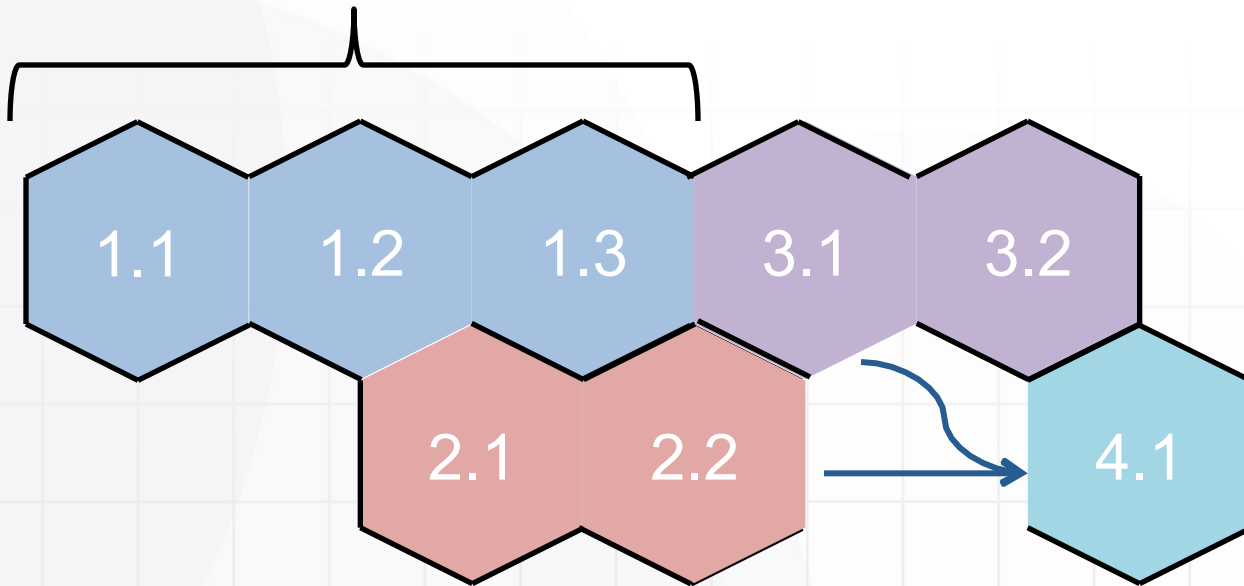# What is a Learning Progression?

According to the National Research Council, learning progressions describe ways of thinking about a topic. Learning progressions become more sophisticated as children deepen their understanding of a particular topic.

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(NRC, 2007)

# Visualizing Learning Progressions

3 concepts within 1 topic



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# A Learning Progression is Not

**unerringly accurate**

but represents best instructional thinking.

**the one and only way**

but a general projected path.

(Heritage, 2009)

