

# Why Does the Snow Get Dirty?

## My First Experience with the Project Approach

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### Introduction

“Why does the snow get dirty” is the essential question my kindergartners asked the first time I attempted doing the Project Approach in my classroom. It is certainly an appropriate and logical question to ask, especially by a 5-year-old as he watches pristine white sheets of snow transform into sandy, black mountains, lining the edges of the streets and parking lots of town, in just a few days. But this wasn’t the question I had in MY head as I thought and planned my winter snow unit. And that, I discovered, is just what the Project Approach is—answering the children’s question on a subject and not the teacher’s question, no matter how child centered the teacher may think it is.

The winter of 2002–2003 was a snowy one in Connecticut. We had a snowstorm in November that closed schools the Wednesday before our Thanksgiving break. Although snow at Thanksgiving is not unheard of in the Northeast, the 8 inches that was dumped on us certainly is. When school reopened, my student teacher had started a thematic unit on “Old Favorites”: nursery rhymes, Mother Goose, fairy tales. She was reading and comparing two stories—*Three Little Kittens* and Jan Brett’s version of *The Mitten*. *The Mitten* was certainly an appropriate choice to study as the snow continued to fall throughout most of December. However, rather than continue in the “Old Favorites” theme, I switched gears and went into my winter/snow unit to take advantage of what was going on in the children’s world around them. I worked on building schema with the children. We read stories about winter and snow, we worked on small group reading and doing center activities that revolved around winter and snow, we brainstormed lists of things we do in winter and snow, and we wrote about winter and snow. All the while, white,

powdery snow continued to fall and turn brown in front of our eyes. Black paved parking lots were slowly turning into frozen sand-covered deserts. I knew why and how this was happening, but apparently the 5-year-olds in my class did not, and unbeknownst to me, they were beginning to think about it.

Right before our holiday break, I asked the children what THEY wanted to learn about in class when we returned to school in January. My hope was, of course, that with all the snow on the ground and all the reading we were doing on snow, that snow would come up. We brainstormed a list of possible topics, and along with butterflies and flowers, winter and snow were listed. So we held a discussion and agreed as a class that we would study snow now and butterflies and flowers in the spring.

During vacation, I worked on a teacher web on “snow.” I listed all the possible topics branching off from snow, wrote down the needed materials, decided where the curriculum goals fit in, and determined possible field trips. I decided to focus specifically on this year’s kindergarten literacy goals in the area of reading comprehension: building schema, questioning, and inferring. Although these are reading comprehension goals, I knew they could also be taught through a scientific and investigative approach. I spent the rest of my vacation planning and collecting more books on snow. I had it in my mind that my students would want to learn about snow and how it is made up of six-sided crystals. I looked specifically for those types of books. I also thought the children would want to learn more about snow sports. I contacted a local ski resort to see if I could arrange a field trip. I planned and organized lessons designed to build a common background of shared experiences for all the students in class. Finally, I looked for

experiments that would involve making predictions and inferences. I was ready, I thought!



Figure 1. Making a snowman on the playground.

In January, we returned to school. That first week back, I focused on building a common schema for all the students. Luckily, it snowed again, so we were able to go outside onto the playground. We did all the things they did in the books. We built snowmen, made snow angels, went sliding, threw snowballs—just had a ball. The next day, we brought snow into the classroom and put it in the water table. The children worked in small groups playing in the snow with shovels and small containers. As they worked, their comments were carefully recorded by an adult volunteer. Later, the notes were reviewed to see what the children were actually saying and asking. We used microscopes, connected to laptop computers, to look at the snow as it melted. Again, the children's comments were scripted and reviewed.

