6.2 An Integer Experiment

You will need
- a coin
- graph paper

GOAL
Add positive and negative numbers.

Explore the Math

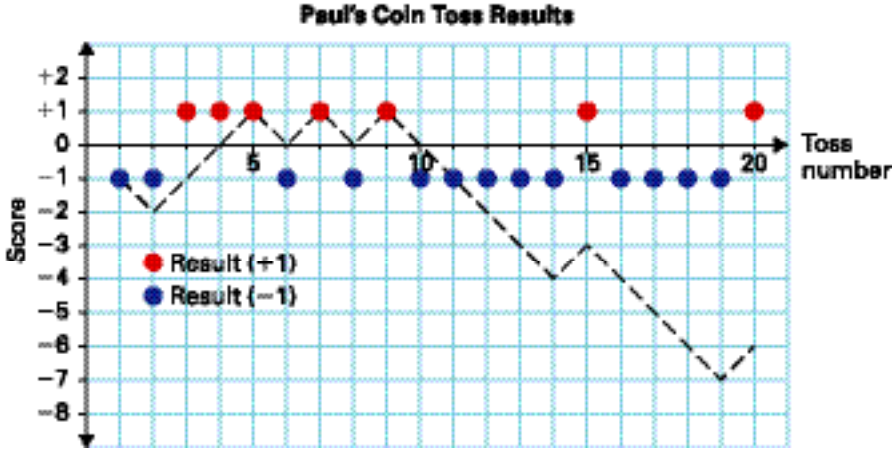
Paul wondered if a tossed coin would land Heads (H) or Tails (T) the same number of times. He tossed a coin 20 times as an experiment.
- When he tossed Heads, he gained 1 point (+1).
- When he tossed Tails, he lost 1 point (−1).

? How do your results for this experiment compare with Paul's results?

A. Carry out Paul's experiment. Toss a coin 20 times. Record your results using a data table like the one below.

Toss number	Result H or T	Point value (+1) or (−1)	Total score
1			
2			
20			

B. After Paul recorded his coin toss results, he plotted them using a scatter plot. He used a dashed line to show how his total score changed with each toss.



Use a similar graph to record your toss results and changing total score.

C. Describe Paul's first 5 tosses as Heads or Tails.

D. Describe the results of your first 5 tosses.

E. How does the graph show that Paul's score was (-1) after 1 toss?

F. What was Paul's score after 5 tosses? How does the graph show this?

G. What was your score after 5 tosses? How does your graph show this?

H. What was Paul's final score? Look at the graph. How can you tell whether Paul's score was positive or negative?

I. What was your final score? Look at your graph. Tell how you know whether it was positive or negative.

J. How are your results the same as Paul's results? How are your results different?

Reflecting

1. How does Paul's graph and your graph show positive and negative scores?

2. a) What happens to the total score when the value of the next toss is $(+1)$?

b) What happens to the total score when the value of the next toss is (-1)?

3. Explain how calculating the total score after each coin toss is like adding a positive or negative number.

4. Suppose that you repeated the experiment with 50 coin tosses.

a) What would be the greatest possible total score? Explain.

b) What would be the least possible total score? Explain.