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# Five Essential Elements
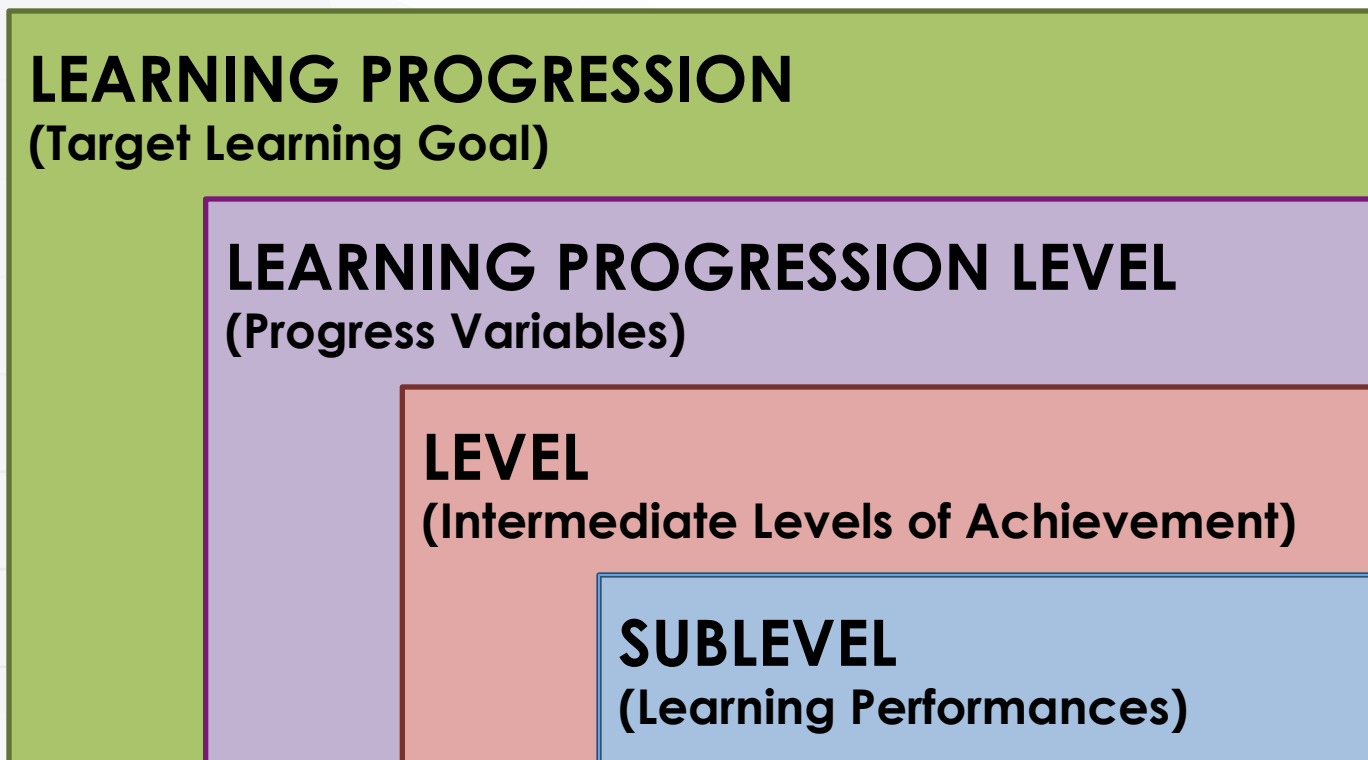
Target Learning Goals

Progress Variables

Intermediate Levels of Achievement that Progress Toward Mastery

Learning Performances at Each Level that Articulate Students' Performance Capability

Assessments that Measure Student Development Along the Progression

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(NRC, 2007)

# A Stepped Approach to a Learning Progression

**LEARNING PROGRESSION**
**(Target Learning Goal)**

**LEARNING PROGRESSION LEVEL**
**(Progress Variables)**

**LEVEL**
**(Intermediate Levels of Achievement)**

**SUBLEVEL**
**(Learning Performances)**

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(NRC, 2007)

# Response to Intervention: A Closer Look at Tier II

**Universal Screening**
**Diagnostic Assessments**
**Progress Monitoring**

## Evidence-Based Interventions (TXRCFP/TEKS)

- Ensure identified students receive instruction related to prerequisite knowledge and skills with new skills to support the core curriculum
- Support understanding of and proficiency with critical mathematics vocabulary
- Identify qualified provider: classroom teacher in different setting or math interventionist

