

The Seven Dwarfs Giveaway

A Simulation Activity for the TI-Nspire

Student Worksheet

Disney World™ is giving away *Seven Dwarfs* dolls in order to attract tourists. Each time a person pays admission to the park, they will receive a doll of one of the Seven Dwarfs: **Bashful, Doc, Dopey, Grumpy, Happy, Sleepy, & Sneezy**.

Admission to Disney World™ costs \$42. Anyone who collects all Seven Dwarf dolls will get two free admissions to Disney World™.

Before you begin, record your prediction:

I predict I will need to visit Disney World™ _____ times to collect all Seven Dwarfs.

Is there a minimum number of visits? Is there a maximum? Why?

Think about the simulation:

What could you use to simulate the selection of all of the Seven Dwarf dolls?

(Hint: Each one is selected randomly and each doll has an equally likely chance of occurring)

Why would this simulation produce a good model? Why would you not use other models to simulate this experiment?

Follow the steps on the overhead to set-up your simulation correctly. Your results can be recorded in the table on the back of this page.

Record the results of your calculator simulation below. Place a tally mark inside the **Tally** column each time you get a doll.

Doll	Tally	Total
1. Bashful		
2. Doc		
3. Dopey		
4. Grumpy		
5. Happy		
6. Sleepy		
7. Sneezy		

- I had to go to Disney World™ _____ times to collect all Seven Dwarfs.
- Record the class average for the number of Disney World™ visits needed in order to collect all Seven Dwarfs.

Class Average: _____

- Our class average represents the expected number of times a person would have to visit Disney World™ to get all Seven Dwarfs. How much money will that person be spending in order to get all Seven Dwarfs? _____
- Do you think it was a good idea for Disney World™ to have the Seven Dwarfs Giveaway? Why or why not?

Extension:

- The formula for calculating the theoretical number of trials it would take to collect n distinct objects if each object has an equally likely chance of occurring is $\frac{n}{n} + \frac{n}{n-1} + \frac{n}{n-2} + \dots + \frac{n}{2} + \frac{n}{1}$. How many trials would you expect you would need to collect all 12 basketball cards of the 2008 USA basketball team out of boxes of Wheaties™? _____

Teacher Notes

1. The expected class average should be close to **18.15 trials**, based on the formula given to the students in the extension question.
2. Based on the formula in the extension question, it should take the students **approximately 37.24 trials** to get all 12 of the 2004 USA Men's Basketball team basketball cards.