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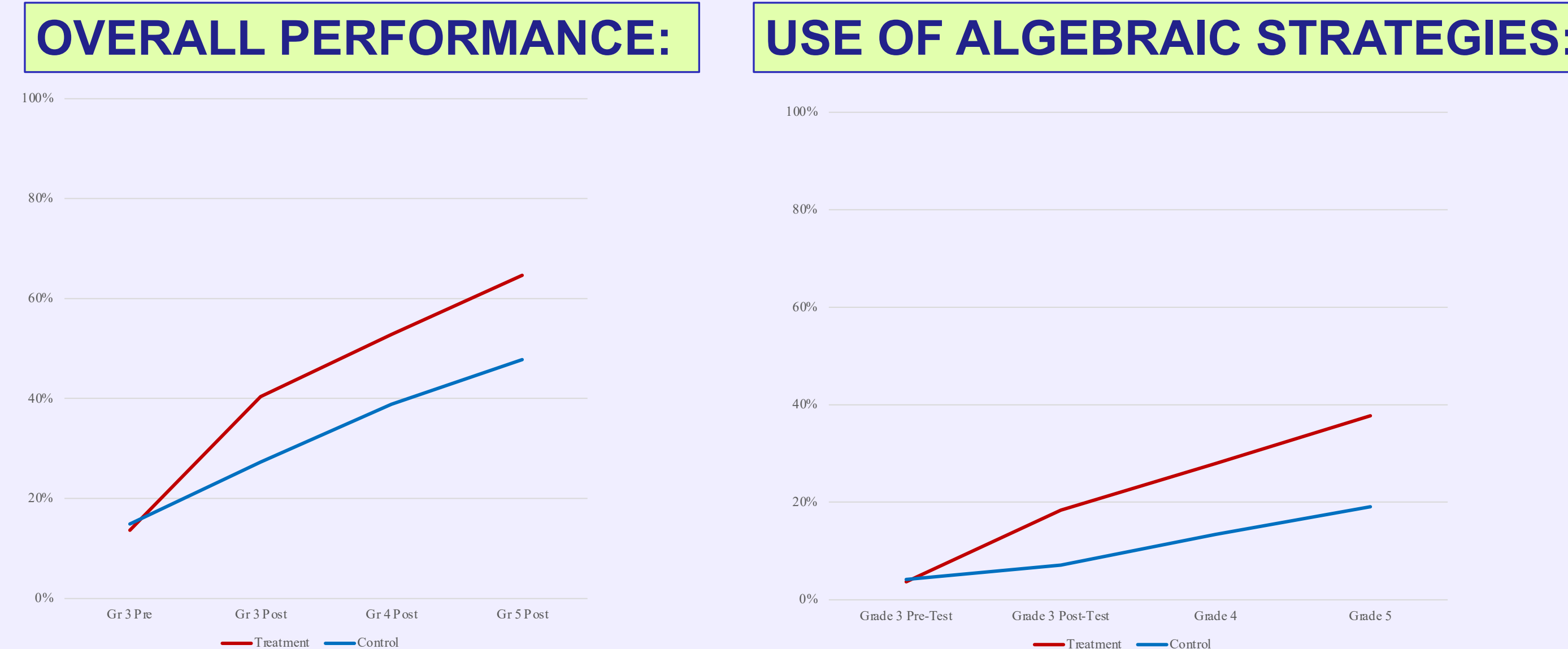
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PRIOR WORK: LEAP's EFFECTIVENESS FOR GRADES 3–5

