i wonder...
REDISCOVERING SCHOOL SCIENCE

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Editorial

In this issue of iwonder..., we explore a somewhat unusual question — do feeling, empathy, and intuition have any role in the way we learn, teach, and do science?

According to the cytogeneticist Barbara McClintock, nurturing a *"feeling for the organism"* one is studying is vital to being a good scientist. This belief was grounded in more than 50 years of quiet, dedicated study of maize chromosomes at the Cold Spring Harbor Laboratory on Long Island. Changes in the life cycle of maize were slow enough to allow McClintock the time and the *"great pleasure"* of getting to know each plant in her study *"intimately"*. Rather than attempting to impose an answer on what she saw, she preferred to become part of the system and let answers come to her through sustained observation. Through this sense of collaboration with her subjects, McClintock amassed extensive data on what was for a long time dismissed as fringe research by her contemporaries. She went on to receive an unshared Nobel Prize for Physiology (1983) for her revolutionary discovery of mobile genetic elements or transposons. In McClintock's words, *"It might seem unfair to reward a person for having so much pleasure over the years, asking the maize plant to solve specific problems and then watching its responses."* Rather than abandon objectivity, McClintock invites us to consider how a close, interactive, and reciprocal relationship with our subjects may influence the questions we ask, and the ways in which we seek to answer them. The theoretical physicist Evelyn Fox Keller contrasts McClintock's approach with a long-standing tradition of scientific endeavour that is fuelled not just by the desire to understand 'nature', but to control and dominate it. She draws our attention to how this desire is reflected in the language we use to describe scientific achievements. And to the many ways in which it reinforces the belief that nature needs to be vexed, twisted, subdued, or steered by us. Arguing that humans are purposive beings, Keller urges us to examine how this feeling of being *"engaged in a battle, in a struggle, in a state of opposition"* with nature influences the goals and practice of science. Robin Wall Kimmerer, an American Distinguished Teaching Professor of Environmental and Forest Biology, explores how choosing English as the language of science influences the way we relate to the nonhuman living world. She points to how we use pronouns of personhood, like he, she, or they, only for (living and dead) human beings. In contrast, *"Bulldozers, buttons, berries, and butterflies are all referred to as 'it', as things, whether they are inanimate industrial products or living beings..."*. Kimmerer invites us to consider how seeing the nonhuman living world as kin, rather than just 'objects' of study or 'natural resources' for human use, would change the way we teach and learn science.

Both articles in our theme section 'Teaching as if the Earth Matters' explore this question by approaching education as a way of connecting with and caring for nature. The Nature Classrooms Group invites us to recognise how our own sense of identity may draw upon our many immediate, direct, and everyday connections with the living world. How essential are our formative childhood memories and immersive sensory experiences of 'nearby nature' in cultivating a personal sense of interconnectedness? They offer a learning framework and pedagogy that could enrich the EVS curriculum by providing age-appropriate and contextually-relevant opportunities for children to develop deep emotional connections with nature. Continuing a conversation they started in our last issue, Poornima and Nishant invite us to reflect upon how we relate to our earth. Do we see it largely in terms of physical 'space' — tangible, measurable, with clearly defined boundaries? Or as more — a fluid 'place' that derives its identity from the many intangible, dynamic relationships between the living and nonliving, human and non-human? From this approach of nurturing relationships, they share their experiences of teaching science so that it is part of a child's journey of growing up and meeting the larger world. Science, then, offers a way of revealing interconnections between more and more things in a child's immediate experience, while also providing a framework to talk about the changing world.

How do you engage with this question in learning, teaching, and doing science? Share your thoughts and experiences with us at iwonder@apu.edu.in.

Chitra Ravi
Editor