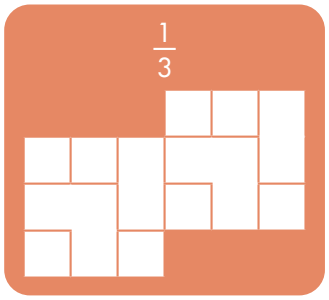
ABSTRACT ART

STRATEGIES

1. Find how many squares in each row or column must be shaded and unshaded.

How many squares must be shaded in each row of the puzzle below?



In the top and bottom rows, $\frac{1}{3}$ of 3 squares must be shaded. So, we must shade 1 square and leave 2 squares unshaded.

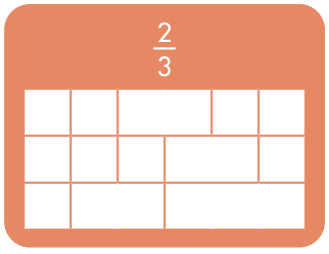
In the second and third rows, $\frac{1}{3}$ of 6 squares must be shaded. So, we must shade 2 squares and leave 4 squares unshaded.

2. Mark the unshaded squares.

Sometimes it's easier to find which squares must be unshaded.

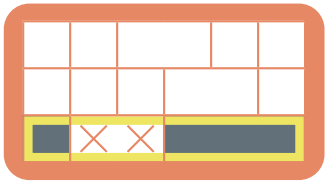
If a square must remain unshaded, mark it with an X.

In the bottom row, which squares must remain unshaded?



In the bottom row, $\frac{2}{3}$ of 6 squares must be shaded, so 4 squares must be shaded. Then, the other 2 squares must be unshaded.

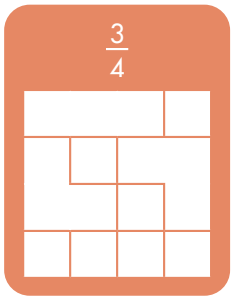
There is only one way to leave 2 squares in the bottom row unshaded, so we mark them with X's.



3. Check large tiles.

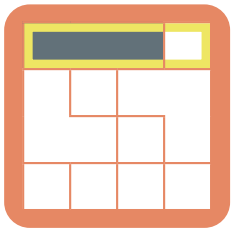
It's easier to determine if a large tile must be shaded or unshaded.

Are the three large tiles in the puzzle below shaded or unshaded?



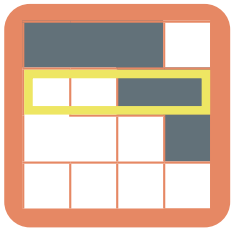
Since $\frac{3}{4}$ of a row must be shaded, 3 of the squares must be shaded and 1 must be unshaded.

In the top row, we can only shade 3 squares by shading the large rectangle.

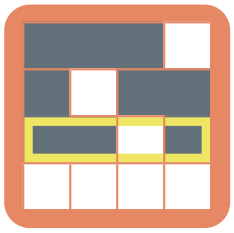


In the second row, we can only shade 3 squares by shading the L-shaped tile on the right, and one other tile. We

don't yet know which of the other tiles is shaded, though.



In the third row, we can only shade 3 squares by shading the L-shaped tile on the left.

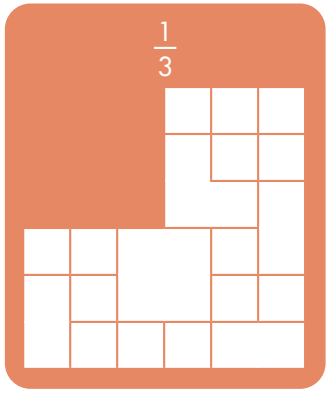


4. Check if we've found all the shaded (or unshaded) squares in a row or column.

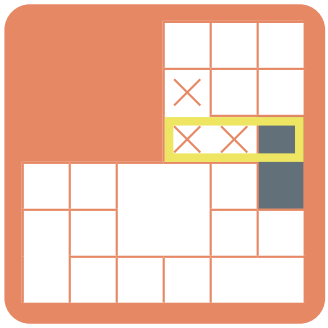
If we find all the shaded squares in a row, then the other squares in that row must be unshaded.

Similarly, if we find all the unshaded squares in a row, then the other squares in that row must be shaded.

