

## LESSON 5 - BASIC PROGRAMMING - LOOPS

**Loops** - Structures in programming that allow the repeated execution of a block of statements. There are two kinds of loops - FOR loops and DO loops. This lesson will show you how to use the FOR loop.

**FOR Loops:** Type the following programs in. Run them and learn how they work. You will use these to do the original programs you have to create.

Ex. 1) ! Counting to 100

For x = 0 to 100

Print x

Next x

End

! tells the number of times to do loop

! prints the value of x

! makes the program repeat the loop with next #

Ex. 2) ! Counting to 10000 on one line

For x = 0 to 10000

Print x;

Next x

End

! causes the printing of each number to stay on 1 line

Ex. 3) ! Name all over the place

Input prompt "Please enter your first name. "; Name\$

For x = 0 to 2000;

Print Name\$;

Next x

End

Ex. 4) ! Timer for 1 second

For x = 0 to 740

Next x

Print "One second is up."

End

Ex. 5) ! Printing in zones

Print "Number", "Square", "Cube"

For n = 1 to 15

Print n, n^2, n^3

Next n

End

! the comma puts the number, its square and its cube in three zones.

### Steps in FOR Loops:

Ex. 6) ! Counting by halves

For x = 0 to 10 step .5

Print x

Next x

End

Ex. 7) ! Going backwards

For x = 100 to 0 step -1

Print x;

Next x

End

### Exiting a FOR Loop when a certain condition is met:

Ex. 8) ! Finding the first number whose cube is > 1000

For x = 1 to 100

if x ^ 3 > 1000 then exit For

Next x

Print "The first number whose cube is greater than 1000 is "; x

End

### Nested Loops - One loop inside another:

Ex. 9) ! Finding the first 10 multiples of the numbers 1 - 5  
For x = 1 to 5  
    For y = 1 to 10                      ! Gives the 1st ten multiples of 1, then 2, then 3, then 4,  
        Print x \* y  
    Next y  
Next x  
End

### Summing using a loop:

Ex. 10) ! Summing a group of numbers  
Input n                                   ! Enter number to sum to  
Let sum = 0                              ! Start sum at zero  
For i = 1 to n  
    Let sum = sum + i                   ! Add each number to previous sum  
    Print i;                             ! Print current number  
    If i = n then exit for             ! Exit loop when the last number is reached  
    Print "+";                         ! Put a plus sign between each number  
Next i  
Print " = "; sum                       ! Place an equal sign after all numbers and give sum  
End

### Assignment:

1. Create a program that fills the screen with a wallpaper design. (Hint - use program 3 as a guide) Start your program with your name and room number on the first line and the name of the program on the second. Save your program as **Wallpaper**. **Have it checked by me before printing it out.**
2. Create a program that will display the negative multiples of 5 from -200 to -5. (Hint - use programs 6 and 7 as guides) Start your program with your name and room number on the first line and the name of the program on the second. Save your program as **Multiples of 5**. **Have it checked by me before printing it out.**
3. Create a program that will print out a number and its square root. Put the numbers in zones. Do this for the numbers 1 through 10. Start your program with your name and room number on the first line and the title of the program on the second. **Have it checked by me before printing it out.** Save the program and **Square Roots**. (hint - use program 5 as a guide)
4. Create a program that will do the countdown for NASA when they send up the next space shuttle. There must be a pause (timer) between each number equal to 1 second. Display the comments that the announcer would give when the countdown is done. You will need to use a nested loop. (Hint - Use programs 4 and 9 as guides.) Start your program with your name and room number on the first line and the name of the program on the second. Save your program as **Countdown**. **Have it checked by me before printing it out.**