contemplated and debated the basis of its universal application. The Golden Ratio has inspired thinkers of all disciplines like no other number in the history of mathematics.



Fibonacci Day is celebrated November 23rd to honor the mathematical genius, and because when the date is written as 11/23, the four numbers form a Fibonacci sequence.

*Keith James Devlin was the Chair of Department at Colby College in Maine from 1989 to 1993. He is the author of 34 books and over 80 research articles, including, “**Finding Fibonacci: The Quest to Rediscover the Forgotten Mathematical Genius Who Changed the World**”.

The Hummingbird's Gift - Wonder, Beauty and Renewal on Wings

New Hampshire Author, Sy Montgomery

I am partial to New England authors, local bookstores, nature stories, interesting book-covers, and a relatively quick read (83 pages!). Pictures? Yes please! All boxes checked!

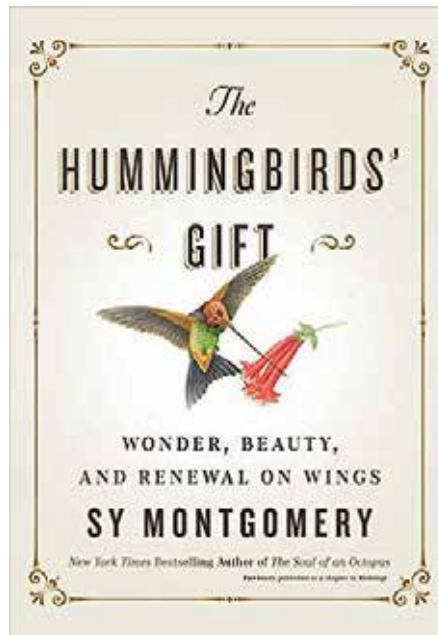
The Hummingbird's Gift is a true, sweet story about Sy, the author, who upon her friend Brenda's phone call drops everything to travel to California (situation not local, but she will indeed bring the message home) to learn from and help her on a rescue mission. Brenda is a licensed wildlife rehabilitator with an impressive record of treatment and release of wild birds, but we learn how daunting this is with tiny, fragile hummingbird chicks.

A clutch of baby birds presumed abandoned by their mother are being rescued. The story brings us along the emotional roller coaster ride of their recovery. It is not immediately clear how the people who brought the birds to the rehabber knew that the mother was not coming back so that kept me on edge for a bit. It is not advised to immediately

presume baby birds found in a nest without a parent have been abandoned, as the mother may be off looking for food to bring back, but the facts do come out eventually.

You will instantly be rooting for the chicks and the people keeping vigil and doing constant feedings. There are sad and anxious moments to push through but you will. Sometimes the writer describes how

the birds might be thinking or behaving like humans, maybe because she thinks it helps us to understand or to better relate to the animals but just try to let any irritation with that go. You will learn amazing things about the life history of hummingbirds and how you too can help them to thrive in this complicated world. The big-hearted humans did their best to help these tiny, precious birds grow to fly free, but the hummingbirds' hearts are proportionately way bigger! You might find yourself immediately planting hummingbird friendly flowers (please plant native) and maybe better understanding what all that fighting at the feeder is about! Enjoy!



BROAD WINGED HAWKS



Connor is a non-releasable broad winged hawk ambassador at Center for Wildlife

Broad winged hawks are among our common summertime visitors here in southern Maine. This small hawk species is about a third the size of a red tailed hawk, our largest resident hawk species. Broad wings, red shouldered, and red tailed hawks are in the *buteo* family of hawks, referring to their large broad wings, short tails, and soaring flying pattern. They also have a high pitched peewee call. Though broad wings are commonly found here and can sometimes be found hunting along treelines like red tailed hawks, they can also be elusive and dwell deep in the forest.

Throughout the fall, the summit of Mount Agamenticus is a great place to spot broad winged hawks among thousands of other migratory birds on their journeys. Broad wings often fly in large kettles or groups along the coast. We are lucky to be under one of the largest flyways or bird highways in the country, as birds and monarch butterflies use the coastline for navigation. Broad winged hawks are referred to as complete migrants, which means that every individual will head south for the winter, making potentially over a 10,000 mile journey to South America.

During migration season, there are several ways you can help keep migrators fueled and on track. If you have a bird feeder, try to keep it clean and filled as many birds tend to use the same stopover or refueling spots year after year. Leaving deadhead flowers also serves the same purpose. Did you know that two thirds of songbirds also migrate at night and can become confused and disoriented by light pollution? To minimize this, you can use motion sensor lights that only turn on as needed, shades when you use lights indoors, warm white or yellow lights instead of blueish bright white lights, or shielded lights which point the light downwards.

