Grade 4

Number Talks

Purposes:

- To give students opportunities to think and reason with numbers.
- Students will develop place value, number, and operation concepts.
- Students will develop computational fluency.

Description:

The teacher will give the class an equation to solve mentally. Students may use pencil and paper to keep track of the steps as they do the mental calculations. Students' strategies are shared and discussed to help all students think more flexibly as they work with numbers and operations.

Materials:

- Chalkboard/white board/overhead projector
- Individual white boards or pencil and paper

Directions:

1. Write an expression horizontally on the board. (For example: 16 x 25)
2. Ask students to estimate their answer before attempting to solve the problem. Post their estimates on the board. This will allow you to see how the students are developing their number sense and operational sense.
3. Ask students to mentally find the solution using a strategy that makes sense to them.
4. Ask students to explain to a partner how they solved the problem.
5. While students are discussing their strategies, walk among the groups listening to their explanations. Find those strategies you want to call attention to throughout the whole class. For example, if a student thinks about the problem as 4 x 25 four times because he/she broke up the 16 into 4 x 4, this is a strategy you might want other students to think about and possibly experiment with.
6. Call on a student to fully explain the steps he/she followed to solve the problem
7. Record the steps precisely as the student explains them to you. Ask clarifying questions as needed to be sure you understand the flow of their thinking process. Be sure to be explicit about the mathematics. (For example: "You said you broke up the 16 into 4 x 4. Why did you do that?" "Does this strategy always work? How do you know?" or "What did you know about the number 16 that allowed you to do that?")
8. As time allows, ask other students to share different methods they used for solving the equation and ask questions about why their strategies work.
9. Record these other methods on the board as well.

10. It is very important to facilitate a discussion about how the different representations/strategies relate to each other and result in the same answer. (See attached example.)

Example: 16 x 25

Teacher/student publicly recording	Student's explanation
16 = 4 x 4 4 x 25 = 100 4 x 100 = 400	I know that 16 is the same as 4 times 4. Four times 25 is 100. But, that's only 4 times 25. So, 16 times 25 is 4 times as much. Four times 100 is 400.

Possible teacher response

"You said you broke apart the 16 into two factors and then multiplied one factor at a time. How does breaking up one of the numbers into factors help you do the problem?"

Teacher/student publicly recording	Student's explanation
10 + 6 = 16 10 x 25 = 250 6 x 25 = 150 250 + 150 = 400	Well, I thought about it as 10 plus 6 is 16. Ten times 25 is 250 and 6 times 25 is 150. If you put the two together, you get 400.

Possible teacher response

"So, you broke apart the 16 into tens and ones instead. How did this help you think about the problem? What do you know about multiplying by two-digit numbers that helped you choose this strategy? Why do both of these strategies work to find the same answer?"

Scaffolds

- When beginning number talks, make sure that the problems and quantities are accessible and within each child's zone of proximal development. For example you may give three problems with different size numbers and ask the students to choose one to do mentally. (e.g., 6 x 25, 16 x 25 and 116 x 25)
- Allow the students to document on paper their intermediate steps **as** they are solving the problem.
- As the students' fluency and flexibility improve, increase the rigor of the problems by using larger numbers and recently taught operations.

The role of the teacher during a number talk is to facilitate and guide the conversation. The teacher purposefully chooses children to share strategies that will move the class toward computational fluency. The teacher asks questions that draw attention to the relationships among strategies. It is important to focus on the mathematics, not just the variety of strategies.

Examples

Multiplication

16 x 25	32 x 50	13 x 12
102 x 9	12 x 25	19 x 99

Division

275 ÷ 25	829 ÷ 9	205 ÷ 5
100 ÷ 15	143 ÷ 13	279 ÷ 9
54 ÷ 12	151 ÷ 11	16,000 ÷ 2,000

Inequalities

Greater than, Less than or Equal to: 89 + 15 □ 85 + 19
Greater than, Less than or Equal to: 89 x 15 □ 85 x 19
Greater than, Less than or Equal to: 16 x 38 □ 18 x 36
Greater than, Less than or Equal to: 32 x 18 □ 38 x 12

Expressions for those students who need more support

56 – 38	62 – 33	100 – 49
750 + 250	372 + 98	59 + 36
864 – 500	370 + 99	855 – 56
104 – 39	87 + 49	58 –39
91 – 53	37 + 86	499 + 76
17 x 8	25 x 6	450 ÷ 45
20 x 4 x 2	15 x 30	16 x 5