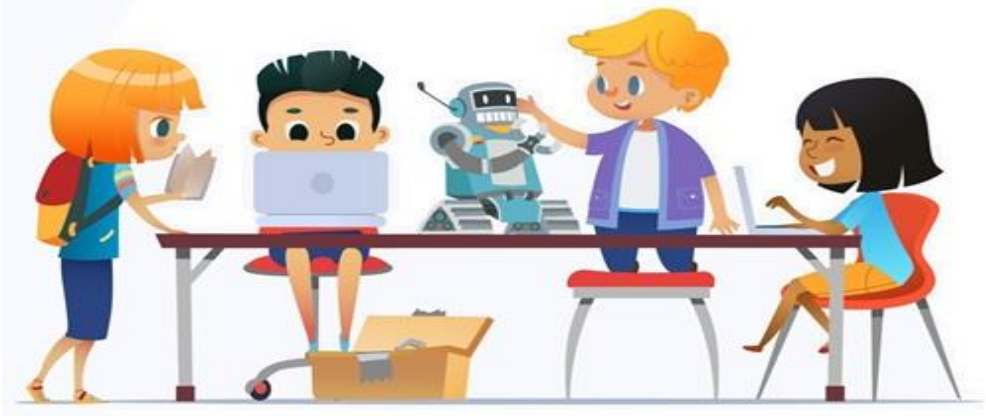
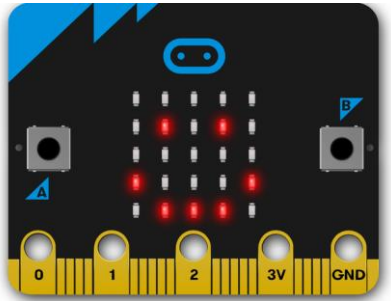
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Send data to the PC

I often hear the words “diagrams”, “data”, “process”, “analysis”… what are all these and where are they used?





As we said in previous lessons, in Science we do measurements to make inferences and draw conclusions.

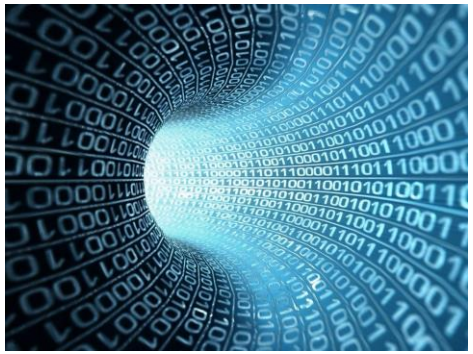


Right! Data is what we get from the measurements!

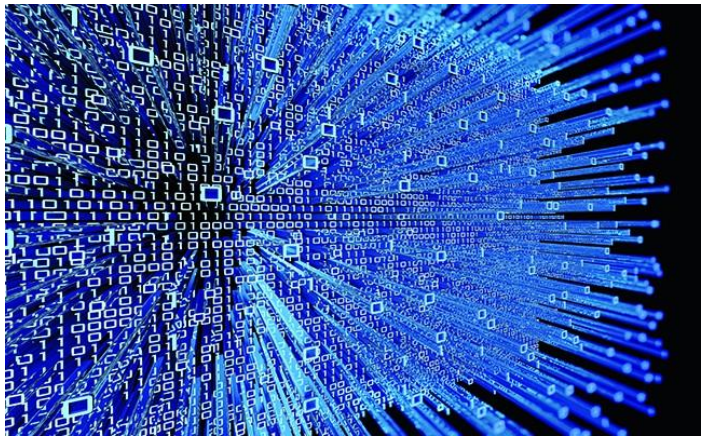
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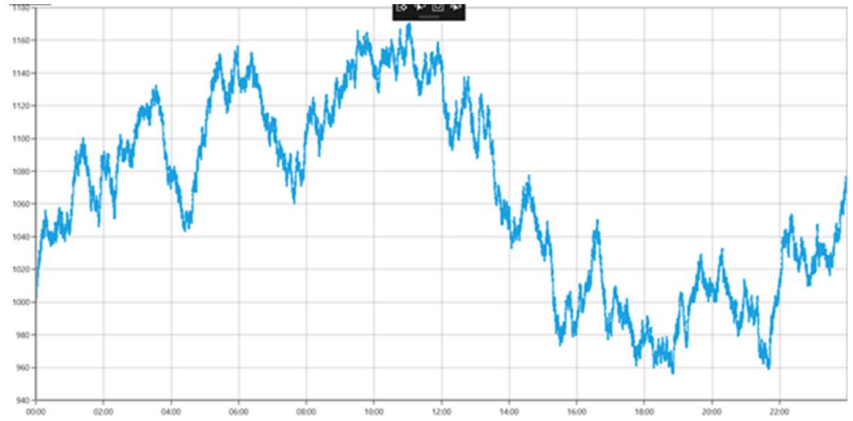
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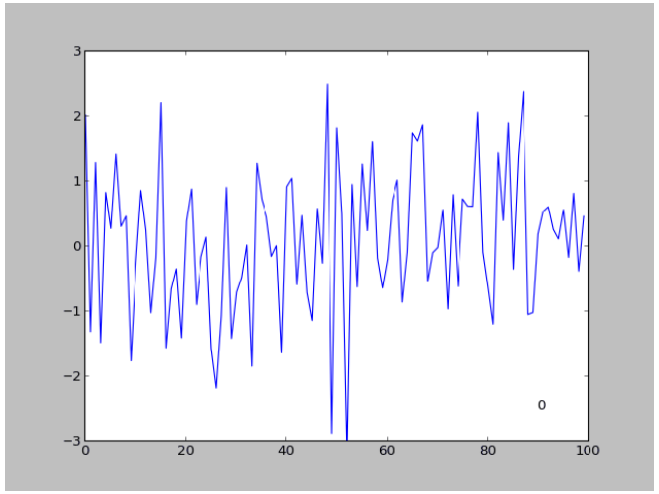