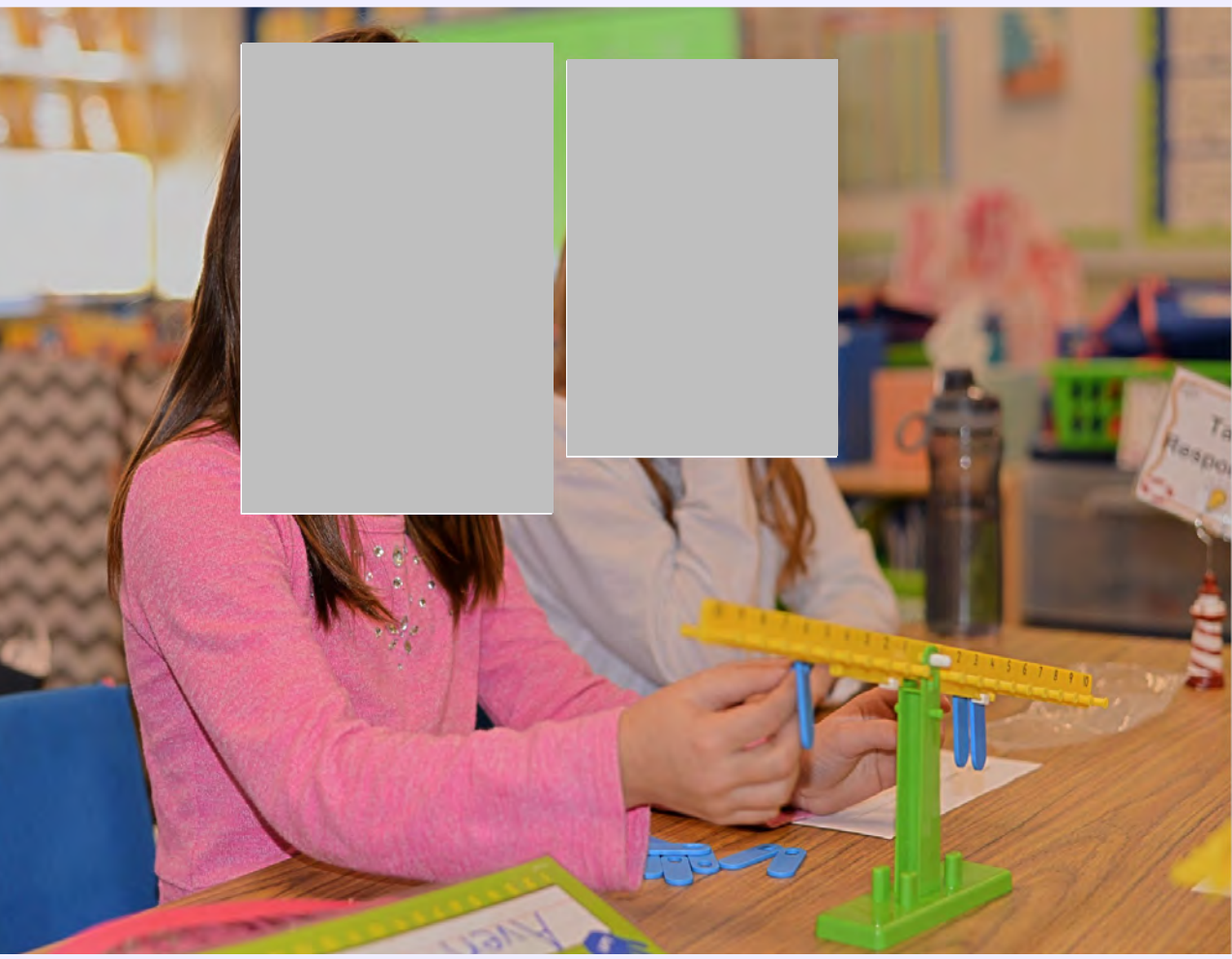
Treatment students significantly outperformed control students on performance and strategy use in a comparison of all schools and those where all students received free or reduced lunch.



LEAP'S POTENTIAL

- Mitigate high failure rates in high school algebra resulting from “arithmetic-then-algebra” approaches
- Supplement widely adopted elementary curricula, which have significant gaps in their treatment of early algebraic concepts

ABOUT THE LEAP K–2 SUPPLEMENTAL CURRICULUM



First-grade students use a math balance to explore a relational understanding of the equal sign.

- Includes twenty 30-minute hands-on lessons for each grade
- Uses cognitively demanding tasks that support children's mathematical sense making.

