Using Student Rubrics to Self-Assess, Revise, and Improve

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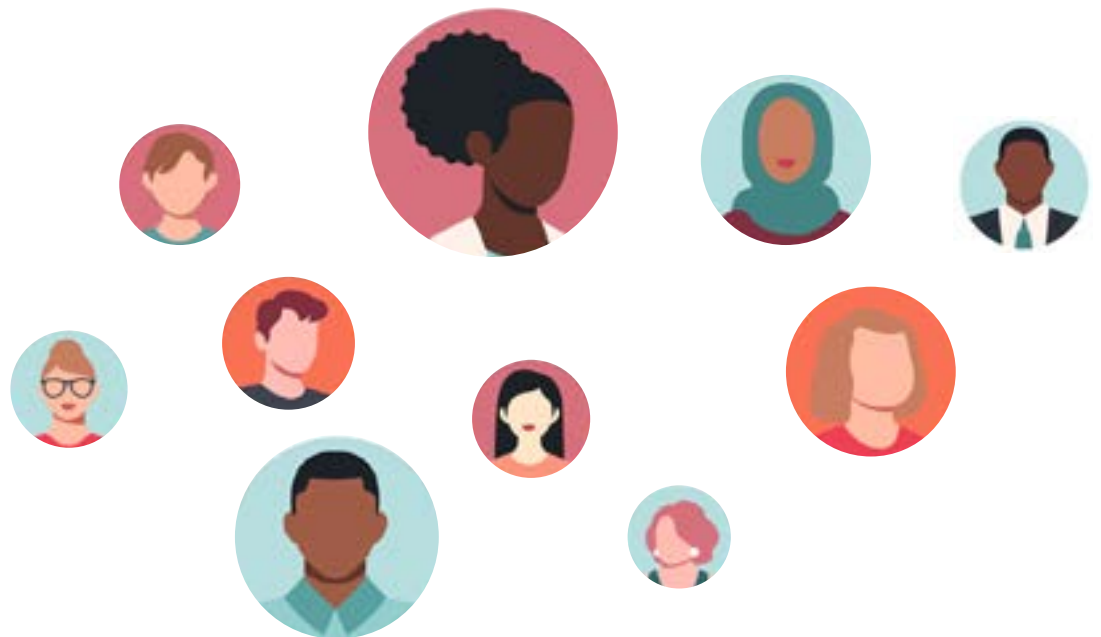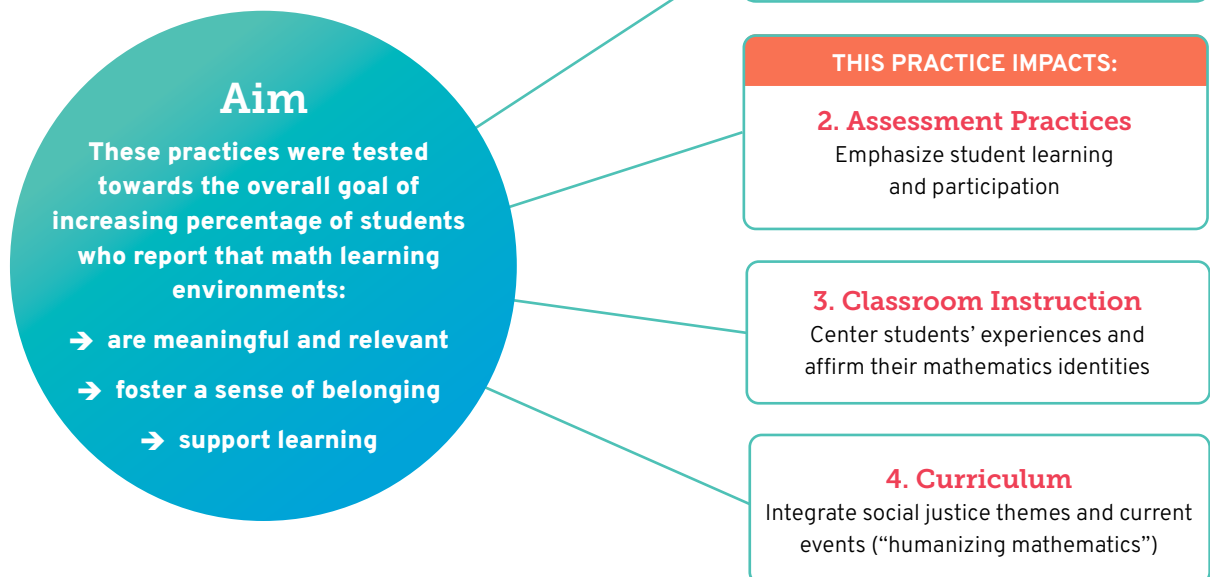
Why This Work Matters

An imperative to center students' experiences in math education

Research points to numerous factors that are instrumental in positive academic outcomes for all students. These include: a positive racial/ethnic identity[1], a sense of belonging[2], and beliefs about their academic abilities[3]. Teachers' expectations are one of the most powerful influences, and these have been found to be lower for Black, Latinx, and Indigenous students due to teachers' biases[4]. Asset-based pedagogy ensures that teachers develop essential knowledge and behaviors that sustain high expectations and promote student identity[5].

