

## Lesson 1: The Application of Random Sampling

Team member's names: \_\_\_\_\_

Goal: To come to a complete understanding of the concept of random variables.

1. Joe wants to go to McDonald's because in their happy meals they have movies in them. There are three different movies that he could get: *The Fast and the Furious*, *Legally Blonde*, and *Terminator 3*. The movie that he really wants is *Terminator 3*. How many happy meals might he have to buy before he gets the movie?

Write the names of the three movies on three pieces of paper. Place all of the papers in a small bag. Take turns picking one of the slips and replacing it until you pull out *Terminator 3*. Make sure you keep track of how many times you pull out the names before you pick *Terminator 3*.

Repeat this process ten times.

Attempt Number	1	2	3	4	5	6	7	8	9	10
Number of Movies Pulled										

- a. What is the average of the attempts? \_\_\_\_\_
- b. Compare your results with the results from other groups. Are they the same? Why or why not?

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2. Using the scenario above, find how many happy meals will need to be purchased to obtain *The Fast and the Furious*. Only this time, use your TI-73 or TI-83 calculator to determine your results. Do the process fifteen times.

Make sure to keep track of your results. [On your calculator use these commands: MATH -> PRB -> randInt( ]

Attempt Number	1	2	3	4	5	6	7
Number of Movies Chosen							

8	9	10	11	12	13	14	15

- What is the average of your experiments? \_\_\_\_\_
- Compare your results to the other groups. What did you discover?

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- The principal at Richards Middle School wants to randomly choose thirty students out of the eighth grade class to attend a concert. There are 150 students total in the eighth grade class.

Using a table of random digits below, describe how the principal might choose the thirty students to attend the concert. Then randomly choose thirty students.

94 36 79 64 22 21 46 80 90 08 77 65 43 54 33 22 33 65 44 55  
 75 87 69 88 76 66 53 43 32 53 73 83 98 38 27 20 94 78 37 20  
 01 36 46 47 67 98 78 09 98 87 76 56 54 32 45 67 89 99 88 65  
 44 33 23 55 47 65 76 56 87 88 00 09 89 86 54 53 43 22 11 14  
 45 68 79 67 89 98 07 92 83 74 02 18 32 76 45 43 32 55 19 12

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- If you were to close your eyes and point to where you want to start on the chart, would you get the same answers every time? Why?

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b. Is this a fair way to make a random choice? Why or why not?

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4. a. From your observations, can you give a brief definition of random sampling?

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b. How can you relate random sampling to previously studied topics?

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5. Give a real life example where random sampling can be applied.

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### Solutions

1. a. The results will differ for each group.  
b. The results should be different from group to group because every group drew a different number of times to obtain the movie.
2. a. The result will differ for each group.  
b. When the results are compared, they will all be different.
3. The principal will assign each student a number 1 to 150. Then he will randomly choose thirty numbers. Each student will have thirty different sets of numbers.  
a. Each time you start in a different spot, you will get a different set of choices.  
b. Yes, this is a fair way to make a choice because it is totally anonymous and random.
4. a. Random sampling is the process where every element of the sample has the same chance of being chosen.  
b. The student should have a unique answer for this question.
5. The student should have a unique answer for this question.