

HABITS OF MIND for the Teaching of Mathematics

Habits of mind that we would like students to acquire include:

- 1. Developing a “curiosity” about mathematics and to have students seek the “whys” behind the procedures and skills being learned.**
- 2. Recognizing that hard work, persistence, and risk-taking are needed when doing mathematics.**
- 3. Developing and demonstrating self-confidence in doing rigorous mathematical problems and analytical thinking.**
- 4. Valuing the process of exploration and investigation of mathematical concepts in making and testing conjectures and in verifying or contradicting those conjectures.**
- 5. Recognizing the need for logical arguments and proofs and deductive reasoning to verify conjectures and recognizing that an intuitive explanation is an important complement to a detailed argument.**
- 6. Realizing the need to communicate mathematics in writing and orally to people with different levels of understanding.**
- 7. Recognizing the role of estimation and the need to examine the reasonableness of results.**
- 8. Recognizing the need to employ strategies and heuristics in solving problems and when to employ those heuristics under different assumptions and limitations.**
- 9. Demonstrating that solving problems in mathematics involves analyzing examples and appreciating the subtleties of an assumption or its limitations.**
- 10. Valuing the use of technology, learning to apply it only when needed or appropriate, and recognizing that technology does not replace the need to learn basic facts, skills, or concepts.**
- 11. Appreciating that mathematics is the language of nature and science and is a tool for quantitative reasoning.**
- 12. Recognizing that failure is a fact of life and that to be successful at challenges, one will experience failure, but will, hopefully, learn from it.**
- 13. Working as a member of a group, but proceeding independently to draw inferences.**

“Acquisition of these habits of mind supersedes master of content knowledge. Their achievement is necessary because ‘It is not enough to know something; the learner must possess the ability to do something with that knowledge, whether it is to solve a problem, reach a conclusion or present a point of view.’” (Report Summary: Understanding University Success)

The habits of mind above are compiled from *Report Summary: Understanding University Success* and *A Consensus Model for Pre-service Teacher Education in Mathematics and Science*.