

Teaching chemistry using a chemical reactions in petri dishes and modelling processes

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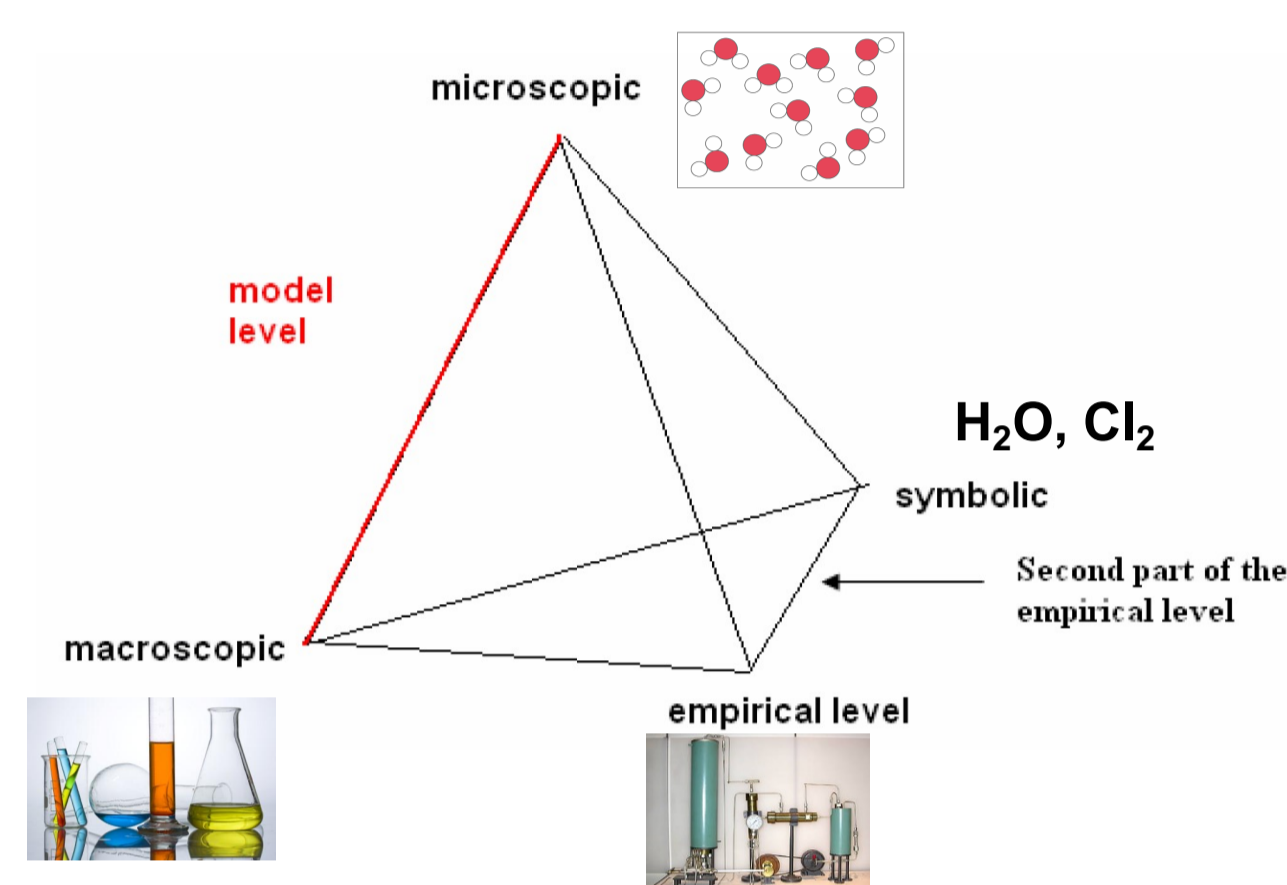
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Focusing Practical work on "Misconceptions"