### Increasing Intensive Intervention Support

- Allocate additional time beyond core instruction time
- Employ needs-based grouping
- Implement effective intervention delivery
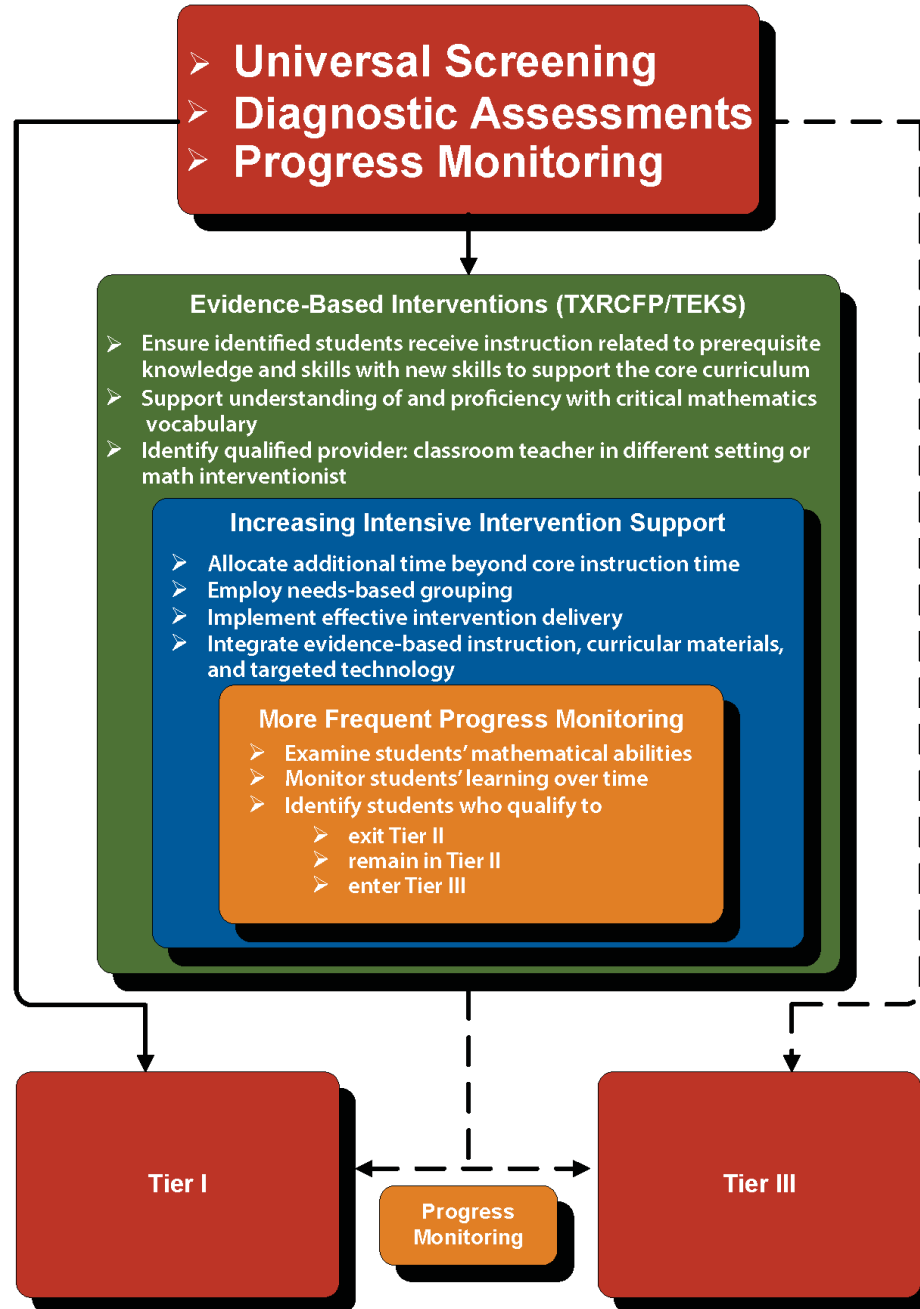- Integrate evidence-based instruction, curricular materials, and targeted technology

#### More Frequent Progress Monitoring

- Examine students' mathematical abilities
- Monitor students' learning over time
- Identify students who qualify to
  - exit Tier II
  - remain in Tier II
  - enter Tier III

**Tier I**

**Progress Monitoring**

**Tier III**

# ESTAR & MSTAR Assessments

## Universal Screeners

- Identify students who are at risk for struggling with algebra-related core instruction
  - Determine *IF* interventions are needed
  - Determine *DEGREE OF INTENSITY* of the intervention needed
  - Monitor students' *RISK STATUS*