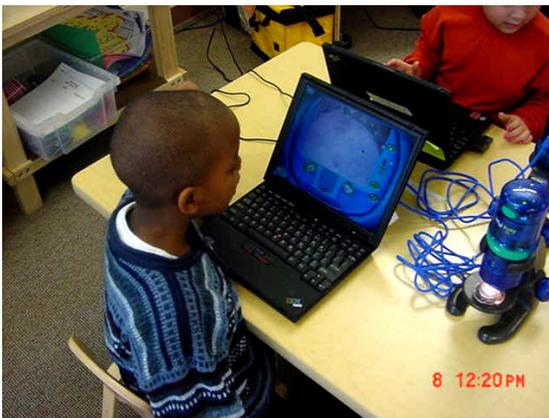


Figure 3. Watching snow melt.

That week, we also worked on two experiments revolving around winter clothing. We kicked off

the experiments by reading *The Jacket I Wear in the Snow*. Both experiments included making and recording predictions, based on new hands-on learning experiences, testing the predictions, and then discussing the results by comparing them to the original predictions.

### Experiment 1

Which kind of cloth would keep you warmer? Four jars were wrapped in four different kinds of cloth. After the children made their predictions, hot water would be poured into the jars. A thermometer in the jar would indicate the water that stayed warmer longer. The children worked in small groups with an adult. Each child felt all four of the cloth samples. The children decided which one of the cloth samples would keep the jar, and themselves for that matter, the warmest. They indicated their choice by placing a unifix cube next to the jar. The adult recorded their comments as they worked. Next, the jars were filled with hot water, and we watched to see which jar stayed warmest the longest by reading the thermometer. It turned out that fleece won. The light bulbs went on for many of the children as they realized that they were wearing fleece pullovers. The experiment helped them to make a connection to real life and realize why much of our winter clothing is made from fleece. We later worked on a project where the children made a hat for a self-portrait of themselves. They chose the material that would keep their heads the warmest. The children all chose fleece.

### Experiment 2

If you stuck your hand in snow, which kind of cloth would keep your hand warmer? Two plastic bags were lined with two different kinds of cloth. One bag was put on each hand of the child. The child placed one hand into the snow, then the other. They waited to see which hand got cold first. Before doing the experiment, though, the children felt the two different kinds of cloth. Using what they knew, they chose the one they thought would be warmer. They marked their response on a chart, completed the experiment, and then discussed if their predictions were correct.

## The Project Develops

At the end of each day, we met as a class to talk about what we were learning. I kept a running list of the children's comments and questions about the snow on chart paper. The questions and comments that kept coming up revolved not around skiing or how many sides a snow crystal has but rather why snow is slippery, how it turns to ice, why school is closed on snow days, why cars get stuck in the snow, why we shovel snow, how we get around when it snows, and why the snow turns so brown and gets so dirty. I realized that I needed to refocus my efforts in response to the interest of the children—in other words, focus on snow removal not snow crystals.

So I made another trip to the library and found *Katy and the Big Snow*. We read the story together and held more class discussions. The children made illustrations of plows. We began webbing all our ideas on snow to see how they related and fit together. The children were discovering that snow can be both fun and dangerous. Slowly, by answering some of our questions and asking others, sharing our experiences and insights from the experiments, we narrowed down our question to the final one: "Why does the snow get dirty?" All of this discussion was driven by the children's interest, not the teacher's.

Armed with this final question, I worked on the last part of the project. Rather than go on a field trip, I brought the field trip to us. I contacted the grounds department of the University of Hartford, because our school is located on their campus. They were more than happy to come over and help to answer our questions and meet with the children. I met with the lead groundsman, Jeff, on two separate occasions. I explained the project to him and shared the children's interest and questions. We agreed that he would come back the next day with a plow truck with a sander on the back.

The following day dawned sunny but cold; the temperature was only about 20 degrees. Before the plow arrived, the children practiced asking four questions about snow removal and then our ultimate question, "Why does the snow get dirty?" We learned that questions are a way to gather information. They often start with the words why, how, what, when, or where. Precisely at 10:45 a.m., Jeff and two of his cohorts arrived. We bundled up,



went outside, and stood around the plow in a sand-covered parking lot surrounded by mountains of dirty snow.