The Mount Agamenticus Visitor Use survey

The Mount Agamenticus Visitor Use survey is a tool that allows for the collection and analysis of data on who is visiting Mount A, popular activities on the mountain, and offers Program staff a chance to receive direct visitor feedback. Data is gathered annually to allow for the analysis of changing trends.

From three in-person survey sessions per day for seven days at two locations (Base and Summit of First Hill), staff spoke with 1,074 visitors in 452 total surveys. These numbers are lower than in previous years, but as always, the weather has a significant impact on visitation.

A few highlights from this year:

- Just over 39% of groups surveyed were First Time Visitors and of those, 9.29% live locally (within 50 miles).
- About 20% of groups were Frequent Visitors, visiting monthly or more often.
- This year, just over half of our visitors surveyed live locally.
- The most frequented areas are First Hill trails and the summit park (about 89% and 98% of surveys respectively, an increase from 2022).
- The most popular activities for those surveyed were hiking (~ 72.50%) and sightseeing (~ 66%).

Full data points and an in-depth analysis will be published at agamenticus.org towards the end of fall!

Visitors provided helpful feedback this year about not only the new parking areas, but also the implementation of seasonal fees. The Conservation Program greatly appreciates this input and hopes to move forward with some minor changes for fall and into next season. Thank you to everyone who took the time to participate!



Species Spotlight



Jewelweed - Nature's Hummingbird Feeder

Jewelweed (*Impatiens capensis*) is an annual plant that blooms just before and up to the end of the growing season. This makes it a good source of nectar during this time of year since many plants have finished flowering. The plant develops seed capsules that when ripe, will explode in the wind or when touched. Another common name for this plant is "touch-me-not". As an annual, it will die back each year and it relies on its seeds to grow next year's plants.

There is a symbiotic relationship between jewelweed and hummingbirds. Jewelweed nectar can contain over 40% sugar, making it a magnet for hummingbirds. In fact, Jewelweed is the primary food source for fall migrating hummingbirds and the hummingbird is a primary pollinator for jewelweed. The flower's inch long tubular design with a long spur at the end requires hummingbirds to stick their heads so far in that they get dusted with pollen. Each flower contains only a small amount of this high-octane nectar, so a hummingbird

must visit many flowers to get its fill and thereby pollinating every new flower it visits. I have seen so much yellow jewelweed pollen on the foreheads of ruby-throated hummingbirds that I thought I was looking at a new species of hummingbird!

As a native plant, jewelweed has a distribution range that covers most of the US and Canada. If you are interested in planting some in your garden, it will do well in shaded/partly sunny areas with moist soil. Seeds can be found online through many seed companies.

FALL PROGRAMS AND EVENTS

Mark your calendar for upcoming programs and events this fall! Full details can be found at agamenticus.org.

Saturday 10/7: *Drop-in Hike 10:00 am*

Saturday 10/14: *Volunteer Community Workday, Shrubland Maintenance 9:00 am – 12:30 pm*

Saturday 10/21: *Halloween in Nature with the Center for Wildlife 4:00 – 6:00 pm*

Saturday 10/28: *Drop-in Guided Hike 10:00 am*

Friday 11/3: *Milkweed Seed Bomb Workshop and Seed Distribution 3:00 – 5:00 pm*

Saturday 11/4: *Milkweed Seed Bomb Workshop and Seed Distribution 10:00 am – 12:00 pm*

Sunday 11/5: *Three Hill Hike with Great Works Regional Land Trust*

The Learning Lodge will be open most Saturdays and Sundays 12:00 – 4:00 pm until October 15th. Keep an eye out for details about our holiday season pop-up gift shop!

The Friends of Mount Agamenticus

The Friends of Mount Agamenticus is a volunteer advocacy and stewardship group for the Mount Agamenticus Conservation Program. We assist program staff in carrying out educational, interpretive, community outreach, and public use objectives without compromising the integrity of the region's sensitive ecological habitat.

We are currently seeking Friends that can assist with any of the following tasks:

- Orienting and coordinating with new volunteers
- Researching fundraising opportunities
- Writing grants and newsletter articles
- Developing and managing website and social media

Please email friends@agamenticus.org if interested.

To learn about additional Mt. A conservation opportunities, please visit our website agamenticus.org.



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