The base exponential function is $y = a(b)^x$

a represents the initial amount

b represents the rate it is changing by

Sometimes a rate is given in terms of a percent.
If the event is increasing by a given percent it is a growth function
If the event is decreasing by a given percent it is a decay function

Base	Growth	Decay
$y = a(b)^x$	$y = a(1 + r)^x$	$y = a(1 - r)^x$
a= initial value →		
b = rate (whole number)	**r = percent (IN DECIMAL FORM!)** →	

USING PERCENTS IN AN EQUATION

- Increasing by 25%
  .25
  1+.25 = 1.25
- Increasing by 2.3%
  .023
  1+.023 = 1.023
- Decreasing by 25%
  .25
  1-.25 = .75
- Decreasing by 4%
  .04
  1-.04 = .96

INCREASE BY 10%.
.1
1+.1 = 1.1

DECREASE BY 10%
.1
1-.1 = .9

EXAMPLE 1-BASE FUNCTION

Four bunnies are left on an island. The amount of bunnies is tripling every month. Write a model to represent this function and determine how many bunnies will be on the island after a year.

$y = 4(3)^x$

$4(3)^{12}$

2,125,764 BUNNIES! AHH!

EXAMPLE 2: GROWTH FUNCTION

The cost of tuition and room for a 4 year state university averages $20,090. The average increase in cost is about 9% each year. How much can you expect to pay for tuition when you graduate in 4 years?

$y = 20090(1.09)^x$

.09
1+.09 = 1.09

$20090(1.09)^4$

$28,358.69

EXAMPLE 3: DECAY FUNCTION

You bought a new iPhone 7 for $649. The price of the iPhone depreciates about 44% each year. How much can you predict you could sell your iPhone for two years from now?

$y = 649(.56)^x$

.44
1-.44 = .56

$649(.56)^2 =$

$203.53