Making Means

For GSP5 Name:

In this activity you'll investigate some properties of the mean and generate examples of data sets that have a given mean.

EXPLORE

1. Open **Making Means.gsp.** Go to page "Line Plot." Make sure you have one data point at 3 and one data point at 7. If not, press *Reset.*

2. Drag the two data points to new values without changing the mean value of 5.00. Find three ways of doing this.

3. Add two more data points so that the mean remains 5.00. Write down your new set of data points.

4. Drag the four data points so that the mean remains 5.00. Write down your new set of data points. Drag them again, while still keeping the mean at 5.00, and write down your new set of data points.

5. Press *Reset.* Add a new data point so that the mean is 6.00.

6. Drag one data point to 0. Drag your two other data points so that the mean remains 6.00. List all the ways you can find of doing this.

7. Place five data points anywhere on the number line, except at 4, so that they have a mean of 4.00.

8. Find two more sets of five data points that have a mean of 4.00 without any one of the data points having the value 4.

9. What strategy did you use to generate data sets with a mean of 4.00?

10. What can you say about data sets that have a mean of 4.00?

11. If you look at your answers to steps 7–10, you will see that you have created many different sets of data, all of which have a mean of 4.00. These may have included {1, 2, 3, 5, 9}, as well as {0, 3, 3, 6, 8} or {0, 0, 0, 10, 10}. Imagine that you added one more data point between 0 and 10 to each of these sets of data. Predict how much you think the mean might change.

12. Test your prediction from step 11. Describe your findings.

13. Drag the six data points to these locations: 2, 3, 4, 4, 5, and 6. Predict what will happen to the mean if one data point is added at 10. Test your prediction.

14. Can the mean increase to 10.00 by dragging in all the remaining data points from the left? Explain.

15. Suppose you find out that the mean value of the heights of the eight members of the family next door is 4 feet. Write down at least two different possibilities for the heights of each member of the family.

16. What kinds of things do you know for sure about the heights of each member of the family?

EXPLORE MORE

17. Press *Reset.* Imagine that your classmate placed a new data point far enough along the number line so that you couldn't see it on your screen. But you could see that the mean value of the three data points was 9.00. How could you figure out the value of the third data point?