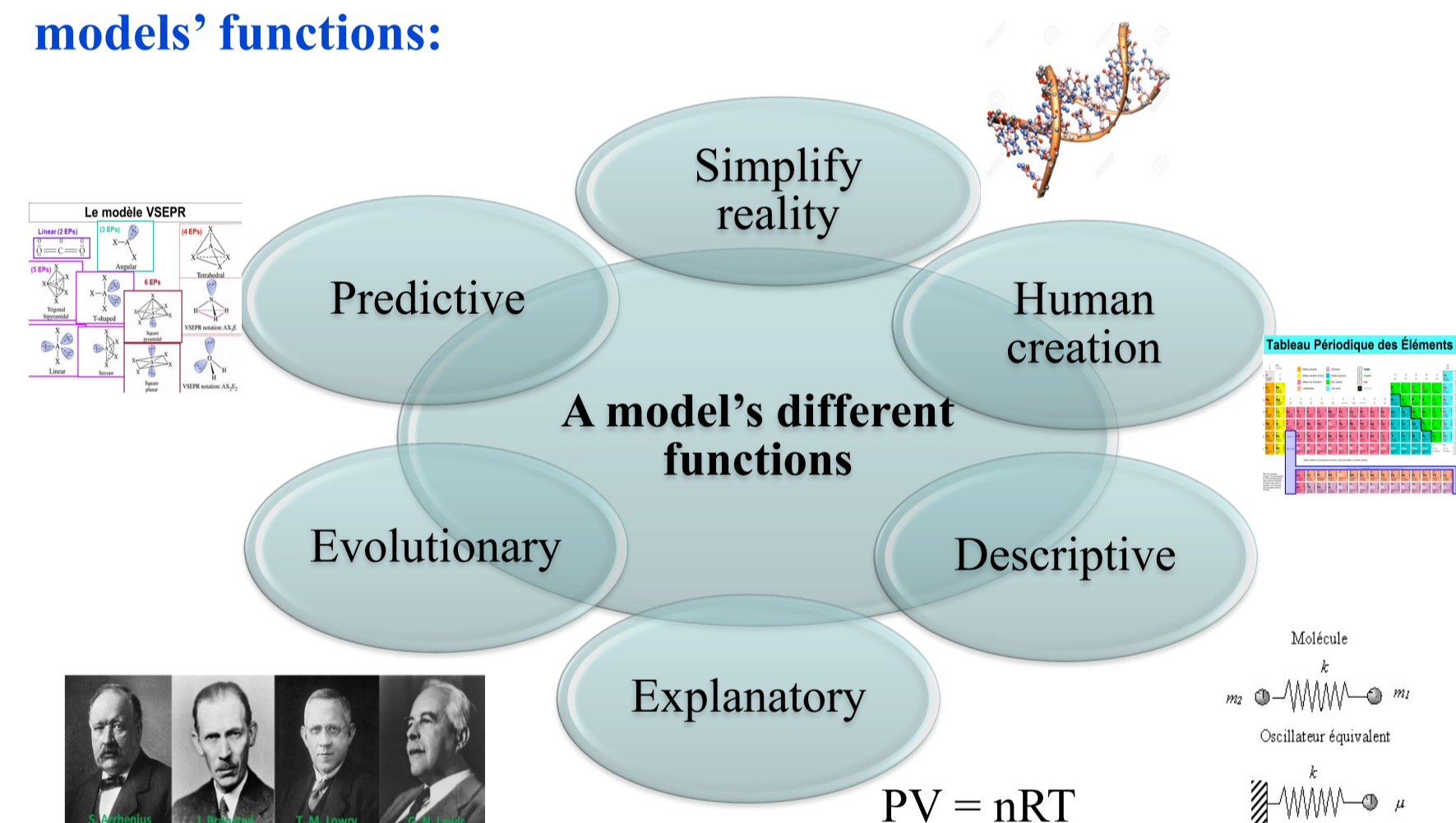


Context

Four **conceptual** levels in chemistry (Kermen & Méheut, 2008)

