

Factors

Name(s): _____

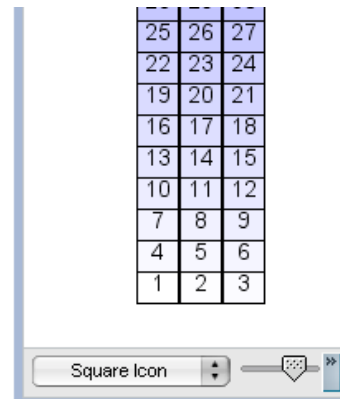
In this activity you will explore patterns related to multiplication. You'll look at properties of the numbers 1 to 100. At right are the data for the number 24. Notice that the value for *factor3* is "yes." This means that 3 is a factor of 24. You can see that 2, 3, 4, 6, 8, and 12 are all factors of 24.

Plot and Investigate

Now you'll look at the data to see what patterns you can find.

1. Open the document **Factors.tp**. You'll see a stack of data cards like the one at right.
2. You'll also see a plot of square icons stacked and ordered by *number*. Drag the right and bottom edges of the plot. You'll see the square icons move around to form stacks of different sizes.
3. Drag the edges or corner of the plot so that the stack is 3 wide, as shown here. You can also use the **Icon Size** slider to make the squares fit better.
4. Describe any patterns you notice in this stack.
5. Now select the attribute *factor3* in the data cards. The color of the plot should change. (The key above the plot tells you what the colors mean.)
6. Describe any patterns you notice in the stack now.
7. What do you think will happen if you make the stack 5 wide and select the attribute *factor5*? Write your prediction, and then try it.

Attribute	Value
number	24
factor2	yes
factor3	yes
factor4	yes
factor5	no
factor6	yes
factor7	no
factor8	yes
factor9	no
factor10	no
factor11	no
factor12	yes
factor13	no
factor14	no
factor15	no
factor16	no
factor17	no



8. In general, what will happen if you make a stack of a particular width and select the same factor as the width? Why does this happen? Include a copy of at least one plot that backs up your answer.

You probably know that division is the inverse (or opposite) of multiplication. You can use your plot to explore division too.

9. Think about the division problem $24 \div 8$. You probably already know the answer is 3. This means that there are 3 groups of 8 in 24 (or 8 groups of 3 in 24). Because you are dividing by 8, make a stack 8 wide and select *factor8*. Look for 24 in the stack.
10. What does the color of the icon for 24 tell you?

11. How high is 24 in the stack? How does this relate to $24 \div 8$?

- 12.. Think about the division problem $24 \div 8$ again. Because you are dividing 24, make the stack 24 wide but keep *factor8* selected. Look for 24.

13. How does this plot show you that $24 \div 8 = 3$?

