A nice visual problem using a 12×12 square from the Sieve of Eratosthanes site…

* WITHOUT COUNTING – A QUICK ESTIMATE! What fraction of the large square is shaded red?
* What strategy did/could you use to count the number of shaded squares?
* There are \_\_\_\_\_ full columns (vertical) and \_\_\_\_\_\_ full rows (horizontal) shaded. How might we use these numbers of rows and columns to calculate the number of shaded squares?
* NOW CALCULATE! What fraction of the large square is shaded red?
* If we agree that only full columns AND full rows (at least one of each) can be shaded…can we ever get exactly one-half of the square shaded?
* How does the problem change if the square is smaller (say, 10×10) or larger (say, 15×15)?

