



How Close to 25? Grades K-2

Introduction

This activity is a valuable opportunity for students to count, visualize number quantity, think about estimation, and to make visual justifications related to the approximate number system. This activity is focused on developing students' counting, sense of quantity, and comparing two quantities visually. It is good for embodied cognition which means experiencing mathematics through the senses and the body and developing the Approximate Number System or ANS- an important area of the brain.

Agenda

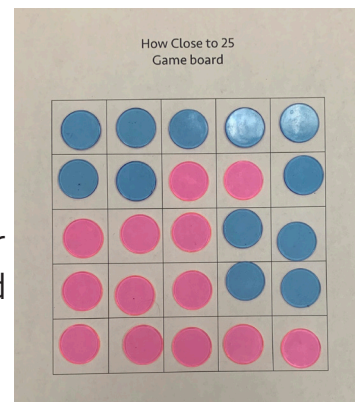
Activity	Time	Description/Prompt	Materials
Mindset Message	5 min	Play the mindset video	Mindset video
Introduce How Close to 25?	10 min	<ul style="list-style-type: none"> Introduce students to the game How Close to 25? When the game board is covered ask the students which player covered more squares. Ask students to discuss with a partner how they could prove visually which player covered more squares, beyond counting or in addition to counting. Have students share how they would make a visual proof by rearranging the counters to show which player covered more squares. 	<ul style="list-style-type: none"> How Close to 25 Gameboard Two colors of counters, 20 of each color One 6-sided die
Play How Close to 25?	15 min	Invite pairs of students to play How Close to 25? and create visual proofs showing who covered more squares.	<ul style="list-style-type: none"> How Close to 25 Gameboard Two colors of counters One die per pair
Share	10 min	Invite students to share different ways of visually comparing which person had more counters.	Whiteboard or Document Camera
Debrief Mindset Messages	5 min	Debrief the mindset messages for this activity.	



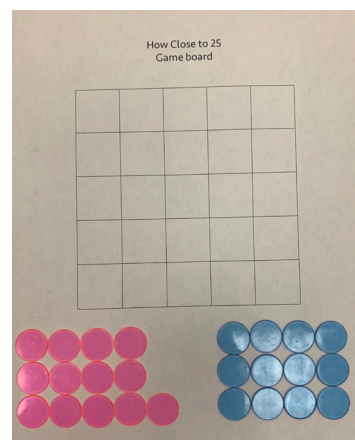
Activity

Watch the mindset video before class. See if there are any clips and/or messages from the video you want to share with your class. At the beginning of class share the mindset messages with your students.

Model the game by playing it with a student. The first player rolls the die and covers the gameboard with that many counters. The next player does the same. Students can cover the gameboard with their counters in whatever way they choose. The pair continues until the game board is covered. At the end of the game, if you roll higher than the number of spaces, you can cover the remaining spaces and the game is over. When the game board is covered, ask students to discuss with a partner which player covered more squares. Ask students to share which player has more counters and how they might organize the counters to prove it visually.



Some students may count and share the number of each color of counters. Acknowledge that this is a method that can be used but today they are going to focus on making a visual proof without counting. We have created this activity with the intent that students do not count to determine the quantity of each color. We are asking that students take the counters and move them into some sort of visual representation that will allow them to compare and determine which color has more. Have students share a few different ways to visually prove which is larger. Encourage students that there are many different ways to visually prove which color has more.



Once students have shared a few ideas ask them to play the game in pairs and create their own visual proofs of which player covered more squares. Give each pair of students one game board and two colors of counters to cover the game board.



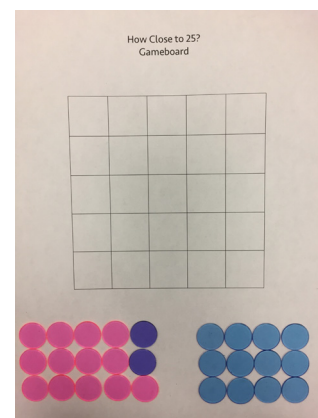
While students are comparing the number of counters look and listen to how they move the counters around to compare them visually. Encourage them to show each other how they know that one player has more counters. Invite students to do this in different ways. Developing the Approximate Number System is about looking at a set of pictures and identifying which of the pictures contain more objects, not by counting one by one. This activity is intended to help students to develop this, in addition to developing their counting and visualization of numbers while playing the game.

After students have had the chance to play the game a few times, bring the class together and discuss an arrangement of counters. You might draw an arrangement of counters on the whiteboard so that it is ready to discuss or project a picture of one from one of the gameboards. Ask students which color of counters is larger than the other. Use arrows, color, and circles to show how students compared the counters visually. Invite other students to share their way of comparing the counters. Draw a new diagram or take a photo to record each new idea shared.

As a class, discuss and celebrate all the different ways of comparing that they came up with. Let them know that having ways to visually compare quantities will help them build their reasoning and doing mathematics is all about reasoning and sense making.

Extensions

- After students have made their visual proof ask them to make the lesser side equal by adding some counters of a different color.



How Close to 25? Game Instructions



Materials: game board, two different colors or counters

Students working with a partner

- Each partner rolls one die to determine who goes first. The partner with the higher roll goes first.
- Partner 1: Roll one die; color/cover in the number of squares
- Partner 2: Roll one die; color/cover in the number of squares
- Continue until the board is covered.
- Discuss and decide who colored in more squares. Work together to design visual proofs of how to decide.



How Close to 25? Gameboard
