

Student Handout

The Tile Game

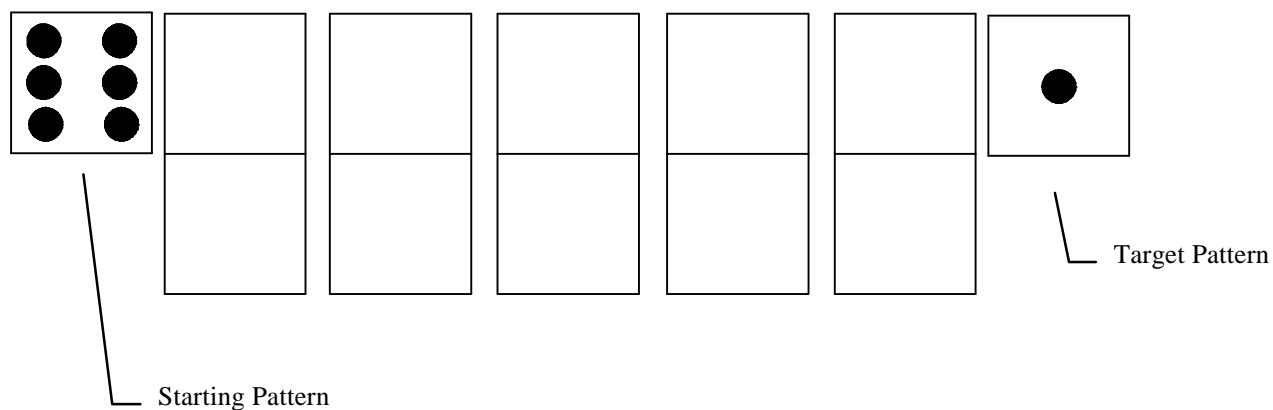
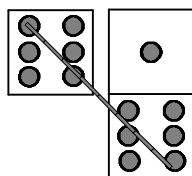
Object of the Tile Game

The objective of the game is to change the starting pattern of dots into the desired pattern by using the smallest possible number of tiles.

Rules of Play

You must match the starting pattern of dots with the identical pattern of dots in the lower half of the first tile that is played. Each subsequent tile must have its lower pattern of dots match the pattern of dots on the upper half of the previous tile. They match diagonally from upper left to lower right as shown in the one tile solution to the game. Play continues until the target pattern is present as the upper half of the last tile played.

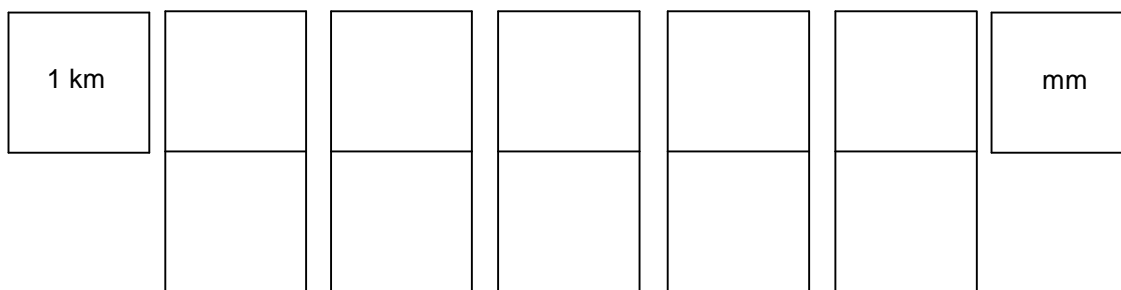
A One Tile Solution



The Metric Conversion Game

This game is played with the same rules as the Tile Game. The patterns that you are striving to match are the units...not the numbers associated with the units. This game does require that you perform a division or multiplication because the numbers will not be matched. Two tiles are constructed for each of the conversions. One has the units $\frac{A}{B}$ and the other has the units $\frac{B}{A}$. All of the spaces shown for tiles do not have to be filled in order to arrive at the target pattern which, in this case, is mm.

