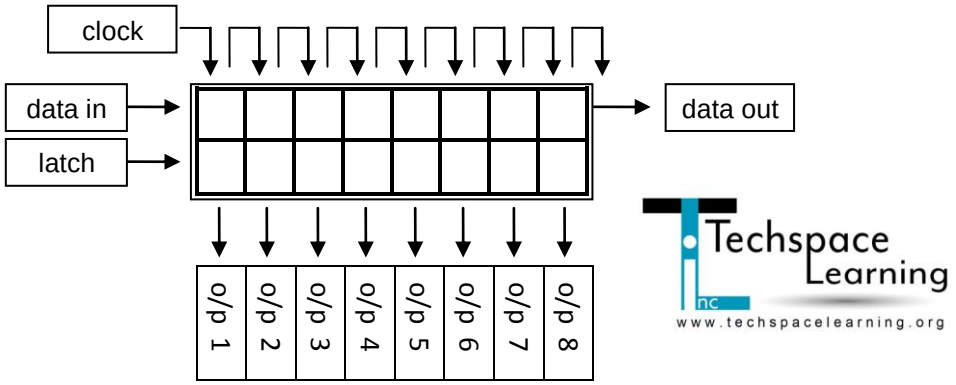
Shift Register **26/2/19**

A shift register is a device that has the ability to take a series of 1s and 0s (ons and offs) and use them to turn on and off discreet outputs. So effectively, 3 outputs of an Arduino can individually activate the 8 outputs of the shift register.

A shift register has:
eight outputs,
a data input,
a data output,
a "clock" input,
a "latch" input

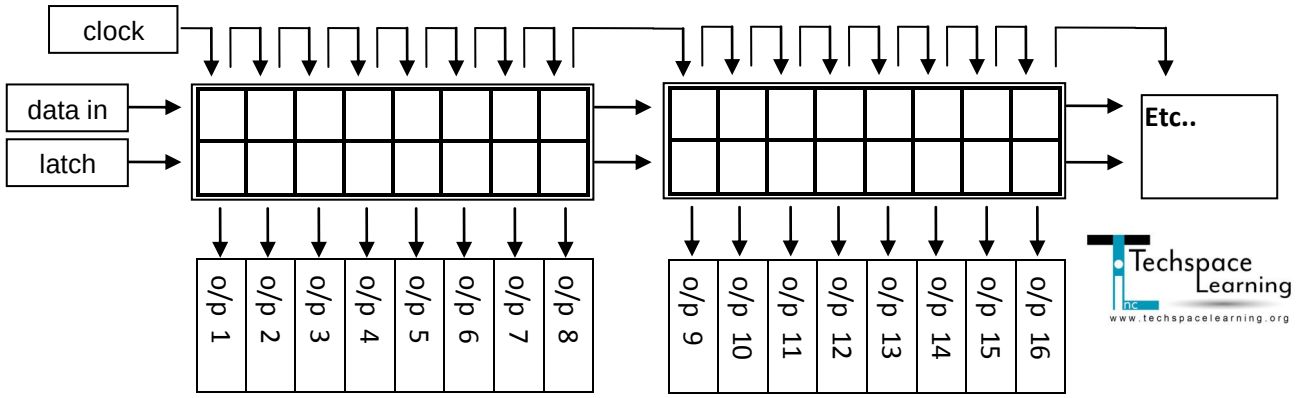
It may also have:
an "enable" input
a "clear" input



When the "clock" is high, it inputs the state of the "data in" line into the first data box. (HIGH or LOW, 1 or 0). The "clock" then goes low. When it goes high again, it shifts the data of the first data box (1 or 0) into the second data box, and then inputs the new state of the "data in" line into the first data box. The "clock" goes low then high as many times as it needs to fill up the data boxes (eg 8 times total).

When the "latch" goes high, all of the data in the boxes is transferred to the output stage at once, thus turning on or off the corresponding output. The outputs will not change again until the "latch" is cycled again, allowing new data to be input into the data boxes.

Shift registers can be "daisy-chained" together to give more outputs. In this case the "data out" of one shift register is connected to the "data in" of the next. The "clock" and the "latch" needs to be connected to all shift registers to make sure they are in sync.



Many shift registers can be chained together to give lots of outputs.
The "enable" pin is normally high, and turns on (or off) the output stages. It does not affect the data.
The "clear" pin clears all the data boxes (makes them all LOW). The "latch" then needs to cycle to change the outputs.
Some shift registers come with drivers built in, which means it can drive a higher voltage and current than 5v at 8ma.