

Chapter 1

The Yellow Door

Turning Problems into Projects in Kindergarten



Teachers

Nicole Chasse and John Walker

Children

Amelia, Ava, Betel, Durjoy, Hakim, Sajan, Tamar, and William

This learning portrait describes how two teachers use student conflict in a play area of their kindergarten classroom to promote children's collaborative inquiry, social and artistic development, and mathematical reasoning.

Children in Nicole Chasse's kindergarten class at the Edward Devotion School* liked to build in the block area. They built and rebuilt sturdy ramps for trucks to speed down and homes for the wooden animals. The only problem was that everyone liked to use the yellow door. As one child named Durjoy explained, **"The yellow door was better than the red windows because it was tall enough for the black horse to walk through. But we only had one door and people were having trouble sharing."** Consequently, the yellow door led to lots of arguments.



*The Edward Devotion School is the largest pre-K-8 elementary school in Brookline, Massachusetts. The Devotion School serves more than seven hundred students, with a large population of English language learners and students who require intensive social and emotional supports.

Growing tired of children's increasing arguments over the door, one morning Nicole asked Hakim, Durjoy, and Sajan, **"Do you think the block area would be more fun without the door, because it seems like the door is causing too many problems for you to enjoy yourselves?"**

Unhappy with the prospect of losing the door, the boys were motivated to find another way to solve the problem.

"Buy more doors!" one boy shouted. Nicole explained that this idea would require money they did not have and encouraged them to keep thinking.

"Make more doors!"

Nicole was intrigued by this idea. She could imagine many opportunities for learning as well as challenges that she posed to the boys: **"How could we make doors just as good as the yellow door so people would use them?"** Hakim, Durjoy, and Sajan suggested asking John Walker, the assistant teacher, to help because he was an expert woodworker and the yellow door was made out of wood. Later that day, the three boys presented the idea to John and the rest of the class. The idea was received enthusiastically and the door project was born.

The Planning Phase

All the other wood projects we did, John Walker thought up. But this project, we actually worked on the beginning plans.—Amelia

The children's desire to make a door exactly like the cherished yellow door offered many opportunities to advance the children's learning and make connections across several strands of the kindergarten curriculum—including arts, English language arts, and math. Because the children had already done some observational drawing, John suggested interested students make sketches or "plans" for the doors based on careful observation of the yellow door, which he could then use to make the door "kits." The children would then help with the finishing—sanding, choosing colors, and painting.

Eight children volunteered to make plans. Some students sketched freestyle, whereas others such as Tamar chose to be more precise by measuring the original door with a ruler to find its exact dimensions. Tamar's idea inspired others to use the ruler so John explained the concepts of length and width. They discovered the door was exactly $5\frac{1}{2} \times 4$ inches.



The “Door Hunt”: Collecting Data on Doors

While waiting for John to build the door kits, Nicole took advantage of children’s increased interest in doors and asked if anyone wanted to explore the school to see what other kinds of doors they could find. The children loved the idea. Not only did it tap into their fascination with doors but also, as Ava later said, they were able to “go to places that kindergartners don’t [usually] get to go to.” Nicole suggested children count and record the different types of doors they saw but did not provide specific instructions on how to record.



Each child took a clipboard, paper, and pencil to record the information. Nicole and John alternated accompanying the small groups, taking pictures or video to document the different doors and children’s observations along the way.

The children’s notations reflected the different features they noticed about doors as well as the different methods they each invented to record the data.



Visible Learners

Some children recorded the order in which they encountered specific doors, others recorded the number of doors they found with particular features, and still others recorded observations in writing. Sajan recorded the doors he found by writing pairs of contrasting features, **"Red and not red, two [doors] and one [door], things [on the door] and no things [on the door]."**

SAJAN'S SHEET
RED AND NOT RED
TWO AND ONE
THINGS AND
NO THINGS
MEN AND WOMEN
NO MEN NO KNIVES
PE DOOR ITGS
ACROSS



In one group, Amelia (who dubbed this part of the project **“the door hunt”**) organized her paper into a graph to make room for all the doors she found. When children shared the data they collected with the whole group, the other children found Amelia’s method very appealing. The next day, another group followed suit and created similar grid patterns on their paper.

Organizing and Sharing the Data

When Nicole and John looked at the children's data, they noticed the children naturally gravitated toward identifying the doors' different attributes. Because counting, describing, and comparing measurable attributes and classifying objects are important parts of the kindergarten math curriculum, they approached Ms. Boss, the school's math specialist, to seek help on planning next steps that would continue to deepen these skills. The next day, Nicole, John, and Ms. Boss presented the class with a new provocation: **"Can you choose one attribute and collect a new set of door information based on only that one attribute?"**

Ms. Boss gave the students a blank piece of paper, demonstrated how to draw a graph, and reviewed the question she had posed—discussing the meaning of "attribute" by using examples from the data the children had collected (size, color, material, unique features, etc.). Before setting off with clipboards and graph paper, each child chose an attribute on which to record information. Tamar, Sajan, Ava, and Amelia all decided to record color; Ethan W. chose size.

After the children collected their data on color and size, Nicole took them to the fourth grade hallway to look at the fourth-graders' graphs of "leaf fall data." She pointed out how they could clearly see which trees lost the most or least leaves in certain weeks. The kindergartners noticed that the fourth-graders used labels and organized the graphs around the types of trees, the weeks they were observing, and the number of fallen leaves. Nicole proposed a new challenge: **"Could we take the information we collected from our door graphs and make it into a graph that others in the school could read?"**

The group was up for the challenge. Nicole worked with small groups in the hallway while John helped out with the rest of the class. Nicole gave the first group of five a choice of working alone or with a partner and a choice of paper—large lined chart paper or blank white drawing paper. Sajan and Tamar decided to merge their data into one graph. Betel, who had opted out of the door hunts, worked with Ava to transfer her data into a graph on the chart paper. Durjoy decided to work on his own. Here we follow Ava and Betel as they work.

