

Subtraction using Number Lines

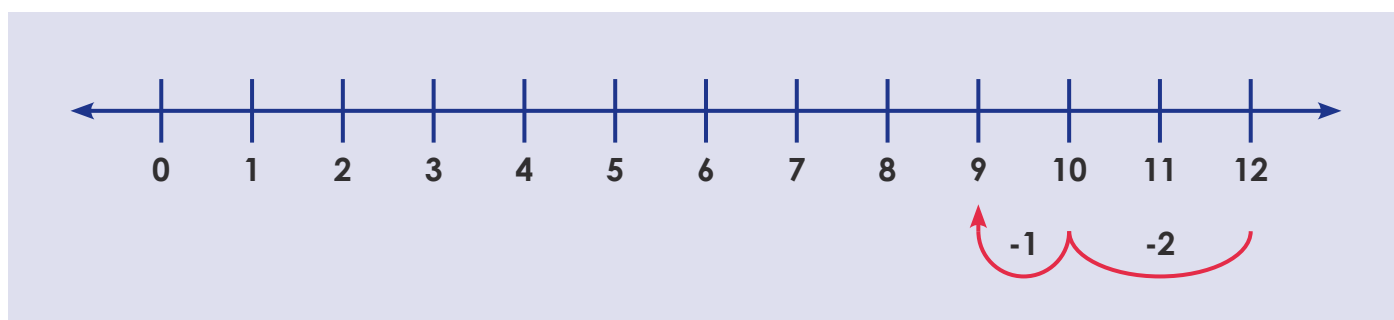
Subtraction can be solved using a number line by either:

- Taking away, moving left (counting backwards) or
- Adding on, moving right (counting forwards).

For example,

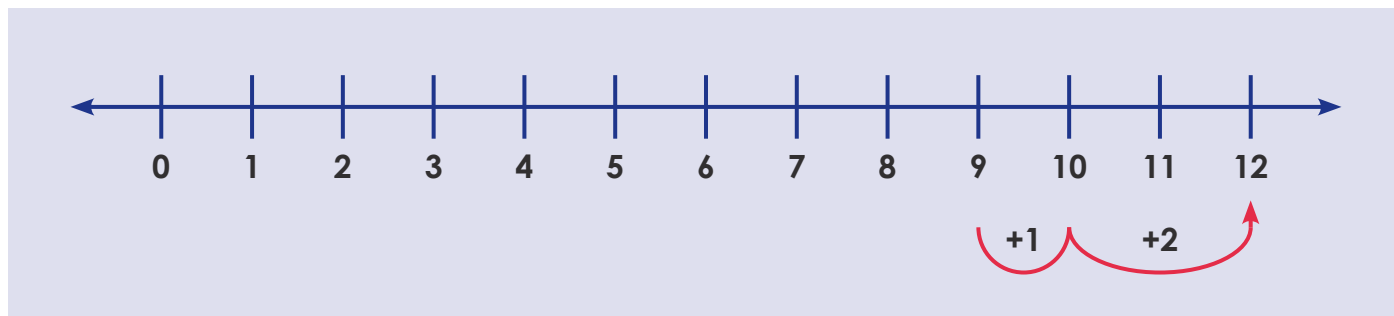
Taking Away

$12 - 3 = ?$ can be solved by starting with the whole of 12, then moving left to take away the known part of 3.



Adding On

$12 - 9 = ?$ can be solved by starting with the known part of 9, then moving right, adding on the unknown part, to make the whole of 12.



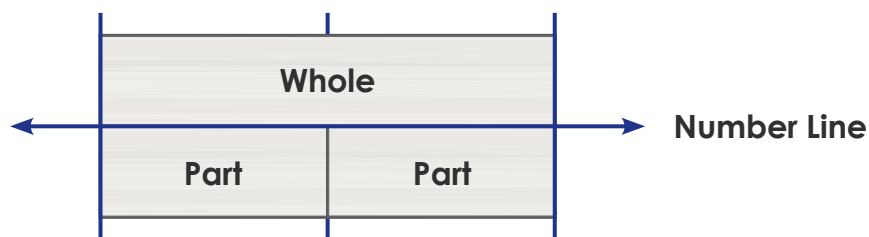
Strategy Development

Typically children's brains find adding on easier than taking away. Adding on relates to counting forwards. Taking away to counting backwards. For this reason subtraction as take away is more suited to numbers where the part being taken away is relatively small, reducing the amount of backwards thinking. For example, taking away is efficient for $12 - 3$ whereas adding on is efficient for $12 - 9$.

