



## The Power of Observation in Science and Art

**W**hat is the difference between seeing and observing? Observation is a potent skill that uses the whole brain and all the senses to help us understand our world more deeply. A rigorous activity, observation integrates what we see with what we already know and what we think might be true. By providing opportunities to exercise one's powers of observation, science museums like the Montshire help people begin to notice things in the outside world that they had missed before.

Scientists engage in a never-ending cycle of observing, recording, testing, and analyzing. Artists, too, engage their powers of observation, producing works that may inspire others to see differently. This fall, visitors can appreciate the observation skills of botanical artists and illustrators with the new exhibition, *From the Mountains to the Sea: Plants, Trees, and Shrubs of New England*, opening September 14.

Botanical art has documented the plant species of New England for centuries. Some species have disappeared; others have recently moved into the region, following ever-shifting climates. These artists and illustrators, whether in the field or in the studio, use close observation to visually communicate a plant's inherent characteristics in a form that can be more telling than a photograph.

Botanical artists share the detailed accuracy of scientific illustrators and the sensitive approach of floral still-life painters. Visitors will be drawn into this serene exhibit that celebrates quiet observation.

*From the Mountains to the Sea* is a juried exhibition by members of the New England Society of Botanical Artists, and will be on display September 14 through December 1.



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# HOPE Foundation Supports School Partnerships



## Dear Friends,

This issue of Montshire News is dedicated to the power of observation. There's more to the eye than seeing—we use what we see to make meaning of other experiences in our lives. Montshire's exhibits are designed to engage visitors in using this powerful skill every day. Whether you're watching the trout swim against the current in our aquarium tank or the sand form ripples and dunes in the *Aeolian Landscape*, you're developing a new perspective on the world outside the Museum's walls. The *Bubbles* exhibit is one of my favorites precisely for this reason. I love observing the patterns and geometries that are formed when the bubbles rise and fall. It's such a simple exhibit, and yet it's rich with references to the natural world.

On your next trip to the Montshire, I invite you to choose a new experience and practice your observation skills. For example, take a slow walk along one of the nature trails and pay close attention to the details of the environment and experience. What tiny details and grand shapes do you see? What colors and textures do you encounter?

We hope to “see” you here at the Museum this fall, and that your observations will be enlightening and inspiring.

Thank you for supporting the Montshire. It is only with your help that we exist as a resource for the community.

  
David Goudy  
Executive Director



The Montshire Museum's School Partnership Initiative, which strengthens the study of science in rural K-8 schools in Vermont and New Hampshire, has received a five-year grant from the Hypertherm HOPE Foundation. The Lebanon, New Hampshire-based manufacturer recently announced a five-year commitment to fund a portion of the Montshire Museum of Science's School Partnership Initiative.

“We are thrilled to be supporters of the Montshire Museum's School Partnership Initiative,” said Barbara Couch, Vice President of Corporate Social Responsibility at Hypertherm and President of the Hypertherm HOPE Foundation. “This program has been proven to lead the way both in building competence for teaching science and igniting a passion for science among students. This opportunity aligns perfectly with Hypertherm's interest in supporting STEM projects.”

Montshire's initiative works with teachers and school districts to improve science education in rural schools. “Many of the rural school districts found in Northern New England are too small to support the infrastructure needed for outstanding science programs. They simply don't have the resources to hire professional staff dedicated to developing and coordinating a high-quality science curriculum,” said Greg DeFrancis, director of education at the Montshire Museum. Additional funders, including the Donley Foundation, the Kettering Family Foundation, and the US Army Corps of Engineers' Cold Regions Research and Engineering Laboratory help support the initiative for the upcoming school year, making possible a variety of activities and services in the classroom and at the Museum.

Ten schools in five rural districts in Vermont and New Hampshire are currently participating in the Initiative.

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**“This type of support is exactly what schools need to increase the quality of science learning at the elementary level.”**

— JEFF VALENCE,  
Principal of the Lyme School

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## NEWS AND NOTES

### MEMBERSHIP RENEWAL

Montshire is pleased to offer a new [automatic membership renewal option](#). Now you can enjoy all the benefits of a Montshire Membership uninterrupted! Signing up is easy when you join or renew—whether online, in person, or by mail. We will charge your credit or debit card annually during your renewal month and your membership will automatically renew for another 12 months. Save time, money, and resources while enjoying the convenience. Learn more at [montshire.org/membership](http://montshire.org/membership).

