










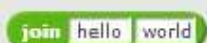
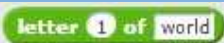




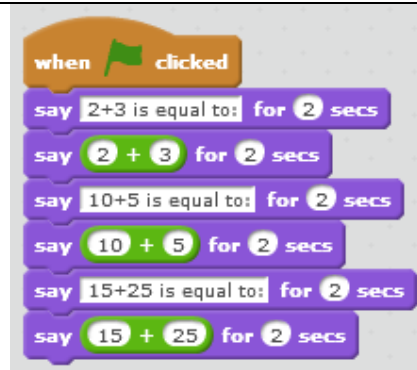
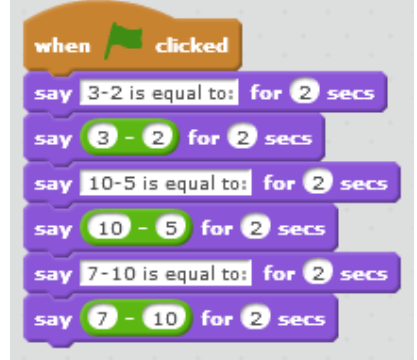
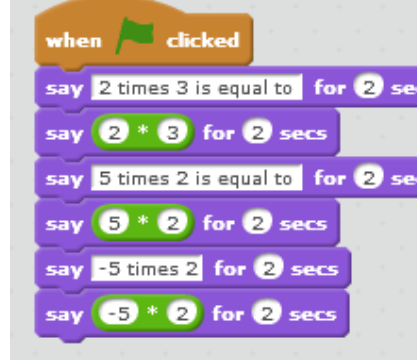
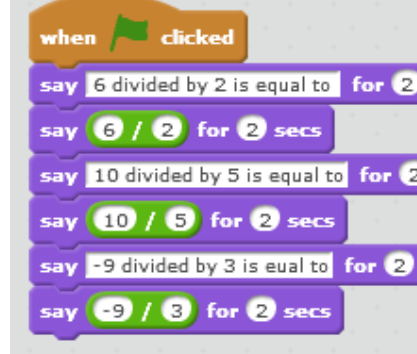


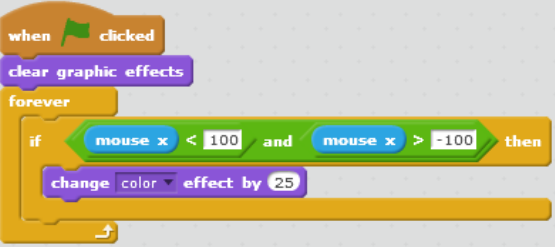
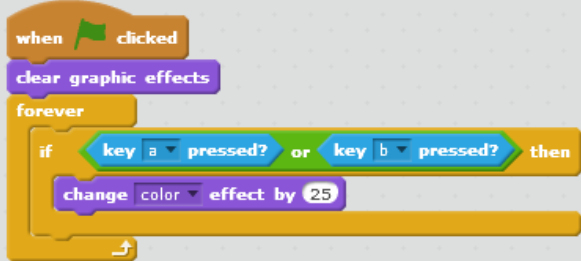
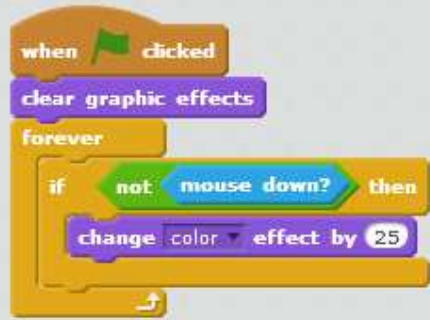


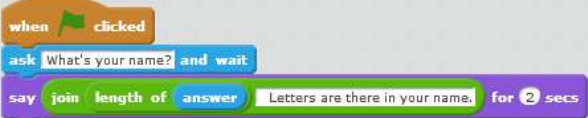
## Operator Blocks - Working with Numbers

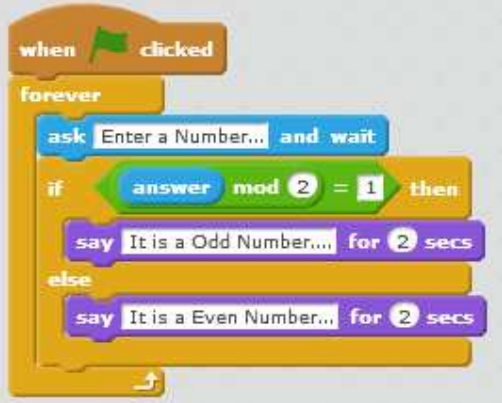



Numbers blocks perform arithmetic operations, generate random numbers, and compare numeric values to determine their relationship to one another. Numbers blocks are green. There are numbers blocks that can be used to round numeric values and to execute a host of mathematical functions like determining absolute value or square root of a number.

