



Creating a Classroom Exhibit

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Introduction

Four years ago, the Smithsonian formed a partnership with two schools in the Capitol Hill area of Washington, Robert Brent Elementary and Stuart Hobson Middle, both of which became *museum magnet schools*. They attract students from across the city with a method that combines traditional class work with the study of primary sources, including museum objects. Each class translates the work into an *exhibit*, a thematic display of objects. Toward the end of the year, on grand Opening Night, the schools become museums, and the students, acting as museum guides, get the chance to show an audience what they've learned.

Among students, teachers, and parents, we found an enthusiasm for this way of learning that is reflected in the record of the schools. Attendance and test scores have risen steadily in the last four years. This year, Brent was one of seven D.C. schools (out of 147) to meet all of the performance-standards targets set by the school district.

In this special *Smithsonian in Your Classroom*, we describe the basic components of the exhibit projects in hopes that you will find inspiration to start one in your room, and that your students will follow through by creating something that surprises you. The magnet school method is in keeping with constructivist education, which has an ancestry in John Dewey's call for "learning by doing" and in his theory that we use our own experience to construct the meaning of the thing that is learned. The teachers at the schools look for the intersections of the students' interests and the requirements of the curriculum. At each stage, they sketch outlines for the work and leave a lot of room within the outlines for the imagination.

While most of the class work at the schools falls under a year-long exhibit theme, and while each class theme contributes to a school-wide theme, we met no one who thinks that such a structure is necessary for a successful project. Fifth-grade teacher Laurie Wingate offered the thought that one might look for ways to work an exhibit into a structure that is already there.

"In most schools, when you have an open house, you just plaster up everything the kids have done," she said. "A teacher could shape an open house to be an exhibit rather than a bulletin board."

The Museum Magnet School Method

THE STUDENTS SHAPE THE THEME. The teacher proposes a broad topic, usually one that is related in some way to the curriculum standards. The students brainstorm on the topic, and common interests begin to emerge.

Students do research on topics related to the theme. Some of the research is done on museum visits and other excursions into the world beyond the classroom.

The class examines the layout of museum exhibits. "At the museum, we take two looks," said sixth-grade teacher Ray Llanos. "We look for the information and we look at how things are displayed."

Everyone has a hand in planning the exhibit and constructing displays. "We are emulating the practices of museums," said Brent art adviser Tina Wyatt. "They're starting to push for the personnel to work together as teams on exhibits."

Students write research reports. Their writing is the basis for the *labels* that accompany exhibit objects. They deliver some of their reports before the class, which is good practice for their presentations as guides, or *docents*.

Teachers give the students a rubric at each stage of the project. The rubric is not a list of instructions, but a checklist of goals for the task. Said sixth-grader Diego Romero, "You need a rubric to be self-directed. Sometimes you can accomplish more by yourself, but without a rubric you might feel kind of lost."

The class trips are an essential part of the projects, and in this the schools have an advantage of location – Washington, D.C., has more museums than any city in the world. But most of the teachers said that they would teach this way no matter where they were, as long as some connection could be made to a museum. What is important is that students begin to appreciate museums as learning resources, and that they see the relationship between their work and that of museum professionals. The larger purpose of the projects, said Brent principal Dr. Lynne Long, is "to connect real-life situations to the classroom." One way this is achieved, said Tina Wyatt, is "to learn from something that's tangible and to reproduce it in a three-dimensional form."

One might think of the very theme of the exhibit as something with a three-dimensional form – something that can be approached from any number of angles. The general theme at the schools this year was *Unlocking the World through Math and Science*, but in all the classroom exhibits there were representations of the students' work in social studies, language arts, and, of course, visual arts.

"One of the things about standards is that there are too many," said fourth-grade teacher Hollis Miller. "It's what everybody complains about across the country. We're expected to tie standards together. This does that beautifully."

Finding a Theme

THE MAGNET SCHOOLS USE THE BUBBLING (or webbing) method of brainstorming. The teacher writes the broad topic in the middle of a chart and circles it. The students call out whatever ideas they have on the topic and the teacher writes them down, circling each one. The students find connections between the ideas. The teacher, at the chart, draws connections between the circles.

"The bubble chart helps the kids to see what they are thinking, and what their friends are thinking," said Ms. Miller. "Once you get all the brainstorming up and then divide it into the different categories, they start to get really excited. They're jumping up and down – 'I want to do this' and 'I want to do that' – and that's when you get the best exhibits."