### VOLUNTEER

Fall provides many exciting opportunities to [volunteer at the Montshire](#):

- ▶ **Explainers** share a joy of science with visitors. Training is scheduled for early October.
- ▶ **Young Scientist Program volunteers** work with a Museum teacher to introduce science to children ages 4-6.
- ▶ **Magic Carpet volunteers** prepare regionally inspired lunches for the Museum's popular travelogue series.
- ▶ **Auction volunteers** provide leadership, creativity and outreach to make the Museum's principal fundraiser a success.
- ▶ **Exhibit volunteers** help with building, painting, maintaining, and fixing exhibits.

For additional information and an application, visit the Museum's volunteer webpage at [montshire.org/about/join-our-team/volunteer/](http://montshire.org/about/join-our-team/volunteer/), or email us at [volunteer@montshire.org](mailto:volunteer@montshire.org).

### MONTSHIRE FUND DEADLINE APPROACHING!

Make a gift on or before **September 30** and you can help make sure the Montshire continues to serve as an educational resource for the community. Charitable contributions support visiting exhibitions, educational programs, scholarships and free admission for families in need. Thank you!

### MONTSHIRE MARKERS

See your name, or that of a loved one, in the Museum entryway! Now, for a limited time, you are invited make a gift of \$500 or more to the Montshire and request a Montshire Marker. These 6" x 8" pavers may be engraved with up to 20 characters (10 per row) to honor or celebrate a special individual, family or event. Act now! Supplies are limited and due to an increase in production costs, the minimum contribution will increase to \$600 after September 30.

### MEMBERSHIP RATE INCREASE

After remaining unchanged for three years, Montshire Museum's membership rates will increase just \$10 beginning October 1. Memberships with an expiration date on or before 12/31/2013 may be renewed prior to this increase.

### SCIENCE PARK MAINTENANCE

The water will be off in Science Park September 3–20 for needed maintenance work on the concrete surfaces found throughout the park. Other parts of Science Park will be open to visitors as is possible.

### WE ARE PLEASED TO ANNOUNCE THE WINNERS OF THE 5TH ANNUAL PHOTO CONTEST:

Thank you to everyone who entered and congratulations to the winners!



CHILDREN

Thom Smith, *Bradford, NH*



FAMILY AND FRIENDS

Brent Leland, *Wenham, MA*





## FOR CHILDREN

### Books and Beyond! Science for Preschoolers

*Mondays, September 16, October 21, November 18, December 16; 10:15 a.m. or 11:30 a.m.*

This popular program combines children's literature and hands-on activities for fun science learning and exploration. Each day features a different book and related science activity. For children ages 3–5 and their parents or caregivers. *Free with Museum admission.*



### Young Scientist Program

*Session 1: Wednesday, September 11–October 23*

*Session 2: October 30–December 18*

*Morning session: 9:30–11:30 a.m., Afternoon session: 1–3 p.m.*

This weekly program includes hands-on experiments, fun projects, and individual explorations in the physical and natural sciences. Designed to engage and excite preschoolers (ages 4+) and kindergartners about science. *Members \$195, non-members \$215.*

### Montshire FIRST® LEGO® League Team

*Tuesdays and Fridays, September 10–mid-November 3:30–5:15 p.m.*

Children in grades 4–8 are invited to join Montshire's FIRST® LEGO® League (FLL) team. We will work together to solve a specific design challenge using Lego robotics. Team members will participate in a regional competition demonstrating their Lego robot and teamwork skills.

