One way to predict future events is to analyse what has happened in the past. Suppose a baseball player has a 0.250 batting average. Is she likely to make a hit the next time at bat? If there is a 20% probability of precipitation tomorrow, would you go to an outdoor concert?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - a possible \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of an experiment

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - a set of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ with the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ result

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - one \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a probability experiment

**Investigate 1: Even or Odd**

Place 5 red and 5 blue chips in a bag. Without looking, take out 2 chips. The 2 chips selected are called an **outcome**. If the chips are the same colour, the **event** is considered even. If the chips are different colours, the event is considered odd. Record the result and then replace the chips.

1. Suppose you conducted 20 **trials** of the experiment. How many odd results would you expect to get? How many even results?

2. Conduct 20 trials of the experiment and record the results in the tally chart below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Trial #** | **Odd** | **Even** |  | **Trial #** | **Odd** | **Even** |
| 1 |  |  |  | 11 |  |  |
| 2 |  |  |  | 12 |  |  |
| 3 |  |  |  | 13 |  |  |
| 4 |  |  |  | 14 |  |  |
| 5 |  |  |  | 15 |  |  |
| 6 |  |  |  | 16 |  |  |
| 7 |  |  |  | 17 |  |  |
| 8 |  |  |  | 18 |  |  |
| 9 |  |  |  | 19 |  |  |
| 10 |  |  |  | 20 |  |  |

Total # of Even Events: \_\_\_\_\_\_\_\_\_\_\_ Total # of Odd Events: \_\_\_\_\_\_\_\_\_\_\_

3. Compare your answers to questions 1 and 2. How did the actual results compare to your expectations?

4. Using the chart below, gather the results of the other groups in your class.

|  |  |  |  |
| --- | --- | --- | --- |
| **Group #** | **Even**  | **Odd** | **Group Results** Total # of Trials= Total # of Even Events=  Total # of Odd Events=  |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |
| 8 |  |  |
| 9 |  |  |
| 10 |  |  |
| 11 |  |  |
| 12 |  |  |

5. How do the group results compare to your prediction in question 1?

6. Suppose you were to predict the number of odd events from 5 trials of an experiment. Which results would you use to make your prediction, your results from question 2, or the combined results from question 4? Explain your choice.

In Investigate 1 a probability experiment was conducted. The **experiment** consisted of 20 trials. In each **trial**, two chips were drawn. Each trial had 2 possible **events**: even or odd.

|  |
| --- |
| **Experimental Probability**Determined using the results of an experiment or simulation$$P\left(E\right)=\frac{\# of successful trials}{total \# trials}$$ |

Example 1: The results of rolling a regular six-sided die are displayed in the graph.

a) How many times was a 5 rolled?

b) Find the **experimental probability** of rolling a 6. Express your answer as a fraction in lowest terms, as a decimal and as a percent.

c) Find the experimental probability of **not** rolling a 6. How is this related to the probability of rolling a 6?

d) How would you expect the heights of the bars to relate to each other? Explain.

Discuss the Concepts

1. Does experimental probability always give an accurate prediction of the likelihood that an event will occur? Explain.

2. Which would you consider to be more accurate: a probability experiment with five trials, or one with 100 trials? Explain.

3. In a probability experiment, you toss a fair coin 10 times. Is it possible that heads will turn up 10 times? Explain.

**Homework:** Textbook, page 66 # 1 - 8