

S-T-R-E-A-M

ST. JOSEPH SCHOOL OF ALL SAINTS PARISH

FEATURE STORY

SJS STREAM Aligns with National Research Council

Walk into any science classroom at St. Joseph School, and you will see concrete manifestations of the National Research Council's new vision for science education. The Council released a document published by the National Academies Press that describes a new approach to teaching science and engineering. The document, *The Framework for K-12 Science Education*, outlines three dimensions for learning. These dimensions are Science and Engineering Practices, Cross-cutting Concepts and Core Ideas. All are embedded in the learning in every classroom in our school.

Teachers plan lessons in the first dimension to bring students to the thinking and activities in which real-world scientists and engineers engage.

From nursery to grade eight, students use the STREAM Lab's space and resources to engage in cross grade activities to practice: 1) generating questions and problems to be solved, 2) consistent use and develop of models, 3) planning and directing investigations, 4) generating explanations for science and solutions for engineering, 5) using math and computational thinking, 6) analyzing and interpreting data, 7) engaging in argument from evidence and 8) obtaining, evaluating and communicating information with their peers.

The hallmark of teacher planning is the integration of the second dimension concepts that cross-cut not only each domain of science, but other curricular areas as well. Each

teacher's unique pedagogy pushes students to think deeper about connections using 7 key concepts of the *Framework*: 1 patterns, 2 cause and effect: mechanism and explanation, 3 scale/ proportion/quantity, 4 systems and system models, 5 energy and matter: flows, cycles, conservation, 6 structure/function and 7 stability/change.

Teachers collaborate around these concepts to build students' conceptual capacity from year-to-year. Teacher support of the vision for vertical progression of learning enables children to develop within the spectrum of Bloom's cognitive skills- from basic identification and understanding to more complex mental activities like analysis, synthesis and evaluation. (Continued, p 3.)

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Endangered Species Researched by Second Graders

The Second graders in Mrs. Alyssa Dick's class have been learning about endangered species. The class was engaged in a project where each student chose an animal and conducted research on why it is considered an endangered species. The Second graders learned new information about

their creature. They identified their animal's threats and predators all while exploring their natural habitats. Students presented their research information on a poster. Then, each student designed a diorama created to represent their endangered animal in their surrounding environments.



Grade Three Makes Borax Snow Crystals A Part of Prayer

Mrs. Helen Fitzgerald's Third graders celebrated winter making borax snow crystals. The class was learning about the unique nature of all God's children in Religion class with a beautiful prayer called, "The Gift of the Snowflake". The discussion centered around creation of individuals with their own unique personalities and talents. The Third graders then tied their religion lesson to an activity in science class. They captured the uniqueness of God's creation by growing their own unique snow crystal using string and borax. The children made concrete representations of the Prayer's message that "God lets the snowflakes fall each winter to remind us that we are all Children of God, that we are unique in our own way and that each of us has been created for a special purpose." *



* Author Unknown

UMASS Nano-technology Partnership Engages 7th & 8th Graders

Dr. Carol Barry, Director of UMass Lowell's Nanotechnology Manufacturing Department introduced our Seventh and Eighth graders to the properties and behaviors of nanoparticles. Through mini demonstrations and hands-on learning stations, students explored how ferro-fluids behave, experimented with hydrophobic fabrics, and manipulated magnets to investigate, at the nano-scale, the intricate patterns and behaviors of nano-particles. Earlier in the week, the members of St. Joseph's Nanotechnology Club experimented with nano-structures, but were interested in knowing more about their behaviors and applications to the real world. They explored photo-chromic dye reacting to ultraviolet light in beads, how the capillary affect works at the nano-scale to defy gravity, and how the structures of amorphous metals yield new behaviors and uses in manufacturing applications. Shea Robertson, Student Council President, welcomed Dr. Barry by sharing a model of the Buckminster Fullerene nano-tube the club made last month. The tube's properties fueled the conversations between the two UMASS Doctoral and Master candidate facilitators and our students. The Haverhill Gazette and Eagle Tribune were on hand to cover the action.