This is particularly important in mathematics[6] where some of the most stubborn inequities persist[7]. Special attention is necessary because this subject area has disproportionately negatively impacted students from historically marginalized backgrounds via high-stakes testing, a hyperfocus on skill development, and the abstract nature of the subject disconnected from their day-to-day lives.

However, equity-focused mathematics teachers are innovating and improving ways to support students' identity as math learners, sense of belonging, and beliefs about their academic ability. To learn more about how these practices can be applied in the classroom, Shift partnered with educators across the country to develop a theory of change describing key levers for improving students' experiences in their math classrooms, and to build and test a few of the potentially high-leverage practices they identified. **The purpose of these resources is to provide educators with concrete examples and guidance from educators that have put these strategies into practice in their context.**

The focus of teachers' work was supporting middle and high-school Black and Latinx students experiencing poverty, but the practices are broadly applicable across demographic groups.

Aim

These practices were tested towards the overall goal of increasing percentage of students who report that math learning environments:

➜ **are meaningful and relevant**
➜ **foster a sense of belonging**
➜ **support learning**

Drivers

1. Class Environment
Develop positive social / academic community behaviors

THIS PRACTICE IMPACTS:
2. Assessment Practices
Emphasize student learning and participation

3. Classroom Instruction
Center students' experiences and affirm their mathematics identities

4. Curriculum
Integrate social justice themes and current events ("humanizing mathematics")

Theory of Change

A Theory of Change is a description of how we believe change (or improvement) will happen; illustrating how our collective actions will lead to the desired outcomes.

Aim

An Aim is a shared goal of an improvement initiative that is 'SMARTIE', i.e. specific, measurable, actionable, realistic and time-bound as well as inclusive (with whom) and equitable (for whom).

Drivers

Drivers describe the main factors, leverage points, and/or ideal conditions that would need to be present to accomplish the aim of an improvement initiative.

Change Ideas

Change Ideas describe how you might create the conditions described in your drivers in order to accomplish the aim.

Change Package

A Change Package is both a collection of consolidated learning arising from testing change ideas in a theory as well as a resource for those who wish to test and adapt these change ideas.

> "My goal is to have students understand where their grade comes from and how it is a reflection of the evidence of mastery of math skills and concepts they have demonstrated."

KATIE KUNKEL, HIGH SCHOOL MATH TEACHER

1. What it is

Rubrics are helpful for teachers because they chart out how a student can gain mastery in a given skill. Rubrics are often used to offer summative assessments for students' progress (i.e., a grade or a score). When put directly in the student's hands, however, rubrics can be a powerful bite-sized formative tool to self-assess understanding and promote learning[8].

In a quest to have a more collaborative (i.e., teacher and students working together) and equitable assessment process, students can use rubrics to self-assess their progress. For example, students are given a mini rubric that outlines the proficiency levels for each skill that will be taught (mastery, proficient, developing, emerging, below emerging). Students use this rubric throughout the unit to self-assess their proficiency levels and help them see what needs to be done to move up the proficiency scale.

This change is most impactful when students review the rubric at the beginning of the lesson/standard to understand the expectation for proficiency, the difference between

AN EXAMPLE OF A STUDENT-FRIENDLY RUBRIC AND STUDENT FEEDBACK FORM

#1: **I can multiply binomials**	
☐ Mastery	I can multiply binomials with no mistakes.
☐ Proficient	I can multiply binomials but I might've made an error when simplifying.
☐ Developing	I can only multiply binomials with no coefficients (I can only do 1st one) OR I can only multiply binomials with coefficients (I can only do 2nd one)
☐ Emerging	I began the process but I got lost along the way.
☐ Below Emerging	My work is blank or almost blank.

#2 and # 3: **I can write and compare Linear and Quadratic functions**

☐ Mastery — The goal of the pink sheet is to help you see where your grade is coming from. I am hoping that you will know exactly what you need to do to move up the scale.

I can write the linear formula and the quadratic formula. I can use my formulas to answer questions about the marathon scenario.

☐ Proficient — I can write the linear formula and the quadratic formula. I answered the questions about the marathon scenario.

What did you think of assessing yourself to see where you are currently at? (using the Pink Sheet)

☐ Developing — I can write the linear formula but I don't think I wrote the correct quadratic formula. I answered the questions about the marathon scenario.

☐ Emerging — I can write the linear formula but not the quadratic.

Did you change your work on your Checkpoint after seeing the rubric?

☐ Below Emer. — My work is blank or almost blank.

Did this activity help you see what you need to do to get Mastery? Explain.

Would you like to keep doing something like this?

No because …	Yes but I think it needs to be explained more. I was kind of confused.	Yes! It was helpful for me to see how to get Mastery/Proficient/etc.	Yes because…

levels, and what specific terms mean. They can assess progress in the middle of the lesson/standard and have a discussion about how to move upwards on the scale. Then have students self-assess at the end of the lesson/standard to see how they've demonstrated their learning. Students can also check their work (by correcting for any errors) against the rubric.

