

The Nature of Mathematics > Mathematical Models

Research on Student Learning

Middle-school and high-school students typically think of models as physical copies of reality, not as conceptual representations. [1] They lack the notion that the usefulness of a model can be tested by comparing its implications to actual observations. Students know models can be changed but changing a model for them means (typical of high-school students) adding new information or (typical of middle-school students) replacing a part that was made wrong. [2]

References

[1] Grosslight, L., Unger, C., Jay, E., Smith, C.L. (1991). Understanding models and their use in science: Con-ceptions of middle and high school students and experts. *Journal of Research in Science Teaching*, 28, 799-822.

[2] American Association for the Advancement of Science, Project 2061 (2001). *Atlas for Science Literacy*, 28.