

Roadmaps for Formative Assessment

Sarah Marten & Lindsey Weiland

Enhanced Learning Maps

Center for Assessment and Accountability Research and Design

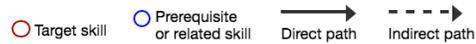
University of Kansas

Lawrence, KS

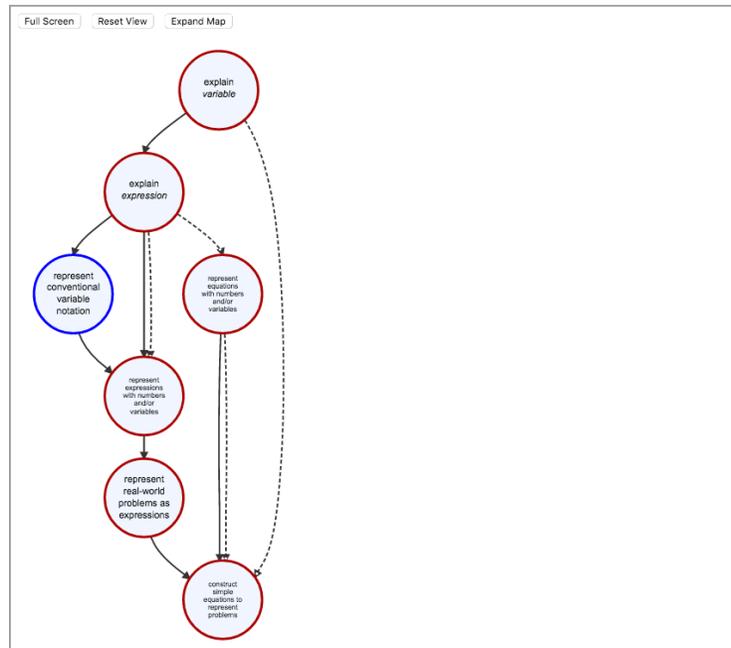
Instructional Resources on KAP Website

Solving Equations and Developing the Foundation for Proofs

| | |
|-----------------|--|
| 6.EE.6 | Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. |
| 6.EE.7 | |
| Combined | |



Hint: Use your mouse's scroll wheel to zoom in and out, and hover over a node to learn more about it.



Resources for this Map

Learning Map Information

An overview of the standards, the learning map section, and the nodes addressed in this unit.

Teacher Notes

A brief discussion describing the progression depicted in the learning map section document with research-based recommendations for focusing instruction to foster student learning and an introduction to the unit's lessons.

Lesson 1

In this lesson, students will solve one-step equations in the form $x + p = q$ and $x - p = q$ using concrete models, the concept of balance, and the Addition and Subtraction Properties of Equality.

Lesson 2

In this lesson, students will solve one-step equations in the form $px = q$ and $x + p = q$ using concrete models, the concept of balance, and the Multiplication and Division Properties of Equality.

Student Activity & Solution Guide – Lessons 1 & 2

A work-alone activity combining content covered in both Lessons 1 and 2. A solution guide for the work-alone activity with example errors, misconceptions, and links to the learning map section is provided.

Lesson 3

In this lesson, students will represent and solve real-world problems using one-step equations and justify their work with the Properties of Equality.

Student Activity & Solution Guide – Lesson 3

A work-alone activity for students to

Classroom goal = move students forward

Wide array of student ability levels

1. Frustrated
2. Slower or faster
3. Arrive at grade level, above or below
4. Uninterested



Many paths to understanding...

- Different start and end points
- Different routes
- Different gaps along the way



