Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Theoretical Probability – Compound Event

***Activity – Finding Probability using a Table***

**Jacob rolls two fair number cubes. Find the probability that the sum of the numbers he rolls is 8.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **1** | **2** | **3** | **4** | **5** | **6** |
| **1** | **2** | **3** | **4** | **5** |  |  |
| **2** | **3** |  |  |  |  |  |
| **3** | **4** |  | **6** |  |  |  |
| **4** | **5** |  |  | **8** |  |  |
| **5** |  |  |  |  |  |  |
| **6** |  |  |  |  | **11** |  |

**Step(1): Use the table to find the sample space for rolling a particular sum on two number cubes. Each cell is the sum of the first number in that row and column. Complete the table.**

**Step(2): How many possible outcomes are in the sample space?**

**Step(3): Circle the outcomes that give the sum of 8**

**Step(4): How many ways are there to roll a sum of 8?**

**Step(5): What is the probability of rolling a sum of 8?**

**Practice:**

1. **Chyanne rolls two number cubes. What is the probability that the sum of the numbers she rolls is less than 6?**
2. **A student spins the spinner and rolls a number cube. What is the probability that she will randomly spin a 1 and roll a number less than 4?**

***Using a Tree Diagram to find Probability***

**A deli prepares sandwiches with one type of bread (white or wheat), one type of meat (ham, turkey, or chicken), and one type of cheese (cheddar or swiss). Each combination is equally likely. Find the probability of choosing a sandwich at random and getting turkey and swiss on wheat bread.**

**Step(1): Make a tree diagram to find the sample space for the compound event.**

 **White Bread Wheat Bread**

 **Turkey Ham Chicken Turkey Ham Chicken**

 **Ched Swiss Ched Swiss Ched Swiss Ched Swiss Ched Swiss Ched Swiss**

**Step(2): Find the number of possible outcomes in the sample space: 12**

**Step(3): Find the probability of choosing turkey and swiss on wheat bread at random: 1/12**

**Practice:**

1. **Use the tree diagram to find the given probabilities**
2. **Ham and cheese sandwich**
3. **Sandwich containing Swiss Cheese**
4. **Use the following information. Elijah gets dressed in the dark one morning and chooses his clothes at random. He chooses a shirt (green, red, or yellow), a pair of pants (black or blue), and a pair of shoes (checkered or red).**
5. **Make a tree diagram and state the sample space**
6. **What is the probability that Elijah picks an outfit at random that includes red shoes?**
7. **What is the probability that no part of Elijah’s outfit is red?**
8. **Nevaeh is getting dressed. She considers two different shirts (Collared, T-shirt), three pairs of pants (Khakis, Jeans, and Shorts) and three pairs of shoes (Sneakers, Flip-Flops, and Sandals). She chooses one of each of the articles at random. What is the probability that she will wear her jeans but not her sneakers?**
9. **You flip three coins. What is the probability of getting 2 tails and 1 head?**
10. **You flip three coins. What is the probability of getting 3 heads?**

***Finding Probability using a List***

**The combination for Khiem’s locker is a 3-digit code that uses the numbers 1, 2, and 3. Any of these numbers may be repeated. Find the probability that Khiem’s randomly assigned number is 222.**

**Step(1): List all the codes that start with 1 and have 1 as a second digit.**

**Step(2): List all the codes that start with 1 and have 2 as a second digit.**

**Step(3): List all the codes that start with 1 and have 3 as a second digit.**

**Step(4): You have now listed all the codes that start with 1. Repeat steps 1-3 for codes that start with 2 and then for codes that start with 3.**

**Step(5): Find the number of outcomes in the sample space by counting all the possible codes. There are 27 such codes.**

**Step(6): Find the probability that Khiem’s locker code is 222.**

 **P(Code 222) = number of favorable outcomes = 1**

 **total number of possible outcomes 27**

1. **Martha types a 4-digit code into a keypad to unlock her car doors. The code uses the numbers 1 and 0. If the digits are selected at random, what is the probability of getting a code with exactly two 0’s?**