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Science Goes to Preschool

Hunched over their microscopes, peering intently into the eyepieces, they look like biology students or scientists anywhere—with one big difference. These are pint-sized scientists—3-, 4- and 5-year-olds, to be exact.

What kind of science can preschoolers do? "What can't they do?" replies Kati Gilson, a Chicago Public Schools early childhood science specialist who heads a science program supported by HHMI in preschool classes run by the Science and Math Excellence (SAME) Network of Rush-Presbyterian-St. Luke's Medical Center. Nearly 1,000 children in 18 inner-city schools participate in the science activities, which teach them to observe, classify and communicate what they've learned—three essential elements of science. An HHMI precollege science education grant supports the science program in 12 schools.

In one class, 4-year-olds are building clay volcanoes and filling them with baking soda and vinegar. "It foams all over and makes a big mess," Gilson remarks. "They love that."

The Magiscopes™ are another perennial favorite. Made for small, eager hands, they are simple microscopes and virtually indestructible. With a magnification of 20x and a pink, plastic wheel for mounting several specimens, the microscopes open a window into a world where ordinary, everyday things—sand, sugar, animal fur, feathers, seeds, even hair and fingernail clippings—take on fascinating new shapes and textures. "It's so big," the children exclaim as they examine a grain of sand magnified 20 times. And their drawings of sand as seen under the microscope are almost always much, much bigger.

In Lourdes T. Torres' class at Daniel J. Corkery School, children freeze water into ice, mix primary colors of paint to see what secondary colors they can create, and stir a dry material such as flour into a wet material like water to make a brand new substance: sticky paste. "If it's something they can get their hands into, they love it; the messier, the better," says Torres.

Torres has been teaching science to preschoolers for two years. "At first I was afraid of science," she says. Then she saw Gilson in action and found her enthusiasm contagious. "If she can do it, I can do it," Torres decided, "and she's always there as a resource." Gilson runs a 3-day science workshop for preschool teachers in summer and shares new, hands-on science activities at meetings during the school year.

Gilson explains the rationale for preschool science. "This is the most curious age," she says. "The more science they get when they are really young and impressionable, the less likely they are to struggle with science when they get older, and the more likely they are to develop a lifelong interest in science that may translate into future studies and careers."

The SAME Network isn't asking anyone to take the value of preschool science on faith. An evaluation team has developed assessment tools, including a basic skills test that the children take in November and May that measures changes in their factual knowledge and reasoning ability. On a scale of 50, most of the children score 26-39 in the fall and 34-47 at the school year's end. At one school that Gilson says is "in one of the toughest neighborhoods in Chicago," scores jumped 13 points, from 32 to 45.