

Handout 1: Jackson County Middle School Innovation Configuration Map for Mathematics Instruction

HOMEWORK

COMPONENT: *The teacher assigns homework tailored to students' needs, provides opportunities for students to further develop understanding, and includes resources that support students.*

DIMENSION	a. IDEAL	b	c	d. LESS THAN IDEAL
Differentiation	<ul style="list-style-type: none"> Homework is at the level where students can have success, but they are still challenged. Teacher assigns problem sets based on level of class with optional extension questions. Teacher assigns problem sets that differ in both the number of questions and the type of questions. Teacher differentiates grading based on skill/performance level to scaffold learning. 	<ul style="list-style-type: none"> Teacher assigns problem sets based on level of class by assigning procedural questions to low-achieving students and some conceptual questions to more advanced students. Teacher differentiates grading based on skill/performance level to scaffold learning. 	<ul style="list-style-type: none"> Teacher differentiates assignments only by varying the number of problems. Grading is undifferentiated. Teacher applies the same expectations for all students. Lower achieving students receive only procedural questions. 	<ul style="list-style-type: none"> Teacher assigns all students the same problem set regardless of skill level or class grouping. Grading is undifferentiated. Teacher applies the same expectations for all students.
Purpose	<ul style="list-style-type: none"> Homework provides many opportunities for students to further develop skills and apply the skills they have learned in new contexts in real-world situations. Homework provides many opportunities for students to revisit and reinforce past content. 	<ul style="list-style-type: none"> Homework provides some opportunities for students to further develop skills and apply the skills they have learned in new contexts in word problems. Homework provides some opportunities for students to revisit and reinforce past content. 	<ul style="list-style-type: none"> Homework provides some opportunity to further develop skills. Homework includes only objectives covered that day in class. 	<ul style="list-style-type: none"> Homework provides opportunities only for students to repeatedly apply the skill they have learned to the same type of problems that they saw in class. Homework includes only objectives covered that day in class.

Mapping our Way to Academic Success Using Innovation Configuration (IC) Maps

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<p>DIMENSION</p> <p>Student resources</p>	<ul style="list-style-type: none"> Teacher consistently helps students create an organized math notebook to use as a resource and models how to use it. Students use <i>digits</i> online resources when they are stuck. 	<ul style="list-style-type: none"> Teacher helps students create an organized math notebook, with notes and examples, to use as a resource. 	<ul style="list-style-type: none"> Students rely mostly on resources from home and occasionally have opportunities to use notes or examples from class, but these are not organized in a math notebook. 	<ul style="list-style-type: none"> Students rely solely on resources from home.
<p>DIMENSION</p> <p>Feedback</p>	<ul style="list-style-type: none"> Students receive timely, individualized feedback on homework, including questions and suggestions for improvement, without a grade. Students are offered the opportunity to retry problems until they can demonstrate understanding and before receiving a grade. 	<ul style="list-style-type: none"> Students receive feedback on homework in a whole-class setting, with suggestions for improvement. Students are offered the opportunity to retry the problems. 	<ul style="list-style-type: none"> Teacher simply marks answers right or wrong. Students do not have the opportunity to retry problems they missed. Students receive grades without any feedback. 	<ul style="list-style-type: none"> Students receive no feedback on homework.

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ASSESSMENT

COMPONENT: *The teacher administers assessments frequently and ensures that assessments are aligned to each other.*

