Heritage Shores Nature Preserve

North Myrtle Beach, South Carolina

MATH TRAIL

Just a short drive from Main Street in North Myrtle Beach, a few miles away in Cherry Grove is a hidden gem, Heritage Shores Nature Preserve. One of the most unique parks in the city in North Myrtle Beach, Heritage Shores Nature Preserve was created in 2007 with seven (7) acres of walking paths. The park is located on an island that extends into the Cherry Grove Marsh. This land has been preserved in its native state and is accessible via a series of elevated boardwalks and observation docks. Visitors will find interpretive signage throughout the park describing the plants, animals, fish, and birds that can be seen within the park.

Park amenities include the following:

- 40 stations along an interpretive trail with native soil primitive walking paths
- Raised wooden walking path through the marsh areas of the preserve
- 2 picnic/shade shelters
- Stationary dock providing viewing access

Directions to Heritage Shores Nature Preserve

Address: 5611 Heritage Drive, North Myrtle Beach, South Carolina 29582 Google Maps

Directions: Take Ocean Boulevard and turn onto 53rd Avenue North, toward the boat landing, away from the Atlantic Ocean. Upon crossing the narrow one vehicle at a time, House Creek bridge, 53rd Avenue leads directly to the Cherry Boat Ramp. The brick lot parking for the Heritage Shores Nature Preserve is located at the western end of 53rd Avenue North, along the creek, to the right of the boat landing area. After parking, it's a four-block walk along the sidewalk, away from the boat landing area to the entrance of the Preserve.

This math trail was developed by the South Carolina Council of Teachers of Mathematics in partnership with Destination North Myrtle Beach.

The Heritage Shores Preserve Math Trail

A **math trail** is a walk with various stops where the participants look at **mathematics** in the world around them, as they ask and answer questions about their discoveries. **Math trails** are a wonderful way to stimulate interest in **mathematics** and to explore the outdoors at the same time.

No tools are needed for a math trail, other than perhaps some string, a tape measure, a notepad, and a pencil, so children are free to roam, observe, consider, reason, and internalize a new appreciation of the math embedded in their natural environment. While on a math trail, students develop mathematical and environmental literacy while having fun. A math trail enables children to engage with mathematical experiences in the real world and to gain first-hand knowledge of how math can be used to interpret the world in which they live, while illuminating new mathematical concepts that complement and extend what they have learned in textbooks and within a classroom.

The Heritage Shores Walking Trail

To begin the Math Trail Adventure, bear to the right when the trail branches left and right.

Our sea turtle friend is headed right, so be sure that you go in that direction as well.

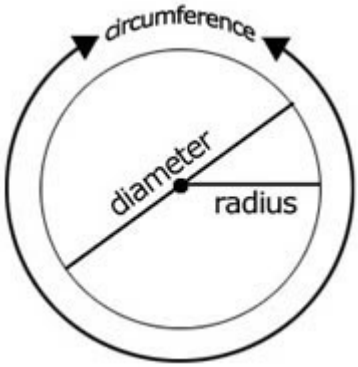
Mathematical Activities for The Heritage Shores Math Trail

1. Your first mathematical activity is to keep a tally of interesting things that you think that you "*might see*," during your adventure. At the end of the trail, you should create your choice of a bar graph, pictograph, circle graph, or other appropriate statistical graph or chart using your data.

2. When you arrive at the first wooden walkway along the trail, stop before you cross it. Estimate how many steps you think that it will take you to get across along the walkway. Write your estimate down. Now, walk naturally and count your steps as you walk across and write the actual number of steps that you took. Compare your estimate to your number of steps. How well did you estimate? Why do you think your estimate and the actual number of steps turned out as they did?

3. Symmetry is when two halves of something are exactly the same. A butterfly has symmetry, as does a heart.  As you walk along the trail, notice the symmetry that you see in the leaves and plants. Draw some of the items that you see that have symmetry and sketch in the "line of symmetry" in your drawings.

