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K-16 STEM in the NEWS

Chase STEM ACADEMY
Students Harnessing the Wind



Chase STEM Academy, Toledo Public Schools' only STEM elementary school, has undergone some unique transformations within the past 3 years. Students are engaged in hands-on learning experiences that span Toledo Public Schools' science, math, social studies, and reading curricula as well as incorporating engineering activities into their daily academics. With a dedicated staff involved in professional development surrounding mathematics, science, and engineering, this school - once in Academic Emergency - has made great gains and is working towards an Effective rating on the state report card. Through a 2009 A+ for Energy Grant, critical partnerships with Lourdes College and Wind Turbines of Ohio, and other donations, the teachers and students of Chase developed a project titled Harnessing the Wind. The grant and partnerships allowed for the construction of a SkyStream 3.7 wind turbine on site in May of 2010. Students are engaged in learning activities surrounding the turbine. In the science lab, science support specialist Andrea Bennett collaborates with teachers to focus on hands-on science and engineering projects. These projects educate and motivate students at all levels, integrating all areas of the curriculum.

For example, fourth grade students are using what they have learned about windmills and turbines to design their own windmills that can perform work, more specifically to lift a load. Students meet math standards utilizing real data of weather measurements, graphing and analyzing results of experiments, and calculating the weight that is lifted by designed windmills. Students utilize

NWO Hands-On Activity



Catch the Wind

In this activity, learn about the aerodynamic forces that make for high flying fun. **Grade Level 3-8**

What You Need

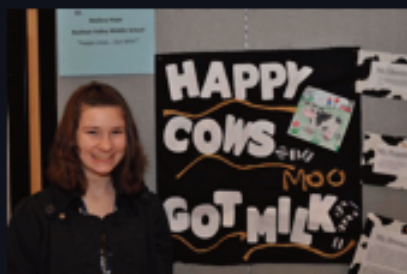
- Standard-size brown paper grocery bags (two for each team of students)
- Masking tape
- Kite string
- Paper clips
- Pencils
- Straight sticks at least 43 cm inches long (bamboo or wooden skewers work well because they're light)
- Spring scale, Meter sticks or rulers, Scissors
- Crepe paper streamers for kite tails (if desired)

problem-solving/decision-making processes while working cooperatively with one another. Throughout the year, all Chase students experience research and hands-on inquiry as a means to problem solving. They use weather-tracking instruments and data from the wind turbine operating outside are sent streaming to the Science Lab for collection and research.

In addition to the Harnessing the Wind project, teachers at Chase include engineering activities throughout the year from Engineering is Elementary, Design Squad, and Technology is Elementary. Students at all grade levels experience different engineering fields and utilize project-based learning activities. Through these exciting hands-on experiences, students at Chase are gaining an appreciation for alternative energy sources and an understanding of the engineering design process and what engineers do, and they are developing problem-solving skills through real-life STEM experiences. And as is evidenced by their academic growth and the smiles on their faces, students are learning and retaining core academic content while having fun.

Ohio JSHS

March 23-25 hosted at BGSU



BGSU will host The Ohio Junior Science and Humanities Symposium (Ohio JSHS) in the Student Union on March 23-25. This program showcases the best high school science and math students in the state who have accomplished cutting-edge research in the areas of science, technology, engineering, and math (STEM). These areas are considered to be the base of an advanced society.

During the symposium, the students will present their research and have the opportunity to interact with BGSU's distinguished faculty and students. They also will have the opportunity to visit many of BGSU's research facilities. See www.ojshs.org for information on the program.

What To Do

1. Each group should create one blueprint (to scale) of the kite. Use graph paper, ruler, and pencil for this. Students can determine scale, as long as it is accurately drawn. Right angles should be checked, with a protractor, to ensure accuracy. Your finished kite can measure no more than 43 cm tall x 64 cm wide (the size of the standard grocery bag).
2. Cut out the side and bottom of a standard-sized brown paper grocery bag. So both sides are exactly the same, fold the kite material in half and use half the diagram to measure and draw your kite pattern. Cut the kite materials while it is still folded.
3. Reinforce the corners 'F' and 'C' with a couple of layers of tape.
4. Punch a hole for string at Corner F and Corner C.
5. Cut two pieces of kite string 45 cm each. Tie a string through each hole. Tie them tight enough so you do not tear the kite. The strings are called bridles.
6. Tie the opposite end of both strings to a paper clip.
7. Cut a 1 m piece of string. Tie one end of this string to the other end of the paper clip.
8. Tape the sticks inside the kite. One stick goes from Corner A to Corner E. The other goes from Corner B to Corner D.

The Toledo ZooTweens

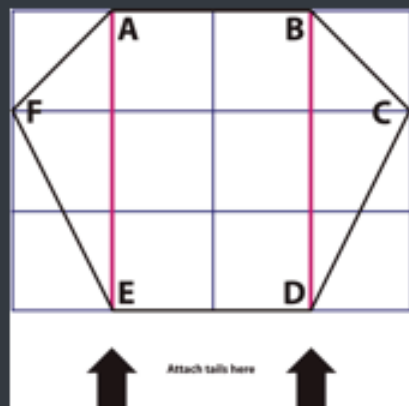
The Toledo Zoo recently received grant funding from the Toledo Community Foundation for a new volunteer program that incorporates "tweens," volunteers between the ages of 10 and 13, into the Zoo's animal enrichment program. Based on the successful ZooTeens program, ZooTweens will work under the guidance of the Animal Behavior Department in researching, designing, and creating animal enrichment projects and assisting with scientific evaluation of these projects. In addition, student volunteers will participate in Zoo visitor education through enrichment displays and question and answer sessions throughout the Zoo.

Animal enrichment enhances animal welfare by encouraging natural behavior and allowing the animals to make choices. ZooTweens will learn about the development and construction of enrichment items for animals as they discover activities and mentoring relationships that promote the development of beneficial life skills, from public speaking to a sense of responsibility born through civic engagement.

Evaluation of enrichment tasks will include charting the increase in the number of animals and species served, the number of new enrichment ideas approved for the animals, and the number of public presentations delivered each month. The Zoo's enrichment coordinator will work with the ZOOTweens to develop several methods of evaluating animal responses to enrichment, including anecdotal evaluations, 1-5 scales, and collecting scientific behavioral data using ethograms (definitions of behavioral categories) and data collection sheets. Visitor "stay time" at exhibits will also be measured before and after enrichment is provided to determine the impact on the visitor experience.

Ultimately, these youth may advance into the ZOOTeen program, where they will receive additional mentoring and gain further experience in animal care and welfare, as well as conservation and community service. Volunteers will be recruited throughout April and May, with the program expected to begin in June 2011. Visit ToledoZoo.org for updates and information.

You are ready to fly!



Observe

Fly your kite. Observe how well your kite flies. How long does it stay in the air? Run slow and run fast, and observe how the kite flies at different towing speeds. Fly next to a building to gauge a relative height for your kite and record your observations in a notebook.

Learn

As a kite is lifted into the wind, some air is held under it. The air underneath the kite pushes it upward so it can fly. Kites are made of very light materials so they can stay up in the air easily. You feel a force as you hold the kite while the wind pushes on it. Newton's Third Law explains this force.

Newton's Third Law, often stated as "for every action (or force) there is always an equal and opposite reaction (or force)," is one of the basic principles on which flight is based. The law predicts that forces always come in pairs and act in opposite directions. The wind pushing on the kite is equal to the kite pushing back on the wind.

STEM Scholarships for Underrepresented Minority Students

The American Chemical Society awards renewable scholarships of up to \$5,000 to students who want to enter chemistry-related fields. African American, Hispanic, or American Indian high school seniors or college freshmen, sophomores, or juniors pursuing a college degree in the chemical sciences or chemical technology are eligible to apply. Contact: scholars@acs.org or toll free: 800-227-5558, ext. 6250.

OSLN Announces Launch: Spring Fling

May 11, 2011 at Columbus Crew Stadium

Teams of students may register for one or all five Design Challenge Events. For information and registration contact challenge@experiencestem.org

OhioView SATELLITES Summer Teacher Institute from University of Toledo

July 11-15, Toledo, OH

Topic: Geospatial Technologies & The Earth's Energy Budget

Visit <http://satellitesk12.org> or contact Dr. Kevin Czajkowski at kevinczajkowski@utoledo.edu or [click here](#) to visit the NWO website to download an application.

At any time there are four forces acting on a flying kite: lift, gravity, thrust, and drag. The force that lifts, pushes, or pulls the kite vertically upward is called lift. Gravity pulls the kite back toward the earth. The downward force of gravity acting on the mass of the kite is called weight. As you pull on a kite string you are providing thrust. The resistance of the kite to the horizontal thrust is called drag. The kite's tail also helps create drag. All of these forces - lift, drag, gravity, and the thrust of the wind come together in the kite at a place called the center of pressure. That's where you tie your kite string. This is also called the tow point. By moving the place your string is attached to the kite on the bridle lines, you can change the amount of lift that is created. You do this by changing what is called the angle of attack.

Investigate

1. Now you are going to do some experimenting. You are going to change the length of the bridle strings and thus change the angle of attack. As a team decide whether to shorten or lengthen your two bridle strings coming off the kite or the string attached to the paper clip. You can decide to lengthen or shorten one side and test that as well. Just be sure to record your original measurements and any changes you made.

Project Wild \$500 Grants Available

\$500 grants from ODNR and The Jennings Foundation will be awarded to 40 schools that best meet the Wild School Site criteria. Submit an application before May 31 to ODNR Division of Wildlife. Details and the application are online at www.wildohio.com

B-Wiser Summer Camp Opportunity for Young Women

Buckeye Women in Science, Engineering and Research is holding a camp at the College of Wooster, **June 12-17, 2011**. Open to girls who complete seventh grade this year, the camp offers hands-on robotics, engineering, energy conservation, and more. Visit www3.wooster.edu/bwiser. The deadline to register is April 30.

Project pi r2 Two Teacher Professional Development Institute

Beginning June 20, 2010

NWO and BGSU are offering a free K-6 teacher professional development program through OBOR which provides 100 contact hours, a teacher stipend, free classroom materials, and outreach programs from Toledo Zoo, Challenger Learning Center, and others. Visit www.nwocenter.org/PiR2/index.htm for details.

STEM Scholarship Program

Scholarships for minority students and women planning to major in the sciences or mathematics at BGSU are offered through the innovative and highly successful AIMS (Academic Investment in Math & Science) program. Scholarships range from \$1500-10,000 depending on merit, interests and financial need. For more info:

2. Now make a prediction...
Our kite will fly higher when we....
3. Cut new strings, make adjustments, and conduct at least 3 flights to test your kite. Does it seem to fly higher than during your initial flights?
4. Following this investigation, decide whether to lengthen or shorten your bridle strings again.
5. Make changes and record your data from at least 3 flights.
6. Graph your data to show how a kite's bridle length might be related to its flight success.

Visit NASA at

<http://www.grc.nasa.gov/WWW/K-12/airplane/kite1.html> for more kite flying lessons and ideas.

Obey all safety precautions and rules for flying kites (see "Kites in the Classroom" presentation at <http://www.nationalmuseum.af.mil/shared/media/document/AFD-070523-007.ppt>).

NWO/COSMOS

[NWO/COSMOS website](#)

The SETGO Program

SETGO offers many excellent opportunities to high school juniors and seniors including a FREE 4-week science and math bridging opportunity that offers \$1,000 upon successful completion. Apply for the SETGO Owens Ready Bridge at <http://www.bgsu.edu/setgo/orb.html>. Other free program opportunities can be found with the SETGO Art of Science Community at <http://www.bgsu.edu/setgo/asc.html>.

The Ohio Technology and Engineering Educators Association Spring Conference

April 1-2, 2011 at Granville Middle School in Granville, OH

Conference Information: www.otea.info

STEM Education Updates

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