

# Investigations with Numicon- Sample page 1

## Starting Point

Pupils individually or with a partner should have access to a supply of Numicon Shapes.

1. Use the Feely Bag and put in three Numicon Shapes that total 15 without the class seeing what you have chosen.
  2. Tell the pupils what you have done and ask them to show you which Shapes might be in the bag. Ask the pupils to tell you about which Shapes they choose, and check that they total 15.
  3. Show one of the Shapes in the Feely Bag to the pupils and ask them to show or tell you what the remaining two Shapes might be. Again, check their addition.
  4. Show them another of the Shapes and ask them what the last Shape in the Bag must be.
- Repeat with three different Shapes.

Exploring combinations of numbers using three Numicon Shapes can take several different directions.

The Shapes can all be different or all the same, or can be a pair the same and one other. The main part of this investigation is set out in two phases.

## The Main Part: Phase 1

This part of the investigation focuses on the question:

**‘What are the smallest and largest totals of three shapes, and can all possible totals in between be made using three Shapes?’**

Start by asking the pupils the following two questions:

‘If I have only three shapes in the Feely Bag, what is the smallest number they could make?’

How about the largest?’

The answers to the above questions are of course 3 and 30 respectively, using three 1-shapes and three 10-shapes. Now ask:

‘Can all totals between 3 and 30 be made with only three shapes?’

You might want to discuss with the pupils how they will record their solutions to this problem, e.g. as a sum or using Numicon Shapes.

Let the pupils work on their own for a time, then initiate a discussion about what they have found out.

They might tell you any of the following:

**That changing one Shape out of the three by a value of 1 will give a solution for the following number, i.e.**

$$2 + 5 + 7 = 14$$

$$3 + 5 + 7 = 15$$

$$4 + 5 + 7 = 16, \text{ etc.}$$

**That some solutions are made using consecutive numbers, i.e.**

$$2 + 3 + 4 = 9$$

**That some solutions are made using multiples of the same number, i.e.**

$$5 + 5 + 5 = 15$$

This phase comes to a natural conclusion when solutions for all numbers from 3 to 30 have been found. Now for the second phase.

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