

# DIY Air Force Activities:

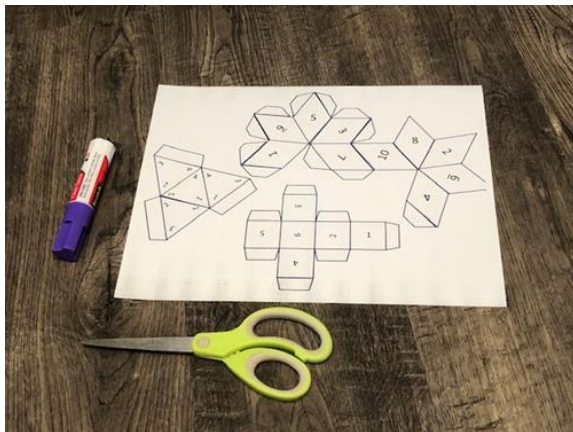
## Random Roll with DIY Dice



### Materials:

- scissors
- glue stick or clear tape
- chalk or painters tape
- pen or pencil and paper
- markers or crayons

\*you could also grab a calculator to check your work!



Have you ever heard the phrase it's a "roll of the dice"? It means the outcome seems to be random and left to chance. Although the results of a dice roll are not entirely random (they are a matter of probability), our inability to predict that answer makes it seem random. To learn more about probability see our Probability Penny DIY! Random numbers are actually quite important, as many things in life are complicated enough to seem random. Consider something like evolution or weather patterns; if we want to simulate these processes, we need to generate random numbers for the inputs. Random numbers are the foundation of many computer simulation methods, but are also useful for cryptography and gaming. This activity will allow you to construct your own dice that you can use in a game or simulation you design!

### Directions:

1. Print and carefully cut out the dice templates. You can color them in with your markers or crayons first! Feel free to print the template out a few times if you want to make more than one of each type.
2. Pre-fold the templates along all of the lines as shown on the back of this page.
3. Add glue to a tab, then fold template over and pinch to secure. It is best to do one tab at a time. You may also use tape. Have an adult help you if needed. Repeat with all dice!
4. Create a game board with the chalk (outside) or painter's tape (inside). You can either play using one track or create two tracks side by side if you want to play with more friends!
5. Here is where you can get creative! With your friends decide on the rules for your game, and use your dice to roll the outcome! You could assign a specific move (if you roll a 6 you have to hop on one leg), or make a math game where you roll multiple dice and add, subtract, or multiply the numbers. The person who can solve the problem first gets to move one square. One die could determine the operator (add, subtract, multiply, or divide) and others the numbers in the problem. Use your imagination, it's up to you! You can also look online for more dice games.

### Air Force Associations:

An Air Force Research Lab nanocomputing research team invented a one-bit random number generator that produces a truly random binary value. The randomness by which they are generated stems from the inherently non-uniform variations in the material from which the system is composed. <https://www.wpafb.af.mil/News/Article-Display/Article/399426/one-bit-random-number-generator/>

Here is a sample game board! You can make yours as long or short as you wish. Feel free to add more twists and turns! Will you make two tracks side by side? Do you have to go back a step if you get an answer wrong? The rules are up to you!