Lesson K.9 Finding Balance

Lesson Overview
 Students use a number balance to examine equivalent quantities. They develop equations to describe a relationship in which two quantities or amounts are the same.

Lesson Objectives

- Compare quantities using a number balance.
- Explore a relational meaning of the equal sign.
- Make and test conjectures about relationships.
- Write equations of the form $a = a$.

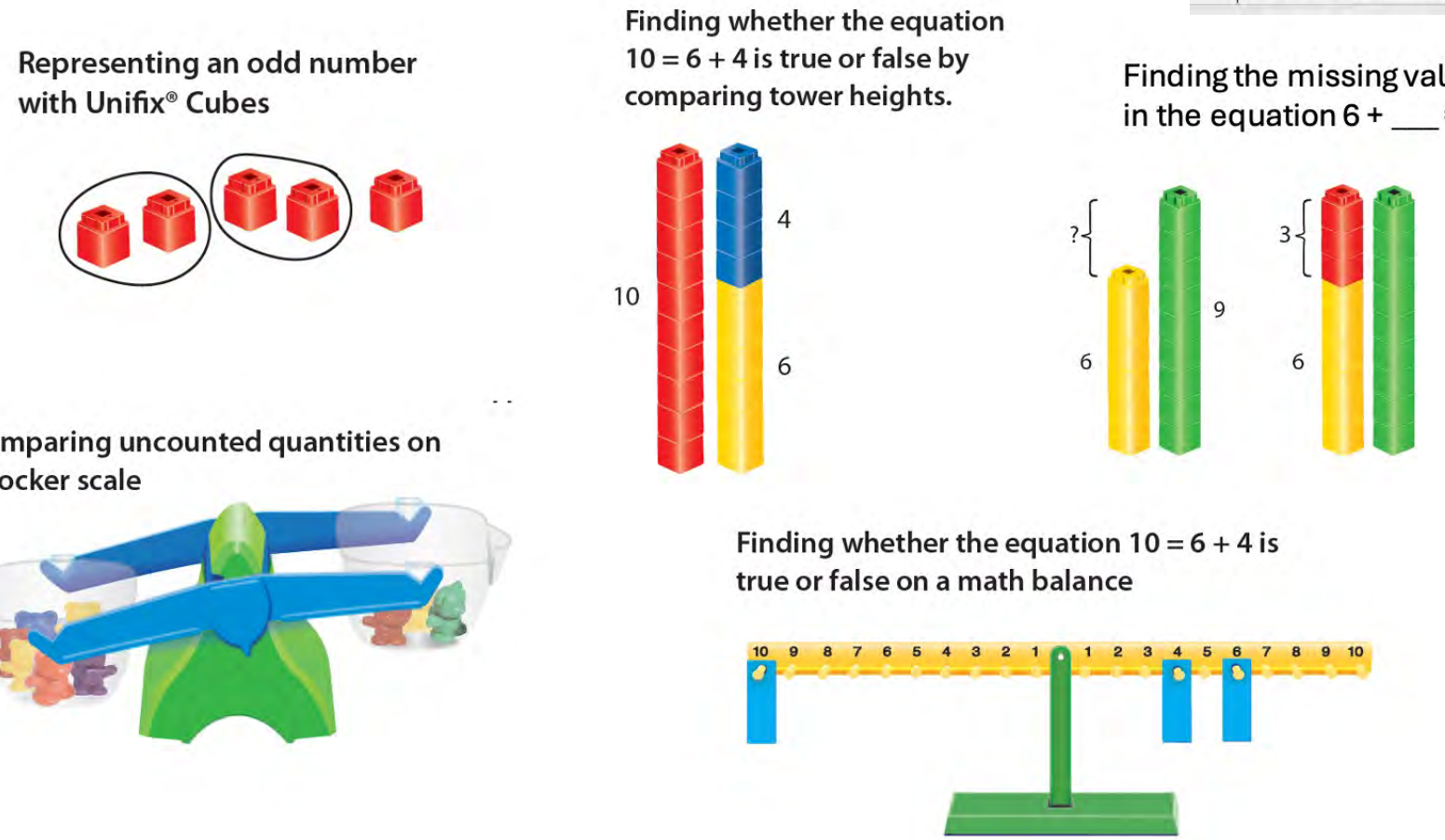
Rationale for the Tasks

- The use of equations in forms other than standard form (such as the form $a = a$) encourages students to think relationally, rather than operationally, about the equal sign.
- The use of concrete tools like a number balance can help students reason about equations. Connecting concrete tools with abstract representations (equations) is an important way to provide students with additional support.

