AMTE
Association of Mathematics Teacher Educators

LEADERSHIP IN MATHEMATICS EDUCATION
NCSM
NETWORK
COMMUNICATE
SUPPORT
MOTIVATE

JUMP START
Formative Assessment

National Council of Supervisors of Mathematics

"Feedback to Students"

AMTE
Association of Mathematics Teacher Educators

LEADERSHIP IN MATHEMATICS EDUCATION
NCSM
NETWORK
COMMUNICATE
SUPPORT
MOTIVATE

JUMP START

Formative Assessment Our Position

The National Council of Supervisors of Mathematics (NCSM) and the Association of Mathematics Teacher Educators (AMTE) affirm the centrality of research-based, mathematically focused, formative assessment—a key element in the national effort to improve mathematics proficiency. Formative assessment needs to be intentionally and systematically integrated into classroom instruction at every grade level. This requires adequate attention in the preparation of new teachers of mathematics and in the continuing education and professional development of current teachers.

Overarching Goals for JUMP START

- To provide teachers with understanding that formative assessment is a *process* of gathering evidence about what students know and understand, their misconceptions, and their incomplete knowledge
- To support teachers in using strategies that inform teaching and learning and shape their instructional decisions “in the moment” and in short and long-term planning
- To suggest strategies for encouraging greater involvement of students

Five Key Strategies

- Clarifying, sharing, and understanding goals for learning and criteria for success with learners
- Engineering effective classroom discussions, questions, activities, and tasks that elicit evidence of students' learning
- Providing feedback that moves learning forward
- Activating students as owners of their own learning
- Activating students as learning resources for one another

Leahy, S., Lyon, C.,Thompson, M., and Wiliam, D., *Educational Leadership,* 2008

Goals for This JUMP START Session

- To understand how feedback can move students' thinking forward
- To differentiate feedback that is likely to help students
- To create examples of actionable feedback

Feedback to Inform Learning

- Feedback should inform students about where they are in the process of moving from "not knowing" to "being proficient" with content
  - **Grades** are one form of feedback
  - **Written comments** on student papers are another
  - **Conversations** with individuals or the class are a third form of feedback
- Feedback is most helpful when it is "actionable," clarifying the current situation in a learning trajectory and suggesting possible actions for moving forward

Actionable Feedback

- Actionable feedback arises from conversations, observations, or viewing students' written work
- It tells students what they are doing right, what they need to rethink, *or* what needs correcting; it suggests how to begin
  - Feedback can be given to the class, small groups, or to individual students
  - Feedback can be written or oral
  - It should relate to the mathematics of the work
  - Feedback should be timely

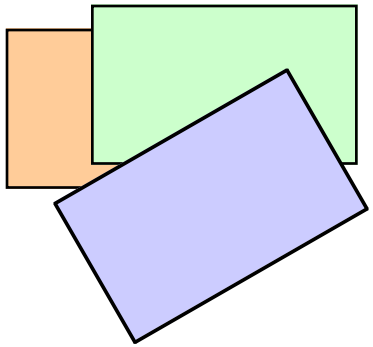
Feedback That Is Actionable

- Provides opportunities for students to have ownership of their learning
- Helps students know what they are doing well and what they need to change
- Encourages students to focus on what they still need to learn
- Helps students answer these questions
  - Where am I going?
  - Where am I now?
  - How can I close the gap?

Wiliam and Thompson, 2007

Is the Feedback Helpful, Actionable?

- In table groups, sort the feedback cards into categories
- Use sticky notes to label the categories



- Talk at your table
  - How did you sort your cards? What groups did you make with the cards?
  - Which feedback is likely to be most helpful to students?

Points To Consider

- Feedback should not be scaffolded to tell students what to do step-by-step
  - Do not replace ‘student thinking’ with ‘teacher thinking’
- Grades (evaluative feedback) may indicate performance, but they do not offer guidance for improvement
  - Students focus on the score rather than quality of work
- When teachers give students feedback and a grade on work, students ignore the feedback and focus on the grades

Points To Consider

- Feedback that encourages student thinking without being directive is difficult to provide
  - Helpful but directive feedback: Remember to line up the decimal points before adding or subtracting
  - Less directive: How can you use what you know about place value to determine if your answer makes sense?
- With a partner choose 2 cards that are directive and discuss alternative feedback that is likely to be less directive yet effective in encouraging student thinking

Praise As Feedback

- Motivational feedback may encourage and appear to support the learner, but it does not offer suggestions for continued improvement
  - Statements such as “Good Work” or “Excellent” without other comments may discourage strong students from attempting more challenging work
- Struggling students may become discouraged when others get praise and they never get this feedback
  - They may not gain self-confidence, may give up trying, or may feel that they cannot learn mathematics

Grades, Written Feedback, or Both?

- Does the type of feedback given to students really make a difference?

