$f(x) = f(x-1)$

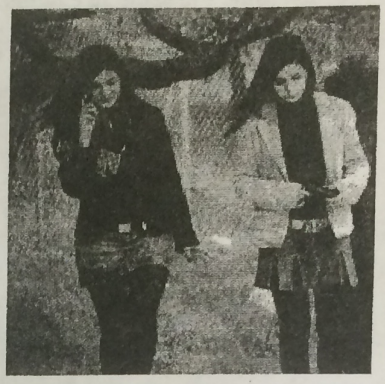
$f(n) =$

Name: Mrs. Clark
#: 1

# 1.1 Something to Talk About

*A Develop Understanding Task*

Cell phones often indicate the strength of the phone's signal with a series of bars. The logo below shows how this might look for various levels of service.





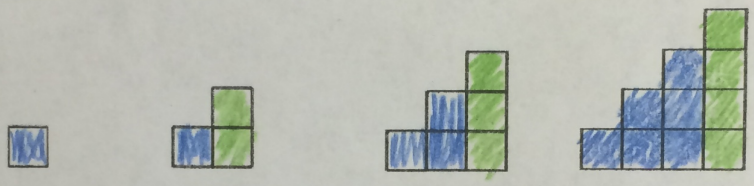
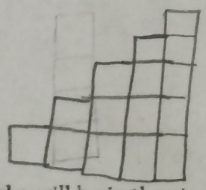


Figure 1 Figure 2 Figure 3 Figure 4

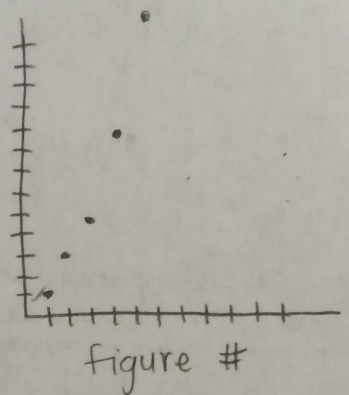
1. Assuming the pattern continues, draw the next figure in the sequence.



2. How many blocks will be in the size 10 logo?

$1+2+3+4+5+6+7+8+9+10 = 55$

| fig. # | # of blocks |
|---|---|
| 1 | 1 |
| 2 | 3 |
| 3 | 6 |
| 4 | 10 |
| 5 | 15 |
| 6 | 21 |
| 7 | 28 |
| 8 | 36 |
| 9 | 45 |
| 10 | 55 |



3. Examine the sequence of figures and find a rule or formula for the number of tiles in any figure number.

# of blocks = # of previous blocks + figure #

Recursive - formula depends on previous figure

$f(x) = f(x-1) + x$ → function notation (standardized)

- $f(x)$: # of blocks in figure x
- $f(x-1)$: figure # before; # of blocks in figure before
- $x$: fig. #

Explicit - doesn't depend on any other figure

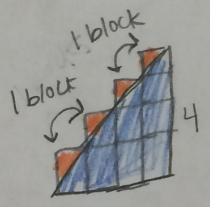
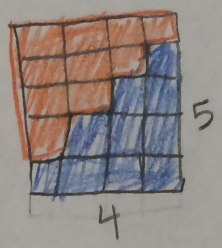


Figure 4

Area = $\frac{1}{2} \cdot 4 \cdot 4 + (1+1) = 10$

Area for any figure $f(x)$ $= \frac{1}{2} x \cdot x + \frac{1}{2} x = \frac{1}{2}x^2 + \frac{1}{2}x$




Area = $\frac{1}{2}(4)(5)$

Area for any figure $= \frac{1}{2}(x)(x+1)$



$10+9+8+7+6+5+4+3+2+1$

$10+1=11$ $f(x) = (x+1) \div 2 \cdot x = \frac{x+1}{2} \cdot x$

$11 \div 2 = 5.5$

$5.5 \cdot 10 = 55$ $f(x) = \frac{x+1}{2} \cdot x$