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Yvonne Lai* (yvonnexlai@unl.edu), **Mary Alice Carlson** (mary.carlson5@montana.edu) and **Ruth Heaton** (rheaton1@unl.edu). *From here, to there, to everywhere: Connecting mathematical time scales to improve teacher education.* Preliminary report.

In helping another learn mathematics, teachers may launch inquiry from as ordinary of an idea as “ $4 - 3$ is 1”, with children as equal conversation partners. In seconds, teachers must see paths to mathematics of the next moments, days, months, years, and lifetime. In short, teachers must understand how mathematics coheres across many time scales, and how coherence and incoherence may impact teaching. Understanding one step of a mathematics problem may present different challenges than connecting several problems to a larger mathematical idea; and indeed these recurrent mathematical situations may imply different challenges to how we design and use mathematics tasks in teaching and teacher education. We report on an ongoing study of teaching that uncovers the challenges and interactions of mathematics at different scales; we will discuss implications for teacher education. We will present examples of tasks targeting and connecting mathematics at different scales, as well as propose directions for future work based on analysis of existing pools of items assessing mathematical knowledge for teaching. Our findings are relevant to teaching and teacher education at elementary, middle, secondary, and undergraduate levels and beyond. (Received September 16, 2014)