

## PD18581: Thinking Routines for Elementary Science & Technology

### Project Description

This project was inspired by the Thinking Routines from [Visible Thinking-Project Zero](#), as described by Jessica Ross during the LCEEQ conference in 2018. The intent of this project was to support teachers in explicitly developing thinking skills with students by identifying some of the “routines” involved in scientific thinking and developing and using examples of using these routines in different areas of the curriculum for elementary cycles 2 and 3.

Although we targeted both elementary cycle 2 and cycle 3 in our plans, we immediately realized that this was an ambitious goal and restricted our work to cycle 2. This decision was also influenced by the fact that the two teachers who were in cycle 3 at the time of application were assigned workloads in cycle 2 for 2018-19.

We began the project by exploring the Thinking Routines from Project Zero and choosing Thinking Routines that aligned with the teaching and learning in science & technology. Throughout the subsequent days, as we examined the evaluation criteria and curriculum more closely, we added other thinking routines to our list.

The thinking routines that we chose and adapted from Project Zero are:

- Observe 10 x 2,
- Observe, Think, Wonder
- Creative Questions
- Parts, Purposes and Complexities

The thinking routines that we added are:

- Predict, Explain, Observe, Explain (PEOE), as described by [Smarter Science](#)
- Creative Criteria
- Classifying
- What would happen if...

During the next three meetings, we spent time sharing classroom experiences with certain thinking routines and identifying, selecting and developing learning activities that can be initiated with these thinking routines. We had initially planned to focus on activities related to a single world (Material, Living, Earth and Space) on each day. However, the teachers chose to focus on activities that they could use immediately in class, which meant that different teachers focused on different worlds. Each teacher met individually with the consultants involved in the project for half a day to identify and discuss how they use thinking routines in their classrooms. By the end of our meetings, we had identified activities related to the big ideas in each world.

We encountered two challenges during this process: 1) Finding ways to explicitly communicate to other teachers how thinking routines can be used throughout different learning activities and 2) Keeping the focus on the student thinking that we wanted to elicit. 3) In order to address our first challenge, we developed templates for sharing activities. The second challenge will be addressed during our last meeting, which will occur outside the scope of this project. This meeting will be used

to reflect on the scope of activities and to identify the Thinking Routines that are used in each activity. Then, we will work on single point rubrics that target scientific thinking.

### **Project Goals**

The project goals were met: activities that develop scientific thinking through thinking routines have been selected or developed for the big ideas in each world. Thinking routines, activities that were selected and developed, and some single point rubrics are shared in this [folder](#). Select documents have been shared in draft form and the final versions will be available by the end of June 2019.. A summary table of the activities linked to thinking routines is included with this report. Documentation is available for all activities mentioned.

### **Project Outcomes**

- 1) The teachers developed a better understanding of the thinking skills involved in the processes related to science and technology.
- 2) The teachers also developed a better understanding of how to make those thinking skills visible.
- 3) We have identified that developing a better understanding of the evaluation criteria related to these thinking skills requires more time and further work. Although we discussed the evaluation criteria, we have identified a need to develop tools that allow teachers to assess scientific thinking.
- 4) As the project progressed, the teachers more readily identified the thinking skills involved in certain activities. The process of finding ways to communicate how they used activities to develop scientific thinking helped the teachers to reflect on these skills and make them explicit in their teaching.

### **Reinvestment**

The materials developed during this project will be used as a focal point for ongoing professional learning at our school board. The elementary science consultant is in the process of considering a series of workshops for cycle 2 teachers to explore thinking routines, supported by learning activities selected by the team members for this project. These resources will also be available to all LBPSB teachers through the website we use to share resources.