MGSE3.MD.8 Video Transcript

00:01
[Opening Music]

00:11
This presentation will review the Georgia Standards of Excellence 3.MD.8 which focuses on recognizing perimeter as an attribute of plane figures and distinguishing between linear and area measures.

00:23
3.MD.8 states that students will solve real world mathematical problems involving perimeters of polygons, including…

00:30
finding the perimeter given the side lengths,

00:33
finding an unknown side length,

00:35
and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

00:42
1st and 2nd grade students begin recognizing and drawing polygons while also measuring length.

00:48
3rd grade students find the area of rectangles and understand perimeter as the distance around a polygon.

00:55
4th graders then apply the perimeter formula for rectangles and find the area of composite shapes.

01:02
As students explore and build shapes, they soon discover that even if the perimeter stays the same, the area of the shape may change.

01:10
These rectangles have a perimeter of 18, but they have different areas.

01:16
When counting the units in the perimeter, students need to make sure that they count the edges of each unit and not just the units themselves.

01:26
In the upcoming videos, you will see how students designed pens with a perimeter of 24 feet for their dogs.

01:33
The students used a model of their choice and shared their results with classmates.

01:39 (Video)
Student: Hi! I will be showing you the perimeter I made with 24 pretzel sticks… There's 5 on this side… and 5 on that side. Then, there's 7 on this side and 7 on that side.

01:54 (Video)
Student: There is many ways you can build a pen with a perimeter of 24, but today I've only done two. So, then, to find the perimeter, we have to do…length… the length plus the length… which gives us 16. Then we have to do the width plus the width, which is just 8. So, 16 plus 8 is… 24.

02:26 (Video)
Student: If we do this one… see, the length is ten and the width is two, so we do 10 x 2. And 10 x 2 = 20. That finds the area.

02:41
Student: But to find the perimeter, we have to do ten… the length plus the length… Which is 10 + 10, which gives us 20. And then we have to do the width plus the width, which is 2 + 2, which gives us 4. So, our perimeter is 24.

03:02
Students also explored how even if shapes have the same area, their perimeters can be different.

03:09
Both shapes have an area of 6 units, but the first shape has a perimeter of 14, and the second shape has a perimeter of 12.

03:19
An engaging way to explore this concept is by showing these images.

03:25
Ask, “Which shape do you think has a greater area?” Allow students to discuss and debate.

03:31
Then give every student a 3 x 5 index card and ask them to cut it in half diagonally.

03:38
Have the students create as many designs as they can by connecting sides that have the same length.

03:44
There are 6 possible designs. The area remains the same even though the shape and perimeter changed.

03:51
To explore this concept further, students used Nearpod to design different chicken coops with an area of 24.

03:59
While the area stayed the same, the perimeters changed based on the arrangement of the tiles.

04:05
Nearpod that was used for the chicken coop task is a digital platform that allows educators to design and create lessons that can be directed live in a classroom setting or assigned as self- paced activities.

04:18
A variety of activities can be incorporated such as videos, quizzes, games, and whiteboards.

04:24
Submission reports can then be downloaded to analyze student work.

04:29
Another engaging way to integrate technology and student discourse is by using Flipgrid.

04:36
Students were posed with a problem that stated, “Would you rather have Cheez-Its that cover a rectangle with a length of 9 and a perimeter of 22 or a length of 5 and a perimeter of 20.

04:47
They discovered that the larger perimeter didn't always yield the biggest quantity.

04:52
With Flipgrid, students can create video responses that their classmates can view.

04:58 (Video)
Student: I'm doing the "Would You Rather Cheeze-it Challenge." I would rather have it with a perimeter of 20 and a length of 5.

05:08
Student: I drew a square. And each side has 5… as a length… and width…because 5 + 5 + 5 + 5 = 20.

05:17
Student: I also made a diagram for the other choice, which would have been a length of nine and a perimeter of 22.