Operator Block	Description
	Adds two numbers together and generates a result.
	Subtracts one number from another and returns the result.
	Multiplies two numbers together and generates a result.
	Divides one number into another and returns the result.
	Generates a random number within the specified range.
	Returns a Boolean value of true or false, depending on whether one number is less than another.
	Returns a Boolean value of true or false, depending on whether one number is equal to another.
	Returns a Boolean value of true or false, depending on whether one number is greater than another.
	Returns a Boolean value of true or false, depending on whether two separately evaluated conditions are both true.
	Returns a Boolean value of true or false, depending on whether either of two separately evaluated conditions is true.
	Reverses the Boolean value from true to false or false to true.
	The two given values placed next to one another.
	The definite character of the given value.
	The measurement of the given value.
	Retrieves the remainder portion of a division operation between two numbers.
	Returns the nearest integer value for a specified number.
	Returns the result of the selected function (abs, sqrt, sin, cos, tan, asin, acos, atan, Ln, log, E^, and 10^ ) when applied to the specified number.

Sl. No	Activity Name	Activity Image
1	Addition - Operator	 <p>when green flag clicked</p> <p>say 2+3 is equal to: for 2 secs</p> <p>say 2 + 3 for 2 secs</p> <p>say 10+5 is equal to: for 2 secs</p> <p>say 10 + 5 for 2 secs</p> <p>say 15+25 is equal to: for 2 secs</p> <p>say 15 + 25 for 2 secs</p>
2	Subtraction - Operator	 <p>when green flag clicked</p> <p>say 3-2 is equal to: for 2 secs</p> <p>say 3 - 2 for 2 secs</p> <p>say 10-5 is equal to: for 2 secs</p> <p>say 10 - 5 for 2 secs</p> <p>say 7-10 is equal to: for 2 secs</p> <p>say 7 - 10 for 2 secs</p>
3	Multiplication - Operator	 <p>when green flag clicked</p> <p>say 2 times 3 is equal to for 2 secs</p> <p>say 2 * 3 for 2 secs</p> <p>say 5 times 2 is equal to for 2 secs</p> <p>say 5 * 2 for 2 secs</p> <p>say -5 times 2 for 2 secs</p> <p>say -5 * 2 for 2 secs</p>
4	Division - Operator	 <p>when green flag clicked</p> <p>say 6 divided by 2 is equal to for 2 secs</p> <p>say 6 / 2 for 2 secs</p> <p>say 10 divided by 5 is equal to for 2 secs</p> <p>say 10 / 5 for 2 secs</p> <p>say -9 divided by 3 is equal to for 2 secs</p> <p>say -9 / 3 for 2 secs</p>

5	Pick Random	<pre> when green flag clicked say My favorite number is for 2 secs say pick random 1 to 100 for 2 secs </pre>
6	Random Art	<pre> when green flag clicked clear set pen size to 3 pen down forever change pen color by 10 go to x: pick random -240 to 240 y: pick random -180 to 180 </pre>
7	Comparison Operator - Less Than	<pre> when green flag clicked clear graphic effects forever if mouse x &lt; 0 then change color effect by 25 </pre>
7	Comparison Operator - Equal	<pre> when green flag clicked ask What is 5 + 2 is equal to ? and wait if answer = 7 then say Good, Correct Answer! for 2 secs else say 5 + 2 is equal to 7 for 2 secs </pre>
8	Comparison Operator - Greater than	<pre> when green flag clicked clear graphic effects forever if mouse x &gt; 0 then change color effect by 25 </pre>

8	Logical Operator -AND	 <pre> when clicked clear graphic effects forever   if (mouse x &lt; 100 and mouse x &gt; -100) then     change color effect by 25 </pre>
9	Logical Operator -OR	 <pre> when clicked clear graphic effects forever   if (key a pressed? or key b pressed?) then     change color effect by 25 </pre>
10	Logical Operator -NOT	 <pre> when clicked clear graphic effects forever   if (not mouse down?) then     change color effect by 25 </pre>
11	Joining Words	 <pre> when clicked ask 'What's your name?' and wait say 'join Hello! answer' for 2 secs </pre>
12	Finding Letters in a word	 <pre> when clicked ask 'What's your name?' and wait say 'join Your Name Starts with letter 1 of answer' for 2 secs </pre>
13	Finding No. of letters in a word	 <pre> when clicked ask 'What's your name?' and wait say 'join length of answer' 'Letters are there in your name,' for 2 secs </pre>

14	Modulus operator	
12	Round Operation	
13	Built-in Mathematical Functions	
14	<p>Understanding the Mathematical Order of Precedence.</p> <p>(Like all programming languages, Scratch evaluates the components of mathematical expressions by following a specific order, referred to as the order of precedence. Specifically, Scratch evaluates an expression using a top-down approach.)</p>	

### Working with Built-in Mathematical Functions:

In addition to all of the mathematical operations that you can put together using the numbers code blocks previously discussed in this chapter, Scratch provides one additional multi purpose code block. This code block is designed to perform any of 12 different mathematical functions, which can be selected from the code block's drop-down list. The functions that this code block can perform are outlined in the following list:

- abs.** Returns the absolute, non-negative value of a number.
- sqrt.** Returns the square root of a number.
- sin.** Returns a value representing the sine of an angle.
- cos.** Returns a value representing the cosine of an angle.
- tan.** Returns a value representing the tangent of an angle.
- asin.** Returns the arc sine for the specified numeric value.
- acos.** Returns the arc cosine for the specified numeric value.
- atan.** Returns the arc tangent for the specific numeric value.
- ln.** Returns the inverse of the natural exponent of a specified value (i.e., the opposite of  $e^x$ ).
- log.** Returns the natural log of a number.