Limit 10 children. Pre-registration required. *Members \$50, non-members \$55.*

### Homeschoolers Series Kitchen Chemistry

*Thursdays, October 3, 10 & 17*  
*Ages 6–8, 10:30 a.m.–noon*  
*Ages 9–12, 1–2:30 p.m.*

Join other homeschoolers in a three-part series of inquiry-based science classes. We'll concentrate on chemistry that can be done at home with ingredients found in the kitchen. Activities will explore density, mixtures, pH, and physical and chemical reactions. *Limit 14 children. Members \$70, non-members \$77.*

### Afterschool Adventures All About Air

*Mondays, September 16, 23 & 30*

*Drop off between 3:15 and 3:30 p.m., pick up at 5:15 p.m.* We'll launch parachutes, fly kites, and make stomp rockets while we explore the properties of air and how objects move through it. Each afternoon begins with a snack and some open exploration time before we dive into the day's projects. This three-week program will ignite your child's passion for all things scientific! For children in grades 1–3. *Limit 12 children. Members \$90, non-members \$100.*



### Afterschool Adventures Science in Motion

*Mondays, October 21 & 28, November 4*

*Drop off between 3:15 and 3:30 p.m., pick up at 5:15 p.m.* This program is filled with designing, building, and experimenting. We'll study motion as we make toys and machines that roll, spin, and pop. Each afternoon begins with a snack and some open exploration time before we dive into the day's projects. For children in grades 1–3. *Limit 12 children. Members \$90, non-members \$100.*

### Afterschool Adventures Inventor's Workshop

*Mondays, November 18 & 25, December 2*

*Drop off between 3:15 and 3:30 p.m., pick up at 5:15 p.m.* This three-part series is perfect for children who enjoy building, tinkering, and figuring out how things work. Our investigations will cover simple machines, mechanics, energy transfer, and more, as we design and build amazing chain-reaction machines. Our final creations will be part of Montshire's Machine Madness event on Saturday, December 7. For children in grades 3–6. *Limit 12 children. Members \$90, non-members \$100.*

### Friday Nights for Teen Tinkerers

*Fridays, September 13, October 25, November 22, January 31, 6:30–8 p.m.*

The tinkering studio is open! Teens can spend a Friday night away from their parents and little siblings. Each month we'll design, create, and build something cool. Teens will have a chance to use their imagination and sharpen their neurons. Pre-registration is encouraged, but drop-ins are welcome. For youth in grades 6–9. *Members \$14, non-members \$16. Check online for each month's tinkering theme.*



## FOR FAMILIES

### Homeschoolers' Day Botany and Microscopes

Thursday, September 19  
10 a.m.–3 p.m.

Join other homeschooler families as we explore the world of plants. We will offer a variety of activities that use magnification and microscopes to explore the natural world up close. *Free with Museum admission.*

### Botanical Investigation Day

Saturday, October 5  
10 a.m.–5 p.m.

From ferns to flowers, spend the day exploring the world of plants with us. We'll investigate cells and seeds, learn to identify ferns, use microscopes to explore flowers and leaves, and enjoy the fall foliage. This full day of special programs complements the New England Society of Botanical Artists' exhibition *From the Mountains to the Sea*, on display through December 1. *Free with Museum admission.*

### Machine Madness Prebuild

Sunday, December 1  
10 a.m.–3 p.m.

Need some motivation or inspiration to help you get started on your Machine Madness (see below) entry? Bring the beginnings of your machine or simply some supplies and ideas to the Machine Madness prebuild. Machine Madness director Mike Fenzel will be available to answer questions, help you come up with solutions, and assist in bringing your ideas to life! *Free with Museum admission.*

### Machine Madness

Saturday, December 7  
1–3 p.m.

Machine Madness is a fantastic family engineering event open to people of all ages and mechanical abilities. By following a couple of simple building guidelines, we will be able to link our homebuilt contraptions to other machines to create one incredible chain reaction! Details and building guidelines at [www.montshire.org](http://www.montshire.org). *Free Museum admission for families who pre-register their machines.*

### BYOBox

Monday, December 30  
1–4 p.m.

Bring the biggest cardboard box you have, or pick one of ours, and create an arcade game straight out of your imagination. Share your game and play other people's games in this afternoon cardboard construction extravaganza. *Free with Museum admission.*

## FOR ADULTS

### FIRST® LEGO® League Programming Workshop for Coaches

Saturday, September 14  
9 a.m.–3 p.m.