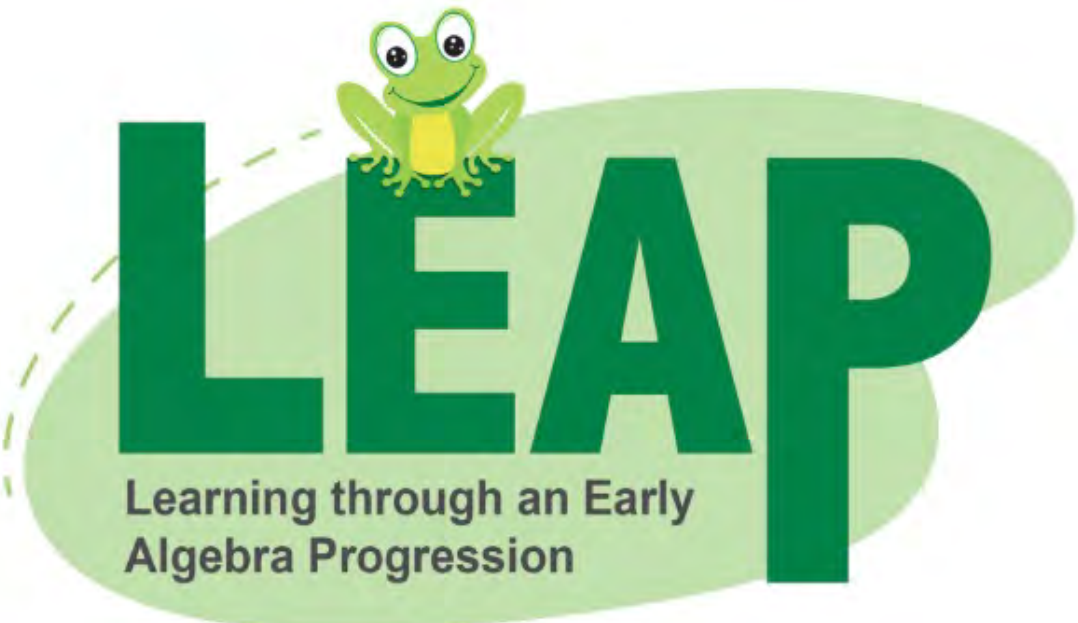
Vocabulary
 balance
 conjecture
 equal sign
 equation
 not equal to

Materials
 demonstration number balance
 rocker scale
 student number balances for partner groups

- Develops key algebraic thinking practices : generalizing, representing, justifying and reasoning with mathematical relationships
- Encourages students to build strong mathematical arguments and discuss their thinking



Incorporates visual and concrete tools to support algebraic reasoning



FOR MORE INFORMATION

About LEAP research:



About the LEAP Curriculum:



About the design of LEAP K–2:



LEAP K–2 RESEARCH GOALS & DESIGN:

- Do students taught the K–2 LEAP intervention with regular instruction significantly outperform students who receive only regular instruction on measures of algebraic knowledge and general mathematics knowledge?
- What is the fidelity with which teachers implement the intervention, what aspects exhibit high or low fidelity, and how does FOI relate to student performance?

- Longitudinal (3-year), randomized (CRT) study in Grades K–2
- 40 schools (20 treatment; 20 control)
- ~2200 students, 600 teachers
- Student assessments: LEAP digital (all students), LEAP interviews (400 students), NWEA MAP (distal measure, all students)
- Teacher data (FOI study and regular practice comparison): surveys, interviews, classroom observations