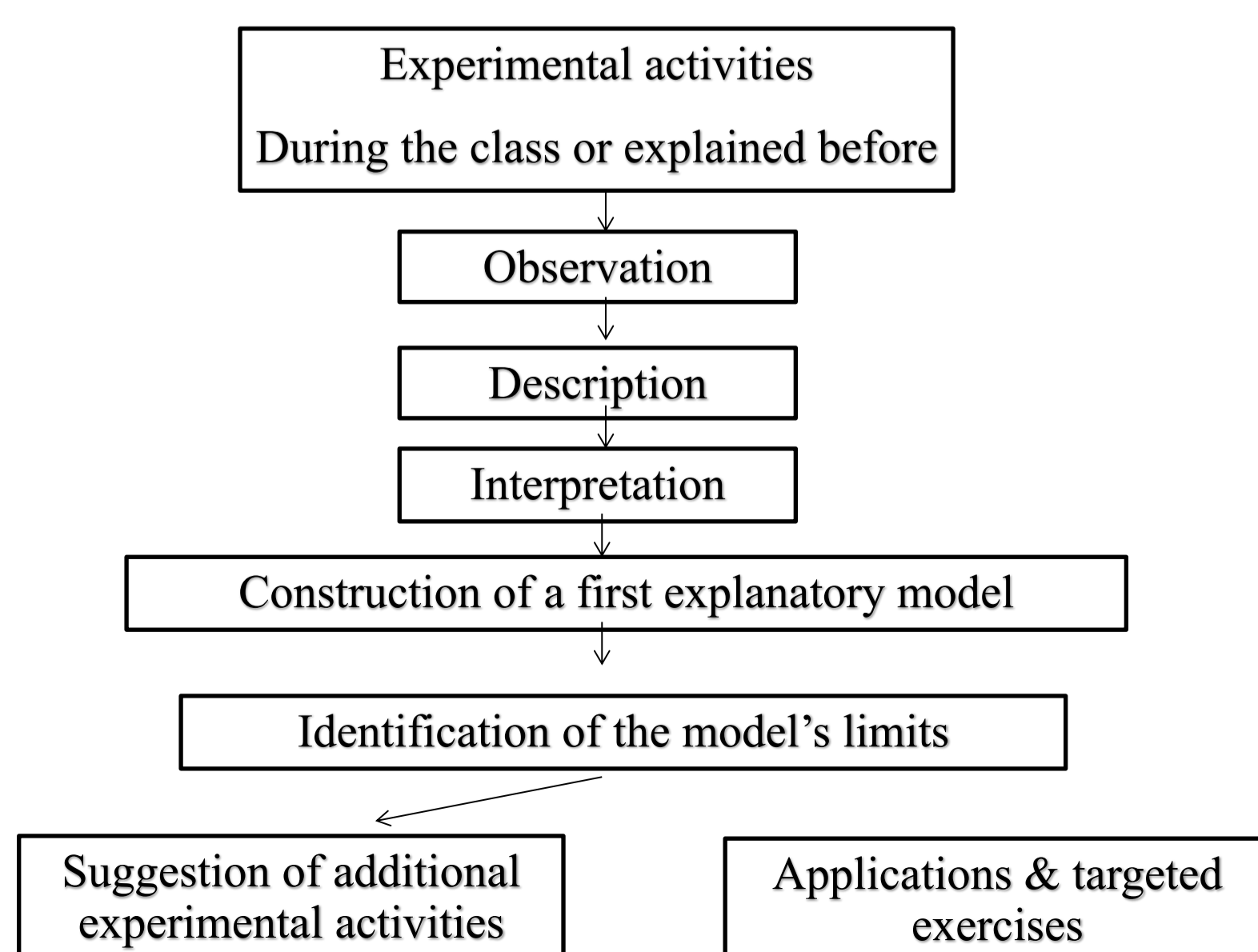


The transition from one level to another occurs thanks to the **models' functions**:

