Addition and Subtraction Concepts: Comparative addition and difference

Comparative addition and difference are the inverse of each other and therefore, these concepts for addition and subtraction should be taught alongside each other. Comparative addition involves making a comparison between situations where at least one of them involves an addition. For example, $3+2 = 5$ and $3+2 = 4+1$ both involve the concept of comparative addition. Comparative difference involves making a comparison between two quantities and finding the value of the difference between them. It is important to understand that, when finding the difference between two numbers, the answer is the same regardless of the order of the numbers in the problem. This is not the same for the subtraction concepts of partitioning or reduction i.e. the difference between 2 and 5 is the same as the difference between 5 and 2 but 5 take away 2 is not the same as 2 take away 5.

Teachers are expected to change the example according to the numbers that the pupils are familiar with. For example, Year 1 teachers will provide examples that involve numbers within 20 after Unit 5 (Addition and subtraction within 20).

<table>
<thead>
<tr>
<th>Word problem</th>
<th>Comparative addition</th>
<th>Jess has three books. Tom has five books. Tom has five books. How many more books does Tom have than Jess?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Jess has three books about animals and two books about plants. Tom has five books. Ali has six books. Who has the same number of books as Jess?</td>
</tr>
</tbody>
</table>

Using Cuisenaire®

Using a bead string

Using a number line
Addition and Subtraction Concepts: Comparative addition and difference

To understand the concept of addition and finding equivalence

**About the maths**

This concept focuses on comparing two situations where at least one involves addition.

**Vocabulary**

Add, plus
equal

**Resources**

Number rods such as Cuisenaire ®
Interlocking cubes or other countable objects

**Getting started**

Place Cuisenaire ® rods on the table.
Ask pupils to select the yellow rod.
Ask pupils to find two rods that are equal to the rod they selected.
Ask pupils to talk about the rods they selected.

*Through this discussion pupils should recognise that the two rods they selected are equal to the yellow rod.*

E.g.
“The red rod and the light green rod are equal to the yellow rod.”

Highlight that they are comparing the rods to find two that are equal to the yellow rods.
Ask pupils to explore different possibilities.

**Task for pupils**

Provide pupils with three red cubes and two yellow cubes.
Ask pupils to place the three red cubes and two yellow cubes together to create a tower.
Ask pupils to create a blue tower that is equal to the red cubes plus the yellow cubes.

E.g.
“There are three red cubes and two yellow cubes. There are five cubes altogether.”

“I have created a tower of five blue cubes. Three plus two is equal to five.”

**Deepening understanding**

Provide pupils with five blue cubes, four white cubes, three red cubes, two yellow cubes and one black cube.
Ask pupils to explore comparative addition in different ways.

Through this task pupils should explore the following:

- Three plus two is equal to five.
- Two plus three is equal to five.
- Five is equal to two plus three.
- Five is equal to three plus two.
- Three plus two is equal to four plus one.
- etc.

*With each example, ensure pupils are focusing on the concept of comparative addition.*
Addition and Subtraction Concepts: Comparative addition and difference

To understand the concept of subtraction as finding the difference

### About the maths

This concept focuses on comparing two quantities and finding the difference between them.

### Vocabulary

- Difference, minus
- More, fewer

### Resources

- Cuisenaire
- Interlocking cubes or other countable objects.

### Getting started

Place Cuisenaire® rods on the table.

Ask pupils to select the yellow rod and the light green rod.

Ask pupils to find the rod that is equal to the difference between the two rods.

Ask pupils to talk about the rods they selected.

E.g.

"The red rod is equal to the difference between the light green rod and the yellow rod."

Highlight that they are comparing the rods to find the difference. Pupils are expected to find the two rods that are equal to the yellow rod when one of the parts is light green.

### Task for pupils

Provide pupils with five blue cubes and three red cubes and five yellow cubes.

Ask pupils to explore finding the difference between the three red cubes and the five blue cubes by creating a tower of yellow cubes, making the red plus the yellow equal to the blue.

E.g.

"There are five blue cubes. There are three red cubes."

"The difference between five and three is two.

### Deepening understanding

Provide pupils with five blue cubes, four white cubes, three red cubes, two yellow cubes and one black cube.

Ask pupils to explore comparative difference in different ways.

Through this task pupils should explore the following:

- The difference between five and two.
- The difference between two and five.
- The difference between five and three.
- The difference between three and five.
- The difference between five and one.
- The difference between five and four. etc.

*With each example, ensure pupils are focusing on the concept of comparative difference.*
Addition and Subtraction Concepts: Comparative addition and difference
To explore the inverse relationship between comparative addition and difference

About the maths
The concept of comparative addition and difference are inverse operations and therefore it is important that children have the opportunity to compare and explore these concepts together.

Vocabulary
Add, plus
Difference, minus
More, fewer, equal

Getting started
Place Cuisenaire ® rods on the table.
Ask pupils to select the red and the light green rod.
Ask pupils to find one rod that is equal to the red and light green rod.
Ask pupils to place the yellow rod above the light green rod.
Ask pupils to find the rod that represents the difference between the yellow and the light green rod.
Ask pupils to find the rod that represents the difference between the yellow and the red rod.

Task for pupils
Provide pupils with three red cubes, two yellow cubes and five blue cubes.
Ask pupils to explore the relationship between comparative addition and difference.
E.g.
"Three plus two is equal to five."
The difference between three and five is two.
The difference between five and three is two.

Deepening understanding
Provide pupils with three red cubes, two yellow cubes and five blue cubes.
Ask pupils to explore the relationship between adding on and taking away from a set of objects using three and two.
Questions to explore and discuss:
• Five is equal to three plus what?
• Three plus two is equal to what?
• Five is equal to two plus what?
• Two plus three is equal to what?
• What is the difference between five and two?
• What is the difference between two and five?
Addition and Subtraction: Open tasks and games

Make 100

For this game, you need dice, a pencil and paper. Each player draws an addition grid like this:

\[
\begin{array}{c}
  \ \ \\  \ \ \\ + \ + \\
\end{array}
\]

Take it in turns to roll the dice. After you have rolled the dice, you decide which box to place that number in. Once all four numbers have been placed, add your two 2-digit numbers to get your total. Closest to 100 wins.

Adapting: You can change the target total, or try using subtraction

Zero the Hero

For this game you need the number grid, (or make your own filled with numbers under 10) two cubes/counters, a plastic cup and pencil and paper.

Write 50 down as your starting score. Put two cubes into the plastic cup and roll them onto the grid. Add the two numbers together then subtract from 50.

Take it in turns to do this. The first to reach zero is the winner.