What Are the Odds?

5th Grade

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** Has an Answer Sheet*

Probability Dice Game

This probability dice game is a great way to cover and build on the basics of probability math. The different combinations dice offer are the perfect grounds for many probability questions, such as, “How likely is it that the total of two rolled dice will be six?” or "What is the probability the three-side will come up on both dice?"

Here’s a quick game that can help your kid grasp the difference between rolling Snake Eyes and Lucky Number Seven!

What You Need:

- A pair of dice, two different colors (for example, red and blue)
- A piece of paper
- Some M&M’s or another little treat

What You Do:

1. Tell your child that you’re going to learn all about dice and probability.
2. Ask him how many different ways there are to roll 2 dice. Remind him that there are 6 options on both sides. Together, you can determine that there are 6 x 6 = 36 possible rolls.
3. Ask him how many ways there are to roll a total of “2” using two dice. After thinking, he should conclude that there’s only one way: 1 + 1
4. Ask him how many ways there are to roll a total of “7.” He should come up with 6 combinations: 1 + 6, 6 + 1, 2 + 5, 5 + 2, 3 + 4, 4 + 3.
5. Time to figure out all of the rolls. Have him fill out the last two columns of the following chart. He has already figured out “2” and “7,” and he can do the rest the same way.

Total to Roll	Ways to Get the Total	Probability of that Roll
2	1	1 /36
3		/ 36
4		/ 36
5		/ 36
6		/ 36
7	6	6 /36 = 1/6
8		/ 36
9		/ 36
10		/ 36
11		/ 36
12		/ 36

6. When he’s done, the chart should look like this:

Total to Roll	Ways to Get the Total	Probability of that Roll
2	1	1 / 36
3	2	2 / 36 = 1/18
4	3	3 / 36 = 1/12
5	4	4 / 36 = 1/9
6	5	5 / 36

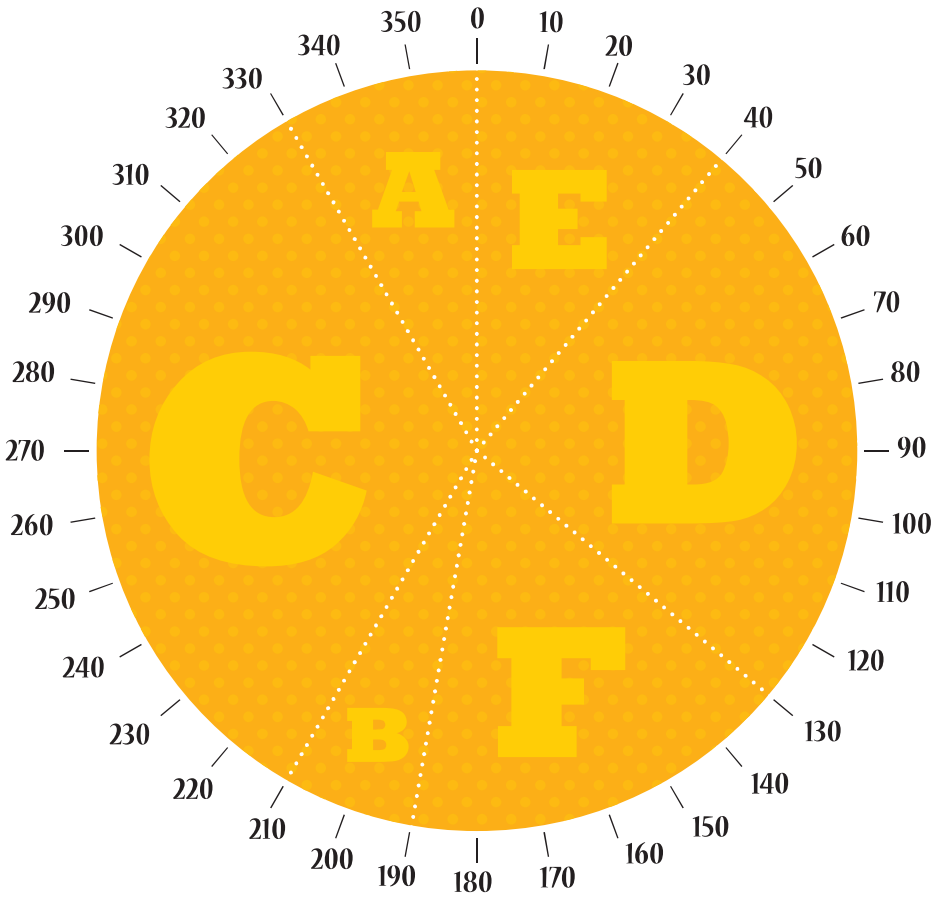
7	6	6 / 36 = 1/6
8	5	5 / 36
9	4	4 / 36 = 1/9
10	3	3 / 36 = 1/12
11	2	2 / 36 = 1/18
12	1	1 / 36

