Appendix B: Jackson County Middle School
Innovation Configuration Map for Mathematics Instruction

HOMEWORK				
COMPONENT: *The teacher assigns homework that is 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	• 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.	• 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.	• 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.	• 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.
DIMENSION	• 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.	• 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.	• Homework provides some opportunity to further develop skills. • Homework only includes objectives covered that day in class.	• Homework only provides opportunities for students to repeatedly apply the skill they have learned to the same type of problems that they saw in class. • Homework only includes objectives covered that day in class.
Purpose				

DIMENSION Student resources	• Teacher consistently helps students create an organized math notebook to use as a resource and models how to use it. • Students use *digits* online resources when they are stuck.	• Teacher helps students create an organized math notebook, with notes and examples, to use as a resource.	• 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.	• Students rely solely on resources from home.
DIMENSION Feedback	• 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.	• Students receive feedback on homework in a whole-class setting, with suggestions for improvement. • Students are offered the opportunity to retry the problems.	• Teacher simply marks answers right or wrong. • Students do not have the opportunity to retry problems they missed. • Students receive grades without any feedback.	• Students receive no feedback on homework.

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	• 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.	• 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.	• 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 only include content from the current unit. • Assessment items partially align with the rigor intended by the standard.	• 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 only include content from the current unit. • Assessment items may or may not be aligned to the rigor intended by the standard.
DIMENSION	• Teacher administers summative assessment at the end of each topic, approximately every 2–3 weeks.	• Teacher administers at least three unit tests each 9 weeks.	• Teacher administers at least two unit tests each 9 weeks.	• Teacher administers only one unit test each 9 weeks.
Summative assessment frequency				
DIMENSION	• Teacher uses assessment data to guide differentiation of instructional practices	Teacher does only 1 or 2 of following: • Teacher uses assessment data to guide differentiation	• Teacher uses assessment data for the entire class to determine areas of strength and growth for the class,	• Teacher does not use assessment data. • Teacher covers all materials in unit equally without
Summative assessment data use				

	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.	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.	rather than differentiating for individual students. • Teacher occasionally uses pre-assessment data to guide teaching. • Teacher occasionally shares assessment data with students, without discussion around it.	considering pre-assessment data.
DIMENSION Formative assessment	• Teacher is constantly checking for understanding using a variety of methods, including Kagan strategies or cold calling, and then responds by adapting instruction.[i] • 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.	• Teacher only uses 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.	• 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.	• Teacher does not check for understanding. • Teacher does not administer formative assessment. • Students do not receive feedback and have no chance to redo work.

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	• Teacher uses judgment to determine when *digits* 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.	• When appropriate teacher uses manipulatives but they may not be the best fit for the content, and teacher may not provide enough explanation.	• Teacher uses materials and manipulatives not aligned to the objective or to the rigor of the Common Core standards.	• Teacher uses only the *digits* program materials. • Teacher exclusively uses worksheets and textbooks and avoids use of manipulatives.
DIMENSION	• Teacher uses materials such as calculators or algebra tiles that are familiar to students across the district.	• Teacher uses only one district-wide material (calculators OR algebra tiles) when using both would be more effective.	• Teacher introduces new materials without sufficient explanation of how to use them.	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.
Consistency				

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	• 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.	• Students think-pair-share as appropriate/when discussing mathematical content. • Teacher uses grouping strategies to group students. • Groupings change infrequently.	• 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.	• Teacher does not group students together to work. • Students solely work independently. • Teacher does not use grouping strategies.
DIMENSION	• Students are actively engaged in DOING math, either through discussion or solving problems.[i] • 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.	• 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.	• Students work on drill activities only, without active student engagement.	• Teacher lectures for a majority of the lesson. • Students spend most of class passively receiving information from teacher.
Student work time				

