

Dicey Equations

Big Idea: Operate/Calculate

Suits: Years 3-9

Materials:

Three 6-sided dice

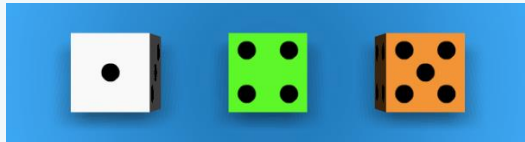
Instructions:

Whole class game:

Ask students to draw a table with two columns (like that shown below).

Include the digits 0-10 in the left hand column.

Roll the three dice. Record the results on the board. (If a double is rolled, roll one die again, until three different numbers are achieved) eg.



Using each number once only, in any combination and connected with any operation sign, write a set of number sentences (expressions) that have solutions 0 - 10. See the example.

Note: As a class, you might agree that exponential notation can be included, even when these digits are not among those rolled. (See the expression for 4.)

Initially, allow students to work with elbow partners or small table groups. Encourage the sharing and justifying of solutions.

0	$5 - 4 - 1$
1	$5 - (4 \times 1)$
2	$(5 + 1) - 4$
3	
4	$(4 - 1)^2 - 5$
5	
6	
7	
8	$(5 - 1) \times \sqrt{4}$
9	$14 - 5$
10	$5 + 4 + 1$

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Teacher Notes

Dicey Equations requires students to think flexibly about numbers and computation. The open-ended nature of the task means that all students can be engaged and multiple solutions are possible. Regular attempts at this warm up will assist students to develop appropriate reasoning and computation strategies. A discussion of the use of brackets and order of operations may be required as students begin to investigate and explore different combinations.

Be aware that:

- Students who lack fluency with number facts may have difficulty with this task initially

Differentiate the task by:

- Allowing students to work with elbow partners or within small table groups
- Varying the number and type of dice
- Rolling and using four dice
- Reducing the number of target number required, eg. writing equations to match the numbers 1-5
- Extending the range of target numbers to include negative integers, eg. writing equations to match the numbers 5 to -5 .

Challenge students to:

- Complete expressions for each of the numbers.
- Use all available digits in expressions, eg. expressions that use all three numbers score 2 points. All other expressions score 1 point. In five minutes, what score can you reach?
- Use 2-digit numbers and fractions in expressions.

Guiding Questions:

- How can you check that answer?
- Which is your most clever answer? Why?

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