

Multiplication & Division, 3-5

TRANSPARENCIES

Transparency 1: Mathematics in this session (HO 1)

Transparency 2: Mental Math Problems

Transparency 3: Tricycle Problems

Transparency 4: One-Centimeter Grid Paper

Transparency 5: Breaking Apart a 6×9 Array

Transparency 6: Sample Multiplication Card

Transparency 7: Context & Representation for 29×6

Transparency 8: Partial Multiple Tower for 15

Transparency 9: Student Work Questions

Transparency 10: Looking at Student Work, $374 \div 12$ - 5 pages

Transparency 11a: Multiplication & Division Units in *Investigations* - 2nd Edition (HO 3a)

Transparency 11b: Multiplication & Division Units in *Investigations* - 1st Edition (HO 3b)

.....
Transparency 12: Arrays for Demonstration Game (2 pages, cut apart)

Transparency 13: *Small Array / Big Array* Demonstration Game

Transparency 14: *Small Array / Big Array* Recording Sheet

Mathematics in This Session

- * Examine strategies for solving multiplication and division problems
- * Understand the relationship between multiplication and division
- * Find patterns in a sequence of multiples in order to solve problems
- * Use arrays to model multiplication
- * Consider how students develop computational fluency multiplying and dividing whole numbers

Mental Math Problems

$$29 \times 6$$

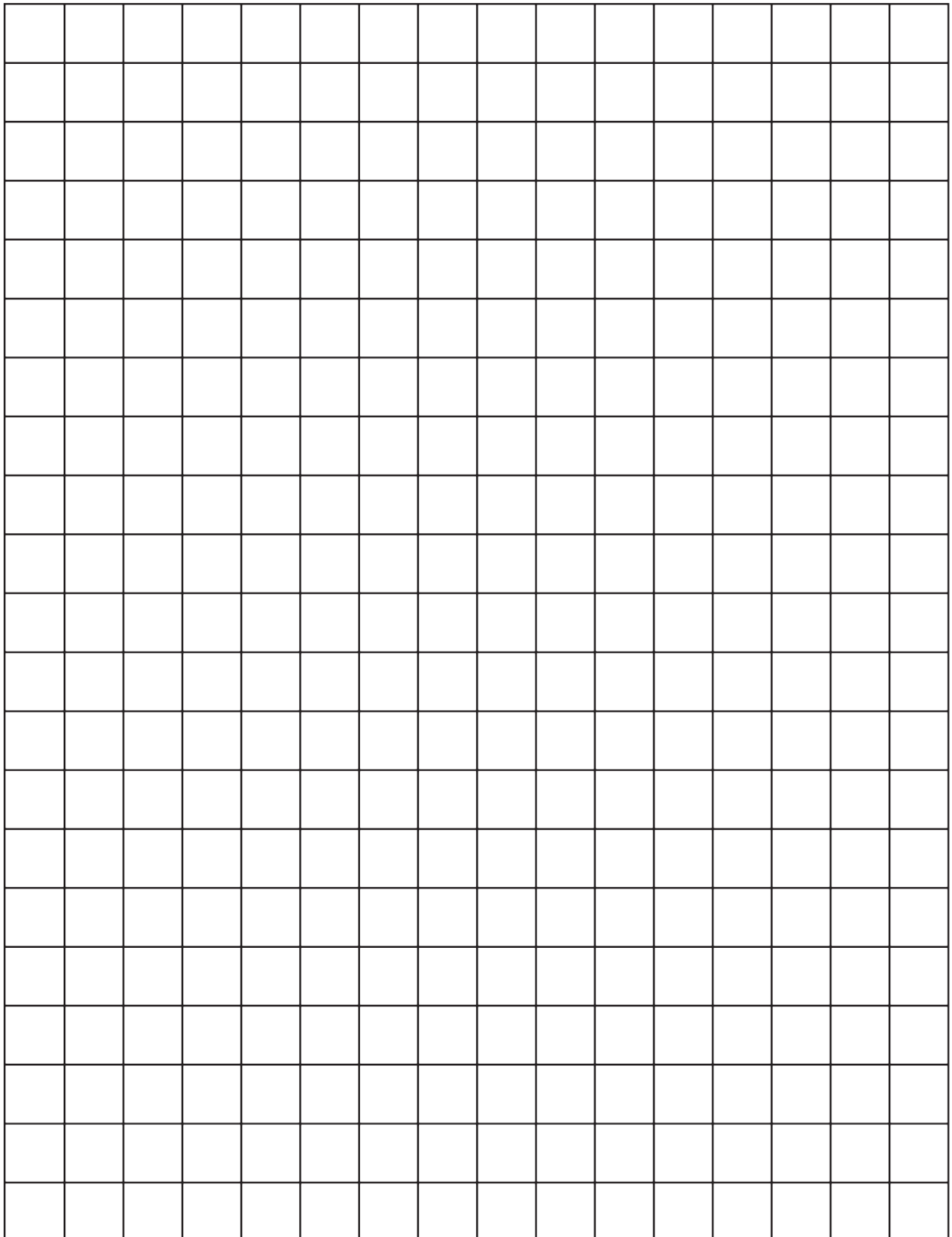
More or less than 150?