DIMENSION Questioning	• 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] [ii]	• Teacher asks some conceptual questions. • Teacher uses questioning techniques (such as cold calling) to ensure he or she engages all students.	• Teacher asks only procedural questions.	• Teacher asks no questions. • Teacher may ask questions but does not allow time for student response.
DIMENSION Student relevance	• 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]	• Teacher may communicate the purpose of the activity and emphasizes relevance, but it may not be clear to students.	• Teacher may communicate the purpose but does not emphasize relevance.	• Teacher does not communicate the purpose of the activity. • Teacher does not tie content to the real world.
DIMENSION Vocabulary	• Teacher provides clear explanation of mathematical vocabulary. • Teachers use vocabulary consistently across the school and district. • Students use vocabulary correctly.	• Teacher uses mathematical vocabulary correctly, but students do not necessarily use it. • Teachers use vocabulary consistently across the school and district.	• Teacher uses simplified mathematical vocabulary rather than academic language.	• Teacher does not use mathematical vocabulary in class. • Teacher may use vocabulary incorrectly.
DIMENSION Explanation of content	• Teachers within the school and district communicate with each other to ensure they are explaining content	• Teachers within the school communicate with each other to ensure they are explaining content	• Teacher shares only one strategy for solving a problem. • Teacher's explanation is confusing for students.	• Teachers explain content across courses differently, which may cause confusion for students.

	consistently across classes and grades. • Students explain content to each other.[iiii] • Teacher's explanation is clear and correct and helps students to understand the content conceptually.[iiv] • Teacher helps students develop multiple strategies for solving a problem.[v] • Teacher teaches students to utilize structure in algebraic and numeric representations (for example, helping students understand embedded parentheses by drawing diagrams).[vi]	consistently across classes and grades • Teacher shares multiple strategies for solving a problem. • Teacher's explanation is clear and correct.	• Teacher's explanation of content is unclear and may include some errors. • Teacher's explanation is solely procedural.

CLASSROOM ENVIRONMENT				
COMPONENT: *The teacher structures classroom in a way that is conducive to student learning.*				
DIMENSION Physical dimensions of classroom	a. IDEAL • 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.	b • Student work is posted. • Teacher groups students and seats them together. • oom is arranged so teacher can easily move between groups.	c • Student grouping is random. • Room is arranged so teacher can easily move between groups.	d. LESS THAN IDEAL • 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.
DIMENSION Classroom climate	• 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 to understand the content	• Some students feel comfortable admitting when they do not understand and asking for help. • Students are respectful to each other.	• Students are hesitant to ask for help. • Students are for the most part respectful to each other, but there are exceptions.	• 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).

[i] Learning Mathematics for Teaching & Hill, H. (2014) Mathematical quality of Instruction: 4-point version. Retrieved May 22, 2018 from http://completemath.onmason.com/files/2017/03/MQI-4-Point-to-use-for-MATH-MODELING.pdf

[ii] Learning Mathematics for Teaching & Hill, H. (2014) Mathematical quality of Instruction: 4-point version. Retrieved May 22, 2018 from http://completemath.onmason.com/files/2017/03/MQI-4-Point-to-use-for-MATH-MODELING.pdf

[iii] Learning Mathematics for Teaching & Hill, H. (2014) Mathematical quality of Instruction: 4-point version. Retrieved May 22, 2018 from http://completemath.onmason.com/files/2017/03/MQI-4-Point-to-use-for-MATH-MODELING.pdf

[iv] Learning Mathematics for Teaching & Hill, H. (2014) Mathematical quality of Instruction: 4-point version. Retrieved May 22, 2018 from http://completemath.onmason.com/files/2017/03/MQI-4-Point-to-use-for-MATH-MODELING.pdf

[v] Woodward, J., Beckmann, S., Driscoll, M., Franke, M., Herzig, P., Jitendra, A., Koedinger, K. R., & 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

[vi] Star, J. R., Caronongan, P., Foegen, A., Furgeson, J., Keating, B., Larson, M. R., Lyskawa, J., McCallum, W. G., Porath, J., & 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 from https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/wwc_algebra_040715.pdf