

Points of Emphasis in M152

A key component of M152 is an emphasis on rigid motions. Whereas a typical instructional unit might focus on performing transformations on coordinates without connections to proof and congruence, in M152, students should:

- be given opportunities to explore and discuss rigid transformations using technology and physical models, starting with cases that do not involve coordinates (LP 7, LP 2).
- explore and reason about the properties of rigid motions (LP 3).
- make and justify claims about the effect of transformations on points, line segments, angles, and other figures (LP 3).
- use rigid motions to logically develop the triangle congruence criteria (SSS, SAS, SAA) (LP 3).

Often when engaging with the ideas of proofs and congruence, students are asked to spend time on lower-level skills, such as the memorization of triangle congruence criteria. When proofs are introduced, attention is paid to the notational conventions of two-column proofs. Time is also often allocated to finding missing measurements in diagrams, absent justification, or reasoning. In M152, students should instead develop triangle congruence criteria from a definition of congruence based on rigid motions and focus deeply on the development of logical arguments. Students should:

- spend significant time constructing a variety of logical arguments and proofs, which can take a variety of forms (prose, diagrams, two-column, etc.) (LP 3).
- use repeated reasoning to make generalizations about the transformations (LP 3).
- engage with their peers to describe their thinking using precise language and critiques and revise their logical arguments (LP 2).
- see geometry and the development of proofs as a form of problem-solving and engage in frequent experiences where they must make sense of given information, construct diagrams, test solution methods, and revise their thinking (LP 1).
- engage in learning experiences that emphasize reasoning over notation and other conventions (LP 2).
- employ a variety of tools, such as graph paper, tracing paper, and geometry software to illustrate and understand congruence (LP 7).