**Match Up**

| Black Dice | Addition |
| --- | --- |
| Red Dice | Subtraction |
| Green Dice | Multiplication |
| Purple Dice | Square & square root |
| White Die | Operators, + - x |
| White Numbers  “Basic” | On 8-sided dice will have the numbers 2-9 |
| Yellow Numbers  “Advanced” | On 8-sided dice will have the numbers 6-13 |

**Type of Game:**  This is a co-operative game for kids playing at the beginning level and becomes competitive at the more advanced levels.Winning at the advanced levels is based on the players ability to multiply, add and subtract numbers quickly and in the correct order.

**Who Should Play:** :Players must be able to add in order to play at the most basic level and can advance to the next levels as they learn to subtract and then multiply.

**Materials Needed:** All eleven of the eight sided dice will be used at the most advanced level. This includes four black, four green and three red dice.

**Skills Reinforced:**

* Ability to find different numbers to reach a common sum at beginning level
* Ability to add, subtract and multiply quickly and accurately at advanced levels.
* Knowledge of correct order of operations at advanced levels

**How to PLAY, Basic Level**

* Either player rolls the two basic black dice (numbered 2-9) and adds them together.
* All of the players (you can play with any number of players at the basic level) will either take turns or on their own (you decide) come up with different numbers to use to come up with the same sum.
* For ease of explaining, here is an example. If the player rolled a 7 and a 9 the total would be 16. Now the players come up with all of the different combinations of two numbers that will add up to 16. So one answer could be 10 + 6 = 16 and another would be 11 + 5 = 16.
* Eventually players would be taught how to systematically find all of the possible answers. For example, 1+15 = 16, 2+14 = 16, 3+13 = 16 and so on.
* Players will use the advanced black dice (numbers 6-13) when they are ready.
* An advanced version of the basic level will have players use three numbers to find the sum that they got rolling the two dice.

**Variation 1**

* This would be the same basic game, but would include subtraction. Players would add the two advanced black dice (numbered 6-13) and then subtract one basic red subtraction die (numbered 2-9) and follow the same process as above.
* For ease of explaining, here is an example. The player rolls a black 6 and a black 8 and a red 3, giving them 6+8 -3 = 11. The number of different ways to get an answer of 11 when adding two numbers and subtracting a third number from that sum is limitless, so in a competitive version of that game you might decide to see who can come up with five different examples the quickest. A co-operative variation would be to have the players work together to come up with a predetemined number of problems (say 10) that all have a final answer of 11 but use none of the same numbers in the problem. For example, 12+8 -9 = 11, 14+3 -6 =11 and 10+2-1=11 are three examples and 100+24-113 =11is another. There is no limit to the options.

**Variation 2**

* Advanced MatchUp is played with the black, red and green dice and involves rolling them to try and get a predetermined number. You can do this in an orderly, structured manner by having the players take turns rolling the dice, or in a frenetic, “mad scramble” version by giving each player their own dice and racing to see who can get the desired number first.Let’s look at an example of each, remembering that players can come up with their own versions of any of these guidelines.