$$15 \times 14$$

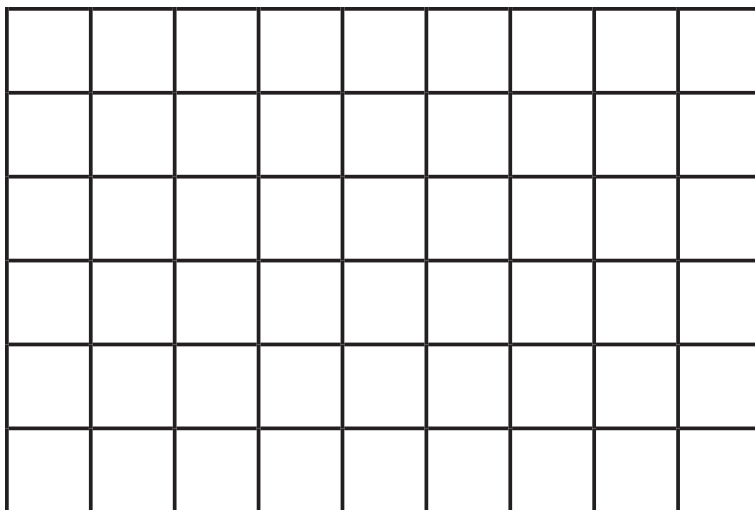
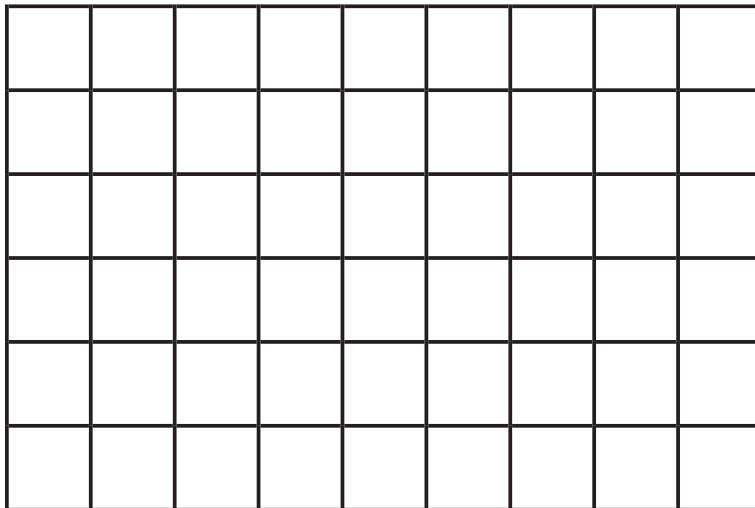
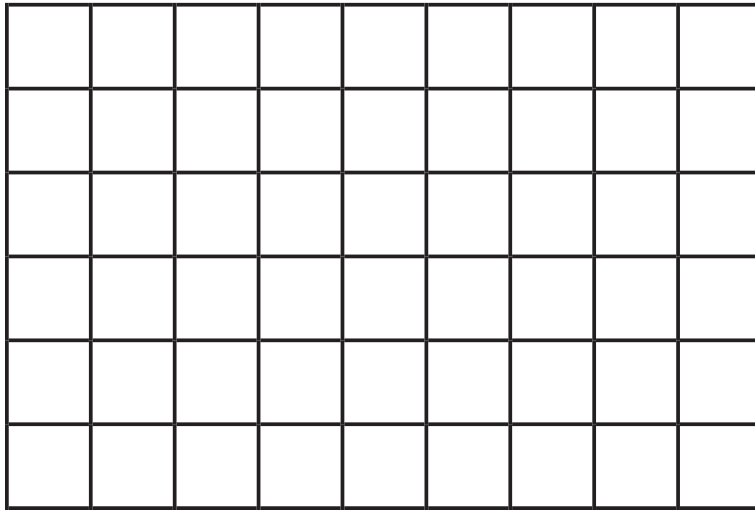
More or less than 200?



