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Tectonic plates, difficulties for pupils to link models and scientific data.

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In a secondary school in the west of France, I teach Biology and Geology to young pupils from 12 to 15 years old. This poster deals with the difficulties that pupils have to link the scientific data concerning the plate tectonics and the models.
I choose to reproduce for pupils some situations that faced some first scientific people as they discovered arguments for the plate tectonics. For example, they have to discover the thickness of the plates by studying the speed of the seismic waves regarding the deepness. That means that they have to construct a curve starting with a table and then to analyze it. The first step is linked to math lessons and is quite easy for them. But the second one needs to mix the curve with its signification. This point is particularly hard and as we correct it, it appears like one moment of « pure science » because they seem to discover something none did before, with the power of their brain !
The second work on this subject is to study the representations of the subduction at an oceanic trench and of the mid-ocean ridge. They first look for drawing explaining what happens for the plates in those places and then they look for proofs that permitted to create those drawings. They really need help to make the difference between scientific data (pictures, curves...) and other drawings similar to the one they choose. For this subject working with documents is not easy because pupils have to ask themselves « what kind of document is it ?» before going further into their thinking.
Nevertheless, they often succeed in those works because the teacher helps them a little. Those subjects open their eyes on what science is for a geological theme. It's also a good method to make them having fun doing science and to make them being seduced by making science.