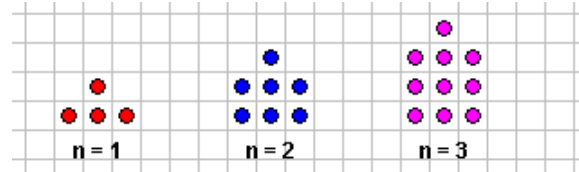1. In the dot pattern tower numbers, we discovered that there were **d=3n+1** dots in a tower with n stories (and the spire).

n = 1   n = 2   n = 3

a. Is there a tower that has exactly 100 dots? If so, how many stories does it have? If not, how do you know?

b. How many stories tall (n) would the highest tower you could make with 126 dots be?

c. How many stories tall would the highest tower you could make with A dots be?

d. How many stories tall (n) would the shortest tower be that had at least 264 dots?

e. How many stories tall (n) would the shortest tower be that had at least B dots?

2. In a pattern block train made with trapezoids, the perimeter of a train made with n blocks is **p=3n+2**.
a. Is there a trapezoid train that has a perimeter of exactly 100 units? If so, how many blocks does it take the make the train? If not, how do you know it's impossible?

b. How many pattern blocks would it take to make a train that has a perimeter of at least 234 units?

c. How many pattern blocks would it take to make a train that has a perimeter of at least P units?

d. If you are only allowed a maximum perimeter of 150 units, how many pattern blocks would it take to make the longest such train?

e. If you are only allowed a maximum perimeter of P units, how many pattern blocks would it take to make the longest such train?