Classroom Seating Plan

Teacher Guide · Solutions · Rubric

Grade 2 · All levels

Overview

Students plan seats for a class event. They decide whether groups can be made into partners (odd or even), write even numbers as doubles, and arrange chairs in arrays with up to 5 rows and 5 columns.

Time: 2 class periods · **Product:** Seating Plan
Standards: 2.OA.C.3, 2.OA.C.4, 2.G.A.2
Prerequisite skills: Count by 2s and 5s; Add within 20

Learning targets

- I can tell if a group up to 20 is odd or even by making pairs.
- I can write an even number as two equal addends.
- I can find the total in an array and write a repeated-addition equation.

Timing and materials

- Day 1 (40 min): partners and doubles (Parts 1–2).
- Day 2 (40 min): chair arrays and the seating plan (Parts 3–4).

Materials: Counters or cubes (25 per pair); Grid paper (printable support page); Crayons. No accounts, paid products or student personal information are needed.

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The three versions

- Remedial: hints for a first step, partly filled tables, sentence frames and fewer open choices; the same learning targets.
- Standard: the full task set at grade level; students choose their strategies and models.
- Advanced: open design constraints, missing information, error analysis and a written justification; no hints.

All versions use the same context and learning targets, so groups can share and compare work.

Implementation notes

- Let students line up counters in two rows to check for a partner.
- Say “rows go across” and point while counting rows.
- Advanced students find every array (up to 5 by 5) for a given number of chairs and explain which numbers have no array other than one row.
- Before Part 1, read the challenge aloud and ask students to restate the goal.
- Close with a gallery walk: each group explains one strategy.

Rubric

Learning target	4 Exceeds	3 Meets	2 Approaching	1 Beginning
I can tell if a group up to 20 is odd or even by making pairs.	Correct and complete; explains how	Mostly correct	Partly correct	Not yet
I can write an even number as two equal addends.	Correct and complete; explains how	Mostly correct	Partly correct	Not yet
I can find the total in an array and write a repeated-addition equation.	Correct and complete; explains how	Mostly correct	Partly correct	Not yet
I can explain my thinking with pictures, numbers and words.	Clear for every part	Clear for most parts	Some explanation	Little explanation
My seating plan is complete and matches my math.	Complete, neat, accurate	Complete	Partly complete	Not complete

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Solutions · Remedial KEY

Part 1: Partners

Each group of children needs partners.

1. A group has 10 children. Can everyone have a partner? Is 10 odd or even?
Yes, even (5 pairs)

2. A group has 7 children. Can everyone have a partner? Is 7 odd or even?
No, odd (3 pairs, 1 left over)

Part 2: Doubles

Write each even number as two equal addends.

3. 10 = ___ + ___
5 + 5

4. 8 = ___ + ___
4 + 4

Part 3: Chair Arrays

Chairs are set in 3 rows with 4 chairs in each row.

5. How many chairs are there?
12 chairs

6. Write a repeated-addition equation for the rows.
4 + 4 + 4 = 12

7. Write a repeated-addition equation for the columns.
3 + 3 + 3 + 3 = 12

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Part 4: Seating Plan

Draw your seating plan as an array on grid paper.

8. How many rows and how many chairs in each row? Write the equation.

Answers vary; the equation must match the drawing.

Extension

Two more rows of the same size are added. How many chairs now?

20 chairs

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Solutions · Standard KEY

Part 1: Partners

Each group of children needs partners.

1. A group has 14 children. Can everyone have a partner? Is 14 odd or even?
Yes, even (7 pairs)

2. A group has 17 children. Can everyone have a partner? Is 17 odd or even?
No, odd (8 pairs, 1 left over)

Part 2: Doubles

Write each even number as two equal addends.

3. 14 = ___ + ___
7 + 7

4. 12 = ___ + ___
6 + 6

Part 3: Chair Arrays

Chairs are set in 4 rows with 5 chairs in each row.

5. How many chairs are there?
20 chairs

6. Write a repeated-addition equation for the rows.
5 + 5 + 5 + 5 = 20

7. Write a repeated-addition equation for the columns.
4 + 4 + 4 + 4 + 4 = 20

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Part 4: Seating Plan

Draw your seating plan as an array on grid paper.

8. How many rows and how many chairs in each row? Write the equation.

Answers vary; the equation must match the drawing.

Extension

Two more rows of the same size are added. How many chairs now?

30 chairs

Classroom Seating Plan

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Solutions · Advanced KEY

Part 1: Partners

Each group of children needs partners.

1. A group has 19 children. Can everyone have a partner? Is 19 odd or even?
   No, odd (9 pairs, 1 left over)
2. A group has 16 children. Can everyone have a partner? Is 16 odd or even?
   Yes, even (8 pairs)

Part 2: Doubles

Write each even number as two equal addends.

3. 16 = ___ + ___
   8 + 8
4. 18 = ___ + ___
   9 + 9

Part 3: Chair Arrays

Chairs are set in 5 rows with 5 chairs in each row.

5. How many chairs are there?
   25 chairs
6. Write a repeated-addition equation for the rows.
   5 + 5 + 5 + 5 + 5 = 25
7. Write a repeated-addition equation for the columns.
   5 + 5 + 5 + 5 + 5 = 25

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Part 4: Array Challenge

The class has 12 chairs. Rows can have up to 5 chairs and there can be up to 5 rows.

8. List every array you can make with all 12 chairs.

3 rows of 4 and 4 rows of 3 (2 rows of 6 and 6 rows of 2 do not fit)

9. Is 12 odd or even? How does an array with 2 equal rows show this?

Even: 2 equal rows of 6 means every chair has a partner.

10. Mia says 13 chairs can make an array with 2 equal rows. Explain why not.

13 is odd, so 2 equal rows leave 1 chair over (6 + 6 = 12).

Extension

Two more rows of the same size are added. How many chairs now?

35 chairs