Number talks

Factsheet

What are number talks?

Number talks are short, 5–15-minute teaching and learning practices that involve students mentally solving computational problems and talking about the strategies they have used. Number talks are powerful tools for developing computational fluency and conceptual understanding at the same time. They focus on sense making as students use number relationships and structures of numbers to mentally add, subtract, multiply and divide. Teachers then facilitate class discussion in which students explain their reasoning and reflect on the reasoning of others. During this time, teachers visually represent student thinking to reflect the relationships and structures a student has used and make their thinking clear to all students. Students with different approaches to a problem are invited to present their thinking to highlight that there are multiple ways to arrive at a solution, promoting flexibility and confidence in working with numbers.

Why it matters

Many students mistakenly believe that speed and following set procedures are essential to computation. Number talks shift that thinking by valuing multiple methods for arriving at a solution and focusing on understanding number relationships and structures that aid in computation. The aim of engaging students in number talks is to develop mental strategies and computational fluency based on understanding, and to build students' capacity to become flexible and efficient mathematical thinkers and confident communicators.

Conducting a number talk

Introducing number talks

Prior to introducing number talks for the first time, establish class norms for these sessions, including:

- different strategies can be used to find the answer to a computation problem — in a number talk, the focus is on explaining the strategy used to solve a problem
- students show they are ready to share their answer and the strategy they used by placing their hand at chest level and giving a 'thumbs up'
- if students are waiting, they should use the time to think of other ways to solve the problem and place an additional finger up for each additional strategy.

With younger students, and when first introducing number talks, a 'dot talk' (see Example 1 on page 3) can be used as a stimulus. The question 'How many dots are there?' is asked. Students find the total number of dots and describe how they found it. Teachers take students through the same general sequence used for a number talk.

Sequencing a number talk

1. Present a computation problem

Write a computation problem horizontally on the board or screen and invite students to solve it mentally.

2. Students mentally solve the problem

Give thinking time and ask students to signal when they are ready to explain the strategy they used.

3. Students share answers

Ask students to share only their answer at this point. On a whiteboard or screen that everyone can see, record all answers provided (both correct and incorrect) without comment.

4. Students share the reasoning behind their solution and the teacher visually represents the student reasoning

Invite a student who has the correct answer to explain the reasoning behind their answer. (Students with incorrect answers will often realise their error as they listen to the reasoning provided.) Record the student's name and, as they explain their reasoning, draw a visual to represent what they are saying, making their thinking visible to all students (see Example 2 on page 4). You may need to ask clarifying questions, such as 'What were you thinking when you …?' or 'Why did you …?' Regularly check in with the student to make sure what you have drawn accurately reflects their thinking. You may need to rephrase their explanations to model mathematically correct language.

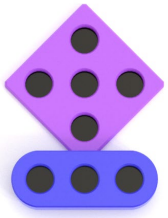
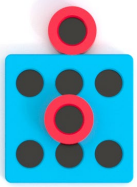
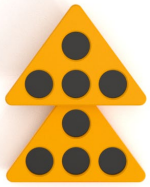
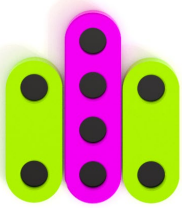
Use the visual to review the strategy used, perhaps inviting others to explain the strategy in their own words. Establish who else used the same strategy.

Invite a student who used a different strategy to find the answer to share their reasoning. Record their strategy in the same way. Repeat the process several times. There generally won't be enough time to review all strategies used, so simply acknowledge this and commit to hearing from a different group of students in the next number talk.

Leave all representations of strategies on the board. Use questioning to assist students in making connections between the various strategies used.

