

_____ asked me to respond to your request for insights into the value of the 'PatternMaster' assignment to the education of a young scientist. I'm eager to do this because I think this exercise has the potential to be one of the most beneficial to a student in developing the traits and skills that will be sought-after by potential undergraduate research labs and future employers. Properly approached, it focuses directly on the core of scientific thinking and discovery: the iterative steps of making observations, formulating hypotheses, designing tests, executing them, and modifying hypotheses as appropriate. It is carried out in a setting of abstract shapes and colors because these do not need to be 'taught' to students, thus allowing them to proceed immediately those core elements of scientific practice mentioned above. Some will find this challenging because it is a departure from the "hear/regurgitate" model that is reviled, but still too-common practice in science education. Indeed, it reflects an effort to turn away from the rote memorization and pointless practice you cite in the New York Times article.

As you note in your letter, the task of arranging the 'cards' is superficial, and if that is the focus, the experience will be tedious and unrewarding. The goal is instead to seek the underlying 'rule' that allows them to be ordered. As pointed out in the lab manual reading, this type of practice has been at the heart of discoveries such as the Periodic Table, the Genetic Code, and (in previous lab work), the Theory of Evolution itself.