

Evidence-Based Recommendations for Remote Math Instruction in the Elementary Grades

WHAT WORKS CLEARINGHOUSE™

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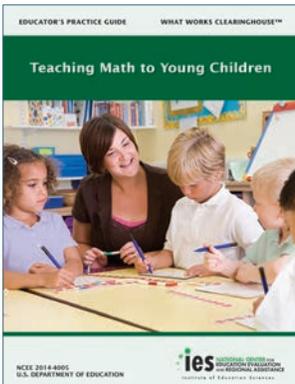
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The What Works Clearinghouse (WWC) maintains a library of practice guides (<https://ies.ed.gov/ncee/wwc/PracticeGuides>) for educators and school officials to use to address challenges in their classrooms and schools. These guides synthesize WWC research reviews, the experience of educators, and expert advice into recommendations that can be implemented in the

classroom. **Many of these recommendations can be implemented for free or at a low cost in remote learning settings by making only small adaptations.**

The examples below come from three practice guides about elementary school instruction in math. **Each original practice guide contains more details as well as additional recommendations.**



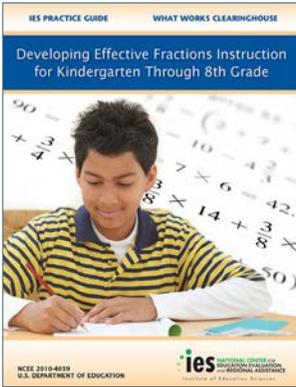
Teaching Math to Young Children

Explore the guide at <https://ies.ed.gov/ncee/wwc/PracticeGuide/18>.

Teach number and operations using a developmental progression. To start, students should practice subitizing, which is immediately recognizing and labeling small numbers without needing to count them. Students should also practice number constancy, the idea that rearranging items in a set does not change its total.

During remote learning, use a short slide show to practice with students. Show a slide with one to three objects on the screen for a few seconds. On the next slide, show a picture of a cloth or box and tell the children that you have covered the objects you just showed them. Then ask the children, “Who can tell me how many (name of objects) I am hiding?” After the children have answered, uncover the objects by showing the original slide again. You or the students can count to check their answer. Continue the game with different numbers of objects arranged in different ways for up to five items. Use both informal (“more” or “less”) and formal (“add” and “subtract”) language to describe changing the number of objects in the set.





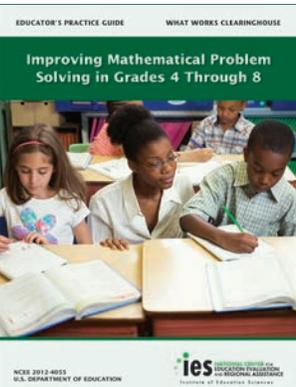
Developing Effective Fractions Instruction

Explore the guide at <https://ies.ed.gov/ncee/wwc/PracticeGuide/15>.

Use **equal-sharing activities** to help develop students' understanding of **ordering and equivalence of fractions**. This might involve dividing sets of objects as well as single whole objects. One way to understand equivalent shares is to discuss alternative ways to partition the same shares. In the example below, students should understand that although there are different ways to partition the cake, each partitioning method results in equivalent shares.

To practice an equal-sharing activity, place students into pairs in breakout sessions during a remote lesson or ask students to complete the activity on their own before the lesson.

Ask students to draw four rectangles to represent four cakes. Then ask them to draw lines over the cakes to show how they would share them equally among eight children. Some students might partition all four cakes into eighths and then give each child four pieces. Alternatively, students could divide each cake into fourths and give each person two pieces, or they might divide each cake into halves and distribute one piece to each child. Ask students to compare and discuss their solutions in the breakout session.



Improving Mathematical Problem Solving

Explore the guide at <https://ies.ed.gov/ncee/wwc/PracticeGuide/16>.

Teach students how to use visual representations to solve problems. Visual representations help students solve problems by linking the relationships between quantities in the problem with the mathematical operations needed to solve the problem. They include tables, graphs, number lines, strip diagrams, percent bars, and schematic diagrams. Use the example below to encourage students to use visual representations when solving problems on their own.

Show students how to draw a schematic diagram to solve problems. Explain what a schematic diagram is by walking students through the following example of a runner. In a remote learning lesson, use breakout sessions to place students into small groups and ask each group to develop a schematic diagram to represent a new problem and then share their diagram with the whole class.

Problem

John participated in a 5-mile run. He usually runs 1 mile in 15 minutes. John took a 5-minute break after every mile. How much time did it take him to complete the 5-mile run?

Sample schematic diagram



The total time it took John to run 5 miles is equal to the total number of minutes in this diagram, or $(5 \times 15) + (4 \times 5)$.