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Uncommon Math 2023-24

Vision Statement

Every mathematics classroom at Uncommon Schools is a joyful community of learners who are problem-solvers, flexible thinkers, risk-takers, and lovers of math. Students develop deep, lasting, and flexible mastery that spans across lessons, units, and courses. To achieve this, we are committed to developing mathematicians who construct viable arguments, respectfully critique the reasoning of others, and persevere through challenging tasks in the classroom, in their everyday lives, and in their future careers. We also strive to motivate and support students' long-term goals to pursue careers in STEM-related fields.

Core Values of 5-12 Mathematics Instruction

1. **We talk math.**
2. **We make math connections.**
3. **We persevere.**
4. **We are a community.**

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Core Value #1: We talk math.

Students drive their own learning, and they develop deeper understanding, when they share ideas with each other. Our classrooms are designed to elevate student voice and build student capacity to have rich discussions about the mathematics they are doing and learning. More than 50% of the lesson is student talk.

<table>
<tr><th>Teacher Actions</th><th>Student Actions</th></tr>
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Teachers are consistently and effectively using quality prompts.
● (Pre-Solving) Notice:
○ What do you notice?
○ What does this remind you of?
○ What do you recognize?
○ What looks new / different?
○ What does this make you wonder?
● Reason:
○ Why?
○ How do you know?
○ Convince us. Convince a skeptic.
○ Explain that using [key math terms].
○ Who did it differently?
○ Prove it.
○ Chart the error: Evaluate.
● Generalize/Apply:
○ What did we learn?
○ What pattern do you notice?
○ Will this always be true? Why/why not?
○ What if...?
Teachers are consistently and effectively using engagement strategies such as:
● Poll
● Everybody Writes/stop and jots.
● Turn and talks on higher order thinking questions.

<table>
<tr><th>Teachers are not asking/saying:</th><th>Instead, they are asking/saying:</th></tr>
<tr><td>What is the first step?</td><td>How could we approach this problem?</td></tr>
<tr><td>What is the next step?</td><td>Are we done? How do you know?</td></tr>
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<td>
● Students actively share their opinion whether they agree or disagree.
● Students never respond with “I don’t know.” Instead they:
○ Ask a clarifying question
○ “Can I have more time to think?”
○ “Can you rephrase the question?”
○ “I am not sure, but my best guess is ___ because [evidence/prior knowledge]”
○ “I am not sure, but I do know ___.”
○ “I am confused about ___.”
● Students believe that understanding “why” and “how” is just as important as finding the final answer.
● Students use strong habits of discussion.
○ Revoicing peers
○ Agree/Disagree/Build/Evaluate
● Students collaborate in small groups.
● Students participate in whole-group discourse.
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Core Value #2: We make math connections.

We actively promote and celebrate multiple representations (e.g., table, equation, graph) and multiple solution pathways (e.g., arithmetic vs. algebraic). Teachers understand the enduring mathematical understandings and encourage students to make mathematical connections between lessons, units, and courses. It is our responsibility to help students understand how each lesson connects to a big idea.

Teacher Actions	Student Actions
● Teachers thoroughly study the Common Core & AP standards, Standards for Mathematical Practice, and other diverse resources to understand and plan instruction around the big ideas of each lesson and unit and how they are connected. ● Teachers understand the vertical alignment of the grade-level standards. (What are the previous and future learnings?) ● Teachers create opportunities for students to see the connections through projects and application-based questions. ● Teachers launch lessons with a big question. ● Teachers begin the lesson by activating knowledge & using a hook. ● Teachers plan to incorporate multiple representations in each lesson. ● Teachers value, model, and celebrate creative thinking, alternative approaches and multiple representations. ● Teachers reference instructional signage and chart papers during instruction. Teachers are consistently and effectively using quality prompts. **Multiple representations:** o How did you picture that? o Is there another way to solve this problem? o Can you show me three other ways to solve the problem. o Can you show me three other ways to represent the final answer. o What's the same or different about these two solutions? o Which of these answers are correct and how do you know? [from 2-4 different representations on the board]	● Students are encouraged to relate ideas to previous lessons or topics. ● Students are encouraged to relate ideas to events in their lives and communities. ● Students can solve tasks using multiple methods and strategies. ● Students leverage instructional signage, chart papers, notebooks, and, when appropriate, technology during independent practice. ● Students can connect different ideas, methods, and perspectives to solve a problem. ● Students build fluency using connections, strategies and conceptual understanding.

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Core Value #3: We Persevere.

The math classroom is a safe and brave space where all members value mistakes and see them as growth opportunities. We take risks and are comfortable being uncomfortable. We encourage curiosity and teach our students how to persevere when facing tough problems.

Teacher Actions	Student Actions
● Teachers believe and communicate that every student can achieve at a high level and conduct instruction that provides consistent opportunity for this achievement. ● Teachers insist on effort, participation and resourcefulness and hold students accountable to it. ● Teachers value, model, and celebrate creative thinking, alternative approaches and multiple representations. ● Teachers acknowledge and celebrate effort. ● Teachers praise risk-taking. ● Teachers honor mistakes and value misconceptions ● Teachers thank students for letting the community learn from their errors. ● Teachers establish a "hands down" culture during IP. ● Teachers dedicate time for "Spicy" problems every day. ● Teachers are data-driven and consistently evaluate & respond to student work. Teachers are consistently and effectively using quality prompts. **Embrace struggle:** o What makes this task challenging? o What did we learn from this error? o Why do you think this error or misconception is so common? o Why did you change your mind?	● Students believe that their ability and competence grow with their effort, and they can succeed at learning mathematics. ● When stuck, students first pause and consider what they know. Then, they use strategies such as drawing a picture, finding patterns and choosing a simpler model to move forward before asking for help. ● When stuck on homework, students use strategies such as reviewing their notes, Khan Academy, etc. to move forward. ● Students believe "This work has value for me." ● Students believe, "My work looks different from my peer's, and I own my strategies and understanding." ● Students regularly set goals, work towards them, and reflect on their progress.

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Core Value #4: We are a community.

We are a community of mathematicians where teamwork is valued. We celebrate each other's growth & achievements, and we support each other through individual and collaborative struggle. We believe that two minds are better than one; we learn better together than alone.

Teacher Actions	Student Actions

● Teachers work hard to create classroom cultures marked by the joy of learning, a spirit of collaboration and expectations for hard work.
● Teachers and students work together when students are stuck.
● Teachers provide opportunities for students to work in pairs or groups.
● Teachers give students wait time during class discussion.
● Teachers regularly celebrate student achievement and growth.
	● Students feel that they belong to this academic community.
	● Students work to understand rather than to get the correct answer.
	● Students freely ask and pose questions.
	● Students connect their ideas to their peers' ideas, solution paths, visuals, and representations.
	● Students take care of each other by:
	  ○ Celebrating their peers' achievements and growth
	  ○ Being patient and/or offering help when others are persevering
	  ○ Saying thanks when a peer challenges or helps
	  ○ Having a positive attitude

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