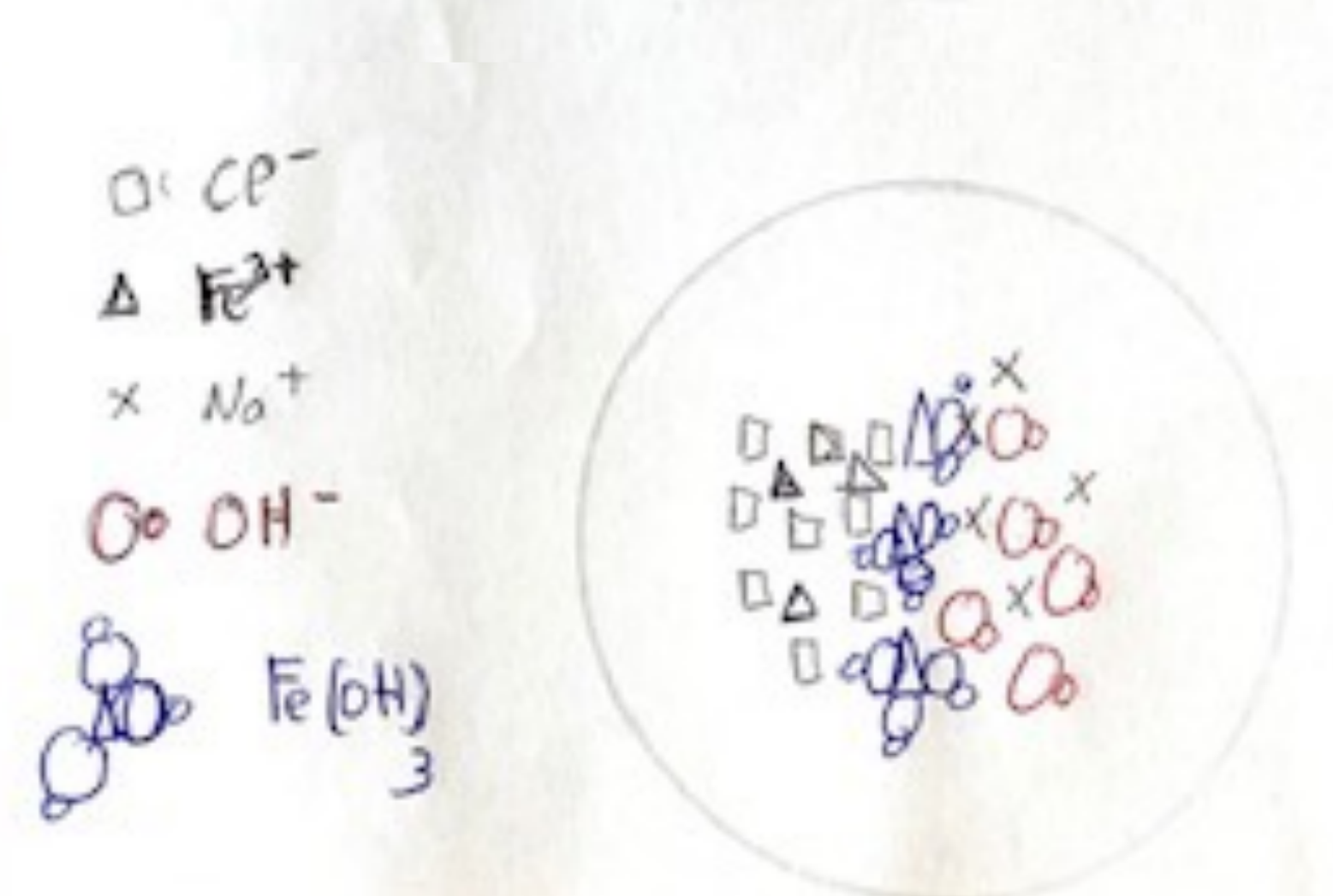
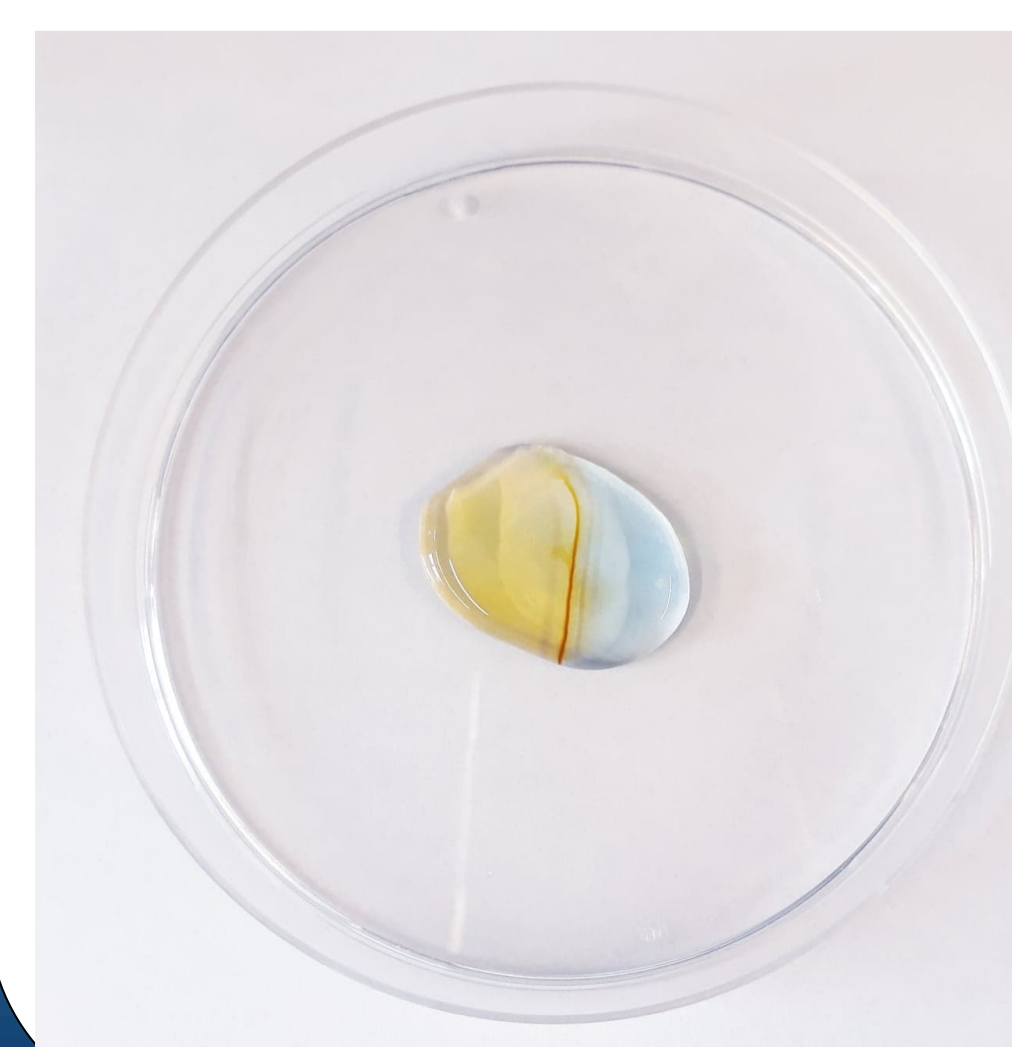
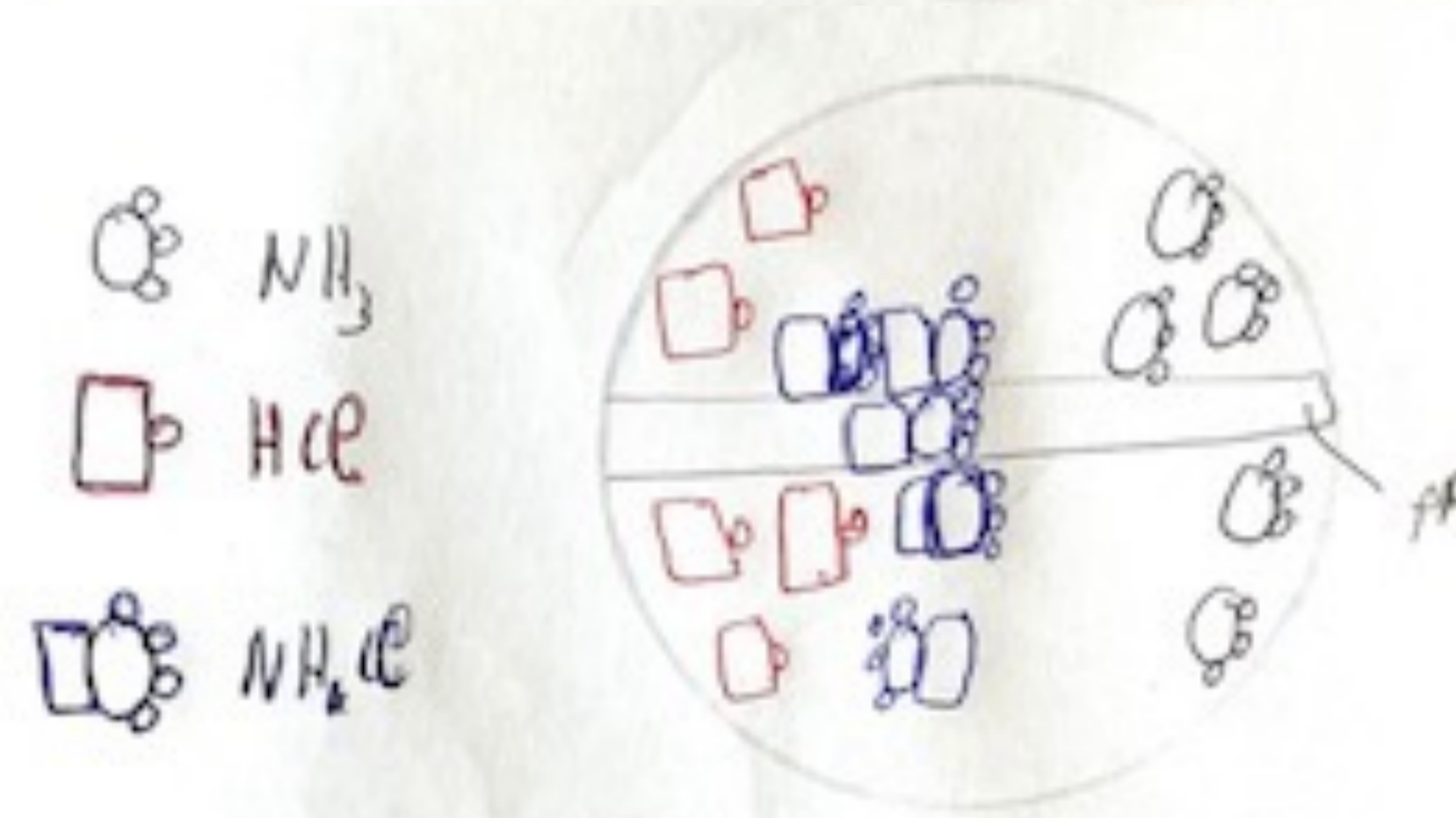
