Guess My Colors

Strands:

Number & Quantity	
Algebra	
Functions	
Geometry	
Statistics & Probability	X

Materials Needed:
- Two decks of playing cards
- *Guess My Colors* cards
- A notepad to keep score

Where:

Outside	
Inside	X
On-line	
On-site	

Play this game to determine how large a sample is needed to make accurate inferences about a larger population.

Set-Up:
- Remove the jokers from the first deck of cards.
- From a second deck of cards, remove the aces and kings and include these 8 cards in the first deck. The combined deck has 60 cards with 30 red and 30 black cards.
- The player with the shortest hair is the first dealer.
- Deal one set of *Guess My Colors* cards to each player.

Object of the Game: Use the information from the cards that are flipped up to guess the proportion of red and black cards within the deck.

Playing the Game:
1. The *Dealer* has the deck of playing cards. The other players are called *Players*. Directions alternate between *Dealer* and *Players* as follows:
2. *Dealer*:
   a. Begin by removing 20 cards from the deck with three possibilities:
      - Remove 20 red cards,
      - Remove 10 red cards and 10 black cards, or
      - Remove 20 black cards.
   b. Do not let *Players* see which cards you remove. Place the removed cards face down to the side. Shuffle the cards left in the deck.
   c. Flip the top 4 cards of the deck face up.
3. *Players*: Decide whether or not to make a guess about the cards the dealer has removed. If you choose to guess now, place the proper *Guess My Colors* card face down in front of you. Once you make a guess, it is final for the round.
4. *Dealer*: Flip over 4 more cards.
5. *Players*: You have another opportunity to guess (as in Step 3) or you can choose to wait for one more round of cards.
6. *Dealer*: Flip over 4 more cards for a total of 12.
7. *Players*: You must guess at this point if you have not done so already (as in Step 3).
8. *Players*: Turn your chosen *Guess My Colors* card face up to reveal your guess.
9. *Dealer*: Reveal the cards you removed (see Step 2a).
10. Points are awarded as follows:

Number of Face Up Cards at Time of Guess	Points for Correct Guess	Points for Incorrect Guess
4	3	–3
8	2	–2
12	1	–1

11. *Dealer*: Return all cards to the deck and pass it to the player on your left.

12. Repeat Steps 1 through 11 until each player has had a turn being the dealer.

Think About It:
1. How did you decide what cards you thought the dealer removed? Are there any other ways to make that decision?
2. Is it easier to guess what cards the dealer took out early on or later when more cards have been flipped over? Why do you think so?

Helpful Hints:
- If the dealer removed 20 red cards, how many red cards would you expect to show up when 4 cards are flipped over? When 8 cards are flipped over? When 12 cards are flipped over?
- What if the dealer removed 10 red and 10 black cards?