7. Here's a dice challenge for him. First, tell him the roll you want him to try and get. Then, give him two opportunities to win a reward (like a small piece of candy.) He can win an award if he rolls what you asked him to get. And, he can win another award for guessing the correct probability of rolling what you've asked of him. Good luck!
    - Roll a total of "9" (1/9)
    - Roll a total of "11" (1/18)
    - Roll a total of 8" (5/36)
    - Roll a total of "12" (1/36)
    - Roll a total of "5" (1/9)
    - Roll a "7" *or* an "11" (6/36 + 2/36 = 8/36 = 2/9)
    - Roll a "2" *or* "6" (1/36 + 5/36 = 6/36 = 1/6)
    - Roll a "2" *or* a "6" *or* a "7" *or* an "11" (1/36 + 5/36 + 6/36 + 2/36 = 14/36 = 7/18)
    - You can make up your own as you go

Probability Darts

Find the portion of the dart board that each panel occupies and use your knowledge of degrees and fractions to answer the following questions about probability.

REMEMBER: Probability is the likelihood a given outcome will occur. It is expressed as a fraction.



Fractions

A **1/12**

30°/360°

B _____

C _____

D _____

E _____

F _____

Use the information above to answer the questions below.

1. Is it more likey that the dart will hit Panel A or Panel D? Why?

2. What is the probability that the next dart thrown hits a panel with a consonant?

3. What is the probability that the next dart thrown hits a panel that alphabetically comes <u>after</u> C?

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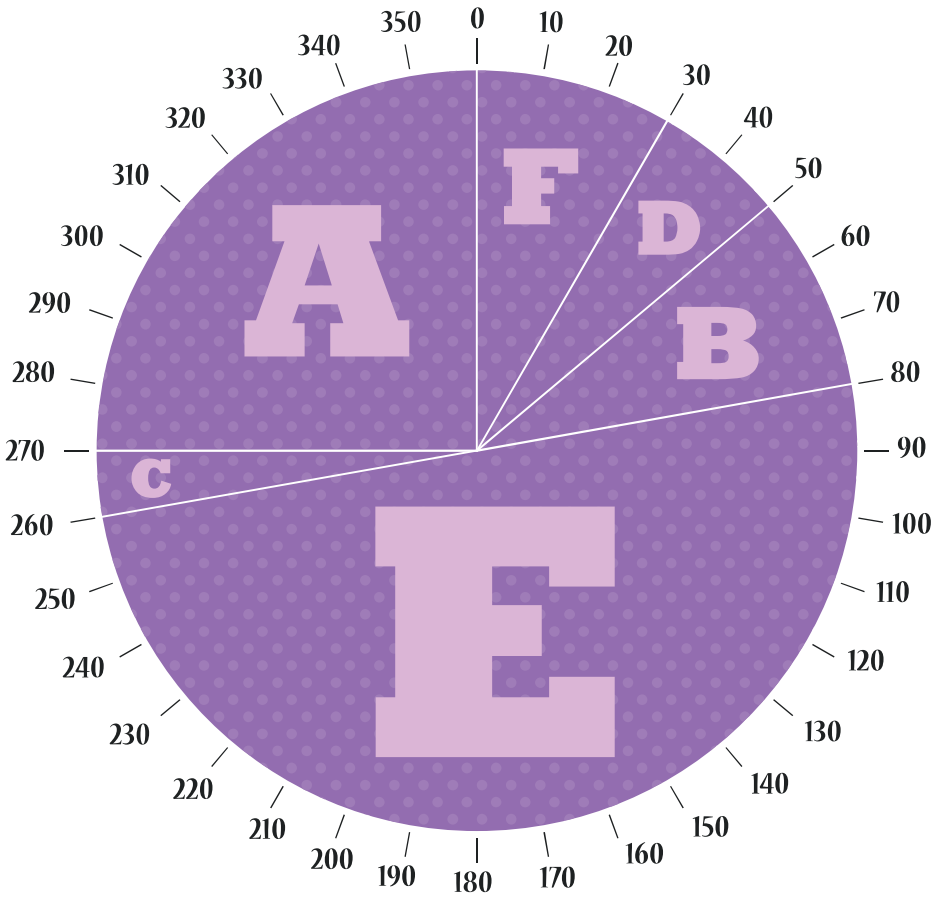

