



In this second lesson for Unit 4 you will learn about the **While...End** loop. We'll compare it to the **For...End** loop and even show why it is more powerful and versatile than the **For...End** loop.

Objectives:

- Learn the structure of the **While...End** loop.
- Compare it to the **For...End** loop.
- See how it is used to ensure valid input values.

The While... End Loop

The **While...End** loop will continue looping as long as its <condition> is True. It looks like this:

```

While <condition>
  <loop body>
End

```

Notes

The <condition> is a logical expression such as **X>0**.

The <loop body> is any set of statements, including other loops and **If** structures. It is processed whenever the <condition> is True.

The keyword **End** is used to indicate the bottom of the <loop body>. At the **End** statement the program loops back to the **While** statement and tests the <condition> again.

'Initialize' the **While**'s condition: establish a value so that the condition is properly established as True or False. If the initial condition is False the loop is completely skipped. If the condition is True then the loop body is processed. The **0→K** at the top of this program sets the initial condition to False. Without it there's no way of knowing what will happen because any value could have been stored in the variable **K** before the program runs.

Somewhere in the <loop body> there should be a statement that will have an effect on the <condition> so that the loop will eventually end and statements after the loop will be processed. Usually this statement is near the bottom of the <loop body>. **K+1→K** ensures that eventually **K** will be greater than 10.

```

NORMAL FLOAT AUTO REAL RADIAN MP
PROGRAM: WHILE
:0→K
:While K≤10
:Disp K
:End

```

An 'infinite' loop! Why?

```

NORMAL FLOAT AUTO REAL RADIAN MP
PROGRAM: WHILE
:0→K
:While K≤10
:Disp K
:K+1→K
:End

```

What will this program do?

Teacher Tip: It's important to stress that the **While** loop might not be processed at all. In the next lesson we discuss the **Repeat** loop which is always processed at least once. This is a subtle but important distinction.

There are three components to building a successful **While** loop: **Initialize, test, and change**:

- **Initialize** a variable.
- **Test** a condition based on that variable.
- **Change** the variable so that eventually the condition becomes false so that the loop will terminate.