Ava, who seemed to understand the concept of graphing and what it was for, first explained to Betel, **"It's lines going that way (indicating horizontally across the page) and lines going down with things in the middle. If we just had a blank piece of paper, it wouldn't be really organized."** Then Ava shared her strategy: **"I'm writing down from this (indicating her data collection sheet which she organized by color)—purple, green, black, and peach"** (pointing to the top of the larger sheet where she has written the colors). Nicole asked Ava what she planned to do with the markers. Ava responded, looking as much at Betel as Nicole to be sure Betel was clear about the plan, **"We're going to draw how many doors there are here (indicating the data sheet) over here (indicating the graph)."** Satisfied that the pair had a plan for moving their graph forward, Nicole went to help Sajan and Tamar—who were still confused—get started.

The hallway began to fill with animated discussions within and across groups. Sajan and Tamar created a counting game and pretended to count all the way up to one hundred. Durjoy ran up with great urgency, **“Does . . . is big . . . b . . . b-i-g?”** Sajan confirmed and Durjoy ran back to share the answer with Amelia. Meanwhile, Ava and Betel were engaged in deep negotiation about their shared task.

After filling in the column on the graph representing the number of purple doors, Ava said to Betel, who was holding a green marker, **“Color in three spaces. Okay?”**

Betel disagreed. **“No. I want to color over here.”** Betel had yet to grasp the purpose behind their coloring. She seemed to base her decision of where to color on other criteria. Ava took a different tack, **“I mean, color in three spaces in this green line. Okay?”**



Betel seemed convinced by this and started coloring in the spaces indicated by Ava.



Ava, perhaps recognizing that Betel had just made a compromise, offered her friend a compliment, **“Wow. You’re a better colorer than me, Betel.”** After carefully coloring in one green square, Betel stopped and put the cap back on the green marker, indicating her completion of the task. Ava said in an encouraging tone, **“So now you can do two more. Okay?”**



Betel responded somewhat enigmatically, **“This is one door (pointing to the green door she has just colored) and now we have to do three more.”** Without looking, Betel picked up a new marker and started coloring in the box immediately below the green one. Ava quickly tried another approach, **“I’ve got an idea, Betel!”** Grabbing her data sheet and showing it to Betel, Ava said, **“Don’t count the purple because we already did the purple. Follow this green one. You just have to do two more in this green line.”** Still not grasping the concept, Betel said good-naturedly, **“But, I can do red?”** Ava, after looking around for Nicole, who had gone back into the classroom, seemed to give up on helping her friend understand the concepts underlying their work and resorted to a more directive approach. **“No. You need to do two more squares of green.”** Betel accepted this without further question and followed Ava’s direction. Ava supervised.



After Ava took a turn coloring in two black squares for the two doors she recorded on her hunt, Betel announced that she would do blue. Ava explained, **“Well, you can’t do blue because I don’t have blue on my graph.”**

Betel's eyes widened as she seemed to grasp the concept behind what they were doing, **"Oh! Because there were no blue doors?"** Great excitement ensued once the two girls were "on the same page." Together, they went through the chart again, with Ava naming the colors and the corresponding numbers of doors and Betel exclaiming, **"Now, I see!"**

With one column remaining on the chart indicating one peach door, both girls reached for the orange marker—the closest color to peach in the basket. Without a word, they each grabbed an orange marker and filled in the last box together, whispering and laughing as they colored.

Later Nicole and John reviewed the completed graphs along with video documentation of the groups working together to see how well each child had understood the concept of collecting and transferring data onto a graph and what further instruction might be needed.

Finishing the Doors

John used the children's designs to make six wooden door kits with doors and frames, which were then sanded and painted by small groups of students. Although the process for choosing a color for the kit varied across groups, it was always democratic. Students working in pairs tended toward compromise, with each one picking a color for the door or frame, whereas larger groups held votes or played rock, paper, scissors.

The Legacy of the Door Project

A few years after the project, Nicole asked several students to reflect on their experience. The students seemed to recognize that there was something special about the door project that made it stand out from other school experiences. Betel liked the project because it enabled her to slow down and concentrate her learning on one topic. **"We didn't rush in it. We just took our time . . . usually you have to do all these other things, but this time we just went on to [new] things about doors."**

Whereas many students identified going around the school collecting data as their favorite part of the project, Durjoy's nomination was **"when everybody stopped fighting over this original door."** Nicole concurred, observing that the tenor of the class, which prior to the door project had been characterized by conflict and strife, had become more harmonious and collaborative overall.

The door project's benefits were multifaceted. The project achieved the students' immediate goal of adding more doors to the block area and provided a range of learning opportunities along the way that directly connected to kindergarten curriculum standards. In the arts, students worked on representing their ideas in two and three dimensions, learned to mix colors, and worked with a variety of materials. They developed their verbal and writing abilities while working with each other in small groups and presenting their ideas and data in classroom meetings. The children's desire for precision led them to learn about measuring and dimensions and opened the door (no pun intended) for Nicole to work toward other mathematical standards such as describing and comparing attributes, placing and counting objects in categories, and identifying and describing shapes.

Visible Learners

But the impact was even greater. When these students graduated from kindergarten, they left behind the doors they had made for future kindergarten classes to enjoy—turning self-interested conflicts into a generous gift to others.



My sister is playing with the doors now.—Amelia