From a device like the micro:bit, we get data the whole time, which are sent to a system.





In order to draw direct conclusions, we create a diagram





A picture is worth a thousand words!

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Send data to the PC



This is not something new.
You are all familiar with the electrocardiograms, that measure the electrical activity of the muscles of the beating heart.





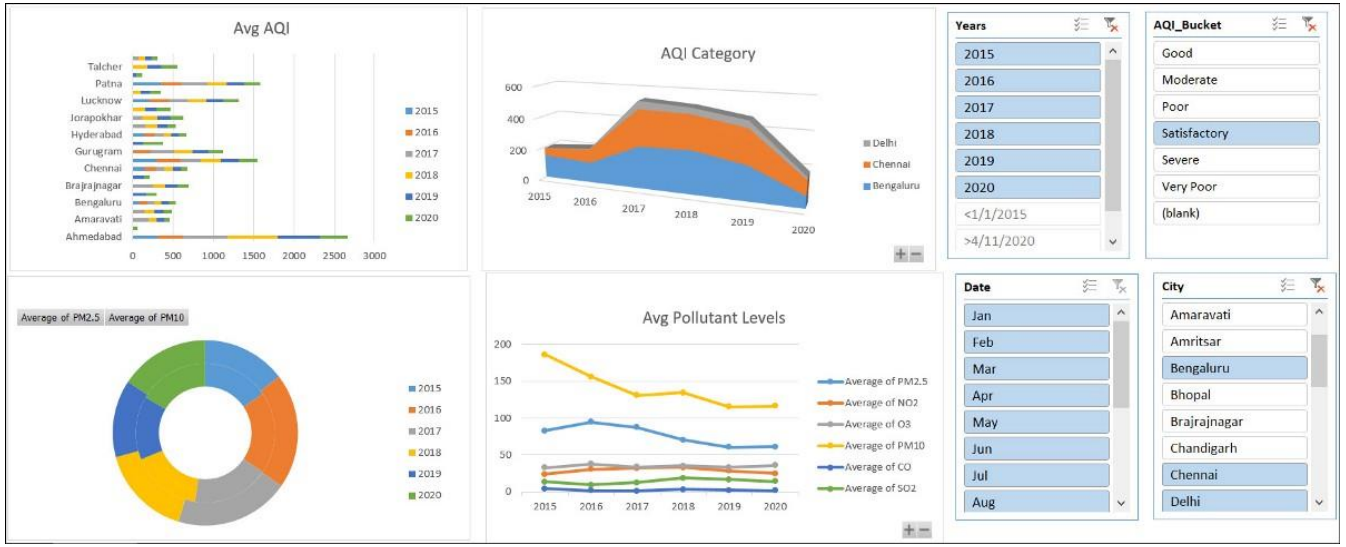
With the micro:bit and other similar devices, you can get measurements of physical units and see them in the PC at the same time.



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But let's return to the data...

Sometimes we cannot draw conclusions from the data, so, we need to process and analyze them.