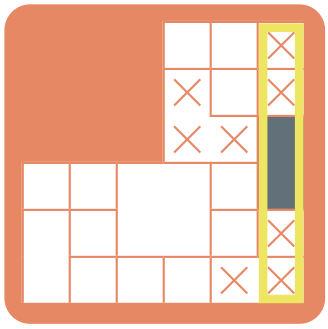
How can we complete the third row in the puzzle below? Then, how can we complete the right column?



There is only one way to shade $\frac{1}{3}$ of the squares in the third row.



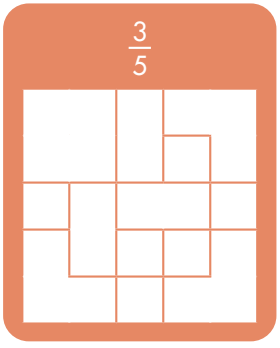
In the right column, we must shade 2 out of 6 squares. Since 2 squares are already shaded, we mark the rest of the squares as unshaded.



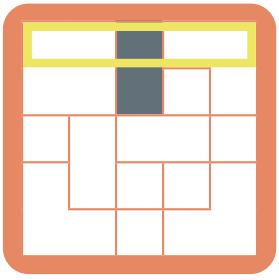
5. Odds and evens.

If we need an odd number of shaded squares in a row, and only one tile has an odd number of squares in that row, then we must shade that tile.

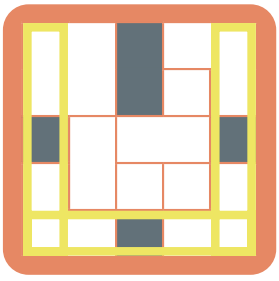
Which tiles around the edge are shaded?



Each row and column must have 3 shaded squares and 2 unshaded squares. In the top row, we can only have 3 shaded squares if we shade the middle square.



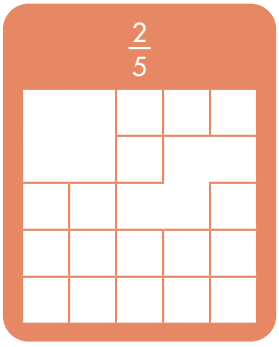
We use the same reasoning in the bottom row, left column, and right column.



6. Guess and check.

If we're stuck, we can shade a tile and see if it works. Choose a large tile that affects lots of tiles around it.

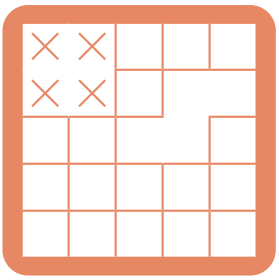
Is the large tile in the top-left corner shaded or unshaded?



If we shade the top-left tile, then the two rows and columns it's in are already $\frac{2}{5}$ shaded. So, all of the other tiles in these rows and columns would need to be left unshaded.

But, this makes it impossible to shade $\frac{2}{5}$ of the middle row.

So, the top-left tile cannot be shaded. We erase the marks we made while guessing, then mark the top-left tile as unshaded.

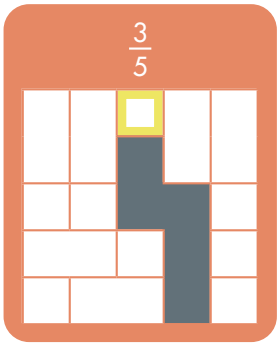


(Keep careful track of guesses, so we can erase them if they're wrong.)

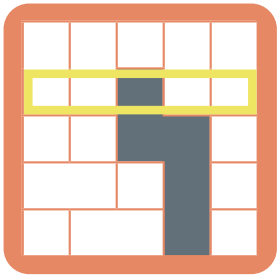
7. Find rows that are linked.

Sometimes the tile connections between two rows (or columns) gives us more information.

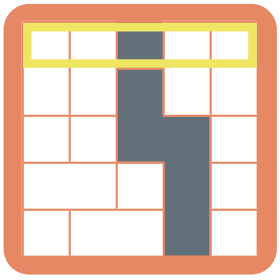
Is the top-center tile shaded or unshaded?



In the second row, three out of the five squares must be shaded. So, two of the unknown tiles must be shaded, and two must be unshaded.



All four of those tiles are also part of the first row. Since only two of those tiles are shaded, we must also shade the top-middle tile so that $\frac{3}{5}$ of the first row will be shaded.



8. Switch between rows and columns.

When we complete a tile, it may give new information for the rows and columns it's in. Be sure to check rows and columns as you complete tiles.