- Fall, winter, & spring

## Diagnostic Assessments

- Identify *WHY* students are struggling with algebra-related core instruction
  - Identify students' current level of understanding in key algebra-related content
  - Identify students' persistent misconceptions in key algebra-related content

- Information to plan supplemental instruction

- Fall, winter, & spring after Universal Screener is given

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# MSTAR Diagnostic Assessments

- Key algebra-related content
  - RN: Understanding Positive Rational Numbers, their Representations, and their Uses
  - VE: Understanding Variables, Expressions, and their Applications
- Content Outline on Learning Progressions
  - To better understand **why** students struggle, not **what** they struggle with
  - To provide a focus for instruction

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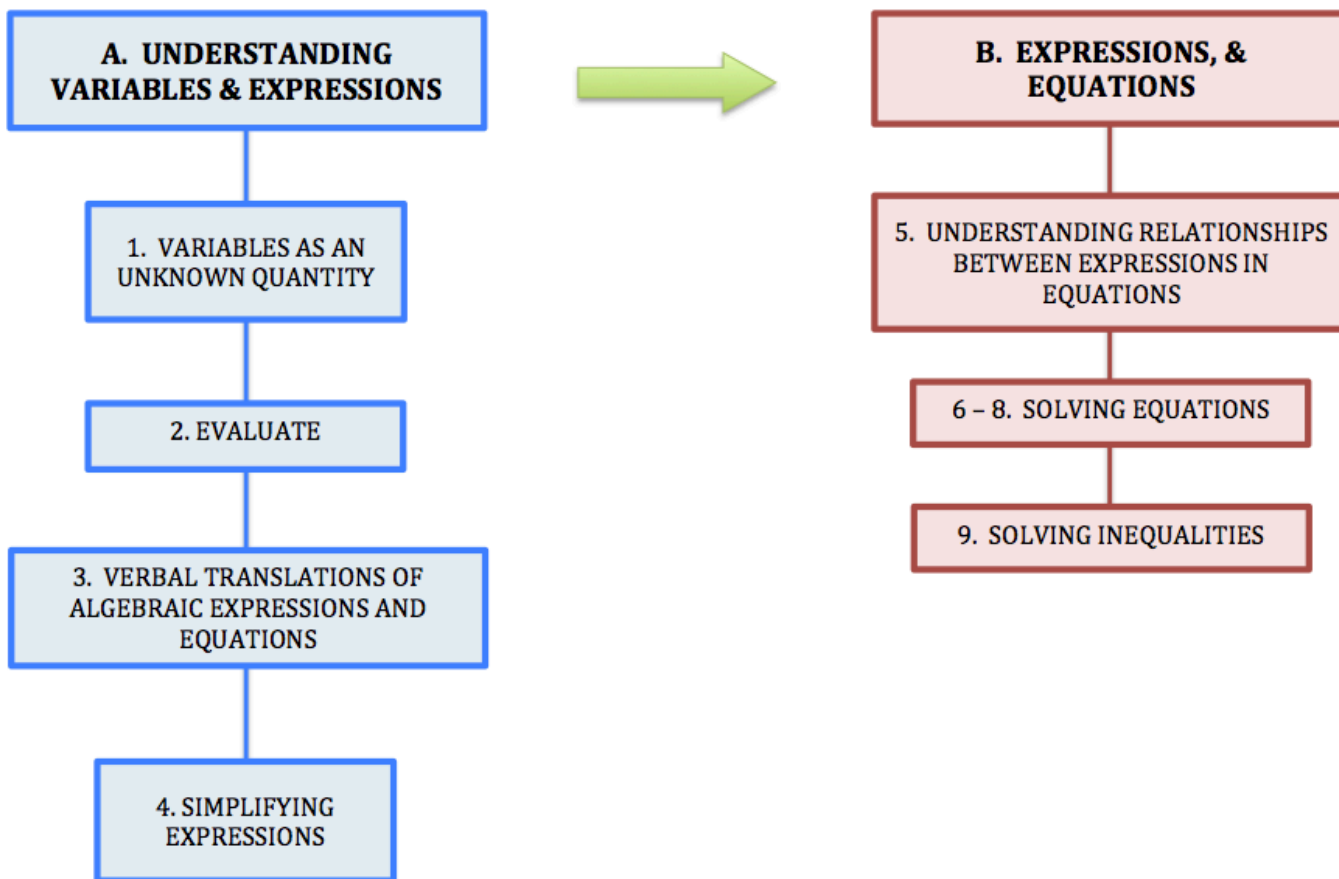# Overview of Learning Progression RN