Wide array of student levels & abilities

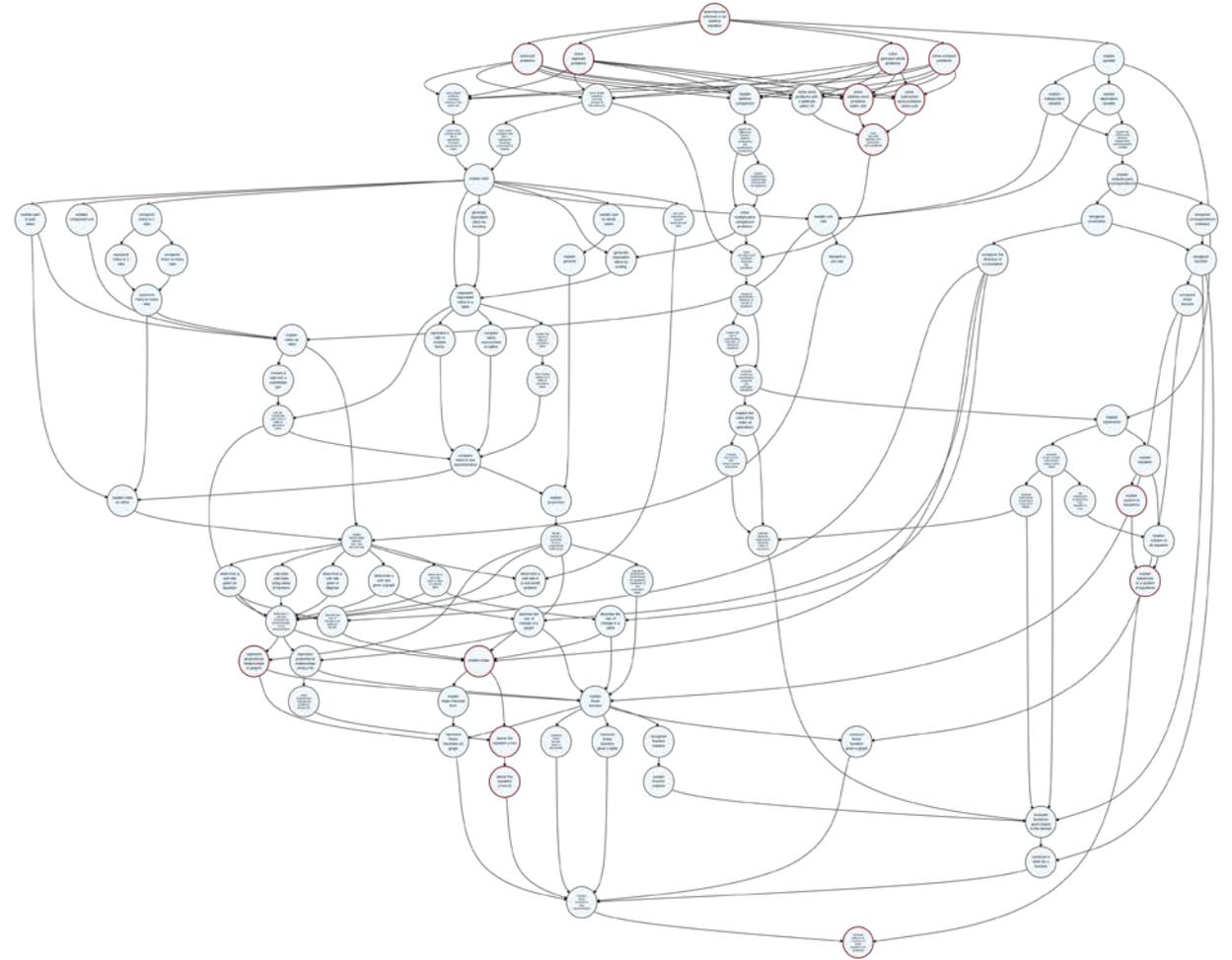
- How do you figure out where students are?
- How do you move them forward?



Can a map be designed that helps teachers get students from point A to point B?

Our Learning Map Model

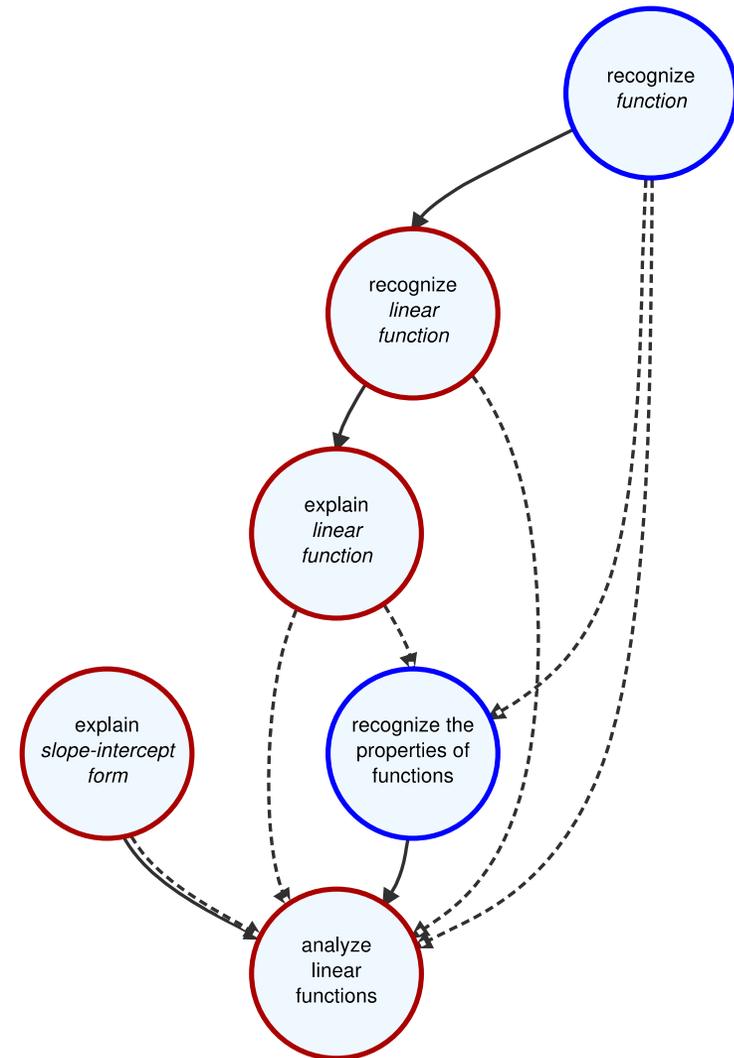
- Models how children learn from birth through high school



