**Morse code**

Dot and dashes

Length of dash is three times that of dot and pause is equal to the duration of dot

Letters in same word are separated by the duration of 1 dash or 3 dots

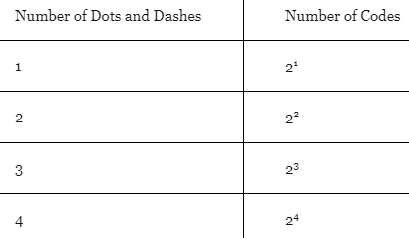
Words are separated by 2 dashes or 6 dots

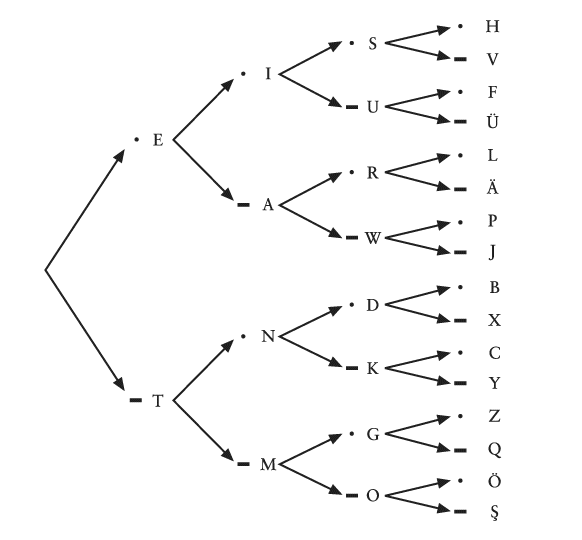
Code, is a system of transferring information between man and machine

SOS, international distress signal is 3 dots, 3 dashes and 3 dots

Speech is about 100 words per minute

See the arrangement below

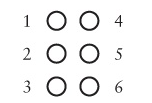




Easy way to back track from the dots and dashes to the letters

**Braille**

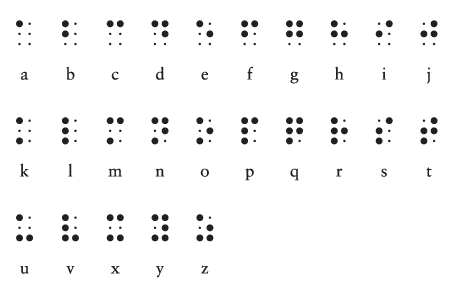
Charles barbier, captain of French army devised a writing method of raised dots and dashes to be used in night. Louie Braille advanced this system to be simpler and devised his system which is still used.



Bigger ones are raised and smaller ones are not



Each dot can either have 2 options, so the total possibilities of representation is 2^6 = 64



I figured, easy way to remember would be, if the dots are in the first 4 then it is within a-j and then if the bottom 2 dots are active then it is u-z and then rest is k-t

**Electricity**

Dislodge electron from the atom in a conductor and bring that under the influence of an electric field such that it moves in the right direction.

Even the electrons out

One atom loses another gain

Chemical reaction in a battery is engineered such that excess electrons are generated at minus and a deficit is created at positive terminal

Negative is anode and positive is cathode

Best conductors are copper, silver and gold

Longer a wire, higher the resistance

Thicker wire means less resistance. Using a pipe analogy, bigger the cross section the water can move smoothly compared to the smaller one.

Voltage is the potential to do work

To get 1amp of current you need 6.240 x 10^18 electrons flowing past a point per second

Ohms Law V = IR

Dry air molecules have very high resistance hence the circuit is open when you hold out a battery in the air

Tungsten inside a bulb glows in vacuum where it does not heat up

Batteries are connected in series

Power P = V x I

100 - 200 milli Amps is lethal

Common, is the part of the that is shared between two circuits

The common can be replaced with earth

Bigger the better, so earth is a very good conductor

To establish connection with earth, you need a large surface area, preferably eight feet pole with ½ inch diameter

Since the setup is same at your house and your friend’s house, the earth can be used as a connector

The resistance of earth is too much for simple applications, hence you need high voltage

+ And – will complete circuit

-And ground will complete

But Positive and ground wont

It is either called positive or neutral, it is better not to call positive because AC current keeps changing direction

Either call hot or neutral

95% of the internet traffic is routed on the transatlantic cables submerged deep in the oceans

Communicating through the satellites is very expensive and has less bandwidth

The transatlantic cables were first established way back in 1860 for telegraphic communication using Morse code

Now they use heavy duty cable for the same job, submerged at about 6000 meters undersea

It seems all the financial data is sent using separate cables that transfer data faster

**Back to Morse**

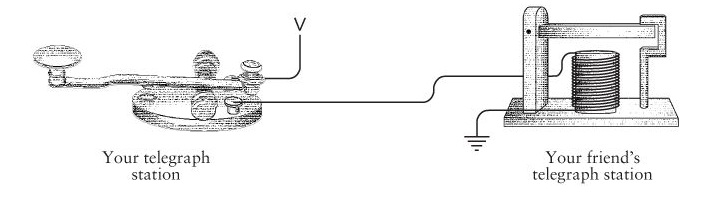
Take an iron bar, run some wires to it and then supply current and that bar becomes a electro magnet

What hath god wrath

What has god done, was the first message sent on telegraph

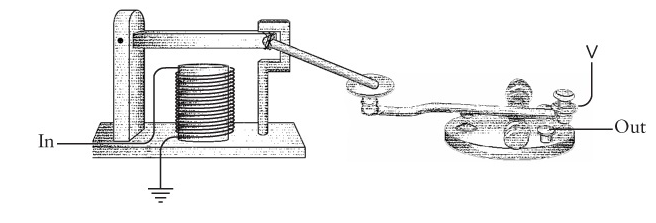
Earliest telegraph created by Morse would use electro-magnetism to automate the sending of message

Dot and dash



As you pressed the switch on telegraph that will send the electricity down the receiver end and do some mechanical work using the electro magnet

Connect the sounder systems at the receiver to key and you got a relay system that is basically repeating the message which is required for long distance communication of the time



**Numbers**

The number system that we use today is the Indo-Arabic system

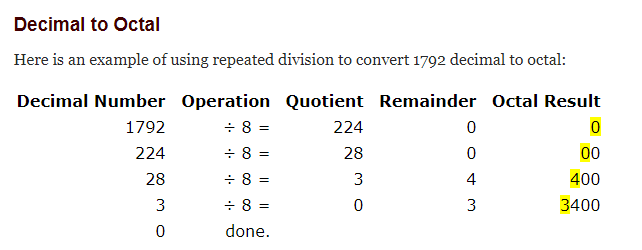
Zero is the major contribution of Indian system, zero

Octal system 0, 1,2,3,4,5,6,7

There is no 8 as in there is no special symbol for ten in decimal

So next would be 10, 11, 12, 13, 14, 15, 16, 17, and 20

Numbers of fingers cartoons have 8 to the base ten or 10 to the base eight



Do the octal addition and multiplication the same as addition

Whenever the numbers becomes big replace with octal equivalent

Binary number system bridges the gap between the arithmetic and electricity

Binary digit is bit

**Bit**

Log 128 to the base 2 gives 7

What this means, you need 7 bits for 128 possibilities

Depending upon the sensitivity of the camera reel, which is established either through 1 or 0 through silver and black, the camera will then adjust the light exposure to match the camera reel