NATURAL AND MATHEMATICAL SCIENCES LEARNING AIMS

The sciences have provided an extremely useful and successful framework for us to understand ourselves and our environment. An understanding of the natural world is crucial for our students as we look towards the future. Our students need to gain some understanding of the major ideas and theories of science as well as the methodologies of scientific inquiry in order to be able to address important questions for themselves as individuals and citizens. Our students need to acquire the skills to critically analyze scientific information of all kinds that is purveyed through various media so that, at a minimum, they can recognize sound and valid arguments. In our increasingly interconnected and dependent world, this is crucial for personal and public decision-making that will bear on the future of life on our planet.

The sciences, through their divisional meetings and subsequent discussions, have developed learning aims in five areas:

1. Students develop their innate curiosity about the natural world and take a life-long interest in science news and advancements.
2. Students explore one or more of the central ideas that form the foundation for modern science.
3. Students understand the process of science - its methodology, how questions are framed, how data are acquired, how arguments are constructed and conclusions reached. In this context, students should learn what science is not and have the ability to recognize and reject pseudoscientific claims. In addition, students should also have the ability to recognize the limits of science. Students also should understand the relationship between science and technology and how the results of scientific discovery can be applied to the needs of society. Students should learn the linkage between experimental methodology and scientific content.
4. Students learn to reason mathematically, and to think critically and analytically through statistical or mathematical methods. Because of the close interrelationship between science and math, in each science course in the core, students will achieve a better understanding of the power of quantitative tools used in the particular discipline.
5. Students learn how recent technological advances have facilitated and accelerated scientific inquiry, and they gain a realistic understanding of the potential and limitations of computation.

Faculty at the divisional meetings supported the idea that courses in the natural and physical sciences in the Loyola core should be designed so that at a minimum each course should seek to engage students with topics that interest them, and teach one or more of the central foundational ideas on which science is built. In addition, because of the close interrelationship between science and math, all science courses in the core should include mathematical, quantitative and/or statistical analysis and interpretation as an important component of the course.