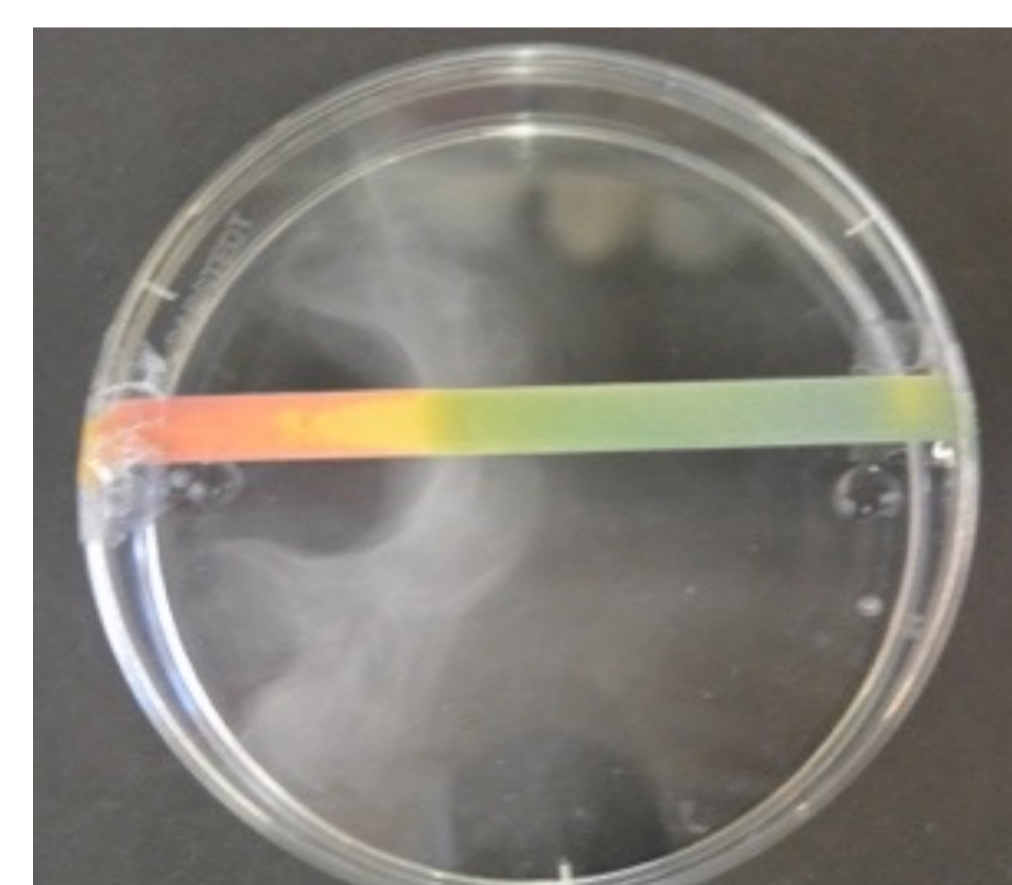