Fractions

A **1/4**

90°/360°

B _____

C _____

D _____

E _____

F _____

Use the information above to answer the questions below.

1. What is the probability that the next dart thrown hits panel C or B?

2. What is the probability that the next dart thrown hits panel A, D, or F?

3. Is the next dart thrown more likely to hit a vowel or a consonant?

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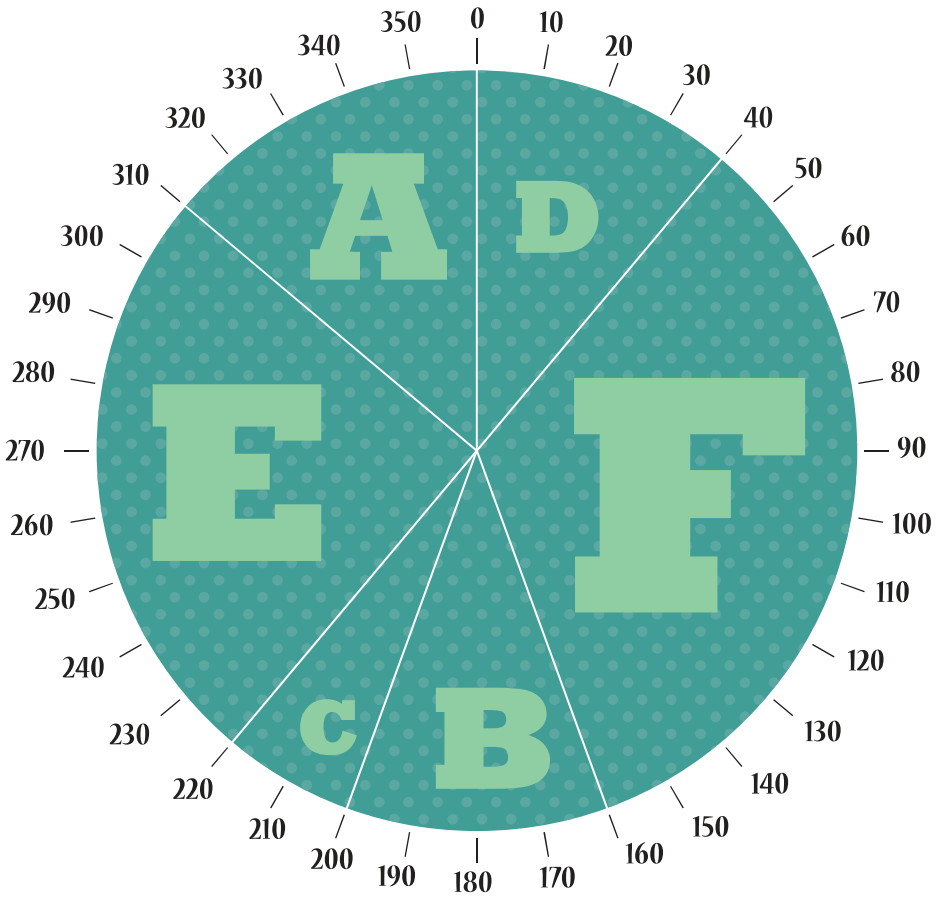

Fractions

A **1/6**

60°/360°

B _____

C _____

D _____

E _____

F _____

Use the information above to answer the questions below.

1. Is the next dart thrown more likely to hit E or F? Why?

2. What is the probability the next dart thrown hits a letter that comes before D alphabetically?

3. What is the probability the next dart thrown hits panel A, B, or D? Is it more or less than 1/2?