

Stacking Books

My math book is exactly $3\frac{1}{2}$ cm thick. Imagine I am stacking books.

1. Complete this table

Number of Books	Centimeters of stack
1	3.5 cm
2	
3	
4	
5	

2. a_n = the measure (in centimeters) of a stack of n books. Find a general expression for a_n and explain your reasoning
3. What is the common difference in this arithmetic sequence? Explain what the common difference means in the context of this problem.
4. Is this sequence a *function*? If yes, define the domain (the set of input values) and the range (the set of output values). If not, explain why it is not a function.

5. The bookshelves in my classroom are 72cm across. How many math books can I put on each shelf? Explain your answer.

6. Let b be a new unit of measure. $1b = 3.5\text{cm}$. Use this to fill out the table:

b	cm
1	3.5 cm
2	
3.16	
4	
4.3	

7. Create a function that allows us to **convert from b to cm**.

- Name the domain and range of this function
- How does this function differ from the arithmetic sequence you found in #2?
- What is the *rate of change* or *slope* of this function? Explain.

8. Linear functions and arithmetic sequences are said to be examples of *additive change*. Based on this activity, explain what that means, and find at least one “non-example” of a function that does not have additive change.

9. Functions can be either *discrete* or *continuous*. We have used both in this activity. Identify the discrete function and the continuous function and explain how they differ.