Learning Progression RN - BLUEPRINT DEVELOPMENT STRUCTURE
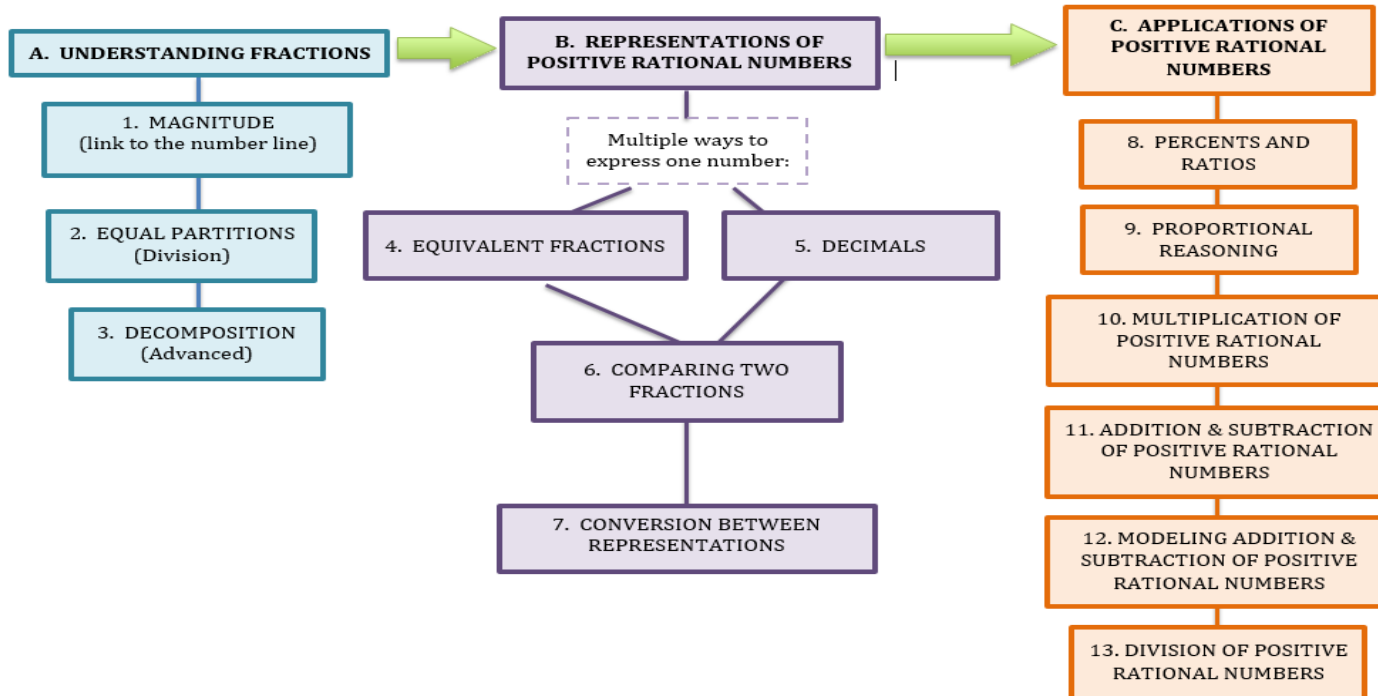
Learning Progression RN: UNDERSTANDING POSITIVE RATIONAL NUMBERS