Ms. Miller does not reject any idea, however wild it seems. Two years ago, around the time that Dolly the Sheep was in the news, her class was brainstorming on the topic of technology. Someone put forth this idea: "Let's clone a sheep!" She went ahead and wrote "cloning" on the chart. Later, she heard about a workshop at the National Museum of Natural History in which students can help extract DNA from cow fat and examine it under a microscope.

The subject of DNA fit nicely into the theme they ended up selecting, "Technology in Fighting Crime," so she enrolled them in the workshop. For the exhibit, they made an elaborate model of a double helix out of drinking straws.

"It intrigues me what they are capable of learning," she said. "What I've learned is that you don't just write off any of these kids."

This year, she put a very big word on the bubble chart: biodiversity. The District of Columbia fourth-grade curriculum emphasises "systems," and she thought that a study of an ecological system would be rich in material. Once she explained what biodiversity is, the students began naming things they associated with it. When they made connections on the chart, they saw that most of those things were animal and plant life that can be found in a forest. They had their theme.

Refining through Research

IN ANOTHER BUBBLE EXERCISE, Ms. Miller asked the students what they would like to learn about forests. She then asked how they could go about learning it, and they some listed ways of doing research: look in the encyclopedia, use the Internet, go to the library.

"That's the book side of it," she said. "By the fourth grade, we're teaching children to read to find information. Using written materials in a project is very important."

But soon they had another source of information – their own piece of a forest in the middle of Washington, D.C. Early in the year, Ms. Miller learned that the National Zoo was inviting school groups to take part in a project to map all the trees on its 163-acre grounds. Late in the fall, they began working with a Smithsonian scientist named Doc in a couple of acres of a wooded area.

The trees had lost their leaves, but Doc showed them how to identify species by the bark. They helped him tag the trees, take measurements, and record the data, and in the process they got some of their math assignments done. In class, they would have been finding x , y coordinates on graph paper. With Doc, they were finding the grid coordinates of the trees.

In science, social studies, and geography, they had been looking at the Amazon rain forest of Peru, particularly in comparison to the rain-shadow forest of the Olympic Peninsula of Washington State. The students tried to find similarities in the languages of Native Americans who lived in these distant but not dissimilar forests. Ms. Miller introduced this exercise with a discussion of the "more concrete" similarities in the dwellings they built.

The exhibit began to take shape when she brought their temperate-zone hardwood forest into the comparative study. They already had an idea to create a forest in the classroom. They decided that they would have three separate forests, and that these would be the main *exhibit stations*, or thematic sections of the exhibit.

They used cardboard carpet rolls for the trunks of the trees, packing paper for the canopies, and crepe streamers for vines. In their Peruvian rain forest, there were papier-mâché jungle animals along with a real one, a student's pet macaw. In the Washington State forest, there were models of the lodge houses of the Hoh tribe. Their Washington, D.C., urban forest was the setting for displays related to the zoo project: the metal disks they used to tag the trees, insects and spiders they had captured, and a cast they had made of a deer track. Posted on all the trees were poems they had written about forests.

The zoo project was a happy coincidence, but because it encompassed so many subjects it showed Ms. Miller that "you can use whatever you've got." This is what she told a group of teachers recently at a seminar in Hershey, Pennsylvania. She used Hersheypark, a venerable amusement park, as an example.

"I can see doing a lot of math with roller coasters and speed," she said.

The Big Picture: Laying Out the Exhibit

MOST OF THE CLASSES DRAW UP simple floor plans when they start to think about the arrangement of the exhibit. Like the bubble charts, these plans make ideas visible. They can also show where ideas might bump against the limitations of a classroom.

"The exhibit stays up until the end of the year, and we had to take that into consideration," said Mr. Llanos. "You have to think of a functional way for it to run. You still have to teach. We decided we wanted to use all the facets and technology of our room the best way we possibly could."

The sixth grade was divided between Mr. Llanos and another teacher, Kristin Hoffman. On opposite sides of a dividing wall, the students created different exhibits, and so had less space than most classes. Ms. Hoffman's theme was "Shaping the World," a study of the uses of geometry in ancient Egypt. Mr. Llanos's was "Cultures and Climates on Earth."

Early in the year, everyone in Mr. Llanos's class chose a country and wrote a research report on the relationships between natural and social conditions. For the exhibit, they made display boards that listed facts from the reports. Rather than using valuable surface space, they hung these from the ceiling.

As sixth-grader Ashley Wyatt said, you have to be both "creative and realistic" when doing an exhibit. Ashley is well known for her talent in design, and takes a special interest in the exhibit layout.

"I like putting things where they look best," she said. "Sometimes you think it all isn't going to fit, but you always find another way."

Ms. Wingate said that she is usually not concerned with keeping the exhibits out of the way of class work. What's most important to her is that the students see that the exhibit "has become real."