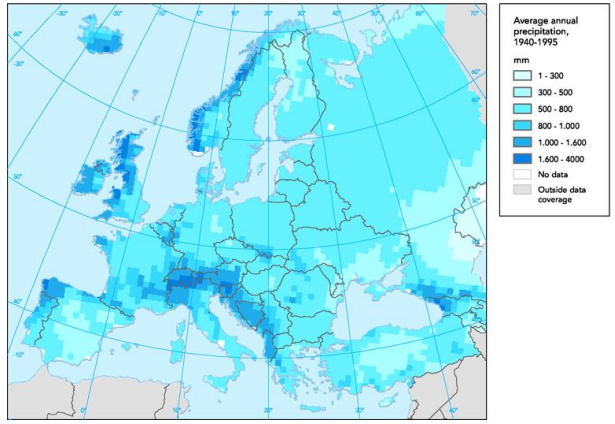


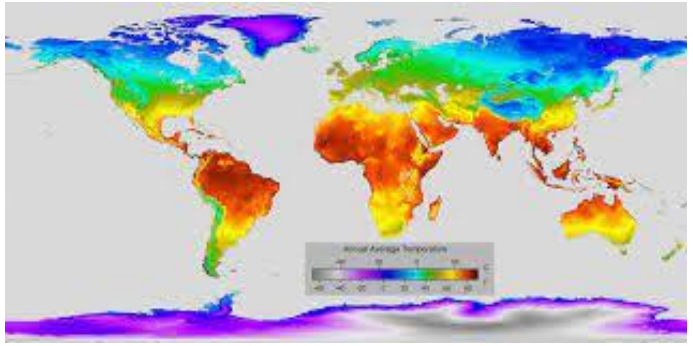
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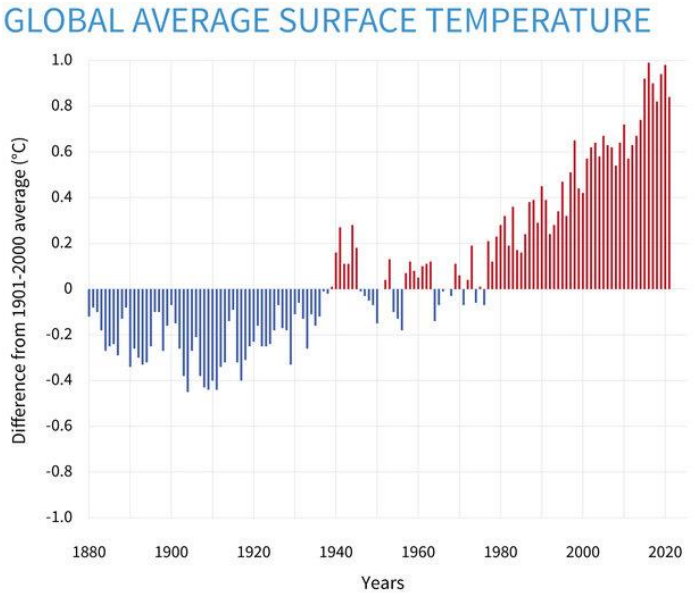
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It is very usual and simple to find the average







Do you know how to calcuate the average?

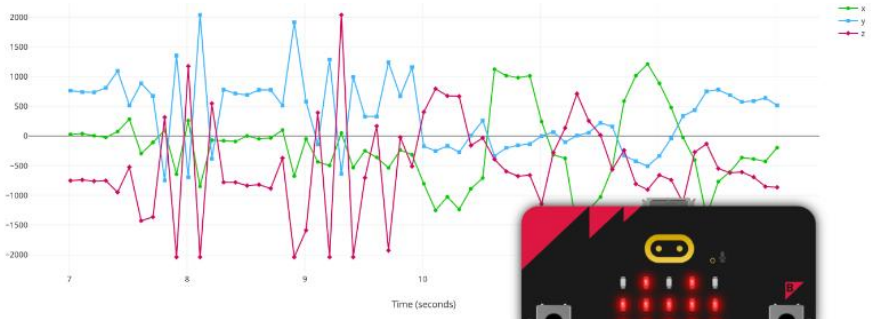
JATO

Average CO_2 emissions (g/km) under NEDC (Volume weighted)

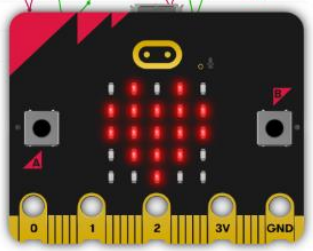
Market	2019	2018	Δ 19 vs 18	% of regs under NEDC
Netherlands	100.1	106.0	-5.9	99%
France	111.1	112.0	-0.9	97%
Ireland	113.7	113.1	+0.6	98%
Greece	116.0	111.4	+4.6	99%
Croatia	118.3	114.7	+3.6	99%
Italy	118.4	115.3	+3.0	98%
Sweden	118.4	122.0	-3.6	97%
Spain	120.6	118.6	+2.0	100%
Belgium	121.0	119.3	+1.7	100%
Slovenia	122.6	120.0	+2.6	98%
Romania	124.0	121.3	+2.7	100%
Austria	124.8	123.4	+1.4	98%
Czech Rep.	126.9	125.6	+1.3	97%
UK	127.4	125.1	+2.3	97%
Hungary	128.7	125.9	+2.7	95%
Slovakia	129.7	127.1	+2.7	88%
Germany	129.9	129.1	+0.8	98%
Poland	131.4	128.3	+3.1	81%
EU-18	**122.2**	**121.0**	**+1.1**	**97%**
Portugal	83.2	105.4	-22.2	12%
Finland	115.6	118.4	-2.8	17%
Denmark	107.8	111.0	-3.2	30%
EU-21	**122.0**	**120.6**	**+1.4**	**94%**
Norway	60.3	72.4	-12.0	97%
Switzerland	137.7	137.3	+0.4	98%
Europe-23	**121.8**	**120.5**	**+1.3**	**94%**

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In the exercises that follow, notice the sensitivity of the device when the conditions change, even a little…



Time (seconds)	x	y	z
7.01	28	764	-752
7.11	40	740	-740
7.21	4	736	-760
7.31	-24	812	-752
7.41	76	1096	-948



For this reason, we need to be careful with the data we take, and not to use the extreme values. So, it is important to take many measurements.

The results need to be compatible with the scientific laws.

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Move on to the worksheet
and do the exercises all together!



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