* If you give each player 5 dice (one basic black, one advanced black, one basic red, one basic green and one advanced green) you can have two players with identical dice. Now they can play by taking turns, or by racing. It makes great sense to start out taking turns, and eventually advancing to “racing”. Here is how it works.
* The players will choose a number that they will try to get by using their five dice. They do NOT have to use all of the dice, but they may only use the dice to perform their assigned function. The black dice can only be added, the green only multiplied and the red only subtracted.In the version with these five dice you will want to pick a number between 40 and 60, since that is the range where you are most likely to be able to land on your number when you roll your dice.But it is vital that the players realize that regardless of what number they pick, they may find it impossible to get to that number with the numbers they rolled. So, let’s take a look.
* Suppose we pick 45 as our number we are going to try to get. That way, if we roll a green 9 and a green 5 we have it, regardless of what we have on our other dice. On the other hand, when we select 45 as our “go to “number if we roll a green 2 and a green 7 we can see that we cannot possibly get from 14 to 45, no matter what numbers we rolled on our other three dice. Players learn quickly that the green dice are the key, and if they do not get us close to our desired “go to” number, we will need to reroll.
* So, we are trying to get to 45. Let’s say we roll a green 8 and a green 5 and a black 6 and a black 7 and a red 8. Well, we check the green product first and see that we have 40 (5 times 8), so we are close to our desired 45. If we had a black 5 we could just add it to 40 and be done. Alas, no black 5. If we had any black number that was 5 greater than our red die we could add that black and subtract the red and bingo, we are at 45. Unfortunately, neither of our two black dice are 5 greater than our red 8, but fortunately (and many of you already saw this),if we add our balck 6 to our black 7 we get 13, and then when we subtract our red 8 from that 13 we get the 5 that we need to add to our 40 to get 45!
* So, here is how the game is scored. Both players roll their five dice and see if they can get to 45. We are not racing, we are just looking at our dice to see if we can get to our desired number. The players can actually look at each others dice and work together to see if they can get to the “go to” number. If you can get to it and I can’t , then you win that round and the number of points you score is the number of dice that you used to get the desired total. If we both got to the desired number we each got a score based on how many dice we used to get there. If neither of us can get there, we will reroll our dice and try again. But even here there is strategy involved, as the players get to decide which dice they want to reroll. For example, if we were playing to 45 as in our previous example and I rolled a green 8 and a green 5 I may choose not to reroll my green dice (because they got me so close to 45) and simply reroll my other three dice. Again, the green dice are the key to getting close to your desired number and if you don’t roll the right green numbers you are in trouble, but not in trouble because you aren’t good with numbers. But rather, because you are a lousy roller! Sometimes it may take a number of rolls to get to the desired number.
* So you can decide how long your game will be. You may decide to play a certain number of numbers. For example, we will play until we have reached 42, 44, 46, 48 and 50. That would be 5 different numbers. Or we may decide to play until one player has earned 10 points. Remember that points are earned based on how many dice you used to reach the desired number. Finally, players will learn quickly that numbers that are multiples of the green dice (for example, 42, 44, 48 and 50 above) are more likely to be achieved using only the two green dice, while 46 cannot be achieved without using at least three dice. So, depending on whether you want to make the game more or less challenging, you decide what your “go to” number will be.
* And finally, you change the game from being orderly and co-operative to being competitive and frenetic (hopefully still friendly) simply by changing from taking turns to racing. You roll your dice and I roll mine and first one to get the desired number wins the round. In this scenario, you will want to build in a penalty (loss of 1 point) for any player who calls out “Got it!” and upon further review we see that they did not actually have it. You might be surprised how often that will happen even with players with good number sense as they are “racing” to get done first.

**Variation 3**

* Plays exactly like variation 2 except that the player has all 11 black, red and green dice to choose from. So you cannot play this variation in the “racing” format unless you have one set for each player playing. But you can still play with multiple players and only one set in the “taking turns” format. The advantage of variation 3 is that with 4 green dice you have a much better chance of “getting close” with the green dice.In fact, we would recommend that when playing variation 3 the players be allowed to reroll any duplicate dice. Obviously, with more dice available, your ideal target number becomes larger. In fact, another option for variation 3 is to predetermine two “go to” numbers (for example 79 and 101) thus giving the player more options to choose from and also the possibility of getting to both numbers.Another nice thing about having four green dice is that the players will learn that once in awhile when no two green dice will work, sometimes three green dice will “get you close.” For example, if I roll a green 2, 4, 11 and 13 I cannot get anywhere near the 79 or 101we mentioned above by simply multiplying two green numbers together, but if I multiply the 2 times the 4 times the 11I can get to 88, from which point both the 79 and 101 are definite possibilities depending on the black and red dice I rolled. And (try it and see) there are so many possible ways to combine those four black and three red dice you can get so many different numbers and also sometimes get the same number but use more dice to get it. Players who have played 35Up (the advanced version of 13Up) will have had great practice with finding numbers using the black and red dice. Fun stuff!

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