

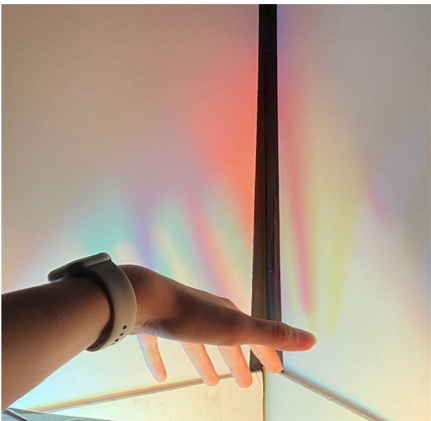
Raven Hill Discovery Center, incorporated in 1991, is a 501(c)(3) tax-exempt corporation.

Mission: Raven Hill provides a place that enhances hands-on and lifelong learning for all ages by connecting science, history & the arts.

To: Friends and Family everywhere
From: Cheri and Raven Hill
Date: July 23, 2022
Re: Sunshine & shadows

Greetings Everyone!

Light is one form of energy. Light energy travels in a straight line until it hits an object. If the object is opaque, light cannot pass through it, so a shadow or area of darkness is created on the back side of the object. A shadow is the absence of light and has no energy. The light rays that go past the edges of the opaque object make the outline of the shadow.



In Raven Hill's "darkroom", red, blue and green light bulbs all emit light. Together, the three colors form white light. When you put your hand in the "white" light, you block some of the colors and form "colored" shadows.

Shadows can be useful. A sundial is a time keeping device that tells the time of day, when the sun's rays hit a gnomon or style, block the light and create a shadow on a dial showing the hours of the day. As the sun moves across the sky, a person can "read" the shadow and thus the time. The world's oldest known sundial was found in Egypt's Valley of the Kings & is over 3500 years old. At Raven Hill, the main campus has a sundial with both Daylight Savings Time and Eastern Standard Time!

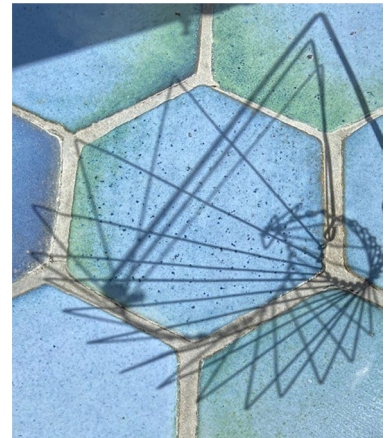
Ancient Egyptians also used obelisks as sundials. Raven Hill's Ancient World has an obelisk, which creates a shadow marking both the time AND the date! Our obelisk was built in 2006.



The Egyptian pharaohs and scribes used obelisks to look powerful. They understood that the length of the shadows indicated the months of the year. The commoners knew that the tip of the obelisk's shadow was a way to measure their work hours. The shadow above reads approximately 11:45am on July 23rd, just before the Center opened yesterday!



In 2010, Leadership Little Traverse participants built this sundial at Raven Hill. You can tell the time, whenever there is enough sun to create a shadow. For fun, we planted the herb, thyme, around the sundial.



Sunshine coming through my bay window sparked the update topic for this week! The sunlight hit a kinetic sculpture and the wires blocked the light, forming this wonderful shadow design.



Re-purposed metal was used to make our style or gnomon. Granite wedges were cut & donated by Petoskey Granite & Quartz Countertops to form the platform. The gnomon casts a shadow onto the platform, which is marked with bluestones showing the different hours of daylight.



These cousins came from southern Michigan and Hawaii to visit Raven Hill. They took turns holding Spike, the bearded dragon. If Spike was living wild in your backyard, you would be living in Australia with the kangaroos!



Look for the small black dot in a light colored oval at the tip of the arrow above. Many lizards, including Spike, have a third eye. A lizard's third eye is called a pineal, parietal, or solar eye. This third eye has a retina and lens, but no iris, which is why it looks different from the other two eyes.

*The eye is on the top of the head acts as a shadow-sensor and allows the lizard to escape quickly, whenever a shadow is detected.
"It is better to be safe than to be lunch for a predator."*

Remember that on Sunday, August 7th, you can support Raven Hill Discovery Center (RHDC) and Top Of Michigan Mountain Bike Association (TOMMBA) by participating in the **Pedal, Pig, and Pint Bike Tour**. Choose your wheels, ride at your level and your pace, or challenge yourself. The **Road to Trail Challenge** combines a road ride around Lake Charlevoix (42 miles) and a mountain bike ride at Avalanche Preserve or Boyne School Forest Trail. The **Twin Trails Challenge** invites you to combine mountain bike rides at Avalanche Preserve Trail and the Boyne School Forest Trails along with the distance in between. Take pictures at the trails you ride and ride coordinators will enter your name in a drawing. First prize is Stiggs Brew School, Second Prize is Stiggs Beer Mug for a year and Third Prize is a Stiggs T-shirt.

All riders must register and sign a waiver at Veterans Park in Boyne City between 7:30am and 10:30am the day of the event. After the ride, meet at Stiggs for lunch and a pint (or soft drink of your choice). All riders receive a free pass to Raven Hill Discovery Center and a 2022 ride shirt. Please join us in supporting Raven Hill Discovery Center and Top Of Michigan Mountain Bike Association. Register online at bikereg.com/pedal-pig-pint-for-raven-hill-discovery-center-and-TOMMBA or at Veterans Park before you start your ride. For more information, contact Holly at 517 231-3341.



This grape leaf is following Helen Keller's advice: "Keep your face to the sunshine and you cannot see a shadow."

Summer hours are in effect. Raven Hill is open weekdays from 10am to 4pm between Memorial Day and Labor Day. In addition, Raven Hill is open all year round from noon to 4pm on Saturdays and 2pm to 4pm on Sundays. Call 231.536.3369 or email info@miravenhill.org to make appointments for other times, including major holidays.

Be sure to mark your calendar for the **Great Lakes Chamber Orchestra** concert to be held here on Thursday, August 11th at 7pm. This is an outdoor concert on the grounds of Raven Hill with wine & cheese served afterwards, as you wander through the indoor and outdoor exhibits at the Center.

Enjoy both the sunshine and the shadows this week! As Frank Lloyd Wright said, "The present is an ever moving shadow that divides yesterday from tomorrow. In that, lies hope."

Cheri