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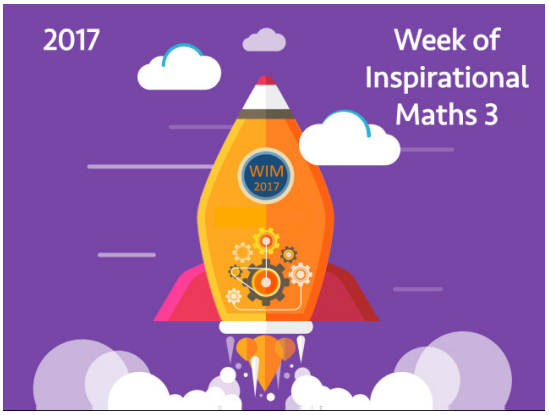

Framing Rectangles
Grade K

Introduction
In this activity students get creative with making rectangles out of square tiles. This activity makes space for our young mathematicians to count, describe shapes, explore ideas, build with square tiles, investigate conjectures, organize findings, add and takeaway square tiles, and record ideas with visuals.

Video
https://youcubed.org/weeks/week-3-grade-K/

Agenda for the activity

Activity	Time	Description	Materials
Mindset Message	5 min	Play the mindset video, ***Brains Grow and Change,*** https://youcubed.org/weeks/week-3-grade-K/	• Mindset Video day 3, ***Brains Grow and Change***
Square tiles playtime	10-15 min	1. Play time with the manipulative 2. Put up an image of a rectangle and ask if anyone built this shape. Tell them this is the shape we will study today. 3. Have students walk about the room to see if anyone built a rectangle, emphasizing how we observe and learn.	Square paper tiles, Framing Rectangles Handouts attached, or a square tile manipulative
Framing Rectangles	45 min	1. Create as many rectangles as you can with up to 6 square tiles in each rectangle. 2. What if you put a different color border of tiles around each rectangle? How many tiles are in your border for each of your different rectangles?	• Square paper tiles, Framing Rectangles Handout attached, or a square tile manipulative • Poster paper (optional) • Glue (optional)

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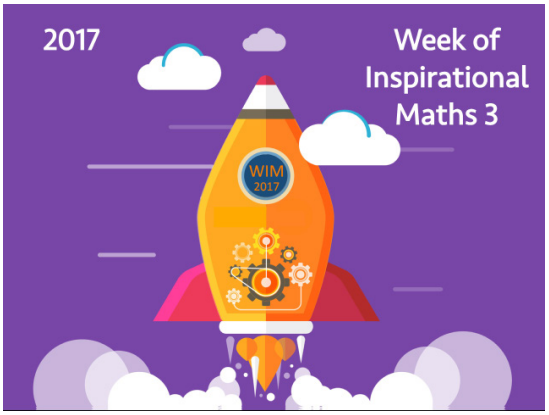

Debrief Mindset Message	5 min	Remind students of the video messages they heard – that there is no such thing as a math brain or a math person! Anyone can learn any level of math with hard work and effort!	

Activity

Set students up to work with a partner, give the square tiles out giving students time to play with them before you start the activity. After some time to build, invite a couple of volunteers to share what they have created. Ask if any students made a rectangle, invite volunteers to share the rectangle they made. If you have a document camera you might consider building the rectangles as students describe them or have students build their own rectangles. Use this as a chance to clarify what a rectangle is. You many want to discuss that squares are rectangles too.

When preparing materials for this activity provide lots of square tiles or paper square tiles so that students can leave all their rectangles built or have enough to glue onto poster paper. You might need as many as 100 paper square tiles per pair, 50 of each color.

Ask each student to count out 6 of the same color square tiles and move the other square tiles to the side. Set up students to explore making rectangles using up to 6 square tiles. Share with students that their first challenge with rectangles for the day is to create as many rectangles as you can with up to 6 square tiles. If you are using paper square tiles you might have students glue their rectangles together on paper as a way to capture all the rectangles they come up with. Another idea could be to take pictures of the different rectangles they make so that you can project them after the class is done exploring.

As students explore, encourage them to be creative about the rectangles they make. If you notice they are making rectangles with dimensions 1x2, 1x3, 1x4, and so on, you might consider having them share the rectangles they made with each other. If pairs have the same rectangles at a table you could tell pairs about rectangles you've seen at other tables. By giving an example of other rectangle possibilities while they explore students can think more openly about the rectangles they are making moving forward.

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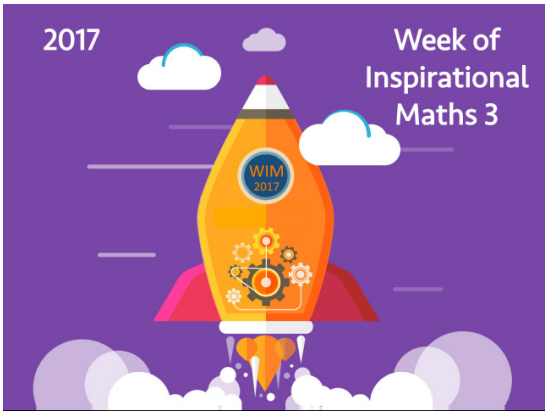

After the first challenge you might bring together the class and have pairs share some of the rectangles they created. You could start by asking the class how many rectangles they created and record the different numbers students give (show excitement when this happens!), and then invite students to share the different rectangles they created. You might have them build the rectangles under a document camera or describe the number of square tiles on the length and width and draw the different rectangles and label the dimensions. Highlight for the class how many different ways they created rectangles with up to 6 square tiles.

For the second challenge have students take out some different colored tiles and tell them about the challenge: What if you put a different color border of tiles around each rectangle? How many tiles are in your border for each of your different rectangles? Have students capture the borders they make by gluing square tile borders around the rectangles from the first challenge.

Bring the class together for a closing conversation. Make a table and have students share their findings. You might prepare this table while pairs are exploring. Once you've recorded their findings, invite students to share findings that might be different, patterns in the number of square tiles, and questions. If pairs still have their rectangles built they will be better prepared to help complete and analyze the class' findings.

Remind students of the video messages they heard – that there is no such thing as a math brain or a math person! Anyone can learn any level of math with hard work and effort!

Extensions

- What does the border of a rectangle with dimensions 4 square tiles by 3 square tiles look like?
- If you have a border with 10 square tiles, what could be the dimensions of the rectangle? Is there only one rectangle with a border of 10 square tiles?
- Is there a rectangle with a border that uses the same number of square tiles? What does it look like? Can you find any others?

Materials

- Square paper tiles (Framing Rectangles Handouts) or Square tile manipulatives
- Poster paper (optional)
- Glue (optional)

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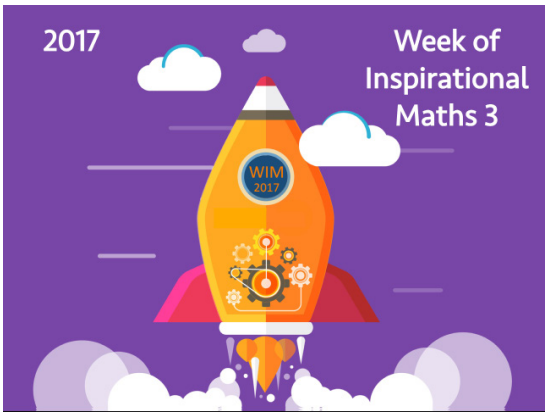
Framing Rectangles
Handout



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Framing Rectangles
Handout