All societies are demanding more of their education systems. The ability to recall a large body of knowledge is now insufficient. Education, in addition, must prepare students to think critically and analytically and reason with the knowledge they are acquiring. Such demands are reflected in the innovative US Next Generation Science Standards (NGSS) and the 2015 PISA framework for Scientific Literacy, both of which I was involved in producing. The US standards present science as a set of disciplinary core ideas, eight scientific practices and seven cross-cutting concepts. The major innovation is the focus on a set of eight scientific practices where argumentation is a core feature. Both the NGSS and PISA define the outcomes of an education in terms of a set of competence-based expectations of what students should be able to do as the outcome of their learning experiences which represents a major challenge for school science. In addition, digital technologies offer a range of affordances which school science has yet to exploit not least the ready availability of information and educational experiences which pose a challenge to traditional means of instruction and assessment. In this talk, I shall explore these issues and their implications.