

# Ordering by Numbers

'Ordering by Numbers' is a general description of some activities that can be carried out in the classroom using prepared number cards. Master copies are given here for photocopying (onto card) and cutting-up to make several different sets suitable for the purpose. A sheet of blanks is also provided for making your own.

The purpose of these activities is to

- gain familiarity with the idea of numbers being 'ordered'
- extend the ordering of positive integers to the negatives
- experience the actual work involved in the sorting needed to produce order from chaos
- recognise different ways of classifying the the same set of numbers
- practice some basic arithmetic

Many variations of the activity are possible but, we start with details of the most basic activity, and variations can then be given more briefly.

## Basic

10 pupils are arranged, standing in a straight line. Each pupil is given a number-card (face-down) from Set A - the cards having been well mixed-up beforehand. On the command "Go!" pupils may look at their card. The object now is for the pupils to change their positions so that the numbers they hold are in order. (specify - lowest at the end nearest the door, or next to the piano etc.). There is one major rule - only pupils standing **next to each other** may compare numbers and swop positions if they wish.

## Variations

- Make a competition of it by timing different 'teams' of 10.
- Make a direct race of it by having 2 teams of 10, lined-up and facing each other.
- Use bigger teams, or the whole class lined-up around the classroom.
- Pupils sit on chairs instead of standing-up. This helps to eliminate some of the *over-enthusiastic* swopping that creeps in, by making a supplementary rule that bottoms must touch the seats before the next swop is made.
- Pupils swop cards rather than their bodies, which just about ensures that the 'next to' rule is observed.
- The 'team' stand facing the class with their numbers clearly on view. The remainder of the class (one at a time) say what swops are to be made merely by calling out a pair of numbers like "eight, three". Whether the 'next to' rule is to be observed or not for this version is a matter of choice. Working in this way could lead to a discussion on the 'tactics' or 'methodology' of efficient sorting.
- Use other criteria for sorting. Perhaps something like "odds and evens" or "primes and non-primes" or "those divisible by 3 and the others" or " - - - ?". Possibly then ordering within those sub-sets.
- Include negative numbers in with the operations of addition and subtraction.
- Make a set using the operation of multiplication (or division?)
- Use sets of other types of numbers:decimals, fractions (or a mixture!).
- Use it as a human number-line to illustrate some basic operations.

Each set consists of 12 cards and the different sets available here are

Set A	Positive numbers	1	to	12
B		13	to	24
C		25	to	36
D	Miscellaneous	37	to	70
E		71	to	99
F	Negative numbers	-11	to	0

*Sets A to F can be mixed without repetition (= 72 cards)*

G	Addition yielding	3	to	14
H	Subtraction yielding	1	to	18
J	Addition yielding	9	to	24
K	Subtraction yielding	-11	to	0

*Sets H to K can be mixed without repetition (= 36 cards)*

Blank cards

Try always to work with a quantity of cards which is bigger than the number of players in the team. This is to reduce the chance of any player knowing that she or he must ultimately finish in the lowest/highest position at the outset - and moving directly to that end regardless of all the intermediate stages.

# Ordering by Numbers ~ Set A

A <b>1</b> A	A <b>2</b> A	A <b>3</b> A
A <b>4</b> A	A <b>5</b> A	A <b>6</b> A
A <b>7</b> A	A <b>8</b> A	A <b>9</b> A
A <b>10</b> A	A <b>11</b> A	A <b>12</b> A

Ordering by Numbers ~ Set B

B

13

B

B

14

B

B

15

B

B

16

B

B

17

B

B

18

B

B

19

B

B

20

B

B

21

B

B

22

B

B

23

B

B

24

B

## Ordering by Numbers ~ Set C

C

25

C

C

26

C

C

27

C

C

28

C

C

29

C

C

30

C

C

31

C

C

32

C

C

33

C

C

34

C

C

35

C

C

36

C

## Ordering by Numbers ~ Set D

D

37

D

D

38

D

D

41

D

D

44

D

D

47

D

D

53

D

D

56

D

D

59

D

D

62

D

D

65

D

D

68

D

D

70

D

## Ordering by Numbers ~ Set E

E

71

E

E

73

E

E

78

E

E

79

E

E

82

E

E

84

E

E

87

E

E

90

E

E

92

E

E

95

E

E

96

E

E

99

E

## Ordering by Numbers ~ Set F

F

0

F

F

F

F

F

-1

-2

F

-3

F

F

F

F

F

-4

-5

F

-6

F

F

F

F

F

-7

-8

F

-9

F

F

F

F

F

-10

-11



## Ordering by Numbers ~ Set G

G

G

G

G

G

G

**1 + 2   3 + 1   2 + 3**

G

G

G

G

**3 + 3   4 + 3   4 + 4**

G

G

G

G

G

G

**6 + 3   3 + 7   5 + 6**

G

G

G

G

G

G

**8 + 4   5 + 8   7 + 7**

## Ordering by Numbers ~ Set H

H

H

**8-7**

H

H

**10-8**

H

H

**9-6**

H

H

**11-7**

E

H

**10-5**

H

H

**13-7**

H

H

**11-4**

H

H

**15-7**

H

H

**18-8**

H

H

**17-4**

H

H

**19-3**

H

H

**20-2**

## Ordering by Numbers ~ Set J

$5+4$

$8+3$

$7+5$

$5+9$

$7+8$

$9+8$

$9+10$

$12+8$

$10+11$

$13+7$

$9+14$

$16+8$

## Ordering by Numbers ~ Set K

K

K

**1-12**

K

K

**3-13**

K

K

**2-11**

K

K

**6-14**

K

K

**5-12**

K

K

**9-15**

K

K

**2-7**

K

K

**4-8**

K

K

**7-10**

K

K

**7-2**

K

K

**5-6**

K

K

**8-8**

# Ordering by Numbers ~ Blank Set

—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—