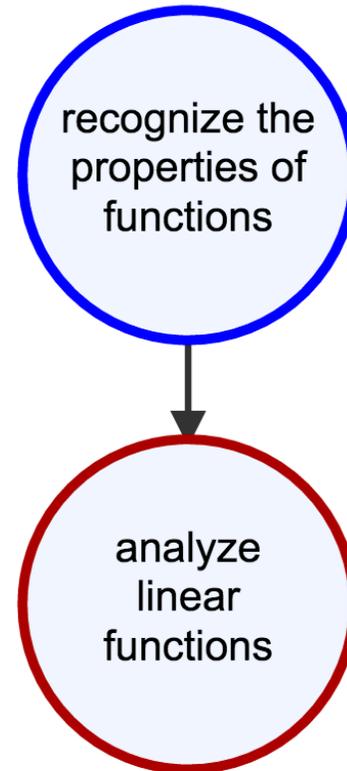
Map Views

- Nodes
- Connections
- Standards
- Research based
- Teacher selected

 Target skill  Prerequisite or related skill



Zooming In



Map alone will not move students forward

Learning Map Model
Visual representation
of how students learn



Formative Assessment
Approach to teaching that
is a process for moving
students forward

What is formative assessment?

- Where is the student going?
- Where is the student now?
- Where to next?

Adapted from Margaret Heritage Presentation, 2016

NOT Formative Assessment: Assessment *of* learning

- Scoring individual assignments
- Reporting grades
- Giving a test at the end of a sequence of learning
- Going over test results
- Interim assessment
- Summative assessment

Adapted from Margaret Heritage Presentation, 2016

Formative Assessment: Assessment *for* learning

- Identify learning goals
- Generate and collect evidence of student thinking
 - Observation
 - Discussion
 - Questioning
 - Review of student work
- Adjust immediately (or near immediately) based on evidence
- Provide ongoing feedback to teachers and learners, not for grading purposes

