Blue Print

Create a map (to scale) of our classroom and arrange the furniture the way you think would most efficiently and creatively utilize the space. Keep in mind traffic patterns, student-seating arrangements (being able to see the chalk board), interference with doors opening and closing, etc. Grade Levels 3 - 5

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Context

Recently we had a social studies fair in our classroom and had to move our furniture out to make room for displays. Students asked if they could put the furniture back the way they wanted to, after the fair. I told them we would have a contest to see who could design a classroom plan that would best meet our needs. The winning plan would be chosen as our classroom set-up. After completing the project, we decided to physically arrange our classroom according to each map so students could see their work and ideas brought to life. This gave students practice in map reading and following a plan. We worked as a group to reach consensus on the best plan and then kept the classroom set-up in this fashion.

What This Task Accomplishes

This task gets students to practice measurement skills in a real-life situation. It provided students with a real-life task, as well as mathematically empowered students and developed spatial sense.

What the Student Will Do

Students first measured the perimeter of our classroom and drew a sketch. Next, the scale was decided. This resulted in a fabulous discussion about reasonableness and workability of scale sizes. One student in my class thought we should divide the task of measuring the perimeter among our class members, so we did. Students then looked at whether the results made sense and made verifications. Students worked with partners, and after drawing the perimeter, students had good experience with understanding the scale and were able to proceed with measuring and creating furniture to scale. We have round tables in our classroom, so students were required to use compasses to ensure appropriate scale sizes. We also have trapezoid tables that were more difficult to measure than rectangular or square tables. Students then arranged the furniture as they saw fit.

Time Required for Task

It took about a week of one hour math classes to complete this project.

Interdisciplinary Links

Students can create scale representations of any object they are studying. For instance, when studying oceans, students used pictures of sea-creatures to create life-size models using a grid and coordinate system. This assisted students in gaining a better understanding of just how big or small these creatures are, as well as their relative sizes. Students can also create scale models of their bedrooms, or create scale models of their dream classrooms. My teaching partner had her class design the classroom set-up for next year adding some special areas that are not presently a part of her classroom. Students are including such additions as another computer cart, a carpet for a reading area and other furniture pieces in their representations. Models can be two or three dimensions depending on what you want to get into. Computer programs can also be purchased to accomplish this task using technology.

Teaching Tips

I encouraged students to use as a scale the size of the graph paper to make the project less complicated. We used 1/2 cm graph paper. I wanted students to experience the metric system since we had previously used standard units of measure, but you can design the scale to meet your unit objectives. As a class we discussed what a 1/2 centimeter should be equal to in order to have a map of an appropriate size. The students chose 10 centimeters or one decimeter. For homework I asked students to look at home for scale models or blue prints they could bring in to share in order to broaden student understanding of the concept of scale. Inviting an interior designer or architect to speak with your students would be great!

Suggested Materials

- Graph paper
- Yard/meter sticks
- Rulers
- Compasses
- Calculators

Possible Solutions

The solutions will vary.

Benchmark Descriptors

Novice

The student misunderstands the term and use of scale, does not justify decisions, makes inaccurate measurements and/or is unable to create an accurate mathematical representation.

Apprentice

The student has basic understanding of scale, but makes some inaccurate measurements and has inaccuracies in creating a mathematical representation. The student is able to create to scale rectangle and square objects, but cannot accurately create circles, trapezoids and other

more complicated shapes. The student makes decisions in placing furniture in a random fashion.

Practitioner

The student has a good understanding of scale and applies it accurately and appropriately. The student creates an accurate mathematical representation and clearly describes strategy.

Expert

The student generalizes knowledge of scale from previous mathematical experiences and elaborates on the process and strategy used. Decisions for furniture placement are justified and well thought-out. The student makes observations and generalizations about their process and solution.

Novice



Novice



Apprentice

My task was to make a map of the class room. The way every body did that was we got into groops and every body in 5 groop helped measured the wall Wich was scotts idea. Then after that we drew the Walls onto a peice of hafe inch graph paper. We did that by Shrinking the size of the class room We did that by equelling a D.s. to a hafe cm. We did the same thing with the ferniter. A D.S. is ten C.M. After we were done We hang them up in the hall. By the way every body got in a group of two and I was With lery



Practitioner

B Lieprint (F) ur (Lassroom) In math we made a map (to scale) of our classroom, and arrange the furniture the way youthink would most efficiently and creatively utilize the space. Our diagrams scale was one /2 cm. Idm. We had to set up the room to show how we wanted it. We also had to make our furniter (to scale) In science we made heal life size ocean creatures In order to do this we use linchgraph paper and had a scale of bour inchdsg. H.

Understanding/Communication: The student uses appropriate math language and demonstrates understanding of scale.

When we were chosing a scale wedecided on % cm(graph papersize)=loke i meater or ten ante meters to make a fair size map. On the chalk board Mrs. Hasson made a ruff ske tohof the primeter and labled the walls A, BC, DE, Fand GThen I came up with the idea to divide the jobs of measuring the walls. Next we made a table of measure ment Then verified the measure ment to . When start ed by making the prime ter (toscale). I measure d the furniter. Then drew them on paper, cutout the furniter and mesured to drew doors,

Practitioner

shelfs and meater. Then F arranged the Furniture. I arranged it how I did was because of how the teacher wanted her desk and how I Felt. Then put in color;

I noticed that the slight est won or mesurement could ruan the whole thing you could do this the remadle a house or any building or space or even flowers,

Froticed that 2 trapizoed tables = I roundetable, the teachers deskis = to 4 regularedesks.

The student makes a mathematically relevant comment.

Practitioner



Expert

Blue print of the Classroom write-up

Understanding: Student shows understanding of scale and procedure.

My task was to sketch a scale diagram (an exact replica) of Mrs. Hossons 4.5 Classroom, useing all the same measurements, except using my scale of 1/2 cm = ldm. to make if smaller on 12 cm graph paper. Though one of the hard parts about drawing the claseroom, was the way it was set-up. All of it's twists and curves had to be measured (in an) and made sure to be drawn as Communication: Student uses good math language part of the map. such as perimeter, and Another thing we did after 1/2 cm = 1 dm.we were done drawing the perimeter OF the classroom, was we measured the perimeter of everything in the classroom. moveable, and useing our scale, drew it on 12 cm. graph paper, cut it out, and got to place it wherever we wished, as new design for the Classroom. (whoever makes the best Classroom design gets to have the class put the from the way they made if) *

Expert

Doing this problem was a bit easy since the class has had experience with something similar to this. That was when we made life size sea creatures, except with that we made them bigger from smaller. (the total opposite.) The sketch of the classroom using all measurements looking down on it From above looks abt like this: Effort GEFF Scott thought of A the brilliant idea, that, we each could have been asigned to a certain wall, and then start our sketch and write up sconer, instead of each indevidule measuring all the walls with a partner. The easiest measuring in this Project, was the regtangles, and squares. anything you could line up with the (lines on the graph paper. The challenging part of measuring was the trapazoids circles (basicly anything you couldn't line up with the lines on the graph paper.)

Expert

Something I noticed while doing this was that if there was enough room, you would be able to put together The two trapazoid tables to make a larger one. Understanding: Student demonstrates spatial sense. IFI could do this project again, I would put more effort into making my drawing of the classroom. I'd also be a little more careful when I measure, and try not to mess. up.

I really thought that this project was like no other.

Expert