DIMENSION	a. IDEAL	b	c	d. LESS THAN IDEAL
Summative assessment design	<ul style="list-style-type: none"> • Teachers teaching the same grade or content collaborate to create common assessments. • Teacher constructs his or her own assessments from multiple sources for items. • All formative and summative assessments align with each other. • Assessment questions ask students to think critically, apply content in new contexts, and explain their answers. • Assessments include questions from past units, particularly in areas where students have struggled. • All assessment items align with the rigor intended by the standard. 	<ul style="list-style-type: none"> • Teacher aligns assessment with those used by other teachers of same grade level. • Teacher uses at least two sources for assessment items. • Many formative assessments and summative assessments align with each other. • Assessments include opportunities for students to think critically, with at least two free response questions. • Assessments include content from past units. • Most individual assessment items align with the rigor intended by the standard. 	<ul style="list-style-type: none"> • Teacher aligns assessment with assessments used by other teachers of same grade level. • Teacher uses one source for assessments. • Some formative assessments and summative assessments align with each other. • Most assessment questions are multiple choice. • Assessments include only content from the current unit. • Assessment items partially align with the rigor intended by the standard. 	<ul style="list-style-type: none"> • Teachers of the same grade level and content use different assessments. • Teacher uses one source for assessments. • Formative and summative assessments are not aligned. • All assessment questions are multiple choice. • Assessments include only content from the current unit. • Assessment items may or may not be aligned with the rigor intended by the standard.
Summative assessment frequency	<ul style="list-style-type: none"> • Teacher administers summative assessment at the end of each topic, approximately every 2–3 weeks. 	<ul style="list-style-type: none"> • Teacher administers at least three unit tests each 9 weeks. 	<ul style="list-style-type: none"> • Teacher administers at least two unit tests each 9 weeks. 	<ul style="list-style-type: none"> • Teacher administers only one unit test each 9 weeks.
Summative assessment data use	<ul style="list-style-type: none"> • Teacher uses assessment data to guide differentiation of instructional practices 	<p>Teacher does only one or two of following:</p> <ul style="list-style-type: none"> • Teacher uses assessment data to guide differentiation 	<ul style="list-style-type: none"> • Teacher uses assessment data for the entire class to determine areas of strength and growth for the class, 	<ul style="list-style-type: none"> • Teacher does not use assessment data. • Teacher covers all materials in unit

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	<ul style="list-style-type: none"> including reteaching, retesting, and acceleration. Teacher presents assessment data to students so they are aware of their areas of strength and for growth and to help them set growth goals. Teacher uses pre-assessment before the unit begins to determine what content to cover for which students. 	<ul style="list-style-type: none"> of instructional practices including reteaching and retesting. Teacher presents assessment data to students so they are aware of their areas of strength and for growth. Teacher uses pre-assessment before the unit begins. 	<ul style="list-style-type: none"> rather than differentiating for individual students. Teacher occasionally uses pre-assessment data to guide teaching. Teacher occasionally shares assessment data with students, without discussion about it. 	<ul style="list-style-type: none"> equally without considering pre-assessment data.
<p>DIMENSION</p> <p>Formative assessment</p>	<ul style="list-style-type: none"> Teacher is constantly checking for understanding using a variety of methods, including Kagan strategies or cold calling, and then responds by adapting instruction.¹ Teacher administers formative assessment, such as exit slips, daily to track student understanding. Students correct each other's work and provide feedback. Students receive feedback immediately and do the work over if appropriate. 	<ul style="list-style-type: none"> Teacher uses only one or two methods to check for understanding and then remediates by giving or eliciting the correct answer rather than letting the student figure it out. Once per week teacher administers formative assessment to track student understanding. Students receive feedback immediately and do the work over if appropriate. 	<ul style="list-style-type: none"> Teacher infrequently checks for understanding and does not adjust instruction based on student responses. Once per month teacher administers formative assessment to track student understanding. Feedback is delayed. 	<ul style="list-style-type: none"> Teacher does not check for understanding. Teacher does not administer formative assessment. Students do not receive feedback and have no chance to redo work.

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MATERIALS

COMPONENT: *The teacher uses materials that are student-friendly and consistent across grade levels.*

