

Sample Oklahoma C³ Mathematics Data Collection Instrument



Mathematics

Standards for Mathematical Practice:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.

5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Students are:

- Applying mathematics to real-life problems**
Are students engaged in problem solving authentic problems that require complex thinking? Can students apply metacognitive strategies that allow them to monitor and evaluate their progress and change course as necessary to solve a problem? Do they create logical arguments and respond to the arguments of others?
- Solving complex problems**
Do problems allow for multiple strategies and/or multiple solutions? Do students show evidence of discerning patterns to approach complex problems?
- Reasoning**
Are students demonstrating the ability to decontextualize and contextualize and create a coherent representation of the problem? Are students evaluating the reasonableness of their results?
- Forming and testing predictions and conjectures**
Do students draw and justify conclusions, make generalizations, use logical reasoning, predict, make judgments and recommendations?
- Communicating mathematical ideas**
Are students using academic vocabulary in mathematics? Are they involved in collaborative discussions about mathematical concepts and procedures?
- Using tools such as:**
Pencil and paper, concrete model, rulers, protractors, calculators, spread sheets, computer algebra system, statistical package, dynamic geometry software
Are students using these to develop conceptual understanding, solve problems, gather data, gain insight, and recognize the limitation of such tools?
- Using and connecting verbal, numeric, graphic and symbolic representations**

Teachers are:

- Incorporating writing opportunities for students in mathematics.**
Are students given opportunities to write and evaluate writing involving concepts and skills in mathematics?
- Using effective questioning techniques that promote deep thinking, elicit higher order responses, and probe, extend, and clarify student thinking about mathematics**
Are questions divergent and open-ended? Are questions about essential mathematical concepts and procedures? Does the teacher practice wait time? Is there equity in selecting students to respond?
- Facilitating student engagement in doing mathematics**
Does the teacher ask scaffolding questions, monitor and observe student work, encourage cooperative learning, and listen to student conversation?
- Incorporating manipulatives and technology in instruction strategically**
Are manipulatives and technology use accompanied by effective questioning and opportunities to make connections to the mathematical concepts? Do the manipulatives and technology enhance conceptual understanding of mathematics?
- Encouraging students to make conjectures and ask questions; using student conjectures and questions to stimulate class discussion of mathematical concepts**
Does the teacher encourage the creation of logical arguments and provide opportunities to critique the reasoning of others?
- Connecting the Standards for Mathematical Practice to the Standards for Mathematical Content**
Does the teacher make rigorous mathematics accessible to all students?
- Using multiple forms of assessment**
Does the teacher frequently use observation, questioning, journaling, and other forms of formative assessment? Are assessments varied, incorporating performance tasks and extended opportunities for written expression?

Comments: