



Objective 5:

Understand how to use arithmetic operations and random numbers

In this objective you learn how to perform mathematical calculations using power, modulus and integer division. Random numbers allow for some unpredictability which is useful for games.

Tasks

1. Try entering the following program to see how arithmetic operators work:

```
#Get user input
number1=int(input("Enter first number: "))
number2=int(input("Enter second number: "))

#Make calculations
power_of_result = number1 ** number2
division_result = number1 / number2
integer_division_result = number1 // number2
modulus_result = number1 % number2

#Output results
print()
print(number1,"to the power of",number2,"is",power_of_result)
print(number1,"divided by",number2,"is",division_result)
print(number1,"divided by",number2,"is",integer_division_result)
print(number1,"divided by",number2,"has a remainder of",modulus_result)
```

2. Try entering the following commands and see what happens:

```
import random
#Roll the dice
random_number = random.randint(1,6)
print("You rolled a",random_number)
```

Note `import random` at the top of the program. For Python to generate a random number it needs the `randint` method which is not in the default set of commands Python understands. Instead it is defined in a library of methods, called 'random'. You can import additional commands from libraries into your program.

3. Change the program so that it outputs a 10 sided dice.
4. Change the program so the user can choose to roll a 4, 6 or 12 sided dice.



Objective 5: Key learning points

How to use arithmetic operations and random numbers

- / and // both perform division. // gives an integer answer.
- **Modulus** is the remainder of a division. E.g. 8 divided by 5 is one with 3 left over (remainder)

Mathematical operators that can be used in conditions include:

+ addition	** power of
- subtraction	// integer division
* multiplication	% modulus (remainder after division)
/ division	

Objective 5: Key words

`import`

Example code: `import random`

Imports a set of library routines into the program to be used.

`random.randint`

Example code: `x = random.randint(1,y)`

x becomes a random number between 1 and y.