DIMENSION	a. IDEAL	b	c	d. LESS THAN IDEAL
Selection of materials	<ul style="list-style-type: none"> Teacher uses judgment to determine when <i>digits</i> is the best source and when it would be helpful to integrate materials from other sources in order to engage students. When appropriate teacher uses manipulatives. Materials align with the objective and with the rigor of the Common Core state standards. 	<ul style="list-style-type: none"> When appropriate teacher uses manipulatives, but they may not be the best fit for the content, and teacher may not provide enough explanation. 	<ul style="list-style-type: none"> Teacher uses materials and manipulatives not aligned with the objective or with the rigor of the Common Core standards. 	<ul style="list-style-type: none"> Teacher uses only the <i>digits</i> program materials. Teacher exclusively uses worksheets and textbooks and avoids use of manipulatives.
Consistency	<ul style="list-style-type: none"> Teacher uses materials such as calculators or algebra tiles that are familiar to students across the district. 	<ul style="list-style-type: none"> Teacher uses only one district-wide material (calculators OR algebra tiles) when using both would be more effective. 	<ul style="list-style-type: none"> Teacher introduces new materials without sufficient explanation of how to use them. 	<ul style="list-style-type: none"> Teacher uses unfamiliar materials without ensuring students know how to use them. Teacher does not use district-wide middle and high school manipulatives (algebra tiles, calculators) and does not consider how materials will be used in future courses.

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INSTRUCTIONAL PRACTICE

COMPONENT: *The teacher provides students opportunities to work actively in groups and independently.*

DIMENSION	a. IDEAL	b	c	d. LESS THAN IDEAL
Student groupings	<ul style="list-style-type: none"> Students “think-pair-share” as appropriate/when discussing mathematical content. Teacher uses grouping strategies (such as Kagan strategies) to group students who differ on various dimensions including gender and ability level. Students work together frequently using several different pairing strategies in addition to shoulder partners. Students work with a variety of classmates, and teacher changes groupings every 6 weeks. 	<ul style="list-style-type: none"> Students think-pair-share as appropriate/when discussing mathematical content. Teacher uses grouping strategies to group students. Groupings change infrequently. 	<ul style="list-style-type: none"> Teacher groups students only by achievement level. Students remain in the same group for the full year. Teacher uses only one pairing strategy and never changes the strategy. 	<ul style="list-style-type: none"> Teacher does not group students together to work. Students solely work independently. Teacher does not use grouping strategies.
Student work time	<ul style="list-style-type: none"> Students are actively engaged in DOING math, either through discussion or solving problems.¹ Students have time in class to start homework with support of instructor and peers, and teacher has time to close lesson and clear up misconceptions. 	<ul style="list-style-type: none"> Students are engaged in doing math, but no time is allotted for closure or follow-up questions to clear up misconceptions before students leave the classroom. 	<ul style="list-style-type: none"> Students work on drill activities only, without active student engagement. 	<ul style="list-style-type: none"> Teacher lectures for a majority of the lesson. Students spend most of class passively receiving information from teacher.

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DIMENSION	<ul style="list-style-type: none"> Teacher asks conceptual questions to push thinking by using think time and building on student responses. Teacher questions students to understand their thinking processes. Teacher uses questioning techniques (such as cold calling) to ensure he or she engages all students. Students generate higher-order questions.ⁱ 	<ul style="list-style-type: none"> Teacher asks some conceptual questions. Teacher uses questioning techniques (such as cold calling) to ensure he or she engages all students. 	<ul style="list-style-type: none"> Teacher asks only procedural questions. 	<ul style="list-style-type: none"> Teacher asks no questions. Teacher may ask questions but does not allow time for student response.
DIMENSION	<ul style="list-style-type: none"> Teacher communicates the purpose of the activity clearly. Teacher ties content to the real world to help students see how the material is relevant.ⁱ 	<ul style="list-style-type: none"> Teacher may communicate the purpose of the activity and emphasizes relevance, but it may not be clear to students. 	<ul style="list-style-type: none"> Teacher may communicate the purpose but does not emphasize relevance. 	<ul style="list-style-type: none"> Teacher does not communicate the purpose of the activity. Teacher does not tie content to the real world.
DIMENSION	<ul style="list-style-type: none"> Teacher provides clear explanation of mathematical vocabulary. Teachers use vocabulary consistently across the school and district. Students use vocabulary correctly. 	<ul style="list-style-type: none"> Teacher uses mathematical vocabulary correctly, but students do not necessarily use it. Teachers use vocabulary consistently across the school and district. 	<ul style="list-style-type: none"> Teacher uses simplified mathematical vocabulary rather than academic language. 	<ul style="list-style-type: none"> Teacher does not use mathematical vocabulary in class. Teacher may use vocabulary incorrectly.
DIMENSION	<ul style="list-style-type: none"> Teachers in the school and district communicate with each other to ensure they 	<ul style="list-style-type: none"> Teachers in the school communicate with each other to ensure they are 	<ul style="list-style-type: none"> Teacher shares only one strategy for solving a problem. 	<ul style="list-style-type: none"> Teachers explain content across courses differently,