Adapted from Margaret Heritage Presentation, 2016

Informed System for Formative Assessment

Formative
Assessment

Approach to
teaching that is a
process for
moving students
forward

+

Learning Map
Model

Visual
representation
of how students
learn

+

Instructional
Resources

Set learning goals
and create the
conditions for
noticing where
students are

Benefits of an Informed System for Formative Assessment

- Teacher
- Student
- Instruction

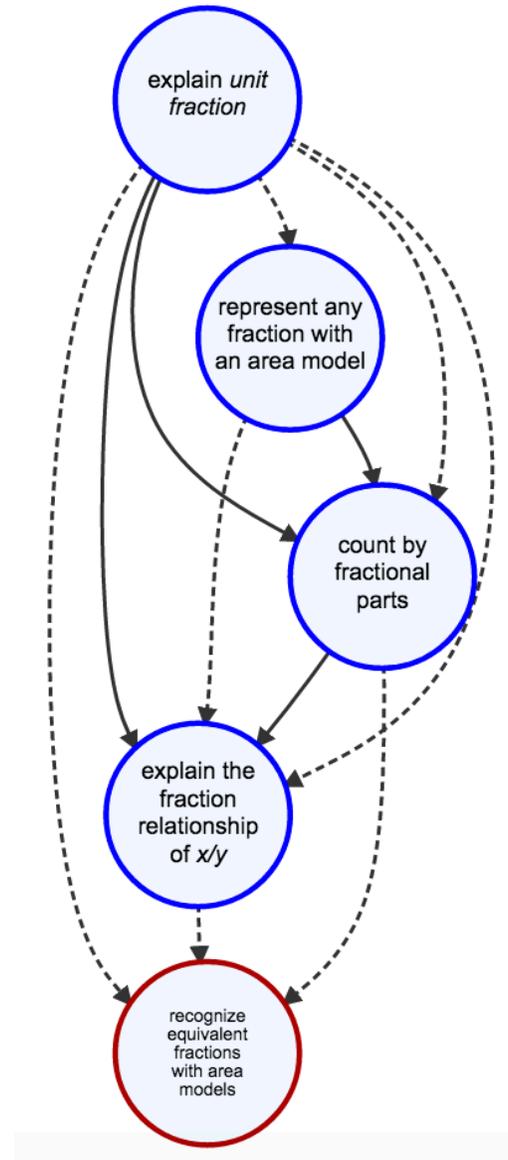


Formative Assessment in Practice

Mrs. Brooks 3rd Grade Math Classroom

Learning Map Model

Recognize equivalent fractions with area models



GUIDING QUESTIONS

Elicit student thinking:

- ▶ [Point to each of the area models separately.] Can you describe what you see here?

Determine if the student can **EXPLAIN UNIT FRACTION**:

- ▶ [Point to the area model of one half.] How does this model represent one half?
- ▶ How many parts are shaded?
- ▶ How many equal parts are there?

Determine if the student can **REPRESENT ANY FRACTION WITH AN AREA MODEL**:

- ▶ How would you draw an area model to represent one fourth? One sixth?
- ▶ How would you draw an area model to represent three fifths? Three sixths?
- ▶ [Point to each of the area models separately.] What fraction does this area model represent?

Determine if the student can **COUNT BY FRACTIONAL PARTS**:

- ▶ [Point to one shaded section in the area model of one sixth.] If this shaded portion is one sixth, how would you count the shaded portions in this model?
- ▶ Based on your counting, what fraction is represented in this model?

Determine if the student can **EXPLAIN THE FRACTION RELATIONSHIP OF X/Y**:

- ▶ How are three sixths modeled in this area model?
- ▶ Are there other ways you could model three sixths on an area model?

Determine if the student can **RECOGNIZE EQUIVALENT FRACTIONS WITH AREA MODELS**:

- ▶ [Point to two area models.] Do these models represent equivalent fractions?

Instructional Resources on the KAP Website

Unit

1. Learning Map Model
2. Teacher Notes
3. Lessons
4. Student Activity
5. Solution/Feedback Guide

Instructional Resources

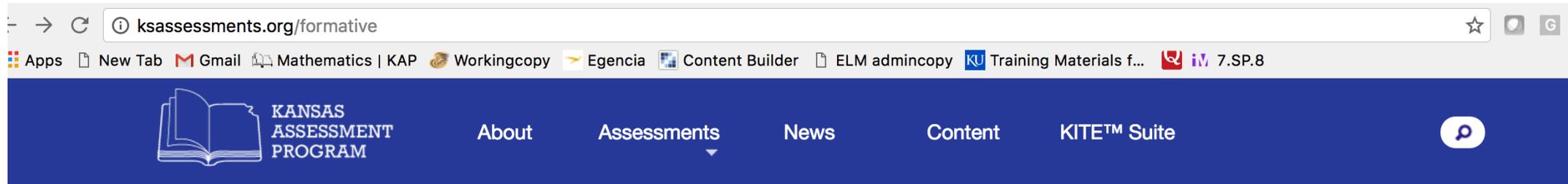
Roadmaps for Formative Assessment

- Support teachers' use of formative assessment.
- Move all kids from point A to point B, no matter where they start.
- Improve student understanding.



Instructional Resources on the KAP Website

<http://ksassessments.org/formative>



About Formative

Math Tools

ELA Tools

HGSS Tools

Formative Assessment

Formative assessment is a process by which teachers continually gauge the depth of students' understanding of classroom subject matter and adjust instruction to address gaps in that understanding.

Whereas summative assessments are tests that evaluate the degree to which students have successfully learned all the material planned for teaching in a given time period (typically, one school year), formative assessment refers more abstractly to the ongoing process of assessing what students have and have not learned for the express purpose of adjusting instruction moment by moment to meet individual students' needs.



Lindsey Weiland
Math Content Developer
lwiegele@ku.edu

Sarah Marten
ELA Content Developer
smarten@ku.edu

Center for Assessment and Accountability
Research and Design
University of Kansas
EnhancedLM@ku.edu



The contents of this presentation were developed under a grant from the U.S. Department of Education administered by the Kansas State Department of Education. However, the contents do not necessarily represent the policy of either of these organizations and you should not assume endorsement by the federal government or the state of Kansas.

