6th Grade　Elementary School Mathematics　Teaching Plan

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Research Theme	Considering How to Use Percentage

1. Teaching Material: Use of Percentages

2. Research Theme

In this class, we shall think about "probability" as an extension to learning about "percentages".

Concretely, we will think about the probability of picking out two balls from a number of balls.

Place six white balls and two red balls in a box.

Pick out two balls at the same time from the box. Two red balls result in 1st prize, one red ball and one white ball result in 2nd prize, and two white balls result in third prize.

Have the children think about the frequencies of these various combinations.

First, the children must figure out the total number of possible scenarios.

The children are expected to think about using listing all the possible cases when picking out two balls.

For example, they can write a different number on each of the balls, allowing easy identification of all the ball pairs. Other possible approaches include developing a table to count the number of matches in the case of a round-robin tournament involving eight teams, or by representing the teams as eight points in a diagram, linking up all possible pairs of points the possible pairs of points and then counting the total number of lines. The goal is to obtain the percentage by thinking about the number of a given combination in relation to the total number of combinations.

	O	O	O	O	O	O	●	●
O	\	3	3	3	3	3	2	2
O		\	3	3	3	3	2	2
O			\	3	3	3	2	2
O				\	3	3	2	2
O					\	3	2	2
O						\	2	2
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In this case, the first prize = 1/28, the second prize is 12/28, and the third prize is 15/28.
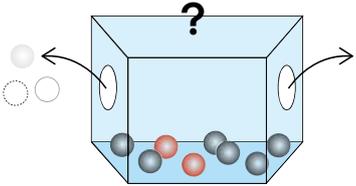
3. Objective

Find ways to think about the number of possible cases.

4. Guidance Plan: Handling of Special 1-Hour Session

5. Implementation of this Class

(1) Objective: To find ways to count the total number of possible cases and figure out the percentage of a given case.

(2) Implementation

Learning Activity	Guidance Points
1. Verify that the box contains 8 balls.	① Using the example of a lottery, let the children see the balls being placed in the box.
2. Think about the possible ball combinations when 2 balls are picked out of the box. White & White　White & Red　Red & Red 　○　○　　　　○　●　　　●　●	② Have the children think about the case when 2 balls are picked out of the box. Have them think in terms of receiving either the 1st, 2nd, or 3rd prize depending on the combination of balls that is picked out.
3. Think about how to figure out the percentage of each combination. ・Use a tournament table. ・Use lines linking the points.	③ Have the children find ways to think about the percentage of each combination while remembering what they have already learned.
4. Obtain the various percentages from all the possible cases. ○○　→　$15 \div 28 \times 100 =$ approx. 54 (%) ○●　→　$12 \div 28 \times 100 =$ approx. 43 (%) ●●　→　$1 \div 28 \times 100 =$ approx. 3 (%) 5. Investigate the probability of each case through actual experimentation. 6. Compare the actual experiment results with the results calculated based on assumptions.	④ Have the children think about the percentages for all the possible combinations while looking at a table, etc. ⑤ While actually drawing lots, have the children check whether the results approximate the assumed values. ⑥ Ask the children to comment by looking at the results of the experiment.