

## Dice Differences

### YOU WILL NEED

- 2 standard dice
- graph paper

Jack and Jill are playing a game. They roll two standard dice and determine the difference between the numbers rolled.



### ? How many differences are possible?

- Predict the following:
  - Which difference will occur most often?
  - Which difference will occur least often?
  - Which differences will occur equally often?
- With a partner, roll two dice 36 times. Record the difference each time as a positive value. How closely do your results match your predictions?
- Represent your results using a bar graph.
- Determine the **experimental probability** for each difference as a fraction.
- Compare your experimental results with another group's experimental results. Were they similar? Combine the two sets of results, and repeat part D for the combined results. How do these probabilities compare with those from part D?
- Combine the results of all the groups in your class. Determine the experimental probability for these combined results. Express each probability as a decimal.

- G. Copy and complete this outcome table. Record the differences as positive values.

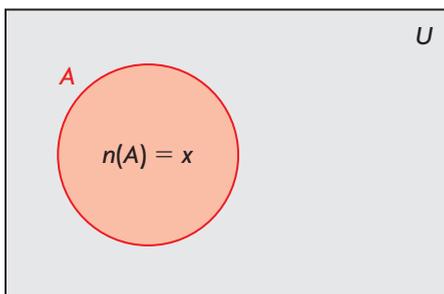
Differences in Rolls of Two Dice						
Die 1/Die 2	1	2	3	4	5	6
1						
2						
3						
4	3					
5						
6						

- H. Determine the **theoretical probability** of each difference as a fraction. How closely does the experimental probability for the class results match the theoretical probability?

## WHAT DO You Think?

Decide whether you agree or disagree with each statement. Explain your decision.

- The probability that event X will happen is  $\frac{2}{9}$ . The probability that event Y will happen is  $\frac{5}{9}$ . Therefore, the probability that either event X or event Y will happen is  $\frac{(2 + 5)}{9}$  or  $\frac{7}{9}$ .
- Ideas from set theory are useful when you are solving probability problems.
- You can use a Venn diagram to determine the probability of an event.



- You can solve probability problems using the same techniques you use to solve counting problems. For example, suppose that you are going to draw two balls from a bag with five different-coloured balls. You can use combinations to determine the probability that you will draw a red ball and a blue ball.