# Bee Pollination

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## EXECUTIVE SUMMARY

*The purpose of the chapter is to provide an exemplar of an inquiry-based unit on pollination for designing and implementing constructivist instructional practices while simultaneously providing outstanding teacher preparation. The unit on pollination was developed by preservice teachers through a partnership between the Monmouth Conservation Foundation and the Monmouth University School of Education. Through collective action, these institutions were able to enhance student learning on a vital part of the science curriculum, provide a rich clinical experience for pre-service teachers, and to familiarize teachers with a more constructivist approach to pre-school science instruction.*

## INTRODUCTION

Children's engagement with science begins with their first discovery (Bredekamp, 2014; Brooks & Grennon-Brooks, 1999; Tu, 2006). They are natural scientists, possessing an innate curiosity for investigating a world of things that are constantly beckoning: some living, some hard, some cold, some large, some metallic, and some dirty (Bredekamp, 2014; Piaget, 1955). Preschool children who engage in scientific exploration develop a better understanding of science concepts later in life. As a

result, science education for preschool children is receiving considerable attention (e.g., Patrick, 2009; Conezio & French, 2002; Sharapan, 2012)

Despite its importance, children often do not engage in high-quality science experiences in early childhood classrooms (Gerde, Schacter, & Wasik, 2013; Fitzgerald & Schneider, 2013; Tu, 2006). Many early childhood educators are hesitant about introducing science in their classrooms because they did not enjoy studying science as students and feel ill prepared to teach it (Conezio & French, 2002). As a result, they teach science through a series of isolated experiments without any connection to a broader and more meaningful science curriculum. For example, one study showed that the preschool science curriculum consisted of children watering plants and displaying a random assortment of stones and shells in the back of their classrooms (Fitzgerald & Schneider, 2013).

Therefore, it is not surprising that a number of studies have discovered that preschool students are not prepared for science instruction when entering kindergarten (Conezio & French, 2012). Studies have found that children in kindergarten are already forming negative views of science. Student interest continues to fade through the elementary years, an occurrence that has been especially true for girls, who, even before kindergarten, are less likely to say they like science than boys (Sharapan, 2012). As a result, scarcely a third of kindergartners showed any knowledge of scientific processes and knowledge. The lack of interest in and knowledge of science has been attributed to ''less investigative science practices'' employed by their classroom teachers (Watters & Diezmann, 2007, p. 351).

Therefore, the purpose of the chapter is to describe how preservice teachers can learn to develop inquiry-based science units. This will be illustrated through a case study description of the design and implementation of an inquiry-based unit on pollination. The unit on pollination was developed through a partnership between the Monmouth Conservation Foundation and the Monmouth University School of Education. These institutions were able to enhance student learning on a vital part of the science curriculum, provide a rich clinical experience for preservice teachers, and to familiarize practicing teachers with a more constructivist approach to pre-school science instruction.

## LITERATURE REVIEW

In this section, the authors provide a framework for understanding the purpose, goals and outcomes of the pollinator project. We begin by discussing the importance of pollination to the future of the environment and hence to the curriculum. To facilitate learning, instruction on pollination can begin as early as the preschool years while the brain is undergoing rapid development. This instruction is best accomplished

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