How Many Teams?

Sample task from achievethecore.org
Task by NC Department of Public Instruction, annotation by Student Achievement Partners

GRADE LEVEL Four

IN THE STANDARDS 4.OA.A.3, (4.NBT.B.6)

WHAT WE LIKE ABOUT THIS TASK

Mathematically:
- Requires students to understand the meaning of the quotient and remainder in order to solve problems in a real-world context
- Addresses content across two major clusters (4.OA.A and 4.NBT.B) within the grade
- Requires students to interpret what is being asked and perform extensive calculations (MP.1) accurately and efficiently (MP.6)

In the classroom:
- Offers opportunities for students to use strategies based on place value, properties of operations, and/or the relationship between multiplication and division to solve division problems
- Provides repeated practice of multi-digit division and can be easily altered to allow for repeated use throughout the year
- Allows for small group, partner, or individual work

MAKING THE SHIFTS[1]

Focus	Belongs to the major work[2] of fourth grade	
Coherence	Builds on grade 3 understanding of division as an unknown factor problem; Continues trajectory toward operational fluency with rational numbers	
Rigor[3]	Conceptual Understanding: not targeted in this task	
	Procedural Skill and Fluency: primary in this task	
	Application: primary in this task	

[1]For more information read Shifts for Mathematics.
[2]For more information, see Focus in Grade Four.
[3]Tasks will often target only one aspect of rigor.

ADDITIONAL THOUGHTS

This task offers students an opportunity to practice division with whole numbers, including problems that have remainders. The required computation is intensive and occurs through non-routine problems. The task includes two parts which are nearly identical, so teachers may choose to use only one part, or have the class work on different parts in groups. Students in grade four should have practice finding whole number quotients and remainders throughout the year, and teachers may assign part 2 at a later time: for additional practice or for homework.

Depending on students' ability to work with four-digit dividends and when this task is presented in a unit, the number of players in each region can easily be modified to three- or even two-digit numbers. Alternative dividends are: 327, 298, and 151. These numbers are chosen so that students interpret remainders, as in the original problem. Using alternate numbers for each dividend may be appropriate for the whole class or for a small group of students. Using modified numbers still allows all students to work with and practice grade-level problems.

To extend this task, the teacher might ask students to investigate whether there is a team size where no regions would have any leftover players. The teacher might suggest the numbers to investigate to the students or leave it up to the students to determine.

It is important to note that this task does not address the second or third parts of the standard, representing problems using equations with a letter standing for the unknown and assessing the reasonableness of the answers using mental computation and estimation strategies including rounding. A teacher may modify this task to more fully address the standard by asking students to round or use compatible numbers to estimate the quotient before completing the computation.

Formative Instructional and Assessment Tasks

<table>
<tr><td colspan="2" style="text-align:center">How Many Teams?
4.OA.3-Task 2</td></tr>
<tr><td>Domain</td><td>Operations and Algebraic Thinking</td></tr>
<tr><td>Cluster</td><td>Use the four operations with whole numbers to solve problems.</td></tr>
<tr><td>Standard(s)</td><td>4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted.</td></tr>
<tr><td>Materials</td><td>Activity sheet</td></tr>
<tr><td>Task</td><td><p style="text-align:center">How Many Teams?</p>
In eastern North Carolina there are 3,277 fourth graders signed up for basketball. In western North Carolina there are 2,981 fourth graders signed up for basketball. In the Piedmont region there are 1,512 players signed up. Every player will get placed on a team in their region of the state.
Part 1:
The league wants to place 9 players on each team. Leftover players will be added to teams, so some teams will have ten players. How many teams will have 9 players? How many teams will have 10 players? Explain your reasoning.
Part 2:
In order to maximize playing time, the league decides to only place 7 players on each team. If there are extra players, some teams will have 8 players. How many teams will have 7 players? How many teams will have 8 players? Explain your reasoning.</td></tr>
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<table>
<tr><td colspan="3" style="text-align:center">Rubric</td></tr>
<tr><td style="text-align:center">Level I</td><td style="text-align:center">Level II</td><td style="text-align:center">Level III</td></tr>
<tr>
<td>Limited Performance
The student is unable to use strategies to find correct answers to any aspect of the task.</td>
<td>Not Yet Proficient
The student has between two to four incorrect answers.</td>
<td>Proficient in Performance

The answers are correct. Explanations are clear and accurate.
Part 1: East: 363 teams have 9 players. 1 team has 10 players. West: 329 teams have 9 players. 2 teams have 10 players. Piedmont: 168 teams have 9 players. No teams have 10 players.
Part 2: East: 467 teams have 7 players. 1 team has 8 players. West: 419 teams have 7 players. 6 teams have 8 players. Piedmont: 216 teams have 7 players. No teams have 8 players.
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Formative Instructional and Assessment Tasks

Standards for Mathematical Practice
1. **Makes sense and perseveres in solving problems.**
2. **Reasons abstractly and quantitatively.**
3. Constructs viable arguments and critiques the reasoning of others.
4. Models with mathematics.
5. Uses appropriate tools strategically.
6. **Attends to precision.**
7. Looks for and makes use of structure.
8. Looks for and expresses regularity in repeated reasoning

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Part 1:
The league wants to place 9 players on each team? Leftover players will be added to teams, so some teams will have ten players. How many teams will have 9 players in each region of the state? How many teams will have 10 players in each region of the statewide? Statewide, how many teams have 9 players and how many teams have 10 players? Explain your reasoning.

Part 2:
In order to maximize playing time, the league decides to only place 7 players on each team. If there are extra players, some teams will have 8 players. How many teams will have 7 players in each region of the state? How many teams will have 8 players in each region of the state? Statewide, how many teams have 7 players and how many teams have 8 players? Explain your reasoning.