NEW DECK (%)

Performance Standard 6D.F

Create a new deck of less than 52 cards showing given percents, explain (in writing or orally) how their created deck meets the criteria and how the sum of the percents can be more than 100%.

- *Mathematical knowledge*: Demonstrate meaning of percent;
- *Strategic knowledge*: Solve problem in a systematic process;
- *Explanation*: Explain completely what was done and why it was done.

Procedures

1. ***In order to solve problems using comparisons of quantities, ratios, proportions, and percents (6D),*** students should experience sufficient learning opportunities to develop the following:
   - Demonstrate and explain the meaning of percents, including greater than 100% and less than 1.
2. Teacher gives each student a regular deck of playing cards and an instruction sheet. (The instruction sheet describes the criteria for the new deck.)
3. Tell the students each of them will be making a new deck of cards. The decks will contain less than the original 52 cards and will meet the criteria as described on the instruction sheet. The criteria are given in percents.
4. Each student should keep notes on the procedure s/he uses as s/he creates this new deck.
5. When each student has completed his/her new deck, s/he needs to sketch a picture of his/her new deck as well as describe and justify, in writing, how each group of cards was selected for the deck and how the deck as a whole fits the criteria. The student also needs to justify, in writing, the sum of the percents being more than 100%.
6. An alternative assessment might be to have the students create deck criteria for other students to solve.
7. Those students unable to write out their justifications may dictate them to the teacher.
8. A student will correctly determine that there are either 20 or 40 cards in the new deck. In scoring, the following list of cards applies to the 40-card deck. A student will correctly include:
   - The 2,3,5, and 7 of each suit. **(40% prime) 16 cards out of 40**
   - The 8 of spades and the 8 of clubs. (Helps satisfy the 60% clubs/spades.) **(5% 8s) 2 cards out of 40**
   - All four 10s. (The fives were included with prime numbers.) **(20% multiples of 5) 8 cards out of 40**
   - All four aces. **(10% aces) 4 cards out of 40**
   - The K, Q, and J of clubs and spades. (Clubs/spades criteria.) **(15% face cards) 6 cards out of 40**
   - The 4 and 6 of each suit. (2s, 10s and two 8s already included.) **(45% even #s) 18 cards out of 40**
   - All the clubs & spades from the original deck EXCEPT the 9s. **(60% clubs/spades) 24 cards out of 40**
9. If the student makes a deck of 20 cards, groupings need to be adjusted. EXAMPLE: Either black ace will be included but only one. Three black face cards will be included in any combination- K, K, J or Q, J, J or K, Q, J etc.

Examples of Student Work not available

Time Requirements

- One class period

Resources

- Deck of regular playing cards for each student
- Instruction sheet (The instruction sheet that is included is only one of many combinations that could be used. If the teacher wishes to change the percents to reflect different decks that could be made, that is easily done.)
- Mathematics Rubric

NAME _____ DATE _____

Make A New Deck

INSTRUCTIONS:

With a regular deck of playing cards (jokers removed) you need to create a new deck of cards numbering less than 52 using the following criteria:

- **40%** **prime numbers**
- **5%** **8s**
- **20%** **multiples of 5**
- **15%** **face cards**
- **10%** **aces**
- **45%** **even numbers**
- **60%** **clubs and spades**

1. After you have created your new deck use red and black colored pencils to show the numbers and symbols of the cards chosen by drawing a sketch of your new deck.
2. Justify your selection of cards in terms of the criteria in writing.
3. Also justify in writing how the sum of the percents can be more than 100%.
4. Use the space below and/or on the back to sketch your new deck and to write your justifications.