CITIZEN SCIENTIST TOOL BOX

This workshop is great for educators looking to incorporate real world data collection into their teaching, and involve students in projects that make a difference. Discover how your observations of nature can help scientists expand scientific knowledge by learning about a variety of citizen science programs in which you can participate. From Ebird, to Michigan HerpWatch, to the Great Lakes Worm Watch Project, we will highlight a variety of flora and fauna projects that need your help. Bring your smart devices to discover how these technology tools and other online resources can help you enjoy your outdoor exploration, identify species, learn more, and provide scientists with valuable data at the same time.

When:
Thursday, February 6, 2014 at 6:30-8:30 p.m.

Sponsor:
Ecosystem Preserve & West Michigan Cluster of the Stewardship Network

Where:
Bunker Interpretive Center

Cost:
$5 suggested donation at the door to support the work of the WMC Stewardship Network

Registration:
Pre-registration is preferred as space is limited to 45 participants, but walk-ins are welcome

Who should attend? Observers of the natural world, educators, homeschool parents, scout leaders, and other naturalists aged 12 & up.

About Citizen Science: Citizen science is a form of research that enlists the public in collecting a wide range of environmental data to expand scientific knowledge and literacy. Citizen scientists range in age and scientific background, however, all citizen scientists enjoy learning more about the natural world.
REGISTER TODAY FOR WINTER PROGRAMS

During the winter, we offer our Critters in the Cold program for grades Pre-K to 6th. This hands-on program allows students to learn more about how animals cope with the cold through one of the following methods: hibernation, migration, dormancy, or remaining active. It provides opportunities for the students to observe animals and/or signs of these animals in the preserve, and to discuss various adaptations that active animals use to survive Michigan winters. The program takes place both outside in the preserve and in the Bunker Interpretive Center.

Winter programs run from February 10 – 28. Programs are 90 minutes in length, and cost $3 per student. Currently, National Heritage Academy Schools are eligible to attend our programs free of charge, thanks to a funding grant.

For more information visit our website, or contact Julie Wilbourn to register your class. To register, we will need your name and school, desired program topic, grade level, number of students and adults, preferred dates/times, and the best way to contact you.

Like our programs? Forward this e-mail to your fellow educators! Thank you for spreading the word that exploring science in nature is a powerful learning experience.

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INSPIRING IDEAS FOR THE CLASSROOM

Each newsletter, we share with you some of our favorite ways to get students outside learning about the natural environment. You do not need to have forests or fields surrounding your school;
school yards can work just as well for experiential learning. Our school yard activities are hands-on, require few supplies, and are easily adaptable to meet your students’ needs. We also include some of our favorite storybooks, art projects, and other resources to enhance learning in the classroom. Additional ideas and photos of art projects and storybooks can be found on our Pinterest page.

**SNOW**

Of course, the perfect topic for this edition is snow. After a few years of very little snow, we are excited to see snowflakes gently falling outside the window nearly every day this winter. Children love snow; it’s a great way to engage them in outdoor learning in a school yard about the states of water and weather. Above all, snow is so much fun to play in! Below are some of our favorite snow activities and resources.

![Snow Image](image_url)

**EDUCATIONAL WEBSITES**

**What Is Snow?** Snow crystals form in clouds where temperatures are between 32 degrees and -39 degrees F. These clouds are made up of tiny water droplets and particles of dust and salt. The particles attract water molecules from the droplets in the cloud, and as more and more molecules gather on the particle, they freeze and build ice crystals - the start of a snowflake! As the crystals become larger, they begin to fall.

**SnowCrystals**: This is a great website containing lots of information about the science of snow, types of snowflakes, photos, time lapse movies, and growing snow crystals. Did you know the shape of a crystal is determined by the temperature and
humidity of the air in which the crystal is formed? Since snow crystals pass through a number of atmospheric conditions before they hit the ground, it is common to start off as one form, and end up as a different form. The seven basic snowflake shapes are: needles, plates, stellar crystals, irregular forms, spatial dendrites, columns, and capped columns.

**Snowflake Bentley**: Wilson A. Bentley was the first person to photograph a single snow crystal in 1885. From his photographs, he discovered that no two snowflakes are alike. He would go on to capture more than 5,000 snowflakes during his lifetime, and thus became known as "Snowflake" Bentley. This website has more information about his wonderful work with snow crystals.

**SCHOOL YARD ACTIVITIES**

**Snowflake Sleuth**

**Materials needed (one each per student)**: Sheets of black construction paper, hand lenses, laminated copies of A Guide to Snowflakes

(Note: Before class, put all the equipment for capturing and observing snowflakes outside so it will come to air temperature.) Invite the students to catch some snowflakes on the black paper. The snowflakes should not melt right away because the paper is cold. Encourage them to use a hand lens to observe the snowflakes up close. What shapes do the snowflakes look like? See if they can identify what type of snowflakes they have using the guide. If you have time, try this activity over multiple days and times, and record the data along with the temperature and weather conditions in a snow journal. Does temperature affect the shape of the snowflake?

**Snow Play**

**Materials needed**: Snow

Invite students to make cool things out of snow by:

- Making a snow angel.
- Drawing shapes or writing words on the snow with their hands and feet.
• Make an animal snow sculpture. Invite them to use their imagination to create a snow turtle or snow penguin.

• Making a snowman or snow lady. Use natural materials to decorate it.

• Build a snow fort for protection from the winter winds.

**FAVORITE STORYBOOKS**

Storybooks are wonderful tools to introduce students to science topics. Information about these books can be found on our Pinterest page. Many of them have accompanying teacher’s guides on the publisher’s homepage.

Below are some of our favorite storybooks and non-fiction books about snow:

- *The Story of Snow: The Science of Winter’s Wonder* by Mark Cassin

- *The Snowflake: Winter’s Secret Beauty* by Kenneth Libbrecht

- *Snow Amazing: Cool Facts and Warm Tales* by Jane Drake & Ann Love

- *Snowflake Bentley* by Jacqueline Briggs Martin

- *Stranger in the Woods* by Carl R. Sams & Jean Stoick

- *Snowballs* by Lois Ehlert

**ART PROJECT: Six-sided Beaded Snowflakes**

**Materials needed:** white chenille sticks, a variety of clear plastic beads, ribbon, scissors

Each student needs three pipe cleaners. Help them to twist the three pipe cleaners together in the middle, and then spread them out to form the six arms of a snowflake. Have the students thread beads on to each arm leaving a half inch or so of chenille stick at the end to fold back into the last bead. Attach a ribbon or string to hang the snowflake on.