

# Using the 100+ board from Direct Educational Services Ltd (DES)

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[www.mathsontrack.com](http://www.mathsontrack.com)

with in-service support on interactive uses of the board available

**Games that can be played on the 100+ board, tailored for any level, include;**

**Stop the bus**

**Target**

**Guess**

**Shuffle**

## **level A**

- read, hear and say numbers from 1-100, any horizontal or vertical line eg: 21, 22, 23, .... 30  
with an emphasis on verbalisation 6, 16, 26, .... 96
- find numbers where both digits are the same eg 11, 22, 33 .. , giving a pattern
- find numbers that need to use a 6 (say), giving a pattern
- ‘close eyes!’ and pupils have to write the missing number when they open their eyes
- show any number and pupils have to say and/or write the number that comes after and/or before
- THE BOARD CAN BE USED AS A NUMBER LINE FOR ADDITION AND SUBTRACTION eg for  $5 + 3$  turn the cube to show the 5, then slightly tilt the next three cubes to the right, but turning the third one fully to reveal the 8, or, for  $20 - 4$ , turn the cube to show the 20, then slightly tilt the next four cubes to the left, but turning the fourth one fully to reveal the 16.
- have a number hidden in your pocket (say 32), and the class gets 10 guesses to determine the number - if they guess 45 turn the 45 on the 100+ board then give a clue eg ‘45 is too big!’ - keep showing all the numbers they guess - after playing this game a few times (which is good for their listening and interpretative skills) they often start to be more systematic with their guesses - play the game once a week and keep a score - if they need more than 10 guesses you (the teacher) gets a point!
- keep the pattern going by turning a few numbers on the board in order eg 3, 4, 5, 6, ? or, 20, 19, 18, 17, ? or 34, 35, 36, 37, ?
- have a pile of cubes and get up to 10 pupils to estimate how many cubes there are in the pile - put their names onto the board at the number they each guess, then count the cubes systematically in 10’s - in order to involve the whole class discuss before you start to count, and as you count, who is most likely to have the best guess - play once or twice a week, and whoever wins always gets to defend their title in the next game.
- bond to 10 eg turn to show the 6 and there are still four grey dots to get to the 10, so 4 bonds with 6, leading to the 6+4 family ie  $6 + 4 = 10$ ,  $4 + 6 = 10$ ,  $10 - 6 = 4$ , and  $10 - 4 = 6$ .

This is a game I call 'target!' and the target number can be any number eg 6 - show the 6 as the target then turn the 2 - so you'd need to have 4 to hit the target - simply a bonding game.

**level B** (continue to reinforce some ideas already described at level A, and also more complex)

- read, say and **now write** numbers from 1-100, any horizontal or vertical line eg 41, 42, 43, .... 50, or, 90, 89, 88, .... 81, or, 9, 19, 29, .... 99, or 97, 87, 77, .... 7
- turn over some numbers to make 'number shapes' on the board, and they have to read them in order round the shape, starting at one of the corners of the shape
- 'close eyes!' and pupils have to write the missing number when they open their eyes
- show one of the numbers and pupils say (and/or write on the white board) the number that is 10 more, or 10 less, or 20 more, or 20 less etc - put into context once the number is shown eg 'there are 54 people on the bus and 20 more get on - how many people are now on the bus?', or 'there are 37 cakes on the table and 10 get eaten - how many cakes are now left on the table?'

HAVING USED THIS BOARD REGULARLY MANY PUPILS WILL BE COMFORTABLE WITH A SUM LIKE  $40 - 3 = 37$ , EVEN BEFORE THEY'VE BEEN SHOWN HOW TO EXCHANGE WITH THE WRITTEN ALGORITHM. HOWEVER, KNOWING THE ANSWER IS 37 IS A NATURAL LEAD INTO USING THE EXCHANGE ALGORITHM.

