

Mathematical Communicating: Representing Numbers

Learning outcomes in focus

Students should be able to:

U.3 recognise that equality is a relationship in which two mathematical expressions have the same value

U.4 represent a mathematical situation in a variety of different ways, including: numerically, algebraically, graphically, physically, in words; and to interpret, analyse, and compare such representations

U.13 communicate mathematics effectively: justify their reasoning, interpret their results, explain their conclusions, and use the language and notation of mathematics to express mathematical ideas precisely

N.1 investigate the representation of numbers and arithmetic operations

Learning intentions

We are learning to:

- flexibly translate between different representation of numbers
- correctly use the order of arithmetic and index operations including the use of brackets
- use the equals symbol correctly
- communicate mathematical ideas

Teaching and learning context

First year students were investigating the representation of numbers and arithmetic operations, exploring index notation and the correct order of operations, interpreting factors and prime numbers. **They were given 30 mins to complete the task.**

Task

Demonstrate how many ways you can show the number 24. You can use any of the types of numbers you have learned about (natural, integers and rational), a visual (a diagram or picture), brackets, powers (index notation).


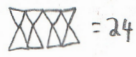
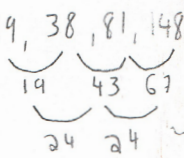
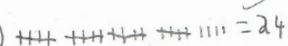
Success Criteria

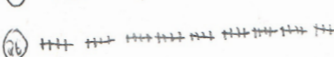
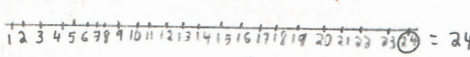
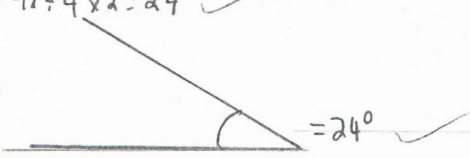
I can

- SC1** correctly use the equals symbol
- SC2** represent numbers in different ways
- SC3** represent my ideas using the language of mathematics
- SC4** correctly use the order of operations using brackets

Mathematical Communicating: Representing Numbers

Handwritten student work showing various mathematical representations of the number 24. A vertical arrow on the left is labeled "24 cm".

$1 \times 24 = 24$ ✓ $x = 24$ ✓ (20)
 $12 + 12 = 24$ ✓
 = 24 ✓
 $\Delta = 3$  = 24 ✓
 $3 \times 8 = 24$ ✓
 $144 \div 6 = 24$ ✓
 $\frac{96}{4} = 24$ ✓
 $24 \times 24 \div 24 = 24$ ✓
 14, 38, 81, 148

 24 mm ✓
 $T_n = 24 \text{ m}$ ✓
 $T_1 = 24(1) = 24 + 0 = 24$ ✓
 $24\sqrt{1} = 24$ ✓
 = 24 ✓
 $25 - 1 = 24$ ✓
 $48 \div 2 = 24$ ✓
 $\text{€}24$ ✓
 $11x + 5x + 8x = 24x$ ✓
 $1, 2, 3, 4, 6, 8, 12, 24 = \text{factors of } 24$ ✓
 $\frac{24}{1} = 24$ ✓

(21) $12 \times 12 \div 6 = 24$ ✓
 (22) $6 \times 2 \times 2 \times 6 \div 6 = 24$ ✓
 (23) $\therefore x \therefore \therefore = 24$ ✓
 (24) = 24 ways to make 24 ✓
 (25) $4 \times 6 = 24$ ✓
 (26)  $\div 2 = 24$ ✓
 (27) $27 - 3 = 24$ ✓
 (28) $2^2 \times 6 = 24$ ✓
 (29) $3^2 + 4^2 - 1^2 = 24$ ✓
 (30) $2^5 - 2^3 = 24$ ✓
 (31) $24 \times 24 \times 2 \div 48 = 24$ ✓
 (32) $25 - 1^2 = 24$ ✓
 (33)  = 24 ✓
 (34) $30 - 6 = 24$ ✓
 (35) $48 \div 4 \times 2 = 24$ ✓
 (36)  = 24° ✓

(36) times

SC4: Correctly uses the order of operations

SC1: Correctly uses the equals symbol


SC2: Represents 24 in different ways using pictures and index notation

SC3: Uses the language of mathematics to represent ideas

Overall judgement:  In line with expectations

 Exceptional

 Above expectations

 In line with expectations

 Yet to meet expectations