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We present some materials and observations from an ongoing study of activities to strengthen the spatial visual reasoning of in-service and pre-service teachers of mathematics. The activities focused on connections between 2-D and 3-D, with related explorations on reflection and rotational symmetry in both, and on passing between dimensions, such as projections and sections of 3-D into 2-D. One of the innovative activities combined filling of (inverted) pyramids with exploration of dilations through dynamic geometry to investigate similarity transformations.

The teachers encountered some obstacles to effectively reasoning with the concrete materials, and communicating their observations - obstacles that other students at University and College are likely to experience. We describe a few of those obstacles. The team of researchers found that we were faced by some of the same difficulties and that we had to develop a shared discourse for the geometry, the reasoning and our communications. This led us to recognize the lack of a larger shared trajectory in development of spatial representations, reasoning and communication in our larger curricula. (Received September 22, 2009)