



# Lady Luck Lotto

## Objectives

1. Participants will compare various ways to invest money and the risks associated with each.
2. Participants will be able to calculate the odds of various ways to make money.
5. How likely is it that someone would “make” money in the stock market?
6. How likely do you think it is that someone in here would make money in the lottery?

## Materials

- Lottery “cards” — (pieces of paper that have 49 numbers written on them or blank pieces of paper).
- Lottery numbers — cut up one lottery card; this is what you will use to draw the six numbers.
- Overhead, notebook, or chalkboard to record the winning numbers.

## Procedures

Begin this activity by handing out cards that have 49 numbers, each numbers between 1 and 49 to each participant. Each participant marks six numbers on their card. (An alternative is to have participants record six numbers between 1 and 49 on a blank piece of paper.)

Then draw six numbers and see if anyone would have won this lottery. (You could even provide a prize and hold it up as the prize the winner would get if his or her number was called.)

Next, begin a discussion about the stock market and what participants already know about the market. Begin by throwing out some questions such as the ones below:

1. What do you know about the stock market?
2. Do any of you invest in the stock market?
3. Have any of you invested money?
4. Why do people invest their money in the stock market?

Then discuss alternatives to the lottery for making money, such as the stock market, sweepstakes from the mail, game shows, local store or restaurant games (like the monopoly game at McDonald's®), and bank accounts. Discuss what seems to be the best (safest) way to get rich.

## Odds of Winning the Lottery Jackpot (all six winning numbers selected)

There are a total of 13,983,816 different groups of six numbers which could be drawn from the set {1, 2, ..., 49}. To see this we observe that there are 49 possibilities for the first number drawn, following which there are 48 possibilities for the second number, 47 for the third, 46 for the fourth, 45 for the fifth, and 44 for the sixth. If we multiply the numbers  $49 \times 48 \times 47 \times 46 \times 45 \times 44$  we get 10,068,347,520. However, each possible group of six numbers (combination) can be drawn in different ways depending on which number in the group was drawn first, which was drawn second, and so on. There are six choices for the first, five for the second, four for the third, three for the fourth, two for the fifth, and one for the sixth. Multiply these numbers out to arrive at  $6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$ . We then need to divide 10,068,347,520 by 720 to arrive at the figure 13,983,816 as the number of different groups of six numbers (different picks). Since all numbers are assumed to be equally likely, and since the probability of some number being drawn must be one, it follows that each pick of six numbers has a probability of  $1/13,983,816 = 0.00000007151$ . This is roughly the same probability



as obtaining 24 heads in succession when flipping a fair coin!

Below is a table that compares the money one could get for investing in a savings account, the stock market and getting a return of 9% or 12%, and if one spent money on lottery tickets. (Our graph assumes the person wouldn't win the lottery in the 20 years

that they play — which is most probable.) This chart is based on a person who could play the lottery twice a week at \$1 per ticket. This would be \$104 that this person would spend a year on lottery tickets. For the savings and stock market examples, assume the person could take this \$104 and save or invest it per year instead and get a return of either 9% or 12%.

Invest \$2 a WEEK in	Savings Account at 2%	Stock Market at 9%	Stock Market at 12%	Lottery
Value after 10 years	\$1139	\$1580	\$1825	\$0
Value after 20 years	\$2527	\$5321	\$7493	\$0

Template for individual lotto pick cards and to cut up squares to draw lotto numbers.

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	32	33	34	35
36	37	38	39	40	41	42
43	44	45	46	47	48	49