NCCA

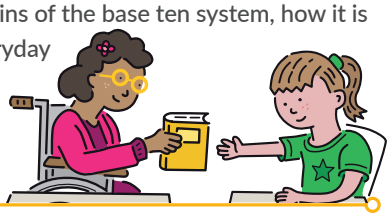
Primary Mathematics Toolkit – Support material

Number: Place value and base ten – Suggestions for children's learning

The child has opportunities to...

Understand and connect

- develop subitising and estimating skills through working with different concrete materials, e.g., *dice, ten frames, tallies, sets.*
- engage in games such as '*Higher or Lower*' to compare the value of 2-digit numbers, 3-digit numbers, decimals, etc. using symbols < , > and = .
- play games to consolidate understanding of place value (including numbers with decimals), e.g., *take turns rolling a number of dice one by one and place these on a notation board with the goal of ending up with the highest/lowest number.*
- use concrete materials such as dienes blocks, counters and notation boards, cuisenaire rods, etc. to compose and decompose whole numbers and decimal numbers.
- explore the origins of the base ten system, how it is used in our everyday lives and the advantages this holds for us.



Communicate

- explain how the value of a digit in a number is determined, e.g., *tell us about the value of each number in a 2/3/4/5-digit number and how these values are determined.*
- discuss the relevance of '10' as a significant number in how we use mathematics to understand our world.
- play number games such as "Guess my Number", e.g., *my number has 0 ones, it is greater than 380 and if you add 2 tens to 370 you will land on my number. What's my number?*
- perform choral counting activities as a class or with small groups, e.g., *count together in tenths, 10s, 100s, 1000s, etc. or a combination of these.*
- collaborate and share ideas around representations of numbers, e.g., *represent 455 in as many ways as you can using hundreds, tens and ones, make €12 using different combinations of coins.*

Reason

- explore and discuss various arrangements of manipulatives to prompt mental images of numbers, e.g., *arrange 20 counters into 2 bowls in as many different ways as you can.*
- explore the differences between the base-ten and other systems, e.g., *seconds and minutes are base-60, while hours are base-24.*
- explain the steps involved in rounding to the nearest 10, 100 or 1000 based on the position of relevant digits.
- justify efficient ways of calculating the addition of 10s, 100s and 1000s to a given number, e.g., *when adding 400 to 1350, I focus on the third digit from the end (3) because....*
- justify their choice of converting from decimals to percentages (or vice versa) in relation to base ten properties, e.g., *to solve this problem, I changed 17% to 0.17 because...*
- address commonly made errors when converting between decimals and percentages, and explain in relation to their base ten properties, e.g., *true or false, 1.5% = 1.5.*

Apply and problem-solve

- use rounding to the nearest 10, 100, 1000, etc. as a step in the problem-solving process when working with larger numbers.
- apply knowledge of place value and base ten to solve problems involving number patterns, e.g., *850, ____, ___, 700, 650; or 1.1, 3.4, 5.7, 8.0, 10.3, ___, _____.*
- apply knowledge of place value to correctly to solve real-life problems, e.g., *in the long jump, John jumped 3.45m, Páidí jumped 3.89m and Lucy jumped 3.6m – who came first/second/third?*
- use rounding to plan for and quickly calculate costs associated with budgets for class/school events, e.g., *a class party, school tour, organising a bake sale.*
- Participate in error analysis activities where they examine how a place value activity was misunderstood, e.g., *two hundred and five = 250; 200+5+4=254.*

Developed in collaboration with **Jean Donnelly, Primary School Teacher, Co. Dublin**