- continue to use as a number line for addition and subtraction but with more complex sums than at level A eg  $18 + 3$ , or  $38 + 3$ , or  $19 - 4$ , or  $40 - 7$ .
- start at any number and go up or down by say 2, or 3, or 4, turning the numbers as you go - discuss patterns, eg start at 3 and go up in 3's (all the way to 30?), or, start at 50 and go down in 2's
- have a number hidden in your pocket (say 79), and the class gets 10 guesses (or if they get good, less guesses) to determine the number - if they guess 38 you show the 38 then give a clue eg '38 is too wee!' - keep showing all the numbers they guess and give clues verbally
- do +/- journeys eg start at 45, subtract 10, then add 3 (get to 38), or, do direction journeys eg start at 58, go down 3 squares, go left 4 squares (get to 84) - both good for listening skills
- get pupils to come to the board and turn all the numbers which are;  
less than 20 and greater than 17 or,  
less than 17 and belong to the 3 times table or,  
even between 40 and 50 or  
odd between 10 and 20
- show a line from say 30 - 40 (using all eleven cubes in a row) and turn the 33 to the grey dot - then ask the question 'is 33 nearer to 30 or 40?' - the answer is definitely '30' - so the board is good for rounding two digit numbers (visually) to the nearest 10.
- THE BOARD COMES INTO ITS OWN FOR THE LEARNING OF TABLES - for level B these are the 2, 3, 4, 5 and 10. For the 2 times table, have all the grey dots showing then turn over the 2 and keep adding on 2 to create, **by repeated addition**, the 2 times table to 20 (I refer to this as the big picture). It helps pupils learn their tables can come simply from repeated addition, and the board offers a clear visual picture for this approach. The 'big picture' can also be used to show  $\div$ . Use the other facility to show the 2 times table in a single line (I refer to this as the 'quick picture').

- Use the 'quick pictures' of the 2 and 4 times tables (along with the 1 times table) to find a half or a quarter of quantities in the 2 and 4 times tables.
- keep the pattern going by turning a few numbers on the board in order eg 3, 13, 23, 33, ?  
87, 77, 67, 57, ?  
32, 34, 36, 38, ?
- Play 'target!' and the target number can be any number (say to 20) eg 16 - show the 16 as the target then turn the 9 - so you'd need to have 7 to hit the target - simply a bonding game.

**level C** (continue to reinforce some ideas already described at level B, and also more complex)

- THE BOARD COMES INTO ITS OWN FOR THE LEARNING OF TABLES - for level C these now include the 6, 7, 8 and 9. For the 6 times table, have all the grey dots showing then turn over the 6 and keep adding on 6 to create, **by repeated addition**, the 6 times table to 60 (I refer to this as the big picture). It helps pupils learn their tables can come simply from repeated addition, and the board offers a clear visual picture for this approach. The 'big picture' can also be used to show  $\div$ . Use the other facility to show the 6 times table in a single line (I refer to this as the 'quick picture').
  - Use the 'quick pictures' of the 3 and 5 times tables (along with the 1 times table) to find a third or a fifth of quantities in the 3 and 5 times tables.
  - continue to use as a number line for addition and subtraction but with more complex sums than at level B eg  $24 + 13$ , or  $39 + 11$ , or  $29 - 12$ , or  $40 - 15$ . Continue to put the questions into context eg 'there are 24 pupils and 13 more join them - how many pupils are there now?', or, 'there are 29 cakes on a plate and 12 get eaten - how many cakes are left?'
  - start at any number and go up or down by say 5, or 6, or 7, turning the numbers as you go - discuss patterns, eg start at 4 and go up in 6's (all the way to 100?), or, start at 53 and go down in 5's (more complex than at level B) - this can be extended by starting at 40p and adding on 60p (the same as starting at 4 and adding on 6)
  - do +/- journeys on the board (more complex 'stop the bus' than at level B) eg start at 45, subtract 30, then add 6 (get to 21) - good for listening skills
  - tell / turn all the numbers which are less than 43 and greater than 36, or,  
tell / turn all the numbers which are less than 32 and belong to the 6 times table  
tell / turn all the numbers between 40 and 50 which belong to both the 6 and 7 times tables  
- these are all activities which help to promote listening skills and are interactive
  - **finding remainders are at level C** and can be difficult for some pupils - the 100+ board gives a visual way of finding remainders. Have the board showing all the numbers, and choose one of the times tables to use. If using the 6 times table, turn all the numbers that belong to the 6 times table to the grey dot. Then for  $20 \div 6$ , there will be 3 grey dots (to 18) and two numbers left showing beyond where the 18 'stepping stone' would be. So pupils can see the 2 remainder.
  - find change from £1 eg for 30p, or 75p etc by showing all the grey dots then turning the number that is spent - the pupils have to mentally calculate the change, and confirm the answer by turning to show the red number - turning backwards and forwards from the white to/from the red gives a clearer confirmation that the two numbers add up to 100.
  - keep the pattern going by turning a few numbers on the board in order eg: 3, 11, 19, 27, ?  
87, 83, 79, 75, ?  
38, 47, 56, 65, ?
- (due to the visuality of the board pupils will generally be able to spot patterns of more complex sequences than if they were simply given the numbers).

