

Modeling and Reasoning on Ohio's State Tests in Mathematics

Modeling and reasoning are two of the eight Standards for Mathematical Practice within Ohio's Learning Standards. The Mathematical Practices describe the varieties of expertise that mathematics educators at all levels should seek to develop in their students. They describe ways in which students engage in the subject matter to develop mathematical thinking by balancing procedures with understanding. The Mathematical Practices provide expected points of intersection between the mathematical content standards for students as they grow in maturity and expertise throughout elementary, middle, and high school.

Each state mathematics test blueprint identifies the Mathematical Practices of modeling and reasoning as an independent reporting category. The minimum for modeling and reasoning on each test is 20 percent of the overall points. The blueprints do not give a limit to the percentage of modeling and reasoning items.

On Ohio's State Tests, the grade-level Content Advisory Committee identified modeling and reasoning on an item-by-item basis rather than the individual standard. Test items can be classified as modeling, reasoning, or modeling and reasoning. Not all test items are identified as modeling and reasoning. For state testing purposes, the Ohio Department of Education and grade-level Content Advisory Committees use the following descriptions when designating test items as modeling and reasoning:

Modeling

- Represent problems, by identifying important quantities and their relationships, using diagrams, graphs, tables, formulas and equations;

Reasoning

- Demonstrate thinking that places emphasis on mathematical principles rather than on skills or procedures;

Modeling and Reasoning

- Analyze, make sense of, and apply mathematics to solve real-world problems relevant to the student;
- Draw, justify and communicate conclusions or inferences supported by logical and mathematical thinking.

The modeling and reasoning descriptions are used for state testing purposes only. These examples are not all encompassing. Districts may describe, implement and assess the mathematical practices differently to align with district curriculum.