# Overview of Learning Progression VE



**A. UNDERSTANDING VARIABLES & EXPRESSIONS**

1. VARIABLES AS AN UNKNOWN QUANTITY

2. EVALUATE

3. VERBAL TRANSLATIONS OF ALGEBRAIC EXPRESSIONS AND EQUATIONS

4. SIMPLIFYING EXPRESSIONS

**B. EXPRESSIONS, & EQUATIONS**

5. UNDERSTANDING RELATIONSHIPS BETWEEN EXPRESSIONS IN EQUATIONS

6 – 8. SOLVING EQUATIONS

9. SOLVING INEQUALITIES

**Learning Progression VE: UNDERSTANDING VARIABLES, EXPRESSIONS, AND EQUATIONS**

# Cognitive Engagement

- 5 strands of mathematical proficiency:
  - Conceptual understanding
  - Procedural fluency
  - Strategic competence
  - Adaptive reasoning
  - Productive disposition
- "Interwoven and interdependent"
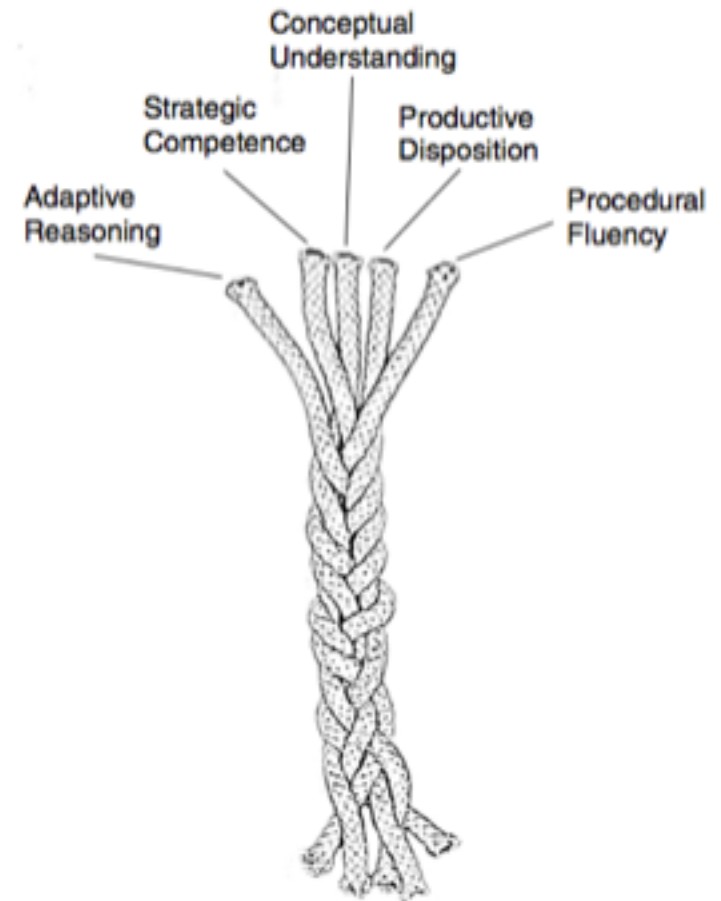


**Intertwined Strands of Proficiency**

(NRC, 2001)

# Sample Item

What is the place value of the underlined digit?

2.1<u>5</u>

| A) The ones place | Student always believes the last digit is the ones place. |
|---|---|
| B) The tenths place | Student knows that the tens place is 2 digits to the left of the decimal, so the tenths place would be 2 digits to the right of the decimal. |
| C) The hundredths place | Correct |
| D) The hundreds place | Student confuses hundreds and hundredths. |

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# Diagnostic Assessments

Key considerations:

- They require more items than a screener.

- They are only given to students who are at risk for not meeting expectations.

- The information in the reports is related to specific student opportunity areas that are useful for designing interventions.

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