Reflecting upon Reflections

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Abstract: This presentation will illustrate how people can construct mathematics by coordinating reversible and composable mental actions. It uses the simple example of reflective symmetry and reflecting the plane over a line. Coordinating pairs of such reflections produces rotations and translations as transformations of the plane. Furthermore, every isometry of the plane is the composition of at most three reflections. Such coordinations can also provide for intuitive understandings of formal propositions, including one about the sum of interior angles in a triangle. Thus, the chapter demonstrates the mathematical power that unfolds as one learns to coordinate even a single kind of mental action. By reflecting on reflections, we begin to experience our personal mathematical power.