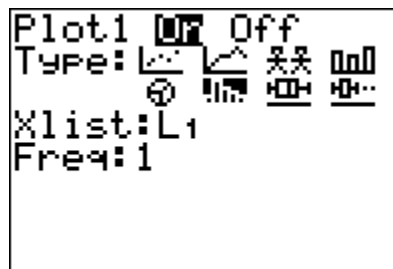## Sharing Birthdays

Class _____

Problem 1 – Birthdays in Your Class

In this problem, you will input your birthday in a class list and explore the data.

1. Write your birthday as entered in the list: _____

2. How many students are in your class? _____

3. Receive the data list back from your teacher.

Create a histogram of the whole class data set.

Press 2nd Y= to set up the plot. Press WINDOW to adjust the viewing window. Make sure each month is represented by a bar in the histogram.
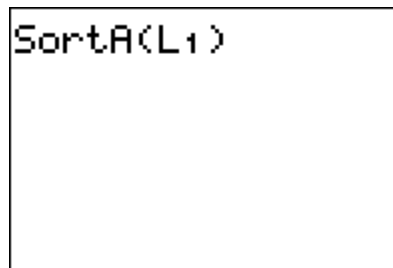
```
Plot1 On Off
Type:⌐ ⌐ ⋀ ⋀⋀ ▟██
      ⊕ ▟▙▙ ▟█▙ ▟█▙·
Xlist:L₁
Freq:1
```

4. What window is most appropriate for your data?

_____

_____

5. Draw your histogram at the right.

6. What does the shape of the graph tells us about the distribution of birthdays throughout the year?

_____

_____

7. Now, sort L1 in ascending order. On the Home screen, press 2nd LIST ▶ 1 and then 2nd LIST ENTER ENTER. Then press LIST to view L1.

```
SortA(L₁)
```

Do any students share the same date? If so, how many dates are shared?

_____

_____

8. Did the outcome surprise you? Why or why not?

_____

_____

Problem 2 – A 50/50 Chance of Sharing a Birthday

In this problem, you will experiment to find out many people need to be in a room to have better than a 50/50 change of two people sharing a birthday.

9. How many people do you think need to be in a room together to have a better than 50/50 chance that at least two people share a birthday? _____ people

10. Set up your random number generator. On a clear home screen, enter the last 4 digits of your telephone number. Then press [STO▸] [MATH] [▸] [▸] to **PRB**, [ENTER] to select **rand**, then [ENTER] to execute the command.

```
3158→rand
```

11. Enter the command **randInt(1,365)** on the Home screen and press [ENTER]. To enter **randInt**, press [MATH] [▸] [▸] [2].

```
randInt(1,365)
```

   You will see one number between 1 and 365. Record the number below.

   Continue pressing [ENTER] to generate additional random numbers until you see a duplicate number. Record the numbers as they are generated. This represents a second person in the room having the same birthday as someone else.

   _____

   _____

   _____

12. How many people (random numbers) were in the room before you had a duplicate birthday? _____

13. Was the number you found in Question 12 greater or less than your initial estimate from Question 9? _____

14. Were the results from the experiment surprising? Explain. _____

   _____

   _____

15. After the classroom has entered their number from Question 12 in list L1, create a histogram of the data in L1. Press [ZOOM] [7] to graph.

   Sketch the graph to the right.

16. Use the **mean** command to find the mean of the list. Press [2nd] [LIST] [3] [2nd] [LIST] [1] [ENTER]. _____

17. How does the class average compare to your estimate in Question 9? Does this surprise you? Explain. _____

   _____

   _____