Are We Teaching the Right Math in the Right Way?

Geometry Email PD Session 1a – Teacher Responses

Unpacking the Standards

Out of the list of math topics below, which three do you typically find to be the most challenging for your students?

(4 responses)

Explain why you believe students struggle with the first of the three boxes you checked.

(4 responses)

Proofs are always something of a struggle.
Students have not been required to explain their reasoning in other math courses.
They are good at saying if somethings is are is not a parallelogram but when they have to design one themselves they struggle with following all the constraints
Students have never fully grasped the concept of coordinate plane. Which direction to go first, then second, etc.

Explain why you believe students struggle with the second of the three boxes you checked.

(4 responses)

Coordinate Geometry proofs seem very arcane to students much of the time.
Students have rarely been required to design anything or do mathematical modeling.
They have a tendency to go with their first answer instead of testing out different ideas
Designing objects to satisfy different criteria requires higher level thinking which is generally not stressed with the lower level student that I teach. They are mainly drilled on knowledge and application.

Explain why you believe students struggle with the third of the three boxes you checked.

(4 responses)

Any creative independent thinking is a source of frustration.
Students have difficulty because they have not been required to carry out measuring or scale conversion.
They are willing to solve a straight forward problem but most are unwilling to try if it requires more than one step to solve the problem
see above

In reference to one or more of the three topics you checked, describe an ineffective teaching strategy often used in classrooms.

(4 responses)

Repeated two-column proofs.
Students are required to prove that opposite sides of parallelograms are parallel based on their slopes, but are NOR required to sketch the graph of the lines on a Cartesian grid.
Teacher shows the student how to do a problem or two and then assign students to do problems on their own.
Simple knowledge and recall. Not using lessons that involve multiple concepts.

Now, describe an effective teaching strategy to address the same topic(s) as the prevous question.

(4 responses)

I have a card sort activity for quadrilaterals that is very challenging, but provokes lots of interesting conversations.

Students should begin with a sketch of the sides of a parallelogram, then confirm that the slopes of opposite sides are the same.

The teacher needs to show students not how to solve specific problems but strategies for solving different types of problems

Create a lesson that requires mastery of a previous topic to be successful with the current one

Louisiana Standard G.MG.1: Use geometric shapes, their measures, and their properties to describe objects.

Give one example of a math problem that would measure a student's conceptual understanding of G.MG.1.

(4 responses)

Given a pictures of a real-world object, asking which area formula could best be used to approximate the amount of paint needed to cover a face.

A student could be required to build, from construction paper, a rectangular prism, a square pyramid and a cone. Then they could find common objects that are similar to these (tissue box, water fountain cup, ice cream cone).

Calculate the amount of area left uncovered by a circular rug in a square room?

Which three dimensional figure best represents the trunk of a tree?

Louisiana Standard G.CO.11: Prove and apply theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.

Give one example of a math problem that would measure a student's conceptual understanding of G.CO.11.

(4 responses)

- Given a quadrilateral, classify it as precisely as possible.
- Students would be required to cut parallelograms diagonally to form congruent triangles, then reflect one triangle onto the other to match up sides & angles to illustrate congruent sides and angles by CPCTC.
- Given the coordinates P(-5,4) Q(-2,7) R(-1, 0) S(-5, -3). Determine if polygon PQRS is a parallelogram or not.
- If a stained glass window has two sides measuring 11 inches and two sides measuring 15 inches, is it a parallogram?

Give one example of a math problem that would measure a student's procedural skill and fluency related to G.CO.11.

(4 responses)

- Given a quadrilateral and a classification, determine a side length or angle measure given some information.
- As described in the previous example, students would use use reflection and rotation to divide parallelograms into two pairs of matching congruent triangles to illustrate that diagonals bisect each other. Similarly, rectangles could be cut into congruent right triangles to prove they have congruent diagonals as the hypotenuses of the right triangles.
- If ABCD is a parallelogram. The measurement of angle C is 53 degrees find the measure of the other three angles?
- If an angle of a parallogram is 108 degrees, what is the measure of its opposite angle?

Louisiana Standard G.GPE.4 Use coordinates to prove simple geometric theorems algebraically.

Give one example of a math problem that would measure a student's procedural skill and fluency related to 6.RP.3c

(4 responses)

- Given the coordinates of the verticies of two triangles, prove those triangles are similar.
- Students could use coordinates and the distance formula to prove that opposite sides of parallelograms, rectangles, rhombi and squares are congruent.
- The ratio of the measure of the sides of a triangle is 4:7:5. If the perimeter of the triangle is 128 yards, find the length of the longest side.
- Use the coordinates given in a plane to determine the hypotenuse of a right triangle.

Louisiana Standard G.MG.3 Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).

Give one example of a math problem that would measure a student's ability to apply standard G.MG.3 in a real-world situation.

(4 responses)

- A farmer requires a pen of a certain area for livestock. Determine the dimensions so that he can spend the least amount on fencing.
- Students could design a garden bordered by a brick perimeter to minimize materials for the border. It could also maximize area for planting.
-) You have some books. You need to ship the books to your friend. The books are 8 inches height, 5 inches width, and 2 inches depth. How many of these books could you pack into your closet which is 20 inches long, 25 inches wide and 30 inches high?
- If a farmer wants a fenced area of 300 square feet and fencing is $10 a foot, what are the least dimensions he can use to spend the least amount of money?

Additional Feedback

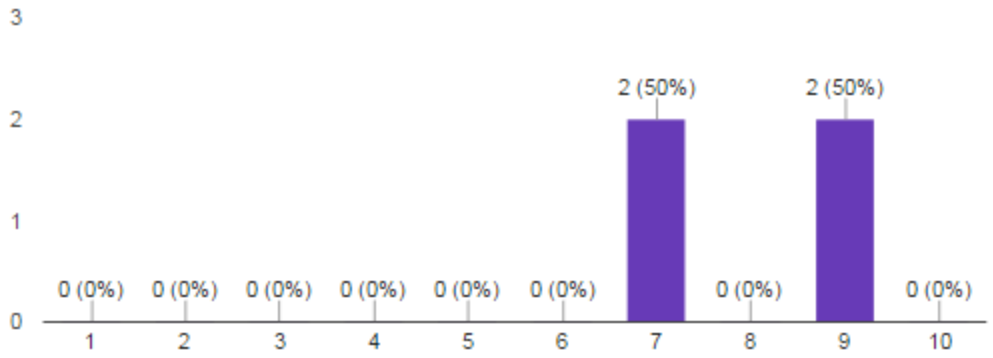
Please provide any other comments you have related to the standards addressed in this Google Form.

(2 responses)

A weakness of this platform for Geometry is the inability to attach pictures. If you want full written specific problems, it is very difficult to do that without being able to attach a diagram.

More work needs to be done in using measurement and the use of measurement tools prior to students arrival in high school classes.

On the scale below, rate this professional development process? (4 responses)



Thank you for completing this task! You may use the space below to comment on your scale response in the prior question...

(1 response)

A couple of questions appeared to be a bit redundant.