Activities (step by step procedure)**:**

1 Multiplication as area of rectangle	• Each student arranges 12 cubes as a rectangle. Share out the various dimensions. • Students realize the sides are the factors of 12
2. Modeling of factors of numbers 1 to 50	• Assign each team of three students a selection of numbers. They use blocks to model the possible rectangles. The solutions are recorded on graph paper, cut out and pasted onto cardboard. • The factors are labeled.
3. Looking for patterns	Students stand up if they have a rectangle with a side of 2. The teacher records the values of the rectangles identified. Students identify the pattern and create a rule to recognize a number who has a factor of 2. Repeat for 5 and 10. For sides of 3 and 9 teacher prompts students to add digits and look for pattern
4.Journal entry	Students create Venn diagram with two kinds of divisibility rules: identify ones digit or add digits
5.teacher presents problem. There is a rectangle with sides Y and X and YX=24. What could the sides of this rectangle be if I only want whole numbers	Pair share- students brainstorm factors of 24 and list the factor pairs using rules they have created or blocks as a scaffold.
6.Discussion of Commutative property	Teacher records students solutions and asks if order counts
7. Convert factor pairs into ordered pairs in T chart	Teacher models t chart with X and Y as headings defining X as a factor of 24 and Y =24/X.
8. Plot points	Students use graph paper and checks solution with teacher's graphing calculator Calculator shows I and III quadrants which leads to discussion of negative numbers
9. Plot y=x	This line is plotted on same graph paper with different colored pencil. Discuss if this line goes through any of the points they plotted for XY=24

10 Analysis of points plotted	Students color area from x-axis and y-axis to a single point. Students count colored area and realize no matter which point selected the squares equal 24
11 Students repeat the analysis using the equation YX= 16	Repeat above steps
12 Discuss the significance of (4,4)	Student realize that line X=Y now intersects one of the factor pairs coordinate
13 Discuss the shape of rectangle (4,4)	Connection is made to square number nomenclature
14 Students graph XY=36, XY= 48	Independent work