05:24
Student: I added…I did nine plus nine… I did 9 and 9 for the… for the lengths and two plus two for the widths because 9 + 9, or 18, plus 2 + 2, or 4, is 22.

05:39
Student: For the "Cheeze-it Challenge," I chose P = 20 'cause I get 25 pieces instead of 18. Thank you for watching!

05:53
The next challenge included a discussion on whether you would rather have a rectangular bedroom with a length of 20 ft and a perimeter of 58 ft or a length of 14 ft and a perimeter of 56 ft.

06:07
Even teachers joined in on the conversation.

06:10 (Video)
Student: I would… I would choose… umm… "B" because it's bigger. The first shape, "A" has an area of 180 feet. It's a rectangle. And how I got that is I multiplied 20 x 9 = 180 feet.

06:31
Student: And then… I got… And then, I did… for shape "B," I did 14 x 14 because it's a square, and I got 196 feet… And that's how I got my answer for shape "B." So, shape "B" is bigger.

06:54
Teacher: Hey guys! I decided to do the two different bedroom sizes problem… Uh… So, I drew out the bedroom that was 14 feet long and had a perimeter of 56 feet. And I found out that it was a square bedroom. And it was 14 feet on each wall.

07:14
Teacher: So, then I drew out the other one, because I wasn't sure I wanted a square bedroom. That one had the walls that were 20 feet long. After I did the math, I figured out that it would only be 9 feet wide.

07:27
Teacher: And I actually decided to go with the 20 foot long and 9 foot wide bedroom because, then my boys could play basketball! We could put a basketball hoop at each end! And they can play basketball in there. I think that'd be fun!

07:47
As shown in the videos, it is important for students to discover the relationship between fixed perimeter and different areas.

07:53
Encourage students to explore this concept by building two rectangles with a perimeter of 30 with one rectangle having the largest area possible and the other having the smallest area possible.

08:05
Students discover that the more elongated the rectangle is, the smaller the area.

08:11
As the rectangle becomes closer to a square, the overall area increases.

08:16
In the previous tasks, students were able to find the unknown side lengths of a rectangle when given the perimeter and the length of one side.

08:24
If the perimeter is 56 and two sides are 8, I can simply subtract16 from 56.

08:33
The remaining sides have a total length of 40, so 40 divided by 2 = 20.

08:40
Students can also find the unknown side lengths of other shapes. The missing side would have a length of 2 because 2 + 2 equals the total length of 4.

08:51 (Video)
Student: The… uh… The way to figure out the number over here is to just do 5 take away 3, which is 2.
Teacher: Wow! Great! Now that we have all of the sides figured out, can we figure out the perimeter? How do we do that?
Student: We add up all of the numbers on the sides… like 5 + 5… 10. And 10 + 2 is 12. And 12 + 3 is 15. 15 + 3 is 18. 18 + 8…26.
Teacher: So, the perimeter of this shape is 26? Can we write 26 in the middle of the shape?
Teacher: Great job.

09:32
In this example, we have a regular octagon. Each side of the stop sign has a length of 6 inches.

09:38
What is the perimeter of the sign? If all of the sides are the same length, then 6 x 8 equals 48 inches.

09:49
In this example, we are given the perimeter without the length of any of the sides.

09:54
Since a square has all sides of equal length, we can simply divide 40 by 4. The sides have a length of 10.

10:03
For additional real-world application, the book *"Spaghetti and Meatballs for All"* by Marilyn Burns encourages readers to find the optimal design to seat 32 people at a banquet style dinner.

10:14
As guests arrive, they all have their own ideas about how to rearrange the tables. The party becomes a cheerful confusion of rearranged tables and chairs.

10:25
Students then work to develop a design that seats as many people together as possible while saving space and using the fewest number of tables.

10:35
The real-life context helps students link area and perimeter.

10:39
For additional tasks and resources, please visit unit 4 in the Georgia Frameworks.

10:45
[Closing Music]