Worried that you don't know enough about programming and have a gaggle of kids to teach? Well, put your mind at ease! Come spend a day with FLL® project manager Skye Sweeney for a hands-on training session. We will go over basic and intermediate operation of an NXT using the NXT-G language. This class will be tailored to coaches of FLL teams. We will learn basic navigation and object manipulation, as well as some simple but effective uses of sensors. At the end you will be comfortable helping your team learn and

having a productive and fun season. Pre-registration required by September 11. *Free, includes lunch.*

### Montshire Unleashed: An Evening for Adults

Fridays, September 20,  
November 1, January 17, April 4  
6–9 p.m.

Allow your inner curiosity to run wild! The Montshire is open after hours for adults of all ages. Pull up a stool at the Science Discovery Lab for some amazing activities or simply explore the Museum's exhibits on your own. Jasper Murdock Ale and wine from the Norwich Inn will be available for purchase. *Regular admission, free for members.*

### Drawing from Nature: Picturing Plants

Saturday, September 28  
9 a.m.–4 p.m.

Whether examining the petals, stamens, and pistils of tiny flowers, the venation of a spectacular leaf, this workshop will help you learn a variety of techniques using graphite and pen, and include activities to sharpen perception and observation skills, composing and problem-solving, and drawing exercises. All levels welcome. Taught by Susan Sawyer, an artist-naturalist with over 30 years experience as a teacher and freelance artist. Limit 12 participants ages 16+. *\$90 members, \$100 non-members, plus \$15 materials fee.*

### Mushroom Walk

Sunday, October 6, 1–4 p.m.  
Mushrooms and other fungi are commonly seen on the forest floor in autumn. But how can you tell which ones are edible and which ones should be avoided? Join expert Faith Hunt on this annual foray that will introduce you to a spectacular variety of local fungi. The program concludes with an opportunity to sample some of the day's edible finds. Limit 12 adults. *Members \$60, non-members \$70.*

For programs requiring pre-registration, register online at [www.montshire.org/programs](http://www.montshire.org/programs)

## MAGIC CARPET SERIES

Join Magic Carpet volunteers for an extraordinary travelogue and a regionally inspired meal. Programs begin at 11 a.m.; lunch is at noon. Proceeds benefit the Montshire's education programs.

Members \$15, non-members \$18.  
Pre-registration required.



**October 7**  
*Namibia*  
Tom Wilson



**November 4**  
*India*  
Bob and Ann Hargraves

**December 9**  
*Hiking the Cotswolds*  
Steve Aikenhead

**January 13**  
*Peru*, Cappy Nunlist

**February 10**  
*Israel*, Craig Cohen

**March 10**  
*Eclipse in Fiji*, Bob Koester  
and Tom Wilson

## UPCOMING EXHIBITIONS



© Regina Milan

► **September 14–December 1, 2013**

### FROM THE MOUNTAINS TO THE SEA: PLANTS, TREES, AND SHRUBS OF NEW ENGLAND

Celebrate the beauty and diversity of New England's native plants through the artistic, scientific and technical aspects of botanical art and illustration.

► **December 7, 2013–January 19, 2014**

### TOYS: THE INSIDE STORY

Peek inside some classic toys while exploring the basics of pulleys, cams, gears, linkages, and circuits.

► **January 25–May 26, 2014**

### SUSTAINABLE SHELTER: DWELLING WITHIN THE FORCES OF NATURE

Explore biodiversity, human and animal architecture, ecosystems, and energy and water conservation—all from the perspective of the "home."



*White River Flyer*

**ALL ABOARD! TAKE THE TRAIN TO THE MONTSHIRE THIS FALL**

**Thursday, Saturday & Sunday, September 26–October 27**

The White River Flyer departs from Union Depot in White River Junction, Vermont, and makes one roundtrip excursion to Cedar Circle Farm in East Thetford, with stops at the Montshire.

The train departs White River Junction at noon and arrives at the Montshire at 12:15 p.m.

Passengers re-board at 2:15 p.m. to return to White River Junction. For more information contact Vermont Rail System online at [www.rails-vt.com](http://www.rails-vt.com), or call 800-707-3530. Happy Travels!





