**Partitioning - What is it?**

Partitioning is the process of breaking a number into parts. It can be represented concretely with materials, visually with pictures and diagrams, symbolically in the form of number sentences and models and mentally for the purposes of number fact recall and computation. Students need to partition numbers efficiently and flexibly.

Partitioning underpins the concepts of quantity, place value and computation. Students first partition when they recognise parts in small numbers, e.g. four being composed of two and two, or three and one. It develops into trusted combinations for small numbers, e.g. ten as 3+7, or 4+6, or 8+2. Students then progress to recognising and using place value parts in larger numbers, e.g. 35 as 30 and 5 (standard place value partitioning) and 35 as 20 and 15 (non-standard place value partitioning).

**Partitioning small numbers (to 20)**

With small collections, children will often intuitively use partitioning to subitise, i.e. seeing how many at a glance.

For example, a young child is asked, *How many in this collection?*

 

The child replies, “Three.”

“And how did you know this?”

The child responds, “It has a two and a one.”

Efficient and flexible partitioning is built upon a child’s trust of how numbers can be broken up and recombined, without a change to the value.

Through regular experience of breaking up collections and visualising numbers in their parts, students can partition numbers beyond those that they can confidently subitise.

Partitioning becomes integral to strategies for recalling addition and subtraction number facts.

For example, a student is presented with the addition fact: **7 + 5**.

Using mental partitioning, the student has at least three efficient options.

* Think of 5 as 3 and 2. Add 7and 3 (compatible numbers). Add the 2 to make 12.
* Think of 7 as 5 and 2. Add 5 and 5 (makes 10). Add the 2 to make 12.
* Think of 7 as 6 and 1. Add the 1 to the 5. Now add 6 and 6 (double fact).

Later, partitioning becomes critical for efficient mental computation and related written methods.

For example,

 **35 + 23 76 – 33 458 + 135**

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**Partitioning into standard place value parts**

Standard place value partitioning reflects the individual values of each digit in a number. Standard place value partitions can be represented with structured materials and on number expanders.

For example,

 245 as 253 as

  

**Partitioning into non-standard place value parts**

Non-standard place value partitioning shows flexible ways to break numbers up. Some, but not all non-standard partitions can be represented on number expanders.

For example,

 327 as

 

 

Other non-standard place value partitions can be described as ‘splitting numbers where one ten ends’.

This can be represented effectively with 2-digit numbers using place value bead strings.

For example,

 32 as 20 and 12

 

 32 as 10 and 22

 

**Note on partitioning**

Larger numbers can be partitioned in ways that do not directly relate to place value.

For example,

 32 as 25 and 7

 

This non-standard form of partitioning becomes valuable in mental computation as students look for compatible numbers to make calculation easier.

For example, a student is presented with this mental computation problem:

**32 + 25**

The student may partition 32 into 25 and 7, and complete the computation as: 25 + 25 + 7.

A child’s informal written method may resemble the following:

 