

Grab 100

Number of Students: Pairs

Materials:

- Large container of drinking straws (around 5000)
- Box of rubber bands or pipe cleaners
- 1 score sheet per student
- 1 pencil (or whiteboard marker if score sheet is laminated) per pair

Preparation:

If the whole class is participating, the collection of straws could be separated into two or three piles to facilitate student access.

Sufficient score sheets need to be photocopied / printed.

Score sheets can be laminated for longevity, although this is not strictly necessary.

How :

Working as a pair, the students agree on how large a pile of straws to take from the container, without counting, with the aim of getting as close to 100 straws as possible.

Once they have their pile, the students firstly bundle the straws into groups of 10 using a rubber band or pipe-cleaner to secure each bundle. If there are sufficient groups of 10, these are then bundled into groups of 100, again securing each bundle with a rubber band or pipe-cleaner.

The students use this bundling method to determine how many straws they have, then write this number down on their score sheet in the "Try 1" box. The students then calculate how close the guess is to 100 and enter this number in the provided box. Students may initially use straws (by adding or subtracting bundled and single straws to make 100) to determine the difference. Students can then progress to use pen and paper methods or mental calculation to state the total before using the straws to check their answer.

Students repeat this procedure twice more, use the information they have gained to adjust their guess each time, with the aim of becoming more accurate in their estimate of how big a pile 100 straws would constitute.

The student who has grabbed the closest number of straws to 100 wins.

Addition and Subtraction - Grab 100 Supplement

Bridging understanding from materials to written strategies:

If students are to work flexibly with written algorithms, clear connections need to be made between the material support and each aspect of the written strategy. An example of these connections is shown below:

Straw Grab – Make up to 100

Written form

Number of straws grabbed, plus some other number equals 100

$$62 + \square = 100$$

(Adding 10s first)

$$\begin{array}{r} 62 \\ +30 \\ = 92 \\ + 8 \\ =100 \end{array}$$

Needed 38 more straws to make 100

or

$$62 + \square = 100$$

(Adding 1s first)

$$\begin{array}{r} 62 \\ + 8 \\ = 70 \\ +30 \\ =100 \end{array}$$

Needed 38 more straws to make 100

Matching straw bundles support

Starting with 6 bundles of 10 straws and 2 single straws

Adding 3 bundles

Makes 9 bundles and 2 straws left

Adding 8 straws, particularly noting that this makes up the last bundle of 10

Makes 10 full bundles, or 100 straws

Starting with 6 bundles of 10 straws and 2 single straws

Adding 8 straws, particularly noting that this makes a new bundle.

7 full bundles of straws

Adding 3 more bundles

6 singles straws left

Note: It is not important at this point whether the 10s or 1s are added first. Either way eventually yields to an efficient mental technique and also paves the way for the understanding of later algorithms for dealing with bigger numbers. In many ways, subtracting the 10s first often seems to be a more 'natural' way of proceeding.

Straw Bundles - Subtraction

Written form

100 take away the number of straws grabbed leaves the number extra we need for 100

$$100 - 62 = \square$$

(Subtracting 10s first)

$$\begin{array}{r} 100 \\ -60 \\ = 40 \\ - 2 \end{array}$$

$$= 38$$

38 straws away from 100

or

$$100 - 62 = \square$$

(Subtracting 1s first)

$$\begin{array}{r} 100 \\ - 2 \\ = 92 \\ - 60 \\ = 38 \end{array}$$

38 straws away from 100

Matching straw bundles support

Starting with 10 bundles of 10 straws

Taking away 6 bundles

Leaves 4 bundles of 10 straws

Taking 2 straws, particularly noting that a bundle needs to be 'broken'.

Leaves 3 bundles and 8 single straws

Starting with 10 bundles of 10 straws

Taking away 2 straws, particularly noting that a bundle needs to be 'broken'

Leaves 9 bundles and 8 straws

Taking away 6 bundles

Leaves 3 bundles and 8 single straws

Note: It is not important at this point whether the 10s or 1s are subtracted first. Either way eventually yields to an efficient mental technique and also paves the way for the understanding of later algorithms for dealing with bigger numbers. In many ways, adding the 10s first often seems to be a more 'natural' way of proceeding.