2 Die

Thats Sum Product

1. Roll 2 dice.
2. Put the top number and the bottom numbers of the 1st die in the boxes in the column for 1st die.
3. Put the top number and the bottom numbers of the 2nd die in the boxes in the column for 2nd die.

	1st die	2nd die
Top number		
Bottom number		

Find the following 4 products and write each product on the lines below

1. The **1st number** is the product the numbers on the **top of the first and second die.**
2. The **2nd numbe**r is the product the numbers on the **bottom of the first and second die.**
3. The **3rd numbe**r is the product the number on the **top of the first die and the number on the bottom of second die.**
4. The **4th numbe**r is the product the number on the **top of the second die and the number on the bottom of the first die.**

_____	+	_____	+	_____	+	_____	=	_____
1st number is the product of the numbers on **top of 1st die** and the **top of 2nd die**		2nd number is the product of the numbers on **bottom of 1st die** and the **bottom of 2nd die**		3rd number is the product of the numbers on **top of 1st die** and the **bottom of 2nd die**		4th number is the product of the numbers on **top of 2nd die** and the **bottom of 1st die**		The sum of the 4 numbers

Solution: The sum of the 4 numbers will always be 49.

Why does this work?

The opposite sides of all die total 7.
If one side is 3 the opposite side is 7 – 3 = 4
If one side is 2 the opposite side is 7 – 2 = 5

If one side is x the opposite side is 7 – x
If one side is y the opposite side is 7 – y

If the top of the first die is x and the top of the second die is y than

	1st die	2nd Die
Top number	**x**	**y**
Bottom Number	**7 – x**	**7 – y**

1. The product the 2 numbers on the top of the two die.
   $x \cdot y$
2. The 2nd number is the product the 2 numbers on the bottom of the two die.
   $(7-x)(7-y)$
   $= 49 - 7x - 7y + xy$
3. The 3rd number is the product the 2 numbers on the top and bottom of one die.
   $x(7-y)$
   $= 7x - xy$
4. The 4th number is the product the 2 numbers on the top and bottom of other die.
   $y(7-x)$
   $= 7y - xy$

Add the 4 numbers together

$$xy + 49 - 7x - 7y + xy + 7x - xy + 7y - xy$$
$$= 49 - 7x + 7x - 7y + 7y + xy + xy - xy - xy$$
$$= 49$$

The sum will always be 49.