4. As you walk along the trail, look for fallen logs or posts along the trail. You should now explore the relationship (ratio) of the circumference (the measure around the tree or post) to the diameter (the distance across the tree or post at its very center). Take any item you have that could be used as a measure (a string, a belt, a towel, or a scarf). Measure across the tree's diameter and keep that measure marked with your finger or by tying a knot in the scarf or string. Using that marked measure, measure how many times you can go around the circumference of the tree or post. Repeat this with three or four trees or posts of different diameters. What have you discovered about the measure of the circumference to the diameter? circumference: diameter



5. As you walk along, begin to take notice of tree branches. Leonardo Fibonacci discovered the pattern in about the year 1200. Each number in the sequence comes by adding the previous two numbers. **0, 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987 …** For instance, the number 13 is achieved by adding the numbers 5 and 8 and the number 21 is achieved by adding 8 with 13.

   The Fibonacci Sequence is actually a numerical representation of the fabled 'golden ratio' which can be found in art and nature, comprising everything from flowers to seashells and even the hairs on your head. When charted on a graph, that sequence spirals outwards, like the branches of a tree.

- The Fibonacci sequence is so widespread in nature that it can also be seen in the way tree branches form and split.
- The main trunk of a tree will grow until it produces a branch, which creates two growth points. One of the new stems will then branch into two, while the other lies dormant. This branching pattern repeats for each of the new stems.

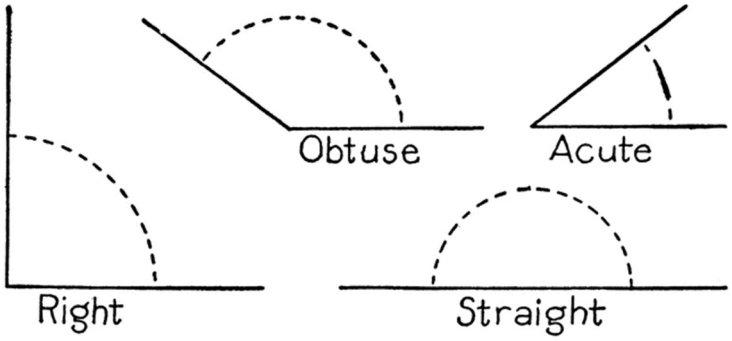
Look for and list other items in nature that you find here in Heritage Shore Nature Preserve that are examples of this mathematics in nature miracle, the Fibonacci Sequence. You'll see some more examples below to help give you some ideas.

This miracle of math and nature has been used throughout history in many works of art such as the Mona Lisa, but it doesn't stop there, the Fibonacci sequence can even be heard in music. An interesting music example is Lateralus by the heavy metal band Tool.

Lateralus's title-track's introduction lasts one minute and 12 seconds and the numbers 0, 1, 1, 2 are the first four in the Fibonacci sequence. The first verse kicks in on 97 seconds, which is approximately 1.618 minutes, i.e. the golden ratio. Each verse is also 55 seconds long, which is the 11th number in the sequence. The syllables in those verses match the sequence too, peaking

at 13 (coincidentally, the same number of total album tracks) and then again in a descending order thereafter. Furthermore, the time signature of the song's main riff is 9/8, 8/8 and 7/8, and 987 is the 17th number in the sequence. The final lines Maynard sings are, '*Spiral out. Keep going*.'

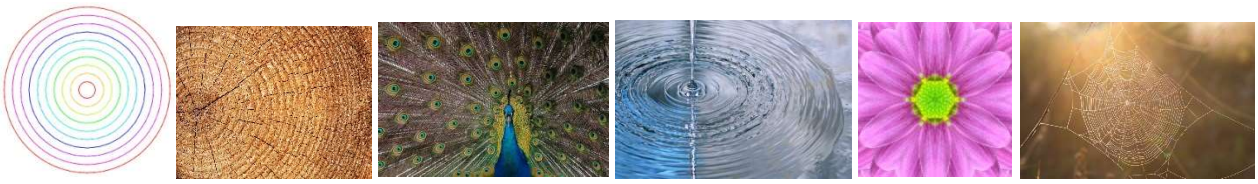
6. When you are about halfway around the island, you will see a shelter with a picnic table along the edge of the water of House Creek. Look for the geometry that was used in the building of this shelter and table. Write down the geometric shapes that you can see. Look for the angles that were in the construction.



How many of each type of angle do you see? How could you measure some of the angles that you have found?