One-Centimeter Grid Paper



Breaking Apart a 6 x 9 Array



Sample Multiplication Card

$$6 \times 9$$

$$9 \times 6$$

Start with _____



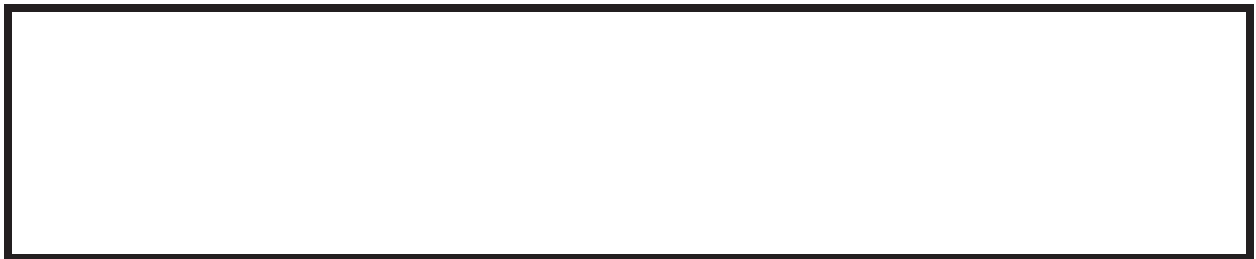
Context & Representation

for 29×6

There are 29 teams in a tennis tournament. Each team has 6 players. How many tennis players are in the tournament in all?

29

6



Partial Multiple Tower for 15

330

315

300

285

270

255

240

225

210

195

180

165

150

135



Questions to consider:

- ✦ Does the student break the problem into easily manageable parts?
- ✦ Does the student solve all the subproblems (using either division or multiplication) correctly?
- ✦ Does the student keep track of what has been solved and what remains to be solved?
- ✦ Does the student combine the products or quotients of their partial solutions to find the solution to the original problem?
- ✦ Does the student present his/her solution strategy clearly and concisely?
- ✦ Does the student correctly identify the remainder?



Looking at Student Work

$374 \div 12$

Student A

$374 \div 12 = 31 R 2$

$12 \times \underline{25} = 300$

$12 \times \underline{6} = 72$

$12 \times 31 = 372$

$372 \div 12 = 31 R 2$

add together
 The problem is 374 so the remainder is 2.

If there 374 cookies and 12 kids. How many cookies do each kid get?

31 and $\frac{2}{12} = \frac{1}{6}$



Looking at Student Work

$$374 \div 12$$

Student B

$374 \div 12 =$
I started with 12×10
which equals 120 then
I triple 120 which is
360. $360 = 30 \times 12$.
I then have 14 left.
There is one 12 in
14 with 2 left over.
Then I add $30 + 1r2$
and I get $31r2$
which is my answer.



