



Serious Squares Day 5

Introduction

This activity invites students to explore a geometric pattern. This task allows students to visualize, identify, and generalize a pattern. As students explore the visual pattern they have opportunities to make decisions about how to represent how the pattern is changing.

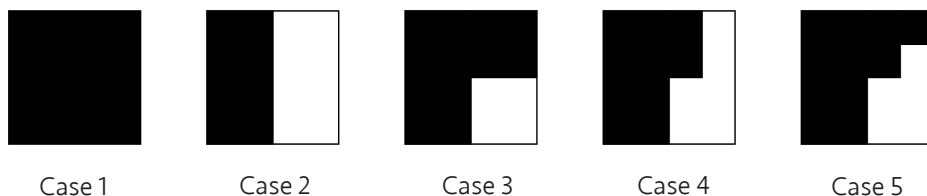
Agenda

Activity	Time	Description/Prompt	Materials
Mindset Message	10 min	Play the mindset video, <i>Brains Grow and Change</i> , https://youcubed.org/weeks/week-4-community-college/	Mindset Video day 5, <i>Brains Grow and Change</i>
Explore	20+ min	<ul style="list-style-type: none"> Introduce students to the visual pattern Serious Squares. Have groups work together as they explore this pattern. Using color, arrows, and diagrams to show off any patterns they are noticing. 	<ul style="list-style-type: none"> Serious Squares handout Colored pencils or pens Maths journals Graph paper Pencils
Discuss	10+ min	<ul style="list-style-type: none"> Invite students to share their findings and patterns at the front of the room. What did they notice about how the pattern is changing? What did they notice about the area of the shaded region? Invite students to share the new patterns they created and what they noticed about the area of the shaded region. 	
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

Display the pattern. Give students some time to think about the pattern on their own. Invite them to share what they notice about how the squares are changing with their group. While they are



discussing ideas distribute the Serious Squares activity handout. Invite students to continue to work with each other to consider how the pattern is growing and the other questions on the handout.

While groups explore the pattern encourage them to use multiple representations to make sense of how the pattern is growing and how to represent the pattern at different stages.

Stop the activity after students have worked for at least 10 minutes. Invite students to walk around and look at different students' work. Then have students return to their group and encourage them to share the ideas they saw when walking around. If they found the ideas useful have them integrate those ideas with their own findings as they continue to work.

Invite students to share with the class their findings and patterns at the front of the room. What did they notice about how the pattern is changing? What did they notice about the area of the shaded region?

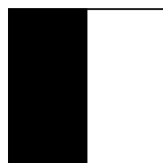
Extensions

- Make a similar pattern with a different shape: Circle, triangle, other. Explore what happens to the area.

Serious Squares



Case 1



Case 2



Case 3



Case 4



Case 5

How do you see the pattern changing?

What does the square in case 8 look like? What is the area of the shaded region? What patterns do you notice?

Use multiple representations to show how the pattern is growing: the visual, a table, a graph, and an algebraic expression equation. Show the connections between the representations using color-coding, arrows, and words.

Will the pattern ever end? Are there any cases for which the pattern does not work?