In regards to the science standards review currently being conducted by the DOE, the science teachers at Gorham High School wanted to share the following thoughts and ideas.

- Why do science standards matter to you?

As with all districts, we are deep into the work of moving to a proficiency based model of learning. PBL depends on high-quality, rigorous and achievable standards to act as a framework for which all the other aspects of proficiency-based learning are built.

- What do you think of the current MLR Science Standards?

In the opinion of our department, the MLR standards have two main weaknesses, but they are limited to the performance indicators and descriptors under the content areas. First of all, those descriptors are written using very basic learning taxonomies (the emphasis is mostly on being able to describe content), which diminishes the rigor of the standards. Secondly, they also focus on many pieces of discreet content knowledge (they emphasize breadth vs depth). In contrast, however, the performance indicators that go with the unifying themes do not have these weaknesses; they ask for a diversity of thinking types (design, analyze, formulate, predict) and focus on key understanding in the field of science, rather than discrete content knowledge.

- What types of science standards is your school working under?
- Have you already adopted NGSS? How has it been going? How much has already been invested in time and funds for materials, pd, etc.?

In our school, we have adopted a set of standards and performance indicators inspired by NGSS. They are not exactly aligned, but emphasize what NGSS identified as cross-cutting concepts and science practices. This overlaps makes our standards very compatible with the NGSS system. Furthermore, because the NGSS standards are aligned with Common Core standards, it makes these connections clear and many science teachers are able to justify that they are also meeting Common Core ELA and Math standards, in addition to our content standards.

Over the past five years, our department has dedicated a lot of time and resources to professional development around the NGSS. Teachers have gone to conferences and
workshop and we’ve brought people in to teach us how to use them. We’ve also spent a great deal of departmental collaboration time in the development of the standards we currently use, which we designed to be compatible with NGSS.

Many teachers use NGSS resources when designing their curriculum, because the close overlap of our standards to theirs allows this. Generally, these resources tend to emphasize critical thinking skills and inquiry and ask our students to achieve more rigorous levels of thinking. The tradeoff with this kind of teaching, however, is that there is not as much time to cover a broad span of discreet content knowledge.

- What direction would you like the state of Maine to head in in relation to science standards?

When designing standards, there are three key features that must be kept in balance: the level of rigor, the achievability of those standards to the entire population of students, and the reality of being able to teach the content within our time constraints.

- What type of science education environment do your students thrive in? What does good science education look like?

The majority of students are not inspired by survey style courses that attempt to cover a broad range of discrete content knowledge. They fail to see how this information applies to their lives and how it would be useful to them in the future. And in reality, much of it probably wouldn't be useful to them in the future. The percentage of students who will be going on to secondary learning institutions in the sciences is small, so to design a system with this population in mind is inherently problematic.

Students must engage in science at their level, exploring how scientific principles affect their everyday lives and how the process of science can help them be more efficient and responsible members of our workforce and communities. This kind of teaching and learning will never be able to cover a breadth of content knowledge within the instructional time we have. Instead, we must focus on core concepts and unifying themes and allow students more opportunities for inquiry and exploration.

- What supports will you need as an educator to implement science standards?
Professional development from other teachers who are successfully using their standards to guide their curriculum, instruction and assessment. We don't need people from outside to do this. Other educators within the state are our best resources.