

Name

Date

Numbers Investigation

- Take some counters or beans. Try to group them in different ways. What do you find?
- Start with 2 counters. How many ways can you group them?
Answer: one group of 2 counters, and 2 groups of 1 counter.



- Do the same with 3 counters and 4 counters. How many ways can you group them?
- Write your answers in the table below.
- Carry on until you have found out how many ways 20 counters can be grouped.
- Write all of your results in the table below.

Number of counters	Ways of grouping	Number of ways
2	1x2, 2x1	2
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

- Which numbers of counters have only 2 ways of grouping?
-

- These numbers have only 2 FACTORS: 1, and the number itself. For example, there are only 2 ways of grouping 3 counters: 1 group of 3, and 3 groups of 1, or 1x3 and 3x1, so 1 and 3 are the FACTORS of 3.
- Numbers with only 2 factors are called PRIME NUMBERS. List all the prime numbers below 20.

- By working out how many ways the numbers *below* can be grouped, or how many factors they have, find out if they are prime numbers.

Number		
27	Factors:	Prime number?
23	Factors:	Prime number?
29	Factors:	Prime number?
25	Factors:	Prime number?
31	Factors:	Prime number?
42	Factors:	Prime number?
24	Factors:	Prime number?
39	Factors:	Prime number?
41	Factors:	Prime number?
49	Factors:	Prime number?

Find out all of the prime numbers below 100.

Use a maths dictionary to find out what these words mean.

- FACTOR _____
- PRIME NUMBER _____
- MULTIPLE _____

Numbers Investigation – Teacher’s Notes

Objectives

- to count objects
- to classify objects
- to record information in a table
- to recognise and understand factors
- to recognise and understand multiples
- to recognise and understand prime numbers



Main criteria covered

Whole Numbers

N1/E1.1 Count reliably up to 10 items

N1/E2.1 Count reliably up to 20 items

N1/E3.5 Recall multiplication facts (e.g. multiples of 2, 3, 4, 5, 10)

N1/L1.5 Recall multiplication facts to 10x10, make connections with division facts

N1/L1.6 Recognise numerical relationships (e.g. multiples and squares)

N1/L2.2 Carry out calculations with numbers of any size using efficient methods

(a) understand words multiple and factor and relate them to multiplication and

division facts (b) understand the word prime and know prime numbers to 20

Handling Data

HD1/E1.3 Construct simple representations or diagrams

HD1/E2.4 Collect simple numerical information

HD1/E2.5 Represent information so that it makes sense to others (e.g. in lists, tables and diagrams)

HD1/E3.4 Organise and represent information in different ways so that it makes sense to others

Di Mellor (details below), the contributor, says:

‘This is a lesson I’ve done twice this week (successfully!) with learners from E1 to L1 - although strictly speaking it is for L2. It was differentiated in that the Entry learners got varying degrees of assistance from me and the support workers, and only did the first 10 numbers, but the L1 and L2 learners went much further with little or no help. They stopped having to move the counters and started to think in the abstract long before the Entry learners - but everyone got a great deal from it. I like group teaching where basically everyone does the same thing at different levels.

As you can see it is pinched from Bruner’s famous experiment with the beans. It works better than shading in multiples of 2, 3 etc. on a number square.’

Links

To find out more about Bruner and his cognitive learning theories visit ...

<http://www.infed.org/thinkers/bruner.htm>

<http://mercury.sfsu.edu/~ching/personal/Learning/theorists/bruner.html>

To see an interactive interpretation of Bruner’s beans ...

http://www.patsula.com/usefo/webbasedlearning/tutorial1/bruner_example.htm