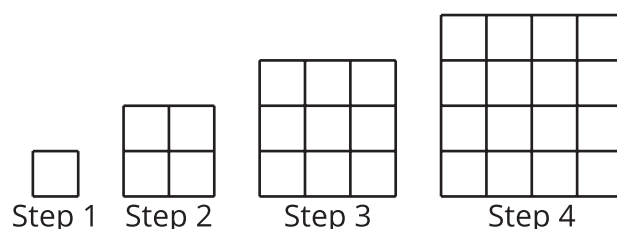


Family Support Materials

Introduction to Quadratic Functions

In this unit, students learn about quadratic functions. Earlier, they learned about linear functions that grow by repeatedly adding or subtracting the same amount and exponential functions that grow by repeatedly multiplying by the same amount.

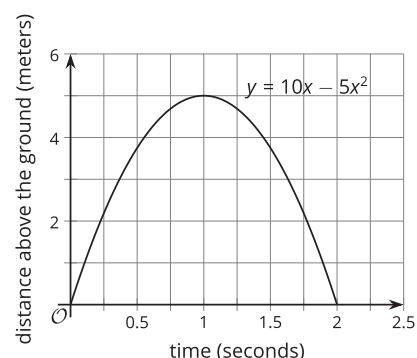
Quadratic functions also change in a predictable way. Here, the number of small squares in each step is increasing by 3, then 5, then 7, and so on. How many squares are in Step 10? How many in Step n ?



Here is a table that shows the pattern.

step number	1	2	3	4	10	n
number of small squares	1	4	9	4×4 or 16	10×10 or 100	$n \times n$ or n^2

In this unit, students will also learn about some real-world situations that can be modeled by quadratic functions. For example, when you toss a ball up in the air, its distance above the ground as time passes can be modeled by a quadratic function. Study the graph. The ball starts on the ground because the height is 0 when time is 0. The ball lands back on the ground after 2 seconds. After 1 second, the ball is 5 meters in the air.

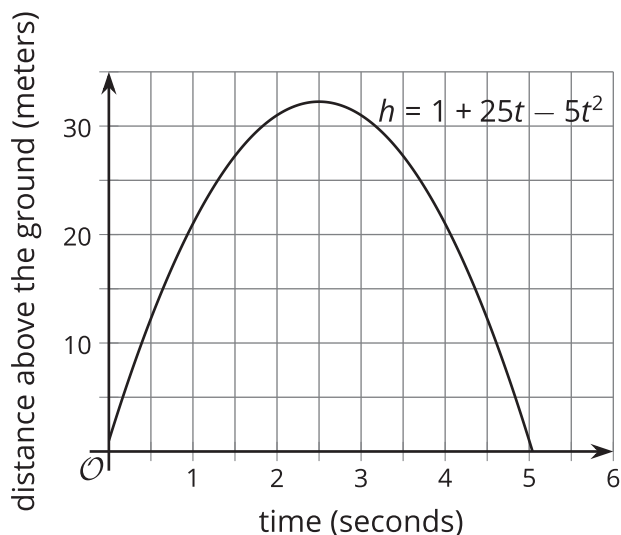


Both of the following expressions give the ball's distance above the ground: $5x(2 - x)$ and $10x - 5x^2$, where x represents the number of seconds since it was thrown. Quadratic expressions are most recognizable when you can see the "squared term," $-5x^2$, as shown in $10x - 5x^2$.

Your student will learn even more about quadratics in the next unit.

Here is a task to try with your student:

The equation $h = 1 + 25t - 5t^2$ models the height in meters of a model rocket t seconds after it is launched in the air. Here is a graph representing the equation.



1. What was the height of the rocket above the ground at the time it was launched?
2. How high did it go up in the air?
3. When did the rocket land back on the ground?

Solution:

1. 1 meter
2. about 32 meters
3. a little more than 5 seconds after launch

Video Lesson Summaries

Here are the video lesson summaries for Algebra 1, Unit 6: Introduction to Quadratic Functions. Each video highlights key concepts and vocabulary that students learn across one or more lessons in the unit. The content of these video lesson summaries is based on the written Lesson Summaries found at the end of lessons in the curriculum. The goal of these videos is to support students in reviewing and checking their understanding of important concepts and vocabulary. Here are some possible ways families can use these videos:

- Keep informed on concepts and vocabulary students are learning about in class.
- Watch with their student and pause at key points to predict what comes next or think up other examples of vocabulary terms (the bolded words).
- Consider following the Connecting to Other Units links to review the math concepts that led up to this unit or to preview where the concepts in this unit lead to in future units.

Algebra 1, Unit 6: Introduction to Quadratic Functions	Vimeo	YouTube
Video 1: Introducing Quadratic Functions (Lessons 2–4)	Link	Link
Video 2: Building Quadratic Functions (5–7)	Link	Link
Video 3: Working With Quadratic Expressions (Lessons 8–9)	Link	Link
Video 4: Graphing Quadratic Equations (Lessons 10–11)	Link	Link
Video 5: Graphing Standard Form (Lessons 12, 14)	Link	Link
Video 6: Vertex Form (Lessons 15-17)	Link	Link

Video 1

Video 'VLS Alg1U6V1 Introducing Quadratic Functions (Lessons 2–4)' available here:
<https://player.vimeo.com/video/505710306>.

Video 2

Video 'VLS Alg1U6V2 Building Quadratic Functions (5–7)' available here:
<https://player.vimeo.com/video/513428116>.

Video 3

Video 'VLS Alg1U6V3 Working With Quadratic Expressions (Lessons 8–9)' available here:
<https://player.vimeo.com/video/509050677>.

Video 4

Video 'VLS Alg1U6V4 Graphing Quadratic Equations (Lessons 10-11)' available here:
<https://player.vimeo.com/video/513430731>.

Video 5

Video 'VLS Alg1U6V5 Graphing Standard Form (Lessons 12, 14)' available here:
<https://player.vimeo.com/video/516771964>.

Video 6

Video 'VLS Alg1U6V6 Vertex Form (Lessons 15-17)' available here:
<https://player.vimeo.com/video/516774619>.