

The Mini Page

Next Week:
Girls in science

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Founded by Betty Debnam



photo by Bruce Leventhal, Forest Lake High School, Forest Lake, Minnesota

Citizen Scientists

Last week, The Mini Page learned about the Great Backyard Bird Count, in which people all around the world help scientists learn about the bird population, but this work goes beyond just birds.

Hundreds of thousands of kids and adults are helping to solve the mysteries of Earth and beyond. They are known as **citizen scientists**.

Although these volunteers are not professional scientists, they are making valuable scientific discoveries throughout the world. They are gathering data on thousands of subjects, ranging from monarch butterfly migration to galaxy shapes to water quality to penguin lifestyles.

Citizen detectives

Amateurs have been making important scientific discoveries for thousands of years. Since the late 1800s, professional scientists have been joining forces with these volunteers. The National Audubon Christmas Bird Count organized birders to gather data starting in 1900. It is the longest-running citizen scientist group survey in the world.

The number of citizen scientists has exploded in recent years. Technology, such as the internet, apps, smartphones and GPS, has made it much easier for everyone to join in the hunt for knowledge.

Helping the experts

Citizen scientists usually work closely with scientific experts. Often, professional scientists need help collecting or analyzing a lot of data

over a wide area and over a lot of time.

Doing the actual research is exciting. Many students get their first real experiences in nature through citizen scientist projects.

It is especially important when kids become citizen scientists. The world needs people who have learned how to think creatively and to look for answers that are backed up by tests and research, experts say.

• In an NSF/NOAA project called

CoCoRaHS (ko-ko-RAHS), observers measure precipitation that falls near their homes. When whole communities come together to monitor the precipitation, it gives groups such as the weather service, farmers, insurance companies, water supply managers and outdoor lovers a better idea of patterns. It helps them predict what to prepare for.

Mini Fact:

Students examine a Mexican butterfly weed, which is in the milkweed family.



photo by Henry Reges, courtesy NSF

A father and son measure rainfall in Concord, North Carolina, as part of CoCoRaHS.

• **Monarch Watch**, based at the University of Kansas, helps monitor monarch butterflies and has started a Waystation Program. It encourages people to plant flowers that monarchs like and **milkweed**, which the larvae need.



photo courtesy Monarch Watch

• Through the Chicago Botanic Garden's **Budburst**, 35,000 citizen scientists are recording information on when plants start changing each season. For example, they record when leaves change color in the fall and when plants begin to flower in the spring.



photo by Carole Cahin, University Center for Atmospheric Research, courtesy Project Budburst

Two students record observations for Budburst.

This helps scientists monitor the effects of temperature changes and rainfall and gather information about climate change.

• In the NOAA **LiMPETS*** network, middle school, high school and college students monitor national marine sanctuary beaches in California.



photo by Aelfric Wolf, courtesy NOAA

Students collect data on rocky **intertidal** areas and sandy beach

Students monitor Pacific mole crabs through the LiMPETS sandy beach network. They measure the crabs, check to see if they are male or female and if the females are carrying eggs.

Intertidal areas are beach areas that are covered by the sea at high tide and uncovered at low tide. The information helps officials track the health of marine life.

Resources



On the Web:

- limpets.org
- cocorahs.org
- budburst.org
- monarchwatch.org

Try 'n' Find

Words that remind us of citizen scientists are hidden in this puzzle. Some words are hidden backward or diagonally, and some letters are used twice. See if you can find:

- BUDBURST, CITIZEN,
- COCORAHS, DATA,
- DISCOVERY, HELP,
- INTERTIDAL, LIMPETS,
- MEASURE, MILKWEED,
- MONARCH, PLANTS,
- PREDICT, SCIENTIST,
- SOLVE, TECHNOLOGY,
- VOLUNTEER.

H E S P L A N T S V M C L Y L
C V I C D E C W O P E I A R I
R L G J I A L J L A T D E M
A O P A D E U T B E S I V P
N S L E R N N L A H U Z T O E
O N R Y T N T T Y D R E R C T
M P D E E W K L I M E N E S S
M X E B U D B U R S T U T I M
U R C O C O R A H S T E N D K
T E C H N O L O G Y X W I J W



Cook's Corner

Blueberry-Lemon Breakfast Cake

You'll need:

- 1 (18-ounce) box lemon cake mix
- 1 (6- to 8-ounce) container plain yogurt
- 4 eggs
- 1 1/2 cups blueberries (fresh or frozen)

What to do:

1. Combine cake mix, yogurt and eggs in a bowl. (Do not add oil or water.) Blend until moist, then beat 2 minutes at medium speed.
2. Gently stir in blueberries.
3. Spray a round tube cake pan with cooking spray. Pour batter into tube pan.
4. Bake in oven at 350 degrees for 40 minutes or until done. Cool for 15 minutes before removing from tube pan. Makes 8 to 12 servings.



* You'll need an adult's help with this recipe.

Mini Jokes



Sam: What's a nuclear scientist's favorite lunch?

Sara: Fission chips!

Sonya: Why are chemists good at solving problems?

Stephen: They have most of the solutions!

Eco Note



A handful of galaxy frogs once hidden beneath a single fallen log in India's Western Ghats mountain range

may have vanished forever, not because of natural predators but because people wanted photographs. The tiny, endangered frogs disappeared after visitors overturned logs, trampled vegetation and handled the animals without gloves, actions that can easily kill amphibians that breathe through their skin. *Melanobatrachus indicus* is the only species in its family, an ancient line of life that cannot be replaced.



photo by Davidraju

adapted with permission from Earthweek.com

For later:

Look in your local newspaper for news about discoveries in any area of science.

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or call 800-642-6480 for more information.

1. To gain knowledge by study or experience; to understand (5-letter verb)

□ □ □ □ □

2. To read, memorize or investigate (5-letter verb)

□ □ □ □ □

3. To show the truth of something with facts; to test by experiment (5-letter verb)

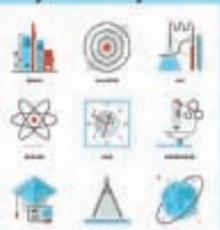
□ □ □ □ □

4. To find out or see, especially for the first time (8-letter verb)

□ □ □ □ □ □ □ □

1. Jennifer wants to _____ as much as possible in her classes.
2. Hank will _____ slides to see examples of the infection.
3. Numbers need to _____ 100% that this information is correct.
4. Scientists hope to _____ a cure for that disease.

ROOTONYM®
by Jan & Carey Orr Cook



Study the definition. When you know the missing word, fill in the letter boxes and the sentence blanks.

Answers: Learn, Study, Prove, Discover.