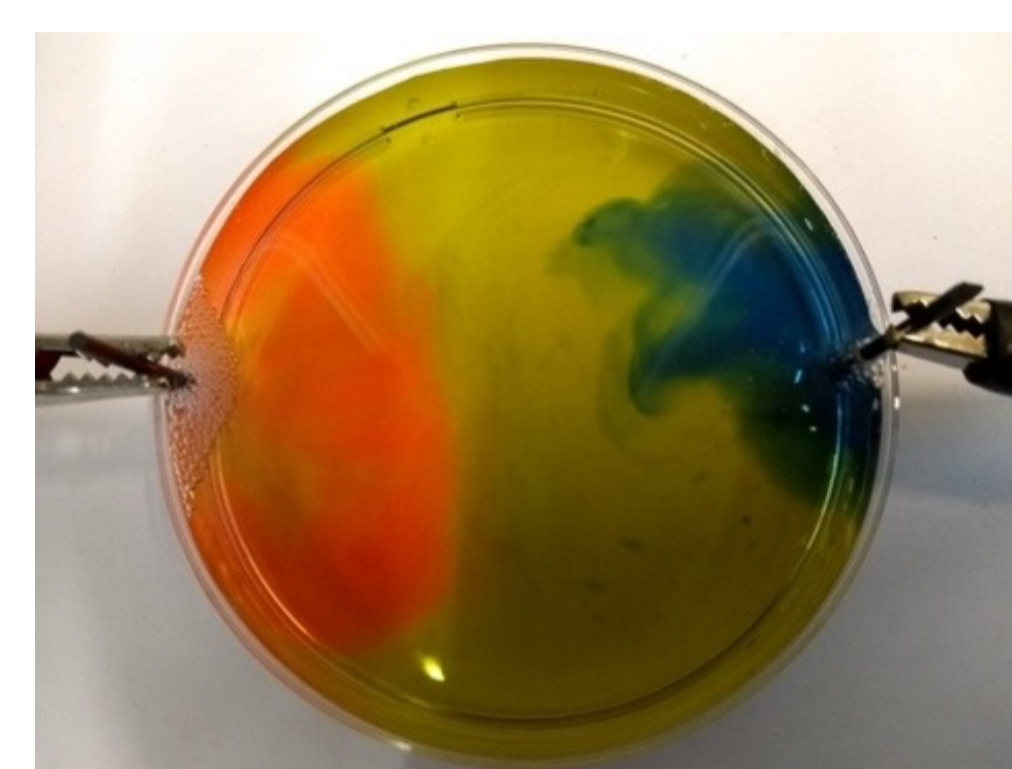


