Win a Magnum

(A guide for students)

**Read the scenario:**

The makers of Magnum (a popular ice cream) are running a promotion. They claim that 1 in 6 Magnums contains a stick that gives the owner a free Magnum.

Imagine you buy 1 Magnum every day. You will keep doing this until you get a free one.

On average, how many days will it take you to win a free Magnum?

**Discuss the scenario:**

Rachel said: “I am going to buy 6 Magnums. One of them will definitely be a winner”. Discuss the validity of Rachel’s statement.

Sophie said: “I bought 5 Magnums last week and none of them were winners, so there is a really high chance that the next one will be a winner.” Is she correct?

Lucy said: “I bought 6 Magnums last week and ALL of them were winners.” Is this possible?

**Investigate (by rolling a die):**

We can simulate this experiment by rolling a die repeatedly.

When the number 6 is rolled, that signifies the lucky stick.

Start rolling a die. Count the number of times you rolled it.

For example, Sophie rolled 3,2,5,5,6, so it took her 5 rolls before she won a Magnum, so her “score” is 5

Perform this experiment 20 times and record your “scores” below

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The mean is \_\_\_\_\_\_\_\_ The median is \_\_\_\_\_\_\_\_Now combine your scores with all the people in your class

|  |  |  |
| --- | --- | --- |
| **Score** | **Tally** | **Frequency** |
| **1** |  |  |
| **2** |  |  |
| **3** |  |  |
| **4** |  |  |
| **5** |  |  |
| **6** |  |  |
| **7** |  |  |
| **8** |  |  |
| **9** |  |  |
| **10** |  |  |
| **11** |  |  |
| **12** |  |  |
| **13** |  |  |
| **14** |  |  |
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The mean is \_\_\_\_\_\_\_\_

The median is \_\_\_\_\_\_\_\_

The mode is \_\_\_\_\_\_\_\_

Based on these results, what is the “average” number of Magnums that need to be purchased in order to win a free Magnum?**Investigate (with Excel):**

Try the same experiment using the Excel spreadsheet.

Were the die-rolling results similar to your Excel results?

Ask your teacher for a copy of this file to put on your computer.

**Compare your experimental probability with the theoretical probability:**

Rachel is going to keep buying Magnums until she wins opens a lucky one and wins a free Magnum.

What is the probability that this will happen on her first attempt?

What is the probability that it doesn’t happen on the first attempt but does happen on the second attempt? (A lose-win)

What is the probability of lose-lose-win?

What is the probability of lose-lose-lose-win?

Rachel decides that she is going to buy a maximum of 4 Magnums.

She will stop buying them if she opens a lucky one.

What is the probability she will open a luck one?

(ie the first or second or third or fourth will be lucky)

**Apply your learning:**

A Magnum costs $4.50. 1 in 6 Magnums contain the lucky stick.

A Cornetto costs $4. There are no lucky sticks.

Lucy likes Magnums just as much as Cornettos.

Should she buy Magnums or Cornettos?