

Multiplication Algorithm Grade 3 – Teacher Hideyuki Muramoto

Wednesday, Dec 6, 2006, 1:35 ~ 2:20 pm Sapporo City Maruyama Elementary School

| Time | Length | Episode |
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| 00:15.80 | 01:35.6 | INTRODUCTION [8 min 36 seconds] The teacher begins writing up the problem for the children to copy into their books. (Note the children are aware of the format: being given a problem on the board and expecting copies for themselves to do the calculations.) |
| 02:21.60 | 01:28.1 | The Problem How many circle-marks are there? revealing the circles line by line as the children guess how many (often based on the previous lesson with 20 circles in each row, before realizing there are 23). |
| 03:19.50 | 01:56.9 | Handing out sheets |
| 05:16.40 | 00:06.6 | Find by calculating |
| 05:23.00 | 00:27.3 | 23 circles |
| 05:50.30 | 00:22.4 | How many in top row? |
| 06:12.70 | 02:40.6 | What next? |
| 08:53.30 | 00:38.6 | CLASS ACTIVITY [5 minutes 13 seconds] Think about how to calculate 23×3 |
| 09:31.90 | 04:34.6 | [class activity] |
| 14:06.50 | 01:48.3 | DISCUSSION [first half: 17 minutes 39 seconds] The teacher begins the discussion by suggesting we cannot calculate 23×3 by using ideas we have learned before. |
| 16:44.90 | 00:50.3 | Who has written it down? The teacher first checks which children have written it down who knows how to do it and who has no idea yet. |
| 19:04.20 | 02:19.2 | Amon sees 23 as $20+3$ based on dividing 20 and 3. The teacher writes $3 \times 3 = 9$, $20 \times 3 = 60$, $9 + 6 = 69$, corrected (as noted below) to $9 = 60 = 69$. |
| 19:51.50 | 00:47.3 | 23×3 is complicated Shinjo presents the same idea |
| 20:41.00 | 00:49.5 | My idea almost the same Another girl does the same, 3×3 is 9 and 20×3 is 6 (corrected to 60). |
| 21:24.70 | 00:43.7 | Used what we learned Another child explained how she used what we had learned in the previous lesson. |
| 21:40.70 | 00:31.2 | Tens and ones. The previous girl explains in terms of the ones and tens places. |
| 21:56.90 | 01:10.5 | Amano 'not finished' (<i>Amano sees the layout as 9, 30, 30, The teacher speaks to him softly and does not make it public.</i>) |
| 23:06.40 | 02:12.1 | Chiba is similar to Amano (but makes a mistake, dividing 23 into 20 and 3, multiplying 3×3 and adding to 20 to get 29. Other children discuss) |
| 25:18.50 | 02:00.7 | Using 10-yen coins again dividing 23 into 20 and 3, but now explains <i>20 is like 2 ten yen coins</i> , so 2×3 is 6. |
| 27:19.20 | 01:34.2 | 2 groups of ten, one of ones. (teacher subdivides picture into rows of 10, 10, 3 and writes as child explains): $10 \times 3 = 30$, $10 \times 3 = 30$, $30 \times 2 = 60$, $3 \times 3 = 9$. $60 + 9 = 69$ |
| 28:53.40 | 00:34.1 | Tell me why (another child explains its easier to make groups of ten. <i>The book says so.</i>) |

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| 29:27.50 | 01:21.6 | Who has the same idea? (Another gives a similar explanation) |
| 30:49.10 | 00:56.4 | 20x3 is easier. I am aware of something. Multiplication of 10 is easier. |
| 31:45.50 | 01:42.4 | OTHER METHODS [14 minutes 27 seconds] A child suggests a new layout, breaking 23 into 10+3+10 with 3x3 in the middle. Sighs of amazement from the class. |
| 33:27.90 | 00:25.3 | Now use 10 & 5. A girl returns to yesterday's calculations of 20x3. Which are still displayed at the side. |
| 33:53.20 | 01:02.6 | I noticed something A boy suggests all methods so far ended with 60 & 9; no one calculates 39 & 30. |
| 34:55.80 | 00:54.6 | 23x3 is complicated. As we said before 23x3 is too complicated and confusing. We've learned calculations like 20x3, [with] numbers which end with 0. |
| 35:50.40 | 01:01.1 | 23x3 doesn't end in 0. A child explains this is why we divided 23 into 20 and 3 or 10, 10 and 3. |
| 36:51.50 | 00:07.9 | a different way? The teacher asks if someone has divided 23 in a different way. |
| 36:59.40 | 01:13.6 | 11+12. A boy says he divided 23 into 11 and 3 to calculate 11x3 and 12x3. The teacher says 'we haven't studied this yet.' The children talk about it being difficult. |
| 38:13.00 | 02:18.1 | 3x9, 3x9, 3x5. The teacher writes the child's calculations on the board in a complex way. The teacher approves and asks how it is similar to other calculations. |
| 40:31.10 | 01:37.3 | 23 is 11, 11 & 1. The child carries out the calculation with a minor error that is corrected. |
| 42:08.40 | 01:37.4 | Vertical form The teacher has noted that Mai writes the problem out in vertical form using the standard algorithm. He asks her to share her idea. There is discussion about 10s and ones, with some use of the idea of 10 yen coins. |
| 43:45.80 | 01:43.6 | is it totally different? Yamada talks about the relationship between the picture and the calculation of 3x3 is 9 and 2x20 is 60. In particular he focuses on 3x2 being 3x20 with the answer in the tens place. The teacher explains in terms of 10 yen coins. |
| 45:29.40 | 00:43.5 | Look carefully. The teacher places paper with calculations using rows of circles by the vertical form. |
| 46:12.90 | 00:07.2 | SUMMARY [5 minutes] Times up. A child says 'I want to do more!' |
| 46:20.10 | 02:08.3 | Any good ideas? Takashi thinks it is good to think with 2 ten-yen coins. He explains 'some people used big clear numbers such as 60 and added the not-round numbers (ones place numbers). Clear numbers are clarified as round numbers ending in zero. Tsubota amplifies the ideas. |
| 48:28.40 | 00:23.8 | Let's read The teacher asks the children to read what he has written on the board. 'Let's think about how to calculate 32x3.' |
| 48:52.20 | 02:20.4 | what should we write? The teacher encourages the children to say what to write. He picks up the words 'vertical form calculation' and writes a sentence selected from the children's suggestions to finish the class. |
| 50:36.50 | 01:35.6 | End credits |