Montshire  
Unleashed

## SEPTEMBER

- 10 Montshire FIRST® LEGO® League **Y**
- 11 Young Scientist Program (session 1 begins) **C**
- 12 Montshire Corporation Annual Meeting (by invitation) **A**
- 13 Teen Tinkerers: Frankenstuffs **Y**
- 14 *From the Mountains to the Sea*, exhibition opens **F**
- 14 First® LEGO® League Programming Workshop for Coaches **A**
- 16 Books and Beyond! Science for Preschoolers **F**
- 16 Afterschool Adventures, All About Air (series begins) **Y**
- 19 Homeschoolers' Day **F**
- 20 Montshire Unleashed: An Evening for Adults **A**
- 26 Montshire Volunteer Breakfast (by invitation) **A**
- 28 Drawing from Nature **A**

## OCTOBER

- 3 Homeschoolers' Series, Kitchen Chemistry (series begins) **C**
- 3 Montshire Fund Celebration (by invitation) **A**
- 5 Botanical Investigations **F**
- 6 Mushroom Walk **A**
- 7 Magic Carpet Program, Namibia **A**
- 16 MCA Employee Appreciation Night **F**
- 21 Books and Beyond! Science for Preschoolers **F**
- 21 Afterschool Adventures, Science in Motion (series begins) **Y**
- 25 Teen Tinkerers—Costume Accessory **Y**
- 30 Young Scientist Program (session 2 begins) **C**

## NOVEMBER

- 1 Montshire Unleashed: An Evening for Adults **A**
- 4 Magic Carpet Program, India **A**
- 18 Books and Beyond! Science for Preschoolers **F**
- 18 Afterschool Adventures, Inventors' Workshop (series begins) **Y**
- 22 Teen Tinkerers, Light up Paper **Y**
- 22 Shop, Save, Explore **F**

## DECEMBER

- 1 Machine Madness Pre-Build **F**
- 7 *Toys: The Inside Story*, exhibition opens **F**
- 7 Machine Madness **F**
- 9 Magic Carpet Program, Hiking the Cotswolds **A**
- 16 Books and Beyond! Science for Preschoolers **F**
- 30 BYOBox **F**

Always check [www.montshire.org](http://www.montshire.org) for the most up-to-date information, full program descriptions, and to register.

# Calendar



## MONTSHIRE MUSEUM

The Montshire Museum of Science features exhibits and programs on natural and physical sciences. The Montshire is an interpretive center for the Silvio O. Conte National Fish and Wildlife Refuge. The outdoor Science Park leads to a network of walking trails on our 110-acre property.

**Hours:** Open daily 10 a.m. to 5 p.m.  
Closed Thanksgiving, Christmas.

**Phone:** 802-649-2200

**Web:** montshire.org

### Admission fees

\$14 adults, \$11 children ages 2–17.  
Free for Museum members and children under the age of 2.

## MONTSHIRE MUSEUM BOARD OF TRUSTEES

Jim Barrett  
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Jennifer Brown  
Lisa Cashdan  
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## MONTSHIRE NEWS

The Montshire Museum of Science publishes *Montshire News* three times a year. Montshire members receive a free subscription.

**Executive Director** David Goudy

**Associate Director** Jennifer Rickards

**Editor** Beth Krusi

**Design** Wendy McMillan Design



First floor exhibit spaces and bathrooms are entirely wheelchair accessible. Second floor exhibit spaces can be reached by elevator. Several nature trails on the Quinn Nature Preserve are also wheelchair accessible.



Montshire Museum of Science  
One Montshire Road  
Norwich, Vermont 05055

# A T.rex Named Sue



**WORLD'S LARGEST T. REX SPECIMEN  
TO BE DISPLAYED AT THE MONTSHIRE**  
MAY 17–SEPTEMBER 7, 2014

The most ferocious dinosaur that ever lived is on its way to the Montshire Museum of Science. The exhibit, *A T. rex Named Sue*, scheduled to open May 17, 2014, features a cast of the most complete Tyrannosaurus rex ever discovered. The exhibition will also feature animatronic dinosaurs, interactive kinetic models, and more.

The exhibit was created by The Field Museum, Chicago, USA, and made possible through the generosity of MacDonaldis Corporation.