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<p>are explaining content consistently across classes and grades.</p> <ul style="list-style-type: none"> • Students explain content to each other.ⁱ • Teacher’s explanation is clear and correct and helps students understand the content conceptually.ⁱ • Teacher helps students develop multiple strategies for solving a problem.ⁱⁱ • Teacher teaches students to utilize structure in algebraic and numeric representations (for example, helping students understand embedded parentheses by drawing diagrams).ⁱⁱⁱ 	<p>explaining content consistently across classes and grades</p> <ul style="list-style-type: none"> • Teacher shares multiple strategies for solving a problem. • Teacher’s explanation is clear and correct. 	<ul style="list-style-type: none"> • Teacher’s explanation is confusing for students. 	<p>which may cause confusion for students.</p> <ul style="list-style-type: none"> • Teacher’s explanation of content is unclear and may include some errors. • Teacher’s explanation is solely procedural.
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CLASSROOM ENVIRONMENT

COMPONENT: *The teacher structures classroom in a way that is conducive to student learning.*

DIMENSION	a. IDEAL	b	c	d. LESS THAN IDEAL
Physical dimensions of classroom	<ul style="list-style-type: none"> Exemplar student work is purposefully posted. Common formulas or vocabulary are posted for students to use as reference. Teacher groups students using Kagan strategies and seats groups together. Room is arranged so teacher can easily move between groups. 	<ul style="list-style-type: none"> Student work is posted. Teacher groups students and seats them together. Room is arranged so teacher can easily move between groups. 	<ul style="list-style-type: none"> Student grouping is random. Room is arranged so teacher can easily move between groups. 	<ul style="list-style-type: none"> Materials on walls are not content specific. There is no seating chart. It is difficult for teacher to move around the room and move between groups.
Classroom climate	<ul style="list-style-type: none"> Students feel comfortable admitting when they do not understand and asking for help. Teacher uses strategies to build community such as group accountability. Students are respectful and encouraging of each other's efforts. Students help each other understand the content. 	<ul style="list-style-type: none"> Some students feel comfortable admitting when they do not understand and asking for help. Students are respectful to each other. 	<ul style="list-style-type: none"> Students are hesitant to ask for help. Students are for the most part respectful to each other, but there are exceptions. 	<ul style="list-style-type: none"> Students do not ask for help. Teacher does not build community. Students rarely interact with each other. Students are disrespectful to each other (for example, teasing).

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ⁱ Learning Mathematics for Teaching & Hill, H. (2014). *Mathematical quality of Instruction: 4-point version*. Retrieved April 6, 2019, from <http://completemath.onmason.com/files/2017/03/MQI-4-Point-to-use-for-MATH-MODELING.pdf>

ⁱⁱ Woodward, J., Beckmann, S., Driscoll, M., Franke, M., Herzig, P., Jitendra, A. ... Ogbuehi, P. (2012). *Improving mathematical problem solving in grades 4 through 8: A practice guide* (NCEE 2012-4055). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/mps_pg_052212.pdf

ⁱⁱⁱ Star, J. R., Caronongan, P., Foegen, A., Furgeson, J., Keating, B., Larson, M. R.... Zbiek, R. M. (2015). Teaching strategies for improving algebra knowledge in middle and high school students (NCEE 2014-4333). Washington, DC: National Center for Education Evaluation and Regional Assistance (NCEE), Institute of Education Sciences, U.S. Department of Education. Retrieved April 6, 2019 from [https://ies.ed.gov/ncee/wwc/Docs/guide\(NCEE 2012-4055\). Washington](https://ies.ed.gov/ncee/wwc/Docs/guide(NCEE 2012-4055). Washington)