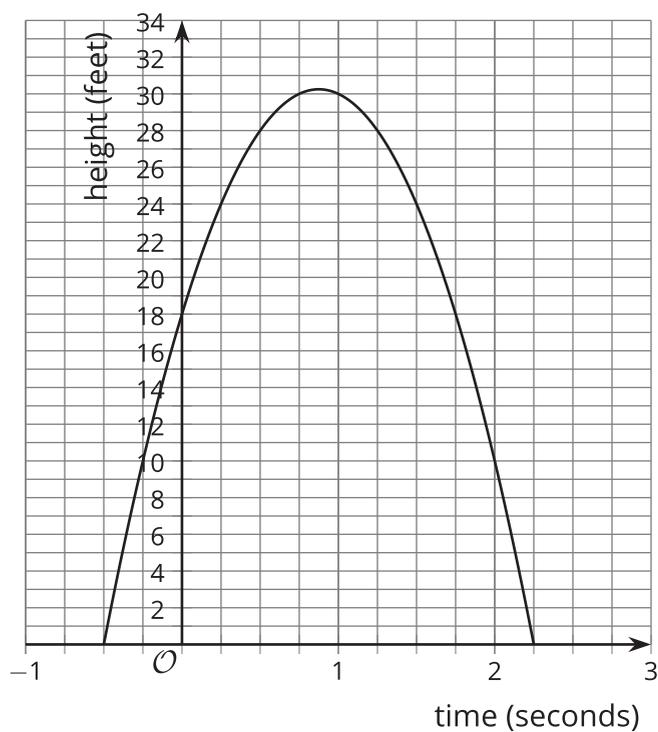


Unit 6 Lesson 14: Interpreting Representations

1 Notice and Wonder: The Arrow (Warm up)

Student Task Statement

An archer shoots an arrow. The arrow's height above level ground, in feet, is modeled by the equation $h(t) = (1 + 2t)(18 - 8t)$, and also represented by this graph and table. The time t is measured in seconds.



t	0	0.5	2	2.25
$h(t)$	18	28	10	0

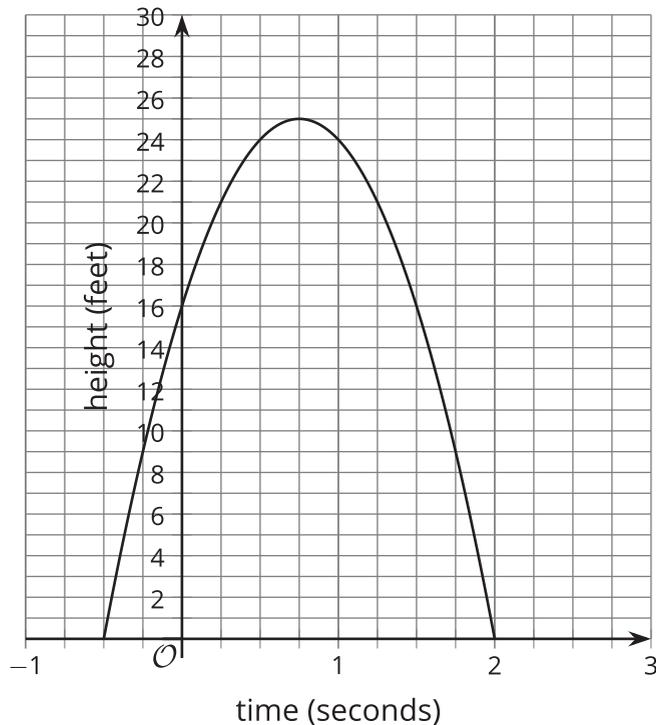
What do you notice? What do you wonder?