- using the above technique simple 'functions' can be introduced by asking 'what is the rule?' eg for 5, 7, 9, 11 ? the rule (or function) would be +2, giving 13 as the next term in the pattern
- use the tables facility to find  $\frac{1}{3}$  of 18, or  $\frac{1}{5}$  of 30, and 'visualising' where the answer lies on the board
- Play games such as 'target!' and the target number can be any number (say to 100) - show the 100 as the target then turn the 85 - so you'd need to have 15 to hit the target - simply a bonding game, or shuffle, bus driver and guess appropriate for level C.

## **level D** (continue to reinforce some ideas already described at level C, but now more complex)

- although all tables to 10 should be done (and known) on completion of level C the board can be used to stimulate more complex times tables which reinforce the level C eg show the 6 times table and use it as a support for the 60 times table, the 600 times table, the 60p times table (involving decimal money) and the 0.6 times table.
- use board to support level D requirement of mental addition and subtraction of 2 digit numbers eg  $47+38$  or  $62-35$  eg turn the 47 and count down 30 more then 8 more and arrive at the 85, or, turn the 62 and count 30 up the board then 5 less and arrive at the 27.
- continue to find change from £1 (but more complex than at level C) eg for 32p, or 78p etc by showing all the grey dots then turning the number that is spent - the pupils have to mentally calculate the change, and confirm the answer by turning to show the red number
- keep the pattern going by turning a few numbers on the board in order (but more complex than at level C) eg 3, 25, 47, 69, ? or, 87, 68, 49, 30, ? and continue to associate a number pattern with a function' and asking 'what is the rule?' eg for 3, 25, 47, 69, ? the rule (or function) would be +22, giving 91 as the next term in the pattern - when the pattern is shown on the board it is much more accessible pattern to spot than just a string of numbers.
- use the tables facility to find now  $\frac{2}{3}$  of 18, or  $\frac{3}{5}$  of 30
- use the tables facility to show equivalent fractions such as  $\frac{1}{2}$  is the same as  $\frac{4}{8}$  etc, and if  $\frac{1}{2} = 50\%$  then  $\frac{6}{12}$  is also 50%
- start at 4 and add on 6 all the way to the end of the board (at B) could be extended by interpreting as starting at 0.4 and adding on 0.6

## **level E** (continue to reinforce some ideas already described at level D, but now more complex)

- add and subtract involving negative numbers - use as a number line similar to the approach taken at level A eg for  $2 - 7$  turn the cube to show the 2, then slightly tilt the next seven cubes, but turning the seventh one fully to reveal the -5, or, for  $-8 + 5$ , turn the cube to show the -8, then slightly tilt the next five cubes, but turning the fifth one to reveal the -3.
- find difference from 1 eg for  $1 - 0.32$ , turn the 32 to reveal the 68, so  $1 - 0.32 = 0.68$  (continue to express the sums in contexts eg 'a block of ice which weighed 1 kg loses 0.32kg of weight due to melting - what is the weight of ice remaining?')
- keep the pattern going by turning a few numbers on the board in order (but more complex than at level D) eg 11, 7, 3, -1, ? or, -19, -13, -7, -1, ? and continue to associate a number pattern with a 'function' and asking 'what is the rule?' eg for 11, 7, 3, -1, ?, the rule (or function)

would be -4, giving -5 as the next term in the pattern

- equivalent fractions (but more complex than at level D) eg  $\frac{2}{3}$  is the same as  $\frac{10}{15}$  etc
- use the tables facility to find now  $\frac{2}{3}$  of 1800 or 1.8, or  $\frac{3}{5}$  of 300, and 'visualising' where the answer lies on the board, which can be extended into level F by finding  $\frac{3}{5}$  of 3

The 100+ board is an excellent resource for numeracy and can be ordered from **Direct Educational Services (DES)** on **01582 504826** or **0800 043 4142**, or, by contacting **Tom Renwick** directly on **0141 332 2692** (e-mail **tom@mathsontrack.com** and visit **www.mathsontrack.com** for in-service/CPD support on interactive uses of the 100+ board)

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