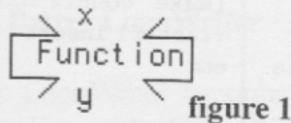


The Battle of the Functions Game

by Gary S. Stager

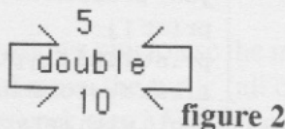
This game is designed to help students understand the concept of mathematical functions and operations. Students will learn how to create Logo reporters and practice their mental arithmetic skills.

For the purpose of this activity we will define a function as a procedure which takes one number as input and outputs one number. The inputted number will be operated on by the function and the result will be reported (figure 1.)



You can think of the function as having an input, X, and an output, Y. The following function can be represented visually 1) as a function machine (figure 2), as a Logo procedure, or 3) as the algebraic equation $y = 2x$.

```
to double :number
output :number * 2
end
```



The beauty of Logo reporters is that they can pass values/data or "talk" to each other. Create the double procedure found above and try typing the following Logo expressions to demonstrate value passing:

```
Show double 5
Show double split double triple 5
```

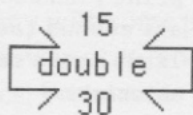
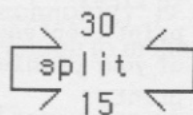
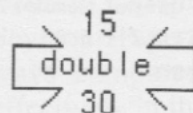
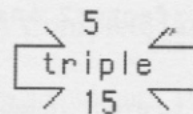


Figure 3 illustrates how values are passed from one function (machine) to another. 5 goes into triple and 15 comes out. 15 goes into double and 30 comes out. 30 goes into split (divide by 2) and 15 comes out. 15 goes into double and 30 comes out. 30 reports to Show and is displayed in the command center (screen). *Note: You need to create the triple and split procedures for this to work.*

figure 3 Were you able to solve this problem in your head?

Sample Function Procedures

```
to triple :number      to add5 :number
output :number * 3    output :number + 5
end                    end

to split :number       to times6 :number
output :number / 2    output :number * 6
end                    end
```

Note: All of the graphics in this article were created with LogoWriter for the Macintosh.

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