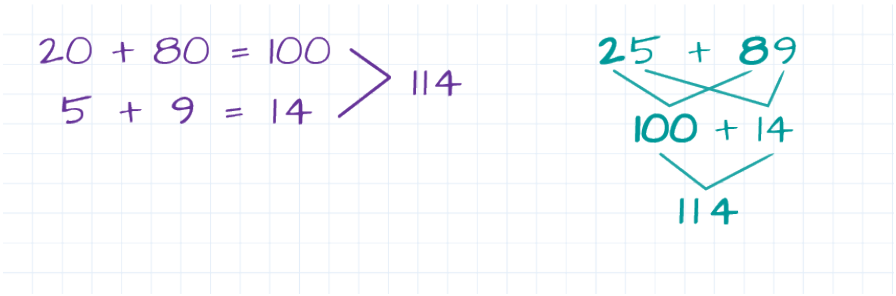
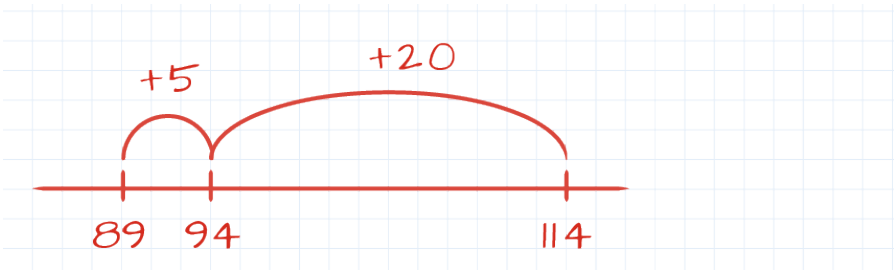
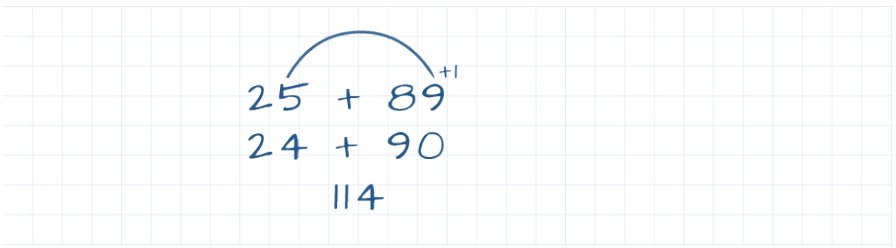
Example 1

Dot talk: How many dots are there?

Summary of student strategy	Possible visual representation	
Start with the 5 ‘die’ representation and add on 3 more.		5 and 3 make 8
Start with the 6 ‘die’ representation and count on 2 more.		6, 7, 8
There is one triangle of 4 on the top and one triangle of 4 on the bottom.		4 and 4 is 8
There is a row of 4 down the middle with 2 on the left and another 2 on the right.		4 + 2 + 2 = 8

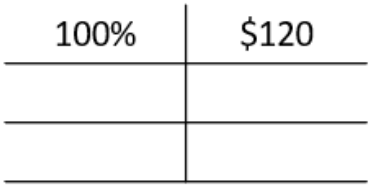
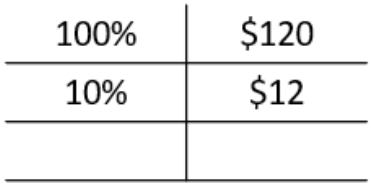
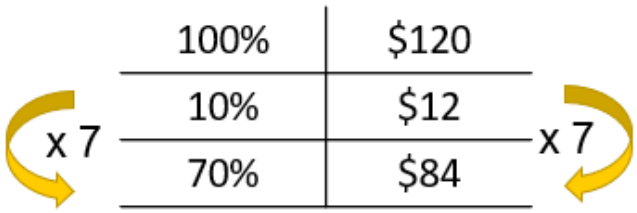
Example 2

Addition: 25 + 89

Summary of student strategy	Possible visual representation
Split the numbers into place-value parts, operate on them separately and then combine to get the total.	
Start with the biggest number (89) and add the ones and then the tens.	
Compensate to make a benchmark number, which is easier to work with mentally.	

Example 3

Find 70% of $120

Summary of student strategy	Possible visual representation
100% equals $120.	
10% of $120 is $12.	
To find 70%, multiply 10% by 7. Multiplying the percentage side by 7, means the money side also needs to multiply by 7. $12 multiplied by 7 is $84.	

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