Dihybrid Cross Simulation

The following activity is designed to simulate a dihybrid cross

Materials: 2 pennies, 2 nickels, data table

Procedure:

1. The penny will represent the genes for seed color. The head of the penny will represent the dominant gene for YELLOW SEED (Y) color. The tail of the penny will represent the recessive gene for GREEN SEED (y) color.
2. The nickel will represent the genes for seed texture. The head of the nickel will represent the dominant gene for a SMOOTH SEED (S) texture. The tail of the nickel will represent the recessive gene for a WRINKLED SEED (s) texture.
3. The coins are used to represent the genes of the parent plants. Are the parents pure or hybrid for seed color and seed texture? _____
4. How many genes does each parent donate (to the offspring plant) for seed color? _____. How many genes does each parent donate (to the offspring plant) for seed texture? _____.
5. Flip all 4 coins and record the results on the data in the space labeled FLIP DATA. Suggestion use tally marks to record results.
6. Flip all 4 coins 99 more times, and record results.

Totals:

1. Add all combinations of genes that produced the following:
    a. yellow seeds and smooth seed texture (Y, S). _____
    b. yellow seeds and wrinkled seed texture (Y, ss). _____
    c. green seeds and smooth seed texture (yy, S). _____
    d. green seeds and wrinkled seed texture (yy, ss). _____

2. Write a ratio of 1a:1b:1c:1d by dividing all by the smallest of the numbers. (Round off to 1 place behind the decimal). _____

3. Record the class totals:
    a. Yellow seed, smooth seed texture _____
    b. Yellow seed, wrinkled seed texture _____
    c. Green seed, smooth seed texture _____
    d. Green seed, wrinkled seed texture _____

4. Write a ratio of 3a:3b:3c:3d by dividing all by the smallest of the numbers. (Round off to 1 place behind the decimal). _____

5. Which ratios is closest to 9:3:3:1 (the group or the class?) _____. Why?

_____
_____
_____

Name: _____

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DATA TABLE

Genotype	Phenotype	Flip data	Totals
Penny: 2 Heads (YY) Nickel: 2 Heads (SS)			
Penny: 2 Heads (YY) Nickel: 1 Head, 1 Tail (Ss)			
Penny: 1 Head, 1 Tail (Yy) Nickel: 1 Head, 1 Tail (Ss)			
Penny: 1 Head, 1 Tail (Yy) Nickel: 2 Heads (SS)			
Penny: 1 Head, 1 Tail (Yy) Nickel: 2 Tails (ss)			
Penny: 2 Heads (YY) Nickel: 2 Tails (ss)			
Penny: 2 Tails (yy) Nickel: 2 Heads (SS)			
Penny: 2 Tails (yy) Nickel: 1 Head, 1 Tail (Ss)			
Penny: 2 Tails (yy) Nickel: 2 Tails (ss)			

What are all of the possible gametes that the parents can produce?