# Balloons

Have you ever blown up a balloon, let it go, and watched it fly around? Have you ever done this in a math classroom? Today we will!

Here is the question we need to answer: How long will it take for a balloon with a 40 inch circumference to deflate? It would be easy to answer this question if we have the right sized balloon, but I only have 9-inch diameter balloons.

**Procedure**

You are going to work in a group of size three or four. Each person will get a balloon, but you will each take turns blowing your balloon up and letting it go!

1. Person 1 will blow up his or her balloon. Someone else will measure the circumference on the balloon to the nearest quarter of an inch and record it in the table below.
2. Have the stopwatch ready to go and have whoever is holding the balloon release it. Time how long it takes in seconds for the balloon to deflate and hit the ground. Record the time it took for the balloon to deflate and hit the ground in the table below. Also, do not “throw” the balloon – just release it and let the balloon deflate and fall to the ground.
3. Repeat steps 1 and 2 with your group. Each person in your group must inflate the balloon to a different circumference.
4. Write your group’s data in the table below and on the table on the board. Record each coordinate pair on the class table. Since this is a scatter plot, it doesn’t matter if people in different groups have the same circumference.

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| --- | --- | --- | --- | --- | --- | --- |
| Name | Circumference  (in inches) | Time  (in seconds) |  | Name | Circumference  (in inches) | Time  (in seconds) |
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1. Use the data to create a scatterplot. You may do this by making a graph by hand or by using technology. Label and scale the axes appropriately.



1. Based on these data, find a linear equation to predict how long it will take for a balloon with a circumference of 40 inches to deflate. Show all of your work.
2. Use the equation to predict how long it will take for a balloon with a circumference of 40 inches to deflate.
3. Interpret the slope of your linear equation. What does it mean in context of the situation?
4. Is your prediction from question (7) an interpolation or an extrapolation? Explain
5. Is there causation between the circumference of the balloon and the time it takes to deflate? Explain.

Now it is time to do the experiment. We will need volunteers to measure this one balloon that is capable of inflating to 40-inches in circumference! We also need a timekeeper.

The actual time for a balloon with a 40-inch circumference to deflate is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. How close was your predicted time to the actual time?
2. What other variables might affect the results of this experiment?