2. Why do it

Using rubrics provide students with opportunities:

> ➤ to self-assess their work

> ➤ to work with their peers to assess other students' work

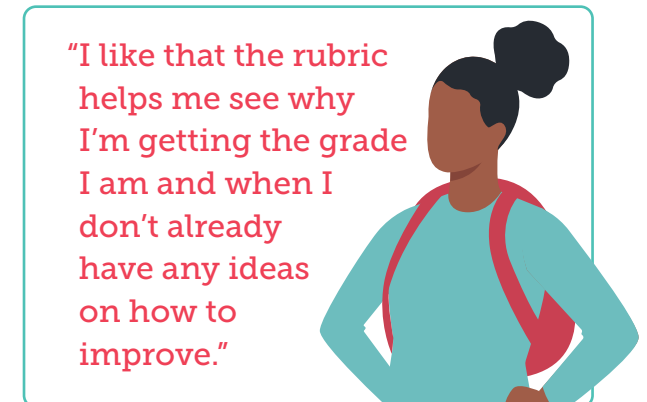> ➤ to explain their assessments against the rubric

Using rubrics can contribute to building a shared classroom culture of learning, feedback, and growth.

"[When using rubrics for group assessments,] I liked how we were working in partners and we got to share different opinions to understand better how we were doing."

3. How to do it

Getting Started

1. Review upcoming unit/lesson objectives

2. Create, adapt, or review the rubric for the lesson/topic/standard

3. Prepare daily instruction and formative assessment (quiz/test, Exit ticket) with aligned problems

4. Check rubric against the lesson plan, resources and materials

> ➤ Are students practicing the skill?

> ➤ Does the skill seem like it levels appropriately?

5. Introduce rubric to students

6. Students assess (individually or in pairs) with a rubric and turn in

7. Assess students and compare student scores. Write feedback and repeat

"I like that the rubric helps me see why I'm getting the grade I am and when I don't already have any ideas on how to improve."

Learning from teacher testing

Considerations

When testing this change idea, it is important to keep these related concepts and frameworks centered:

- Growth Mindset
- Student Agency
- Coproduction
- Peer Feedback

➤ Students tend to be **more accurate** when assessing against a rubric within a group vs. indivdually

➤ Students tend to be **less accurate** when there are multiple objectives to assess

➤ There are **time tradeoffs**: creating rubrics for multiple standards and learning objectives (i.e. at the unit level) can be time-consuming but may pay off long-term. In some cases, a routine where rubrics written 1 or 2 at a time within the course of regular lesson planning may work better

➤ Writing rubrics can be difficult for teachers who have not taught the standard/objective before; use/adapt existing ones if possible

➤ The process of understanding rubrics and self-assessment can take more class time than initially anticipated. Be mindful of this when planning classroom time

➤ **Co-assessing samples** of student work against the rubric can be helpful in getting students used to using rubrics

➤ Consider allowing **retakes of quizzes** and other assessments on a set of similar, but different problems after self-assessing against a rubric

Possible Adaptations

➤ Have student representatives attend **course team meetings** with teachers to co-develop a rubric for a performance task. This involves them in the process and ensures that the rubric is student-friendly

➤ Within rubrics, consider showing progress criteria **without assigning accompanying labels** for levels (i.e., mastery, proficient, developing, etc.) to focus students' attention on the content of the descriptors

➤ Compare and contrast the peer assessment process in **pair shares or larger group formats**

➤ Use **in-class student conferencing** to gauge progress/get feedback (e.g., with students who are consistently inaccurate compared to rubric or don't like the rubrics) to learn if any adaptations to the process are needed

➤ **Embed rubrics** in course materials (at the top of lesson activities or within quizzes/tests)

SEASONALITY:

This is an activity that is best deployed starting at the beginning of a term or unit and then at intervals over the course of the unit. This allows for testing, feedback, and adaptations and to check if students get more accurate over time.

Suggested Measures

➤ Collect data on student beliefs and perceptions to gauge their impressions about using rubrics and how they are used in class. Note any barriers and opportunities for improvement Consider "Likert Scale" (1-5 agreement rating) questions such as:
  • "Using the rubric helped me identify how I can improve"
  • "I like using rubrics to help me learn"

➤ Meaningfully disaggregate student feedback about using rubrics across different classes, grade levels, and demographic characteristics and adapt to the needs of those who are not finding value in the process

➤ Track the following measures over time:
  • % of students who score accurately (within 1 point) of the teacher or sample
  • % of students who improve proficiency/mastery after reviewing a rubric and/or retaking a quiz

➤ Compare and contrast student accuracy when using created rubrics vs standard rubrics

Connection to the Theory of Change

Driver 2: Assessment practices emphasize student learning and participation

Change concept: Provide regular, curricularly driven opportunities for students to self-assess their progress relative to standards

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Want to learn more about other drivers and changes?

[Change Package]

[Theory of Change]

Appreciation and References

Thank You

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