SE Learning Task: Heads Wins!

1. Suppose you are approached by a classmate who invites you to play a game with the following rules: Each of you takes a turn flipping a coin. You toss your coin first, and he tosses his coin second.
    - He gives you $1 each time one of the coins lands on tails.
    - You give him $1 each time one of the coins land on heads.

    a. Create a tree diagram for the four possible outcomes and probabilities for the two tosses.

    b. What are the possible outcomes?

    c. What are your winnings for each outcome?

2. Suppose your classmate suggests a change to the rules of the game. He suggests the following rules after you flip a coin.

    - If you get heads, you give him $2.
    - If you get tails, then he flips his coin.
    - If he gets heads, you give him $1.
    - If he gets tails, he gives you $2.

    Who is most likely to win? Justify your reasoning.

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SE LEARNING TASK: Probably Graphing (Adapted from http://illuminations.nctm.org)

To explore the probability of getting heads in a coin toss, run an experiment of 30 trials. Count how many heads you get in 30 trials to investigate how the experimental probability changes with each trial. In your table, record how many heads have come up in your experiment, the number of trials completed, and the experimental probability (as a percentage) after each trial.

For example, if your first six trials resulted in Tails, Heads, Tails, Heads, and Heads your table would look something like this:

Trial	Outcomes (Circle H or T)	Cumulative Frequency of Heads	Probability (Write as a Percent)
1	H or T	0	0%
2	H or T	1	½=50%
3	H or T	1	1/3= 33%
4	H or T	2	2/4=50%
5	H or T	3	3/5=60%

Record the result of your experiment below.

Trial	Outcomes (Circle H or T)	Cumulative Frequency of Heads	Probability $\frac{\text{Cumulative Frequency}}{\text{Trial Number}}$
1	H or T		
2	H or T		
3	H or T		
4	H or T		
5	H or T		
6	H or T		
7	H or T		
8	H or T		
9	H or T		
10	H or T		
11	H or T		
12	H or T		
13	H or T		
14	H or T		
15	H or T		
16	H or T		
17	H or T		
18	H or T		
19	H or T		
20	H or T		
21	H or T		
22	H or T		
23	H or T		

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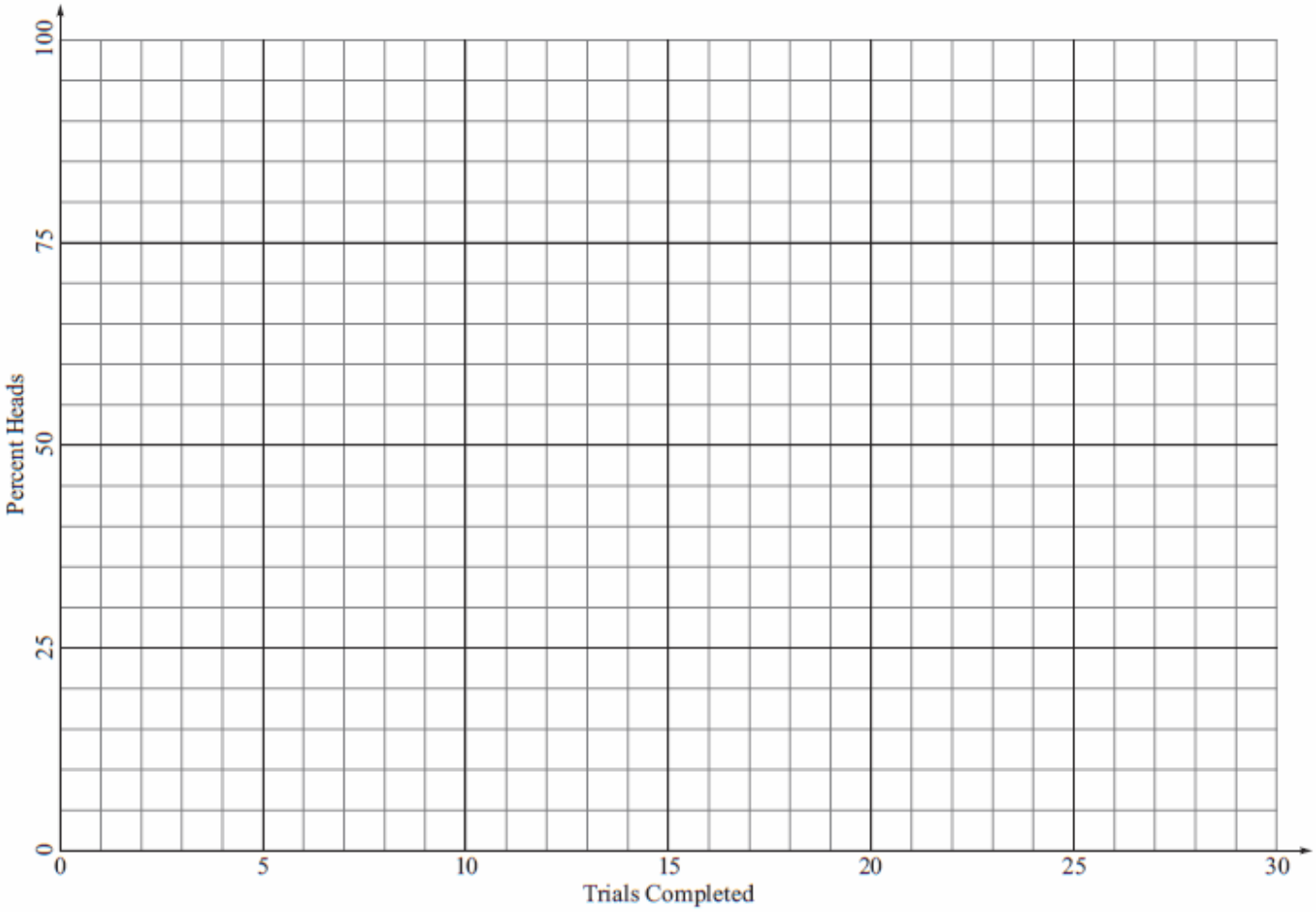
24	H or T		
25	H or T		
26	H or T		
27	H or T		
28	H or T		
29	H or T		
30	H or T		

2. Graph your results below. Draw lines between the points when you are finished.



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