Neuron - a node that holds a number
- **Activation -** the number in a neuron

Hidden Layers - neurons in hidden layers represent abstract patterns where structure is hard to find
- *Second last has components, third last has subcomponents, etc, etc.*

Perceptron -
- **Multilayer Perceptron -** A network where all nodes in one layer are connected to the next, with at least one hidden layer

Speech Recognition - picking out sounds that make syllables that make words, etc

Weights - values at edges
- Weights are some indication of the strength of the connections
- **Activation Function -** squishes our activations to normalise them to 1
    - **S Sigmoid function** tails off at infinities so its range is from 0 to 1
        - Old school
    - **RELU** = **max(0, a)**
        - Faster to train a network
        - Simplification
- **Bias -** Bias is a value that controls when a node activates
    - If we only want the node to fire when it is sure of the pattern, we make a bias quite negative so $a(W^TX + B) > 0$ is harder to achieve
        - **W** = n*m
            - n = number of nodes in the previous layer
            - m = number of nodes in the current hidden layer
        - **X =** m * 1
        - **B =** m * 1

Learning - finding the best weights and biases to maximise performance of the network