

Essential Objects

Class	Description
Part	A physical brick in the world.
Model	A container for Parts.
Folder	A container for Scripts and value objects.
Script	A container for <i>Lua</i> source code.
LocalScript	A Script that runs its code on a client.

Basic math functions

Operation	Description
$a + b$	Adds a and b .
$a - b$	Subtract a and b .
$a * b$	Multiply a and b .
a / b	Divides a by b .
$a \% b$	Remainder of a divided by b .

Function	Description
<code>math.random(n)</code>	Returns random number from 1 to n (no negatives).
<code>math.random(a, b)</code>	Returns random number from a to b .
<code>math.max(...)</code>	Returns the largest number.
<code>math.min(...)</code>	Returns the smallest number.

Basic math functions (cont)

<code>math.floor(n)</code>	Rounds n down.
<code>math.ceil(n)</code>	Rounds n up.
<code>math.abs(n)</code>	Returns absolute value of n .
<code>math.sqrt(n)</code>	Returns square root of n .
<code>math.pi</code>	Approx equal to 3.14159

It's important to work out problems by hand before translating their solutions into code. Algebra is necessary for success. Read about all math functions here.

String functions

Operation	Description
$a .. b$	Combine two strings.

Function	Description
<code>string.len(str)</code>	Returns length of <code>str</code> .
<code>string.upper(str)</code>	Returns <code>str</code> in upper-case.
<code>string.lower(str)</code>	Returns <code>str</code> in lower-case.
<code>string.reverse(str)</code>	Returns <code>str</code> in reverse.
<code>string.rep(str, n)</code>	Returns <code>str</code> repeated n times

String functions (cont)

<code>string.sub(str, a, b)</code>	Return substring of <code>str</code> from a to b .
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A **string** is a collection of characters, or text. An example of a string property is the `Name` property. Read all string manipulation functions here.

Tables

```

local list = {1, 2, 3}
local firstNum = list[1]
list[2] = 4
print( " There are " .. #list ..
" number s")
local total = 0
for i = 1, #list do
    total = total + list[i]
end
print( "The total is " .. total)

```

Tables are a collection of values. They are defined using curly braces `{}` with values separated by commas. Access the values inside using square brackets `[]`. Tables are sometimes called **arrays**. Use a **for** loop to work with all items in a table individually. The `:GetChildren()` method returns a table of children in an object.



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 Page 1 of 3.

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Constants

game	Parent of all game services.
workspace	Container for all bricks and models are stored.
script	The currently running script.

Finding Objects

```
workspace.Part:Destroy()
print( script.Parent.Name)
game.Serv erS tor age.Tr ee: -
Clone()
```

Use a period to access an object's children.
Use .Parent to access an object's parent.
Use constants like game, workspace, and script to identify objects in the hierarchy.

Creating objects

How do I create an object?

Using `Instance.new (class)` and setting the parent:
`object.Parent = parent`

How do I access an object's properties?

Use a period (.):
`print(object.Name)`

How do I set an object's properties?

Use a period (.) and equals sign (=):
`part.T ran spa ncy = .5`

How do I destroy an object?

Using `object :De stroy()`

Creating objects (cont)

How do I copy a preexisting object?

Using `object :Cl one()` and setting the parent:
`newTree = workspace.Tree:Clone()`
`newTree.Parent = workspace`

General Object Functions

Method name	Description
<code>:FindFirstChild(name)</code>	Return a child with <code>name</code> or <code>nil</code> if it doesn't exist.
<code>:WaitForChild(name)</code>	Pauses until a child with a name exists and returns it.
<code>:IsA(className)</code>	Return whether the object is a certain type of object.
<code>:Clone()</code>	Makes and returns a copy of an object.
<code>:Destroy()</code>	Permanently delete an object.
<code>:GetChildren()</code>	Return a list of an object's children.

These are functions (aka methods) for all classes of ROBLOX objects. Read about all methods here.

Event basics

```
function onTouch(part)
    print( par t.Name .. "
    touched me!")
end
worksp ace.Pa rt.T ou che d:c -
onn ect (on Touch)
```

Events are specific occurrences relating to objects. When an event **fires**, or occurs, all connected functions are called.

Basic functions

`wait (n)` Wait `n` seconds then continue.
`print (...)` Display something in the Output window.

Variables

```
local myScore = 5
myScore = myScore + 1
print( myS core)
local myName = " Ozz y"
print( "My name is " .. myName)
```

Variables store data of any kind - numbers, strings, tables, objects or `nil` (nothing). A **local** variable is only accessible in the block of code it is defined in.



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Page 2 of 3.

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If statements

```
if
workspace:FindFirstChild("Tree")
then
    print( " There is a tree
here.")
end
if coins < 5 then
    print( "You need more
money." )
else
    print( "You have enough
money! ")
end
if player.Name == " Jake" then
    print( "You are an
awesome guy, Jake")
elseif player.Name == " Sal ly"
then
    print( "You are a
sweeth eart, Sally")
else
    print( "You are a pretty
cool person ")
end
```

If statements will run their code if the value between **if/then** is true (or not nil). They can one an **else** block, or any number of **elseif** blocks.

Loops

Numeric for loop

For counting numerically.
Example: Count from 1 to 5:
for i = 1, 5 **do**
 print(i)
end

Generic for loop

Most often used for object children.
Example: Print all children in object:
for i, child **in** pairs(object:GetChildren()) **do**
 print(child.Name)
end

While loop

Perform code until a condition is false.
Example: Remove all children named 'Ball'
while object:FindFirstChild("Ball") **do**
 object.Ball:Destroy()
end

Repeat-until loop

Perform code once, then again until a condition is true.
Ex.: Copy objects until there are 5.
repeat
 newObject = object:Clone()
 newObject.Parent = workspace
 wait(1)
until #workspace:GetChildren() >= 5

Loops are used to **iterate**, or repeat code a number of times.

Function examples

```
function sayHello()
    print( " Hello, world")
end
sayHello()
function addTwo Num bers(a, b)
    print( "The sum is:", a +
b)
end
addTwo Num bers(3, 5)
function calcul ate Squ are(n)
    do
        return n * n
    end
local result = calcul ate Squ -
are(3)
```

A function is a named block of code that can be run anywhere in code by **calling it** by name. Functions can have **arguments** (given values) and/or **return** values.



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