The fifth-graders' theme this year was architecture. Like Mr. Llanos's class, they looked at how people adapt themselves to climate and resources, but they concentrated on housing. They visited the National Building Museum and met an architect at a construction site on Capitol Hill. In their major project, they became architects themselves. Ms. Wingate gave each of them a budget, a key for translating square footage into dollars, and a profile of a fictional client. They designed "dream houses": they went through several drafts of blueprints and then built scale models.

Two students, Ronnisha Martin and Jasmine Sarantis, said that the project gave them a great respect for the work of architects, though perhaps not a strong desire to go into the profession themselves.

"This was kind of difficult, so imagine building a real house that has to be perfect," said Ronnisha. "You'd have to be good at a lot of different things – drawing and math and science."

Then, too, "there's a lot of erasing to do," said Jasmine. "Too much erasing. My hand ached."

Quite understandably, all of the students wanted to display this work in a prominent place. They had paid attention to how traffic flows through museums. They figured out that if they put the blueprints and models on desks in the middle of the room – in the centre of a circular flow of traffic – they would not be overlooked by any visitor.

Ms. Wingate had their final blueprints laminated. After Opening Night, they kept them on their desks and left the desks the way they were arranged for the display.

"I'm always conscious of letting them see that when you walk into the classroom, you're walking into an exhibit," she said. "You put your backpack away in its place. You just act a different way."

The Fine Details

BECOMING A DOCENT

Ms. Wingate thinks that the best way to teach docent skills is to arrange for a guided tour at a museum and to have the students judge the museum docent's performance according to their own experience as audience members. After a tour, her students list the things that they liked or didn't like about the docent. The list is the basis for their rubric when they practice their Opening Night presentations.

Most of the items on this year's rubric could be applied to any kind of public speaking:

I speak loudly and clearly.

I hold my audience's interest by speaking with expression.

I change my presentation to fit the audience.

But there was also this one:

I am comfortable with my knowledge and am willing to say when I don't know something.

"That's my favourite," said Ms. Wingate. "Sometimes they ask a docent a question, and the docent fumbles around and comes up with a makeshift answer. And the kids know that the docent doesn't know."

LABEL WRITING

Sandra Jenkins, an eighth-grade teacher at Stuart Hobson, asks students to judge the labels on museum walls just as if they were essays on paper. The magnet schools stress that labels are a vital part of an exhibit. Ms. Jenkins, though she is a science specialist, always stresses the importance of good writing.

"One should not be separate from the other," she said of science and writing. "My husband is always telling me that. He's an engineer, and other engineers send him reports from sites around the country. He's always saying, 'I'm certain that what I'm reading isn't what they want to say.'"

By the time her students begin composing their labels, they know what they want to say. They have, in fact, already said it in their research reports. "They are not pulling rabbits out of a hat," she said. The trick, rather, is to get it down to a paragraph or so.

"For labels, the way I put it is, 'If the object could speak, then what would it say?' But you can't afford extraneous language. Sometimes it takes ingenious writing techniques to really refine this."

The students practice the refinement of language all year. For every science unit, she has them write a poem on the subject, whether it is ecology or textiles or rocketry. She submits some of the poems on nature to the River of Words Project, an "environmental poetry" contest sponsored by the International Rivers Network, the Library of Congress, and former United States poet laureate Robert Haas. For the last three years, a Stuart Hobson student has won first prize for the District of Columbia.

"The poems give me another way of seeing the content of what they've learned," she said. "It's like science fiction. To be good, there has to be accurate science behind it."

Grace Notes

MUSEUM VISITS SOMETIMES spark ideas that hadn't occurred to the teacher. Late in the year, the fifth-grade class went to see a National Portrait Gallery exhibit that had brochures. One of the students, Jasmine Reed, let out a cry: "We don't have brochures!" Back in class, Ms. Wingate had them create their own personal, handwritten brochures. The idea added a nice touch, and served as another occasion for writing on the theme of the exhibit.

Ms. Wingate, like all the teachers, added touches of her own. It was her idea to have the students dress the part of architects at a construction site, somewhat in the manner of docents who are part of the exhibits at "living museums" like Colonial Williamsburg. She borrowed hard hats from a friend who works for a development company and got a donation of construction aprons from a hardware store in her neighbourhood.

Earlier, when the students were working on their blueprints, she created checkbooks for them. For every room they designed, they wrote a check to a fictional contractor. On the memo line, they wrote the square footage of the room. They turned the checks over to her so she could see if they were doing the math correctly.

