CCSS Standards in Mathematical Practice

Standard	Demonstrates Competence With Standards *(Check item(s) where student shows proficiency)*
Makes sense of problems and persevere in solving them	☐ Explaining to themselves the meaning of a problem ☐ Looking for entry points ☐ Analyze givens, constraints, relationships, and goals ☐ Make conjectures about the form and meaning of the solution ☐ Plan a solution pathway ☐ They monitor and evaluate their progress and change course if necessary. ☐ Explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends ☐ Ask themselves, "Does this make sense?" ☐ Understand the approaches of others to solving complex problems ☐ Identify correspondences between different approaches.
Reason abstractly and quantitatively.	☐ Make sense of quantities and their relationships in problem situations ☐ Bring two complementary abilities to bear on problems involving quantitative relationships ☐ The ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols ☐ The ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved ☐ Habits of creating a coherent representation of the problem at hand ☐ Considering the units involved ☐ Attending to the meaning of quantities ☐ Knowing and flexibly using different properties of operations and objects
Construct viable arguments and critique the reasoning of others	☐ Understand and use stated assumptions, definitions, and previously established results in constructing arguments ☐ Make conjectures and build a logical progression of statements to explore the truth of their conjectures ☐ Analyze situations by breaking them into cases, and can recognize and use counterexamples ☐ Justify their conclusions, communicate them to others, and respond to the arguments of others ☐ Reason inductively about data, making plausible arguments that take into account the context from which the data arose ☐ Able to compare the effectiveness of two plausible arguments ☐ Distinguish correct logic or reasoning from that which is flawed and—if there is a flaw in an argument—explain what it is ☐ Can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments

Model with mathematics	☐ Apply the mathematics they know to solve problems arising in everyday life, society, and the workplace ☐ A student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another ☐ Are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later ☐ Able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas ☐ Can analyze those relationships mathematically to draw conclusions ☐ Routinely interpret their mathematical results in the context of the situation ☐ Reflect on whether the results make sense, possibly improving the model if it has not served its purpose
Use appropriate tools strategically.	☐ Consider the available tools when solving a mathematical problem ☐ Tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software ☐ Sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations ☐ Analyze graphs of functions and solutions generated using a graphing calculator ☐ Detect possible errors by strategically using estimation and other mathematical knowledge ☐ Mathematical models, and technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data ☐ Able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems ☐ Use technological tools to explore and deepen their understanding of concepts
Attend to precision	☐ Communicate precisely to others ☐ Use clear definitions in discussion with others and in their own reasoning ☐ State the meaning of the symbols they choose, including using the equal sign consistently and appropriately ☐ Careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem ☐ Calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context ☐ Students give carefully formulated explanations to each other ☐ Examine claims and make explicit use of definitions
Look for and make use of structure	☐ Look closely to discern a pattern or structure ☐ Step back for an overview and shift perspective ☐ Can see complicated things as single objects or as being composed of several objects
Look for and express regularity in repeated reasoning	☐ 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