Homework for MCMC & Probabilities Day

At a fairground a man advertises a gambling game that allows participants the chance to win a money prize if they pay an entrance fee. The game sequence goes like this:

- The man flips a fair coin (with an equal chance of the coin landing heads or tails up).
- If the coin lands tails up, the game ends and you walk away with nothing.
- If the coin lands heads up, he flips the coin a further two times and you receive the total number of heads across these latter two flips, H. So if the coin lands heads up twice, you receive \$2; if once, you receive \$1; if zero, you receive \$0.

Create an R function that simulates playing this game many times, and use this to estimate the expected pay-out from this game, and therefore how much you should be willing to pay to play. (*Hint*: use R's `rbinom` and `if...else` functions).

Submit two things:

1. A written description (with a visualization, if desired) of the expected pay-out, and how you calculated it, and how much you would be willing to pay.
2. Your code as a .R file. I should be able to "`source`" this code and run it on my computer (i.e., it needs to be self-contained).