"With kids, I don't think you can underestimate the value of the little things that make them feel somehow specialised or special," she said. "If I told them, 'Here's this piece of lined paper for keeping track of how much money you're spending,' maybe fifty or sixty percent of them would have done it. But if you give out a checkbook with their name on it, and let them design the cover, they get so excited about that. They kept the checkbooks better than I keep mine."

The Opening

OPENING NIGHT AT BRENT began with an assembly in the gym. Fifth-grader Cheryl Grant was the first to address the audience of more than three hundred.

"We hope you learn something new or review something you already knew," she said. "All we ask is that you leave feeling brighter and smarter than you did when you came."

At the magnet schools, it is important that the visitors, most of whom are parents, take the exhibits as seriously as the students do. None of the work – the study of primary sources, the collection and creation of objects – is quite fulfilled if the opening is treated merely as an academic exercise. It, too, must be a real-life situation. The students must try to teach others what they have learned.

Sixth-grader Anthony Boykins said that the best way to do this is to involve the visitors in the exhibit: "You should always ask questions, and also ask if they have comments."

Classmate Diego Romero remembered that one year some of the docents read their presentations from cards, and so may have seemed uninvolved themselves.

"We had one lady who left before she got all the way through the room," he said.

In all the rooms this year, there were activities for the visitors. In Ms. Miller's class, the three parts of the forest exhibit were connected by a game. Visitors rolled dice and advanced so many squares on a path that wound around the trees. Some of the squares had questions on them. The students' first idea was that you would have to answer the questions correctly before rolling again and moving on, but they relaxed this rule – any attempt at an answer would do. (Good thing, too. Otherwise, this reporter would still be standing on a square marked "How long is the Amazon River?")

The fifth-graders turned what began as a decoration into an interactive station. They were going to make a sign by hammering nails into a two-by-four to form BRENT. They decided instead to let each visitor hammer in one nail. After Opening Night, they had a souvenir – a head count, you might say, of everyone who had come through.

This idea, said Ms. Wingate, reflected their own preference for hands-on exhibits at museums, but also showed the kind of thinking that an exhibit project can foster.

"In trying to organise things into themes and questions, I think – I hope – it gives them something they can walk away with that's not specific knowledge, but a sort of framework for setting up ideas and organising their thoughts."

What Else Was Learned?

Hollis Miller said that her students might have learned more this year than she will know. She thinks, for instance, that they benefited just by watching someone like Doc at work. They had used field guides for identifying trees and birds, but some hadn't realised that there are people who possess such knowledge and can put it to good use. Doc was a real-life field guide, and not a bad role model.

In the zoo project, they were "learning things through the back door, without knowing they were learning them," and sometimes they were moving ahead of the curriculum. For example, the metric system is introduced toward the back of the fourth-grade math book, and she wasn't sure if they would get to it. In the woods, they *had* to get to it because the Smithsonian used metric tape to measure the DBH (dimension at breast height) of the trees.

"How many fourth-graders know what DBH is, or can find grid coordinates?" she said. "They won't forget this. A few years from now, some junior high teacher is going to be amazed."

The Art and Science of Museum Trips

Sandra Jenkins suggests that teachers visit the museum before a class trip so that "nothing is left to chance." Without a plan or definite purpose, she said, you can spend hours meandering, or "you can go through in ten minutes."

Ms. Jenkins maps out a "curriculum journey." She narrows the focus down to just a few exhibits. To help students further focus their attention, she designs an activity.

This year, she went to the National Air and Space Museum before teaching a unit on space. She chose four exhibits: *How Things Fly*, *Rocketry and Space Flight*, *Exploring the Planets*, and *Apollo to the Moon*. She had the students draw a picture of one object in each and then write a detailed description of it.

"This brought in other disciplines," she said. "When you can make those hooks, I think, it is the most powerful way to teach."

Advice from a Magnet School Docent

Sixth-grader Shamia Irving thinks that the key to keeping the attention of an audience is not to keep them too long.

"I remembered to put in all the interesting facts, but I wanted my presentation to be no longer than two minutes," she said.

The presentation was based on a research report on Greece. Two facts that interest her are that Greece has one official church and that it once had many gods. Her favourite of the gods is Apollo, the golden-lyre player, because she is very interested in music.

"People said I spoke nicely, I stood up straight, and I was dressed well. I had one lady who identified specifically that I did a great job of limiting my time."

When she practiced, she timed herself by the minute hand of the classroom clock, which moves with a loud tick: "I listened very carefully. When the clock ticked once, I had already covered three aspects of my project. When the second tick came, I was wrapping up."

Shamia likes being a docent and thinks she is well suited for the role.

"I have a lot of experience talking both to children and adults," she said.

How did she gain this experience?

"I talk a lot."

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