Application in secondary education

It is **imperative** that students develop their own models thanks to an **education that is centered on modeling**.

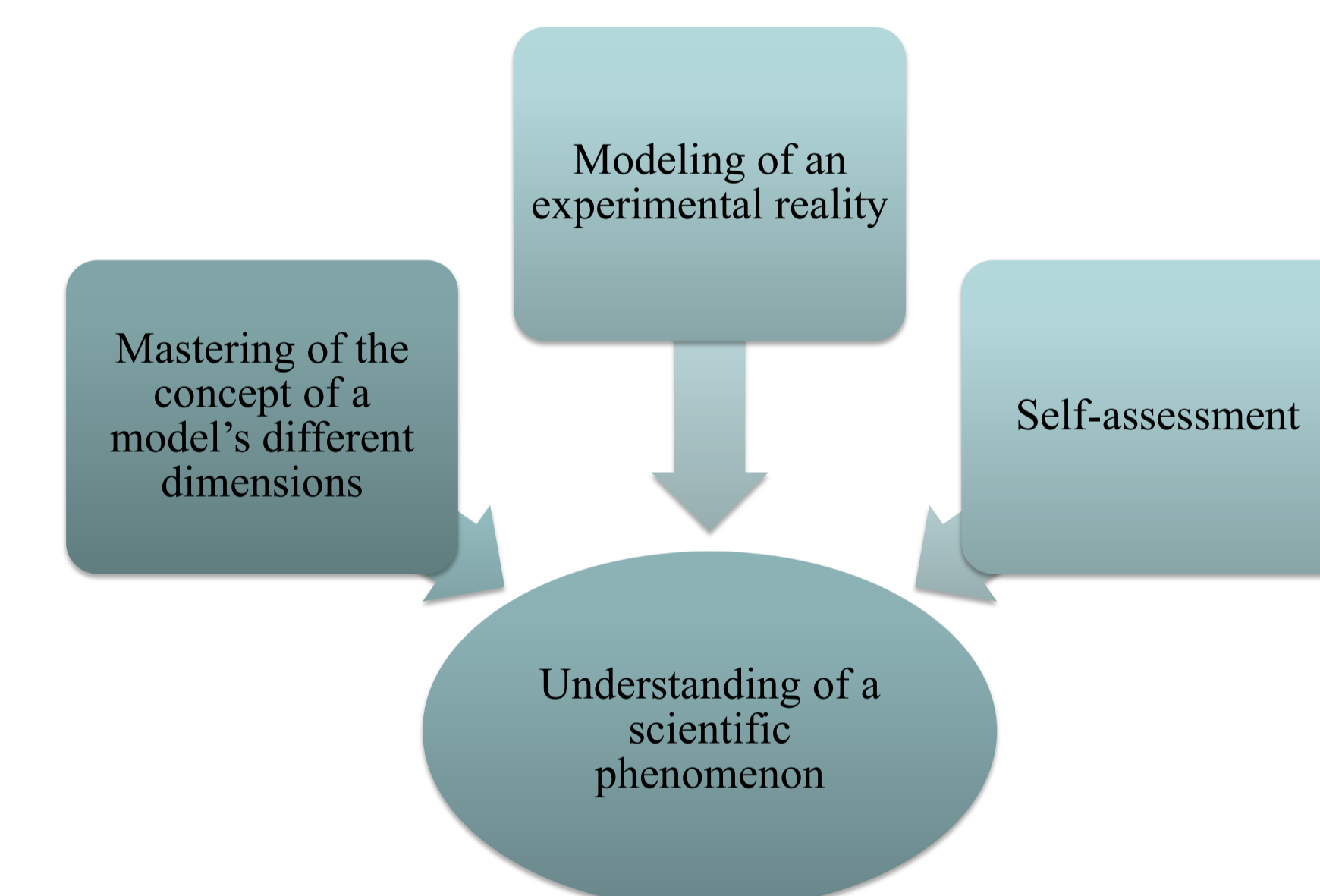


Applications : Modelling observations of some reactions



Conclusions

- Teaching through scientific modeling can :
 - Change the students' **preconceptions**
 - Improve the students' understanding** of models on a submicroscopic level
 - Develop the students' **creative skills** to acquire knowledge that are based on experimentation
 - Make it easier for the students to describe a given **experimental reality**
 - Let the students acquire a certain **ease in using a model** and in understanding what it represents
 - Work in an **more autonomous** way with animations and online questionnaires



« They helped me **visualize** what happened on a **microscopic level** »
 « I think modeling allows for a better **vision of things** and makes it easier to understand the material »
 « Modeling with sticks and spheres has especially helped me **visualize** and **understand** chemical kinetics better »
 « With chemistry, I always have a hard time understanding if what we are studying is true because we cannot see it. In a way, modeling can help us **see what we have studied** and I think it makes us **want to learn more** »

References

- Taber, K. S. (2001). Constructing chemical concepts in the classroom: Using research to inform the practice. *Chemistry Education: Research and Practice in Europe* 2: 43–51.
- Gilbert, J. K., and Zylberstajn, A. (1985). A conceptual framework for science education: The case study of force and movement. *European Journal of Science Education* 7: 107–120.
- #CLEAPSS and #UncleBob. Consulté le 5 octobre 2019)