Lesson Plan for Mathematics

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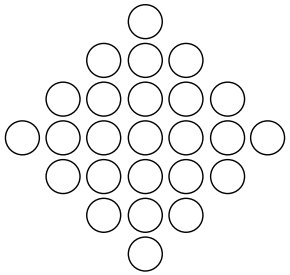
Research Theme	Consideration of Lecturing by ñRepresenting Ideas as Expressions and Interpreting Themò with Problem Solving using Multiplication

1. Subject: Finding units for using multiplication



2. About the research theme

In this lesson, students find the number of dots in a dot block like the one shown on the right figure, and find out ways of counting the number of dots in it.

Some students represent their ways of counting as expressions, and others interpret the meaning of each expression.

Through these activities, students can find unexpected interpretations for their own expressions, and find emergent ways of counting. We aim to use these experiences to find the value of learning from each other in studying mathematics.

In particular, for each expression presented by a student, another student interprets what the former meant with the expression. This activity widens studentsôways of thinking about expressions

3. Objective

To understand how to solve problems using multiplications.

4. Lesson term (Special one-hour lesson)

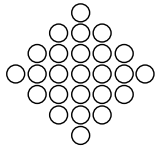
Finding units for using multiplication é é é é é é é é é é é 1 hour (this lesson)

5. Development of this lesson

(1) Objective of this lesson

Find ways to count the total number of dots in the square with 4 dots on each side, and represent each way of counting as an expression. Interpret the meanings of the expressions.

(2) Development

Contents	Attention
1. Looking at the following figure, consider ñHow many dots are there?ò 	(1) Show the figure only just for a moment to students so that they build an image of the arrangement of the dots in the figure.
2. Confirm that there are 25 dots, and think about how to represent the way of counting them as an expression.	(2) Each student should try to represent his/her own way of counting as an expression.
3. Students represent their ways of counting as expressions, and others interpret those expressions. (1) 1 + 3 + 5 + 7 + 5 + 3 + 1 = 25 (2) (3Ǐ 3) + (4Ǐ 4) = 25 (3) 5Ǐ 5 = 25 (4) 6Ǐ 4 + 1 = 25 (5) 3Ǐ 8 + 1 = 25 etc.	(3) Students look at expressions made by other students, and think of interpretations for those expressions. ３－(1) ３－(2) ３－(2) ３－(3) ３－(3) ３－(3)
4. Confirm that there are various ways of counting.	(4) Confirm that there are various ways of counting, and that for each expression, several interpretations are possible.