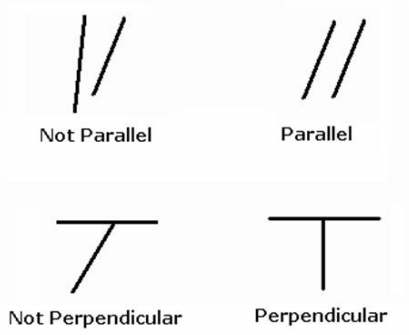
7. After leaving the picnic shelter on the point of the island, continue along the trail. Look for more picnic tables. How many picnic tables are there on the island? How many people could sit at each table? How many people could have a picnic lunch, sitting at a table on the island at the same time?

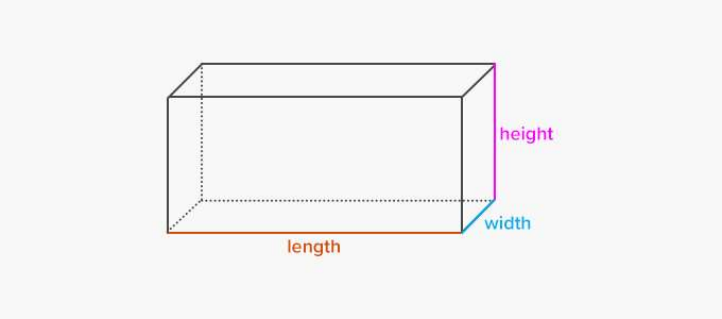
8. A common shape in nature is a set of concentric circles. Concentric means the circles all share the same center, but have different radii. This means the circles are all different sizes, one inside the other. A common example is when we see the ripples in a lake or pond when something hits the surface of the water. We also see concentric circles in the layers of an onion and the rings of trees that form as it grows and ages. Orb spider webs also have concentric circles. Write down the concentric circle that you have seen along the trail.

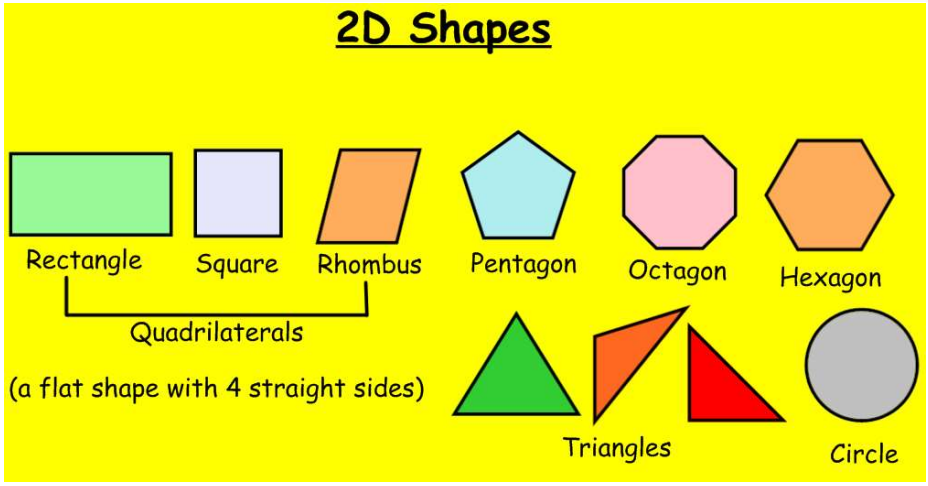


9. Did you know that a tree's age can be estimated by measuring the trunk? Measure the circumference of a tree. On average, the circumference of a tree grows at about 1/2 to 3/4 inches per year, how old is the tree that you measured?

10. Docks, bridges, and buildings have several geometric details that can be described, including parallel and perpendicular lines, angles, and measurement of their dimensions, as wells as their shapes. In how many ways can you describe the docks on this island mathematically?







The North Myrtle Beach Chamber & CVB and the South Carolina Council of Teachers of Mathematics hope that you have enjoyed your visit to the Heritage Shores Nature Preserve in North Myrtle Beach, South Carolina. By the time that you have completed your mathematical walk, you'll have noticed that you arrived back to where your walk began. If you have any other ideas that could be added to this mathematical adventure or if you would like to help develop and design other mathematical trails or science trails, please contact Cindy Parker, M.Ed., Executive Director of the South Carolina Council of Teachers of Mathematics by emailing: director@scctmconference.org