Looking at Student Work

$374 \div 12$

Student C

$374 \div 12$

start with: $12 \times 10 = 120$
 $12 \times 20 = 240$
 $12 \times 30 = 360$
 ~~$12 \times 40 = 480$~~ $+12$
 $12 \times 31 = 372$

$31 R2$



Looking at Student Work

$374 \div 12$

Student D

Trevor

$374 \div 12$

$300 \div 12 = 25$ I know $12 \times 25 = 300$ because we did it a lot $4 \times 25 = 100$ and there are 3 of them

$+ 70 \div 12$ $(12 + 12) + (12 + 12) + 12$
 $24 + 24$
 $48 + 12 = 60$

$+ 4 \div 12 =$
 $= \text{answer}$



Looking at Student Work

$$374 \div 12$$

Student E

$374 \div 12 =$ I know $12 \times 5 = 60$
another $12 \times 5 = 60$ another $12 \times 5 =$
 60 and $60 \times 3 = 180$ You know you
have 15 12's. $180 + 180 = 360$
another 15 12's = 30 12's
and one more 12 so 31.2



Multiplication & Division Units in *Investigations*

3-5

Grade 3

2nd Edition

✦ Equal Groups

Multiplication and Division

Grade 4

✦ Factors, Multiples and Arrays

Multiplication

✦ Multiple Towers and Division Stories

Multiplication and Division

✦ How Many Packages? How Many Groups?

Multiplication and Division

Grade 5

✦ Number Puzzles and Multiple Towers

Multiplication and Division

✦ How Many People? How Many Teams?

Multiplication and Division

Multiplication & Division Units in *Investigations*

3-5

Grade 3

1st Edition

✦ Things That Come in Groups

Multiplication and Division

Grade 4

✦ Arrays and Shares

Multiplication and Division

✦ Landmarks in the Thousands

The Number System

✦ Packages and Groups

Multiplication and Division

Grade 5

✦ Mathematical Thinking at Grade 5

Introduction, Landmarks in the Number System

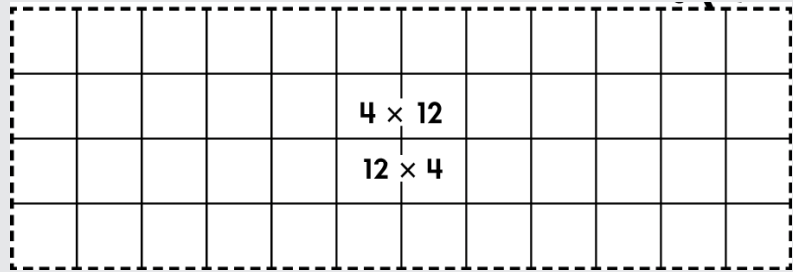
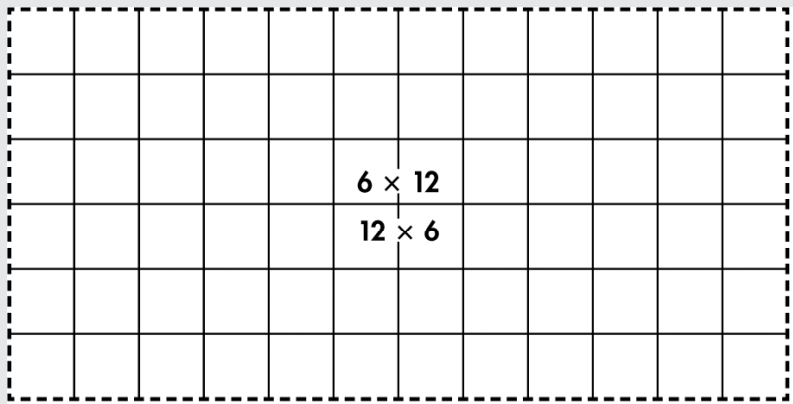
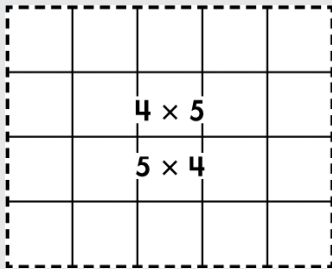
✦ Building on Numbers You Know

