Cover or cannot — Boards up to 8 wide

Name: _____ Date: _____

Decide whether dominoes can cover the board exactly, and say how you know.

1 A 6 by 6 courtyard of paving stones has the two corner stones at the same end dug up — the two along the top edge, left and right.

Can the rest be covered exactly by paving slabs, each covering two squares that share an edge, with none left over and none overlapping? Say YES or NO, and say how you know.

Why Color it like a chessboard first, because that is what rules the other one out. The two dug up squares are at the same end of one edge; on a board with an even side they are opposite colors, so what is left still has 17 dark and 17 light — equal, which is the test every covering must pass. And it can be done: that edge's row keeps an even run of squares once its two ends are gone, and every other row is a full even row, so lay the paving slabs along each row in turn. It can be done.

YES

Name: _____ Date: _____

Decide whether dominoes can cover the board exactly, and say how you know.

2 An 8 by 8 tiled floor has its two OPPOSITE corner tiles lifted out — one at the top-left and one at the bottom-right.

Can the rest be covered exactly by tiles, each covering two squares that share an edge, with none left over and none overlapping? Say YES or NO, and say how you know.

Why

Name: _____ Date: _____

Decide whether dominoes can cover the board exactly, and say how you know.

3 A 6 by 4 board of squares has its two OPPOSITE corner squares cut off — one at the top-left and one at the bottom-right.

Can the rest be covered exactly by dominoes, each covering two squares that share an edge, with none left over and none overlapping? Say YES or NO, and say how you know.

Why

Name: _____ Date: _____

Decide whether dominoes can cover the board exactly, and say how you know.

4 An 8 by 4 grid of lockers has the two corner lockers at the same end walled off — the two along the top edge, left and right.

Can the rest be covered exactly by double lockers, each covering two squares that share an edge, with none left over and none overlapping? Say YES or NO, and say how you know.

Why

Cover or cannot · Boards up to 8 wide — Answer key

> **If they are stuck**
>
> - Do not try to cover it. Color it like a chessboard first — what does every single tile have to cover?

1. Color it like a chessboard first, because that is what rules the other one out. The two dug up squares are at the same end of one edge; on a board with an even side they are opposite colors, so what is left still has 17 dark and 17 light — equal, which is the test every covering must pass. And it can be done: that edge's row keeps an even run of squares once its two ends are gone, and every other row is a full even row, so lay the paving slabs along each row in turn. It can be done.

2. Color it like a chessboard. Every tile covers two squares that share an edge, and those are always one dark and one light — so a full covering needs the same number of each. The two lifted out squares are opposite corners, which are the same color, so what is left has 30 of one color and 32 of the other. You can place 30 tiles to cover 60 squares, and the 62 − 60 = 2 left over are the same color and never touch. It cannot be done.

3. Color it like a chessboard. Every domino covers two squares that share an edge, and those are always one dark and one light — so a full covering needs the same number of each. The two cut off squares are opposite corners, which are the same color, so what is left has 10 of one color and 12 of the other. You can place 10 dominoes to cover 20 squares, and the 22 − 20 = 2 left over are the same color and never touch. It cannot be done.

4. Color it like a chessboard first, because that is what rules the other one out. The two walled off squares are at the same end of one edge; on a board with an even side they are opposite colors, so what is left still has 15 dark and 15 light — equal, which is the test every covering must pass. And it can be done: that edge's row keeps an even run of squares once its two ends are gone, and every other row is a full even row, so lay the double lockers along each row in turn. It can be done.