*Figure 3. The children examined a snowplow.*

The children began asking their questions. Jeff got into the truck and showed them how the plow could be moved up and down or side to side to push the snow off the road. He explained that plowing is the first thing they do after a snowstorm. Next, our question was asked: "Why does the snow get dirty?" Rather than ANSWER the question, Jeff SHOWED them why it gets dirty. I could not have been any happier with how he did it.

First, Jeff kicked together a small pile of snow. Then, he scraped up some sand, scattered on the parking lot, with his hand and sprinkled it on top of the pile. We all watched. The white snow, combined with the brown sand, made dirty snow! So that was it—the sand makes the snow dirty! But Jeff did not stop there.



Figure 4. Jeff demonstrated how to melt snow.

When I had met with Jeff the day before, I held told him that the children thought the sand came from the ground, or the cars' tires, and not from the plows. So he went on to demonstrate the equipment on the back of the snowplow, the sander. He explained and showed us how sand is spread through the use of a sander. He told us many places put down sand, like our school, to help make the roads less slippery after it snows. But then he added his own twist. He told us that at the university they do not use sand but rather a salt and alcohol mixture. He demonstrated why. Again, he made a pile of snow, but this time, he sprinkled the salt mixture on top. In a matter of minutes, the snow began melting. The children were amazed. Jeff went on to tell them that the salt melts the snow cleanly without leaving any residue, thus the snow will disappear and not become dirty. The children thought that was a better solution to snow removal rather than having dirty snowbanks all over the place.

We thanked the experts and went back into the classroom armed with the knowledge we had gained from our field experience. We worked on two more experiments, making predictions, testing them, and finally discussing the outcomes. One experiment was deciding which plow shape worked better. Using cardboard strips, the children acted like a plow pushing snow out of the way. They plowed sand out of the way in the sand table. They discovered that a straight plow, like Jeff's plow, worked better than a pointed plow like Katy's in *Katy and the Big Snow*. The straight plow made a larger path in the bottom of the sand table. The second experiment confirmed what we learned

outside with the snow removal experts. We brought in three plates of snow. I sprinkled one with sand, the other with the salt mixture, and the third one I left alone. Using tally marks, the children indicated their choice of which would melt the fastest. The salt mixture won hands down!

Finally, the children made new illustrations of snowplows and sanders. Using their new knowledge of plows and some brochures that Jeff had given us on snowplows, the children drew far more detailed illustrations, focusing specifically on the plows than they had in earlier pictures. Below are samples of the children's work as they drew plows and sanders.



Figure 5. The children made new illustrations of snowplows and sanders.



Figure 6. A drawing of a snowplow.

## Conclusion

As I began wrapping up this, my first project, I reflected on what my students had learned. They could certainly answer our final project question as is indicated by our interactive writing piece. They would say that sand from the plows makes the snow dirty. They can even elaborate and explain that salt is better than sand because it melts the snow and DOESN'T make it dirty. Further, the children can show which plow is more effective at removing snow by placing their hands together at the fingertips, indicating a straight plow. But what of the comprehension goals that I had set out to meet: building schema, questioning, and inferring?

All three comprehension strategies were continuously addressed in real and authentic ways throughout the project. We built schema as we read about and interacted with the snow. And what better way of practicing questioning is there than actually formulating questions for a purpose as we did for the expert visit? Finally, we had to use much of our shared schema to make inferences and predictions in the experiments we undertook. So, yes, I have met those goals. In addition, by following the children's interests, and not strictly my own, the class experienced high levels of student engagement and excitement. I was able to continue to meet the kindergarten curriculum goals, as well as involve parents.

This project was a success for me and my class! It was a meaningful, child-centered approach to teaching where the students were truly active participants. The students were empowered to make decisions about what to learn, were able to learn skills and apply them to real-life situations, and were able to work in an exciting environment. Who would have thought that dirty snow could be such a powerful teaching tool!