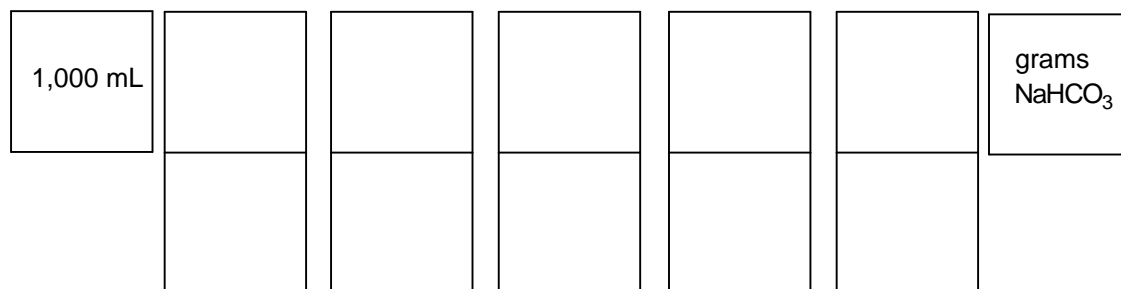
How many millimeters are present in one kilometer?



The Molarity Game

This game is played with the same rules as the other tile games but the tiles are constructed to include all of the possible conversion factors used in the problem.

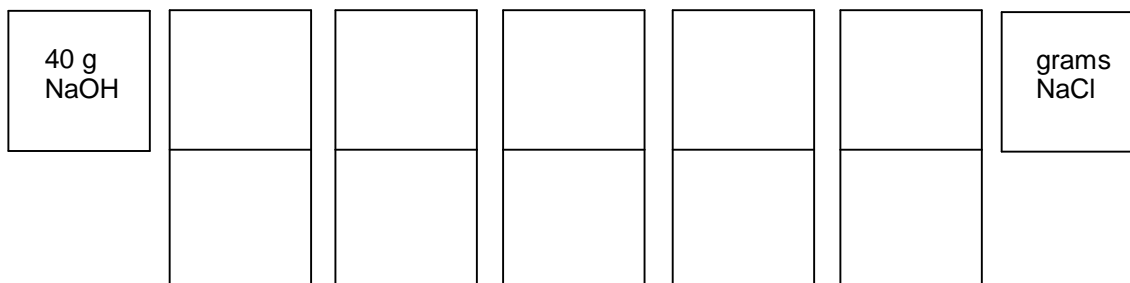
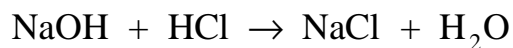
How many grams of NaHCO_3 are present in 1000 mL of a 1 M solution of NaHCO_3 ?



The Stoichiometry Game

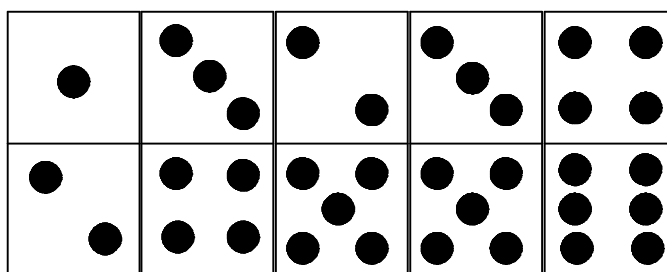
This game is played with the same rules as the other tile games.

How many grams of sodium chloride will be formed by the reaction of 40 grams of NaOH with excess HCl?



Game Tiles

Cut out the tiles and use them in the space given for each game problem. You may not need all the spaces to solve the puzzle.



1,000 m	1 km	1,000 mm	1 m	1 cm	100 mm	100 cm	1 m
1 km	1,000 m	1 m	1,000 mm	100 mm	1 cm	1 m	100 cm

1,000 mL	1 L	84 g NaHCO ₃	1 mole NaHCO ₃	1 mole NaHCO ₃
1 L	1,000 mL	1 mole NaHCO ₃	84 g NaHCO ₃	1 L

1 mole HCl	1 mole H ₂ O	1 mole HCl	1 mole NaOH	1 mole H ₂ O	1 mole NaCl
1 mole NaCl	1 mole HCl	1 mole H ₂ O	1 mole H ₂ O	1 mole NaOH	1 mole HCl
1 mole NaOH	1 mole NaCl	1 mole H ₂ O	1 mole NaCl	1 mole HCl	1 mole NaOH
1 mole NaCl	1 mole NaOH	18 g H ₂ O	58.5 g NaCl	36.5 g HCl	1 mole HCl
1 mole NaOH	36.5 g HCl	40 g NaOH	58.5 g NaCl	18 g H ₂ O	1 mole HCl
40 g NaOH	1 mole HCl	1 mole NaOH	1 mole NaCl	1 mole H ₂ O	1 mole NaOH