Type(s) of Feedback	Student Progress
Grades only	No progress
Grades and written comments	Some progress
Written comments only	Progress

Butler, R. *Enhancing and Undermining Intrinsic Motivation,* 1988

Actionable or Descriptive Feedback

Advice from different authors about using feedback effectively is similar, though terminology may vary slightly

Guskey writes that feedback

- Is specific to the learning targets
- Describes learning
- Points students in a productive direction
- Makes students aware of errors or areas for more thought
- Provides next steps for specific action

Others point out that feedback

- Is about the work, not the students
- Is timely
- Focuses on the content or the process
- Often is given in the format of a question
- Provides students with a sense of control
- Is based on inferences about what students know

Feedback to the Class or Small Groups

- Helpful feedback can be given to the class or groups of students depending upon the inferences about what the students know and can demonstrate

  Although there is a clear set of priorities for the development of feedback, there is no 'one right way' to do this. The feedback routines in each class will need to be thoroughly integrated into the daily work of the class, and so it will look slightly different in every classroom.

  (Research reviewed by Black and Wiliam) suggests that changing the kinds of feedback we use in mathematics classrooms could have more effect than all the government initiatives put together. (Wiliam, 1999, p. 11)

Classroom Examples

Examples of Feedback

Student uses an incorrect value in computing areas of a square and circle

- *"The formulas are correct, but how did you decide what numbers to substitute in the formulas?"*

Upper elementary student uses repeated addition rather than multiplication

- *"You used repeated addition to find the solution. Is there a more efficient operation you could use?"*

Student is showing improvement

- *"Much better! You wrote the standard form correctly for each number. Did you include the units in all of your answers?"*

Examples of Feedback

Student neglects to give a written explanation (or has minimal explanation)

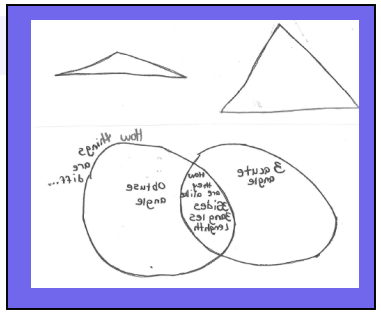
- *"Use 2 words from our math wall to describe how you found the solution to problem #5"*

Student gives numerical answer without showing any work

- "Show me how you solved the problem using numbers, tallies, pictures, or words"

Student computes correctly but does not include decimal point

- "Is your solution in the tens, hundreds, or thousands? You forgot to include the decimal point"



Examining Student Work

- *Students' Task*: Draw two different triangles. Use a Venn diagram to show how they are alike and how they are different
- With your partner discuss the student work
  - What information would you expect in a strong response?
  - What is the nature of the misconceptions or mistakes on the students' papers?
  - Which students do you want to question?
  - What "next steps" instructionally would you plan for this class?

Writing Helpful Feedback

- After examining the student samples, consider what feedback you might give to the class
- Would you divide the students into groups?
  - If yes, how would you group them?
  - What would you say to the different groups?
- Divide the student examples so each person has at least 2 samples
- Write feedback to these students
- Share your feedback examples with others

To Summarize

- Actionable formative feedback takes many forms
  - Comments and suggestions
  - Questions
  - Examples and non-examples
- Providing actionable feedback takes practice
- Helpful feedback assists students in knowing what part of their work to retain and what to rethink
- Having a balance between giving individual feedback and feedback to the class comes with practice

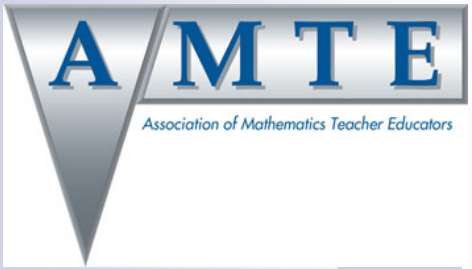
To Summarize

- Feedback is formative only if the information given back to the learner is used by the learner in improving performance
- The bottom line is that teachers need to reflect on what students are saying and putting on paper so that they are able to give their pupils feedback that they know in advance is going to be useful

Black and Wiliam, 2007

References

- Black et al. (2002). Working inside the black box: assessment for learning in the classroom. London: Kings College.
- Butler. R. (1988). Enhancing and undermining intrinsic motivation. *British Journal of Educational Psychology*, 58(1), 1-14.
- Guskey, T. R. (2003). How classroom assessments improve learning. *Educational Leadership, 60*(5) 6-11.
- Leahy, S., Lyon, C., Thompson, M., and Wiliam, D. (2008). Classroom assessment: minute by minute, day by day. *Educational Leadership*, 63(3), 19-24.
- Wiliam, D, and M. Thompson. (2007). Integrating assessment with instruction: what will it take to make it work? In *The Future of Assessment: Shaping Teaching and Learning*, edited by C. A. Dwyer. Mahwah, N.J.: Lawrence Erlbaum Associates.



JUMP START

Formative Assessment

JUMP START Authors

Ana Floyd
Randolph County Schools, NC

Jeane Joyner
Meredith, College, NC

Katherine Mawhinney
Appalachian State University, NC

Mari Muri
Wesleyan University, CT

Wendy Rich
Asheboro City Schools, NC

Catherine Schwartz
East Carolina University, NC