Counting on or back is an initial strategy used to subtract. However, students should **not** count on or back more than **1, 2 or 3** (Booker et al., 2014). This includes jumps of one on a number line. Alternative strategies need to be taught.

Subtraction using Bond Blocks on Empty Number Lines

Bond Blocks are placed on empty number lines using the part-part-whole diagram arrangement.



Use Bond Blocks to solve subtraction on empty number lines by placing the:

- Whole** first, above the number line.
- Known Part** next, below the number line.
- Unknown Part** (which is the answer) last, below the line.
This part will fill the gap below the line to make the parts equal in length to the whole.

Subtraction can be solved by using an empty number line by either:

- Taking away, moving left or
- Adding on, moving right.

Once students are fluent solving subtraction using taking away and adding on encourage them to:

- Pause before beginning to solve a subtraction question.
- Consider the size of the whole and known part in relation to each other.
- Choose whether taking away or adding on is more efficient.

Taking Away

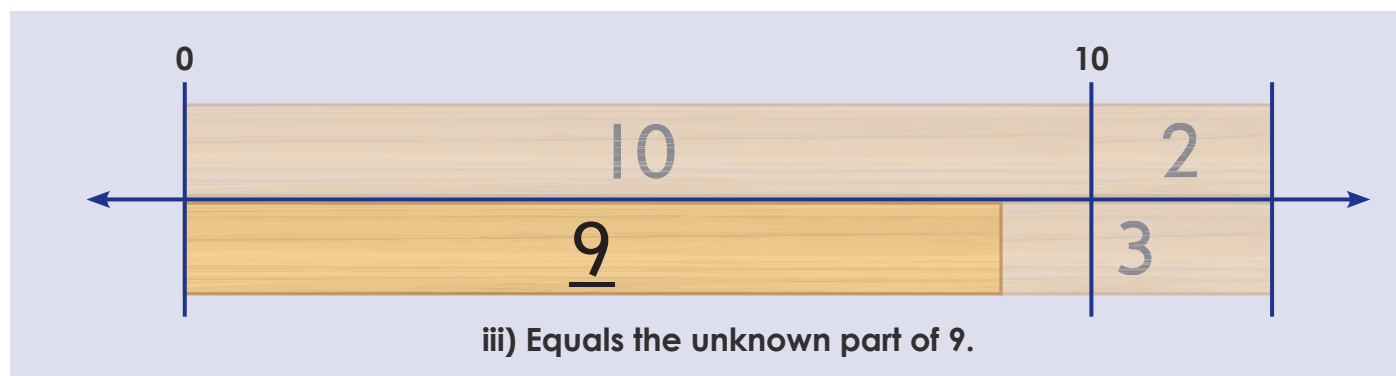
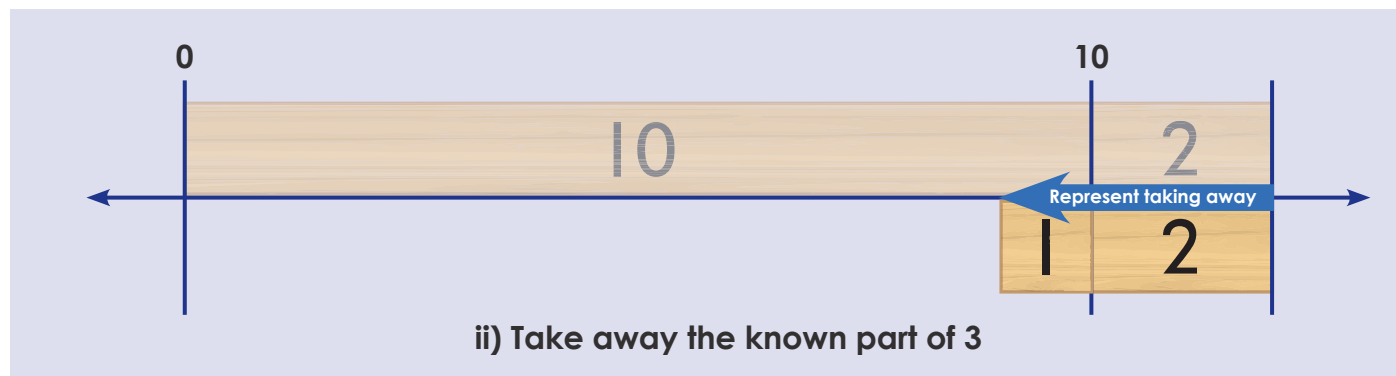
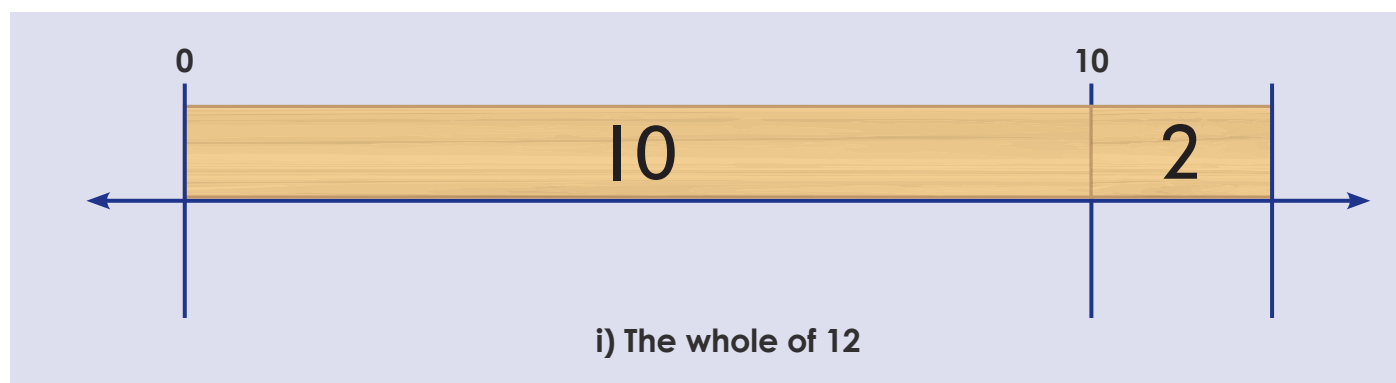
When using Bond Blocks to solve subtraction by taking away place the blocks in this order:

- Represent the **whole**.
- Represent the **known part** being taken away. Start at the whole, place blocks moving left.
- Represent the **unknown part** that is the answer. Fill the gap below the line to make the parts equal in length to the whole.

For example,

$$12 - 3 = \boxed{?}$$

12 i) Whole	
? iii) Unknown Part	3 ii) Known Part



Adding On

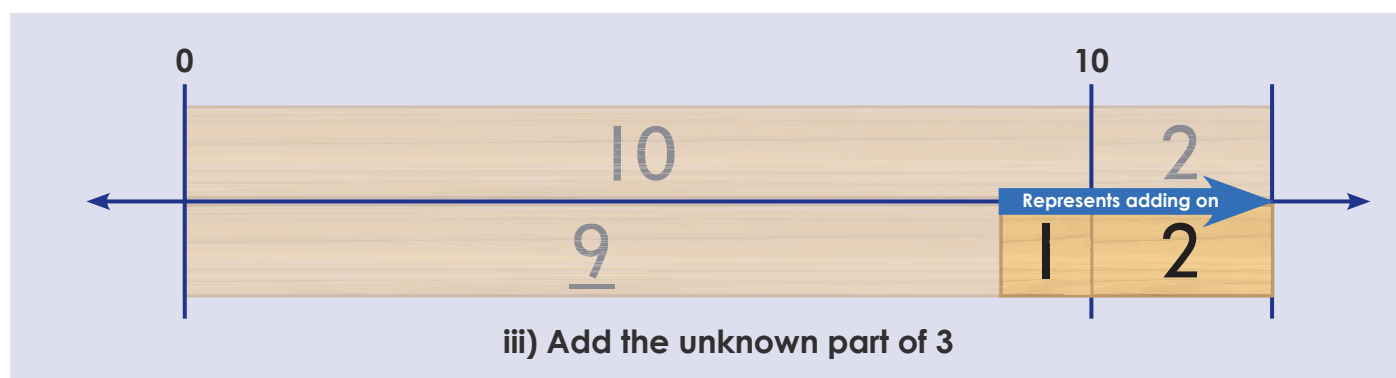
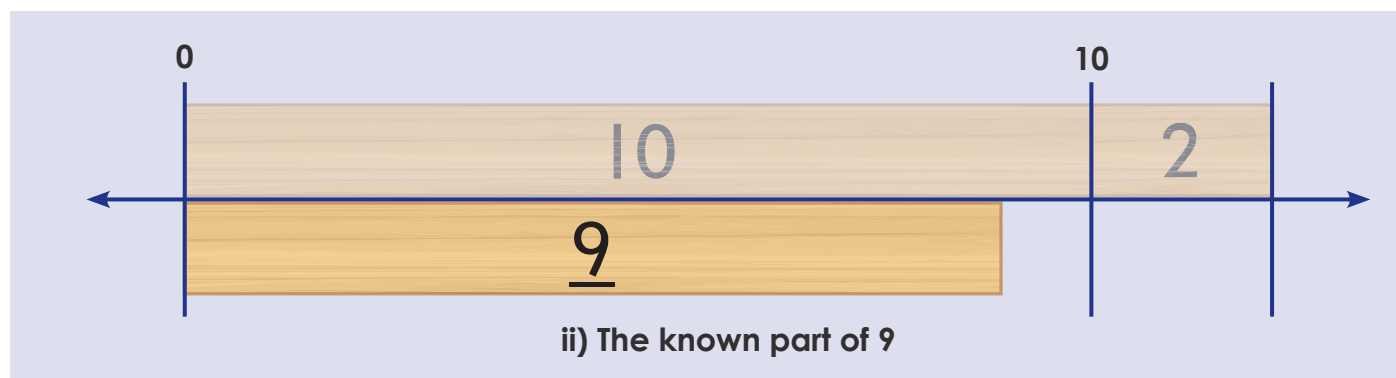
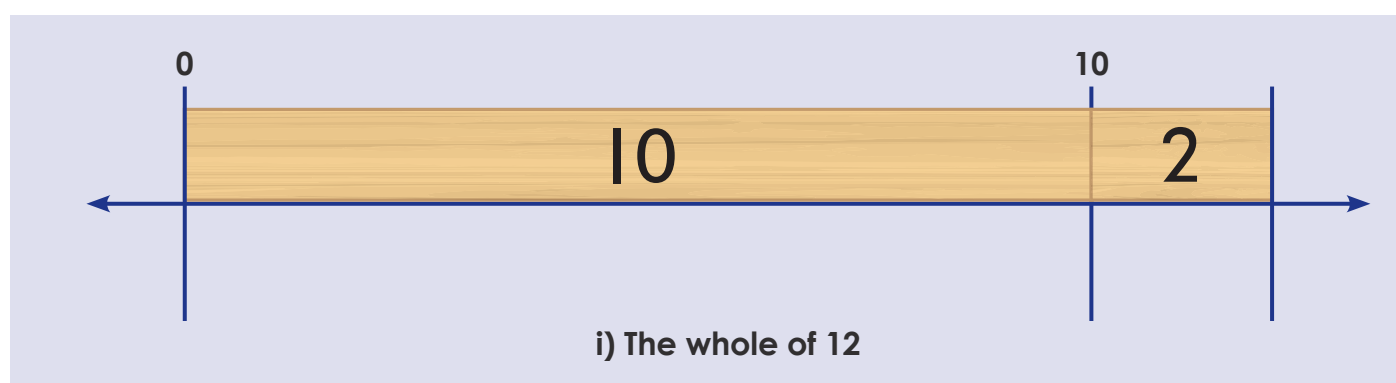
When using Bond Blocks to solve subtraction using adding on place the blocks in this order:

- Represent the **whole**.
- Represent the **known part**.
- Start at the **known part**, add on blocks moving right, to make the parts equal to the **whole**.
The amount added on will be the **unknown part** (answer).

For example,

$$12 - 9 = \boxed{?}$$

12 i) Whole	
9 ii) Known Part	? iii) Unknown Part



References

Booker, G., Bond, D., Sparrow, L., Swan, P. (2014). Teaching Primary Mathematics (5th ed.). Pearson.