

UNIT 3 • LINEAR AND EXPONENTIAL FUNCTIONS**Lesson 1: Graphs As Solution Sets and Function Notation****Problem-Based Task 3.1.3: The Private Library**

In 2012, Terrence was hired to organize a private library. He decided to sort the books alphabetically by title first, and then by year of publication.

First, Terrence placed a sticker with the first letter of the title on the spine of the book. Then he sorted the books by year of publication. Since Terrence already knew that the oldest book in the collection was published in 1800, this meant that none of the books were published before that year. Therefore, he decided to subtract 1800 from the year of publication, and make that the number listed on each book's sticker. Some of the books Terrence stickered include:

- *All Is Fair*, 1960: Sticker = A160
- *Newts and Squirmlers*, 2003: Sticker = N203
- *Zanzibar's Wetlands*, 1890: Sticker = Z90

Terrence's sorting processes can be written as functions. Given the function T for the title, the function Y for the year of publication, and the function S for the sticker number, determine the domain and range of the following functions:

- $T(\text{title}) = \text{First letter of title}$
- $Y(\text{year}) = \text{year of publication} - 1800$
- $S(\text{book}) = T(\text{title})Y(\text{year})$

NAME: _____

UNIT 3 • LINEAR AND EXPONENTIAL FUNCTIONS

Lesson 1: Graphs As Solution Sets and Function Notation

Problem-Based Task 3.1.3: The Private Library

Coaching

- What are the domain and range of the title sorting function, T ?
- What are the domain and range of the year sorting function, Y ?
- What are the domain and range of the sticker function, S ?
- What would be the range of the function S if the library only had the following books?
 - Georgian Love Story*, published in 1822
 - Panama and Other Canals*, published in 1904
 - The Likely Story*, published in 1965
 - Jitterbug*, published in 1920
 - Donkey's Wild Adventure*, published in 2008
 - Wormholes and Quasars*, published in 1989
 - Ben and the Art of Stagecoach Maintenance*, published in 1835