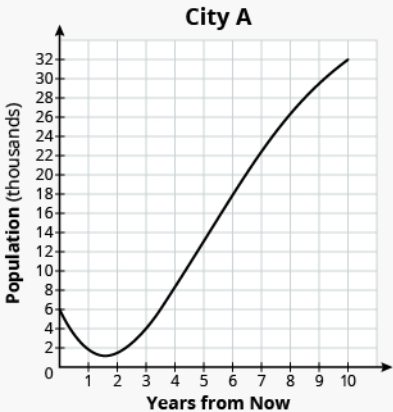# NWEA Assessment Item Illustrating 8.F.A.2

Domain: Functions
8.F.A: Define, evaluate, and compare functions.
Calculator Availability: Yes

Use the information to answer the question.

Two students set out to model the future populations of City A and City B. The first student graphs the future population of City A, in thousands, over the next 10 years. The graph of the model's function is shown.

City A

The second student guesses that City B's population is going to grow linearly and models the population in the table, as shown.

City B

Years from Now	1	3	5
Population (thousands)	11	15	19

How will the populations compare in 8 years? Select one choice from each set to complete the sentence.

Based on the models, the population of [**City A / City B**] should exceed [**City A / City B**] by approximately [1000 / 2000 / 3000 / 5000] people 8 years from now.

Alignment: 8.F.A.2: Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

In this item, a comparison of the values of the two functions is a good way to tie the content of the standard back to the definition of function. This item intentionally avoids a comparison of functions based on their rate of change because although that is reasonable for addressing the standard, it is important that other properties of functions are highlighted for comparison.
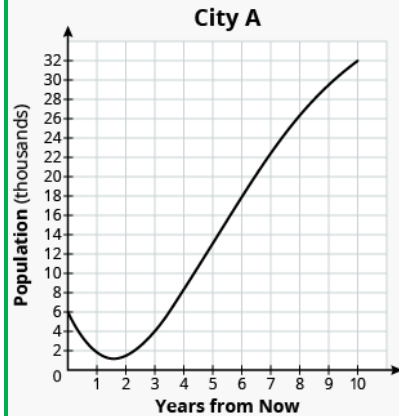
Coherence: Comparing relationships has been part of the grades 6–8 progression in algebraic thinking, starting with ratio and rate reasoning with quantities,[6.RP.A] progressing to solving problems with proportional relationships and equations,[7.RP.A, 7.EE.B] and extending to comparing proportional relationships.[8.EE.B.5] In grade 8, students further extend their knowledge to the new concept of functions and use their acquired knowledge and skills to draw comparisons between functions. This work with functions prepares students for work with analyzing functions in grade 8[8.F.B] and for future work with more complex functions in high school courses.[HSF]

Rigor: This item attends to conceptual understanding and application. Conceptually, students need to read the graph at year 8 for City A and find the value at year 8 for City B, which can be found in a variety of ways. The mathematics is not obvious from the given context and presentation of the functions. Therefore, students need to decide how to answer the question.

Answer Key:

Use the information to answer the question.

Two students set out to model the future populations of City A and City B. The first student graphs the future population of City A, in thousands, over the next 10 years. The graph of the model's function is shown.

City A

The second student guesses that City B's population is going to grow linearly and models the population in the table, as shown.

City B

Years from Now	1	3	5
Population (thousands)	11	15	19

How will the populations compare in 8 years? Select one choice from each set to complete the sentence.

Based on the models, the population of [**City A** / **City B**] should exceed [**City A** / **City B**] by approximately [**1000** / 2000 / 3000 / 5000] people 8 years from now.

All content linked to within this resource was free for use when this resource was published in August 2020. Over time, the organizations that manage that external content may move or remove it or change the permissions. If the content is no longer available, please email info@studentsachieve.net.