Computation and Estimation Strategies

Arrays for Demonstration Game

CUT

CUT



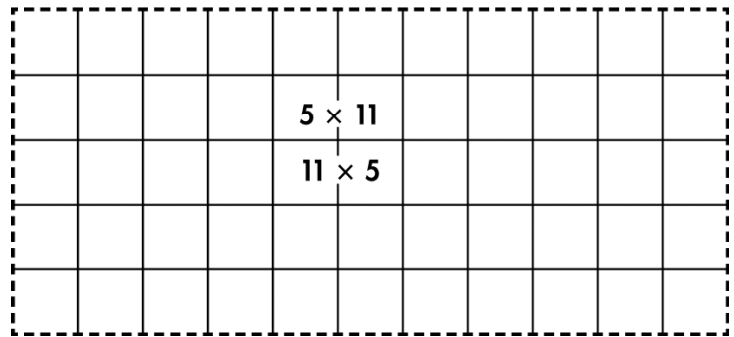
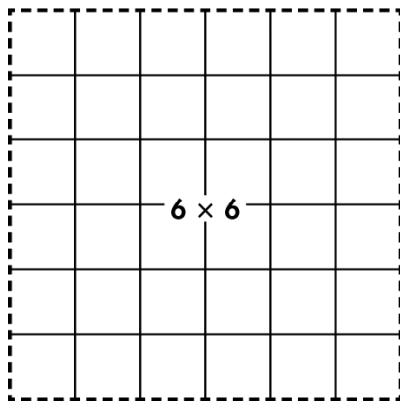
CUT

CUT

CUT

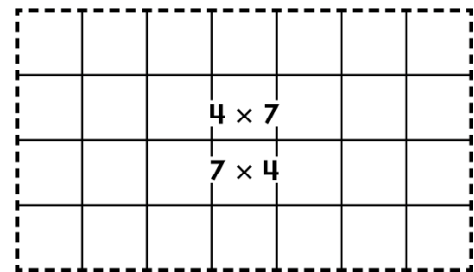
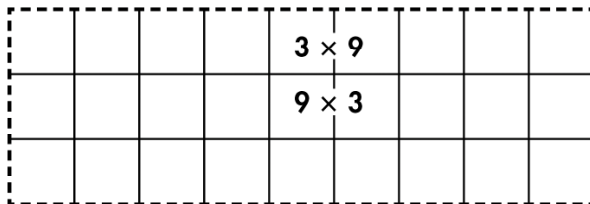
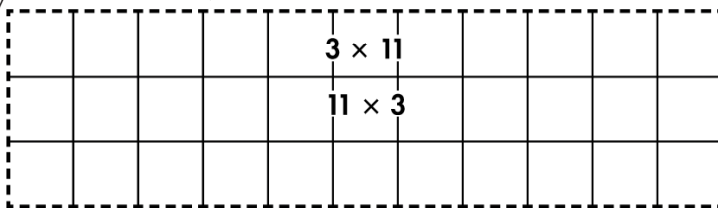
Player A's Cards

CUT



Player B's Cards

CUT



CUT

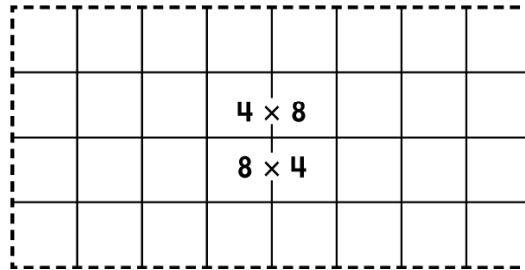
CUT



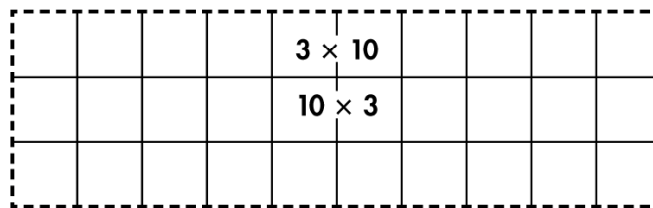
Arrays for Demonstration Game

Additional Cards

CUT



CUT



CUT

CUT

CUT

CUT

CUT



Small Array / Big Array Demonstration Game



Player A's Cards _____

Player B's Cards _____



Name _____

Date _____



Multiple Towers and Division Stories

Small Array/Big Array Recording Sheet

Record each match you make with two equations, as in the example. Use parentheses to show the small arrays that make up the big array.

Example:

3×11 11×3
2×11 11×2

$$\text{Equation: } 5 \times 11 = (3 \times 11) + (2 \times 11)$$

$$55 = 33 + 22$$

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

© Pearson Education 4