

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them.

DO STUDENTS

- Explain a problem to themselves, determine what it means, and seek possible entry points?
- Analyze what's given, constraints, relationships, and goals?
- Make conjectures about what the solution might look like?
- Plan a solution pathway instead of jumping into a solution?
- Use multiple representations (verbal descriptions, symbolic, tables, graphs, diagrams, etc.)?
- Check their answers using different methods?
- Continually ask "Does this make sense?"
- Understand the approaches of others and identify correspondences between different approaches?

2. Reason abstractly and quantitatively.

DO STUDENTS

- Make sense of quantities and their relationships in problem situations?
- Decontextualize a problem?
- Contextualize a problem?
- Create a coherent representation of the problem, consider the units involved, and attend to the meaning of quantities?

3. Construct viable arguments and critique the reasoning of others.

DO STUDENTS

- Understand and use stated assumptions, definitions, and previous results?
- Make conjectures and build a logical progression of statements to explore the truth of their conjectures?
- Analyze situations and recognize and use counterexamples?
- Justify their conclusions, communicate them to others, and respond to arguments of others?
- Compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and articulate the flaw?
- Hear or read arguments of others and decide whether they make sense, and ask useful questions to clarify or improve the argument?
- Use mathematical induction as a technique for proof?
- Write geometric proofs, including proofs by contradiction?

4. Model with mathematics.

DO STUDENTS

- Apply the mathematics they know to solve problems in everyday life?
- Apply what they know and make assumptions and approximations to simplify a complicated situation as an initial approach?
- Identify important quantities in a practical situation?
- Analyze relationships mathematically to draw conclusions?
- Interpret their mathematical results in the context of the situation and reflect on whether the results make sense?

5. Use appropriate tools strategically.

DO STUDENTS

- Consider the available tools when solving mathematical problems?
- Know the tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful?
- Identify relevant external mathematical resources and use them to pose or solve problems?
- Use technological tools to explore and deepen their understanding of concepts?

6. Attend to precision.

DO STUDENTS

- Communicate precisely to others?
- Use clear definitions?
- Use the equal sign consistently and appropriately?
- Calculate accurately and efficiently?
- Express measurements and numerical answers with a degree of precision appropriate for the context?
- Interpret approximate and rounded measurements as a range of possible measurements?

7. Look for and make use of structure.

DO STUDENTS

- Look closely to determine a pattern or structure?
- Utilize properties?
- Decompose and recombine numbers and expressions?
- Have the facility to shift perspectives?

8. Look for and express regularity in repeated reasoning.

DO STUDENTS

- Notice if calculations are repeated, and look both for general methods and for shortcuts?
- Maintain oversight of the process, while attending to the details?
- Continually evaluate the reasonableness of their intermediate results?