Fifth Grade Explores Engineering Project from Museum of Science

Fifth grade students are learning about magnetic levitation through the design and building process. Students share the pre-occupations of real-world engineers as they problem-solve, designed, build and test a train that moves along its tracks via magnetic levitation. The activity is one of several engineering projects offered through the Museum of Science's Engineering is Elementary program. The fifth graders were given materials and time to work out design sketches on their own. They referred to the concepts explored in their interactive notebooks, referenced class experiments and tapped one another's creativity and talents to create design options for both train and track.

The next step for students is the actual building process and using prototypes to test their train and track designs. After the first successful run, the Fifth graders will invite their Pre-kindergarten Study-Buddies to view and run the trains.

SJS STREAM ALIGNS WITH NATIONAL RESEARCH COUNCIL (CONTINUED)

The third dimension of the *Framework*, Core Ideas, is the content knowledge taught in each domain of science— life, earth and space, physical, and engineering/technology applications. Teachers at St. Joseph plan units and individual lessons around these ideas- the meat of the new Next Generation Science Standards (NGSS). Your child's teacher integrates these standards, the Common Core standards for Math and Language Arts and the Massachusetts Frameworks standards in the planning and teaching process. Together with (A)rt and (R)eligion, science and engineering/technology blend to

make *STREAM* learning a comprehensive process that supports the *Four Strands of Science Learning* embraced by the National Research Council. Teachers work collaboratively and generate learning experiences that make the four strands concrete for students. Classroom learning pushes students to 1) understand and communicate scientific explanations, 2) generate scientific evidence, 3) reflect on new knowledge and 4) participate fully in science.

Out-of-class activities, guest speakers, demonstrations and after school clubs support and extend St. Joseph pedagogy that aligns with the National Research Council's vision

for science and engineering education. As we enter the Spring Trimester, we welcome parents and the wider community to visit our classrooms to witness the contemporary science learning ongoing at St. Joseph School.

As teachers, we wish to share our expertise with other educational professionals and connect with potential partners who can support St. Joseph students and this new vision at the classroom level. If you share this interest, please contact Dr. Christina DiBenedetto, Consultant to *STREAM*, at cdibenedetto@sjslav.com.

Fitzgeralds' Classes Tackle Melting Snowmen Project

Every winter people build snowmen, but as soon as the warm weather comes, these snowmen melt. During the month of February, Mrs. Fitzgerald in the third grade and Ms. Fitzgerald in the sixth grade combined student brainpower to tackle the problem of melting snowmen. The cross-grade teams put their heads together to design "melt-safe" structures that would prevent snowmen from melting. The structures had to have four walls and cover the snowman from top to bottom. Some materials they used included hay, waxed paper, aluminum foil, construction paper, paper towels and plastic wrap. After designing their structures, they were put to the test, and as you can see— success. There was much celebrating between the two grades in our *STREAM* Lab!



Pen-pals and Puppets bring a French Flair to STREAM



Students at St. Joseph's have been connecting to peers in France via a "Pen-pals in France" program coordinated by French teacher, Madame Auclair. The students exchange written correspondence about math, science, art, religion and other highlights of their year with counterparts in France. Also, Madame's Puppets have captured the hearts of Fourth graders. There are more than a dozen puppets— each having its own personality. The children are quite familiar with them. Mostly the puppets ask questions about science, math and other fun things ongoing at the school, the parish and in other social settings. The children answer.....in French of course. Each student was required to fill out an adoption paper and choose a name for their puppet. Each puppet comes from a different French-speaking country. C'est magnifique!

**ST. JOSEPH SCHOOL OF ALL
SAINTS PARISH**

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Mission Statement

St. Joseph School of All Saints Parish serves students from nursery through grade eight from Haverhill, Massachusetts, and surrounding areas.

We offer a challenging academic program integrated with Catholic values in a safe and welcoming environment. We strive to develop an awareness and concern for the less fortunate through the practice of the Corporal Works of Mercy.

EXCELLENCE IN EDUCATION



Nursery and Pre-K Study Animals' Winter Survival Skills

The ECC children completed a STREAM project on how animals survive in winter. They listened to a story called "Animals in Winter" and viewed photos of animal dens. They then experimented with hand exposure to ice water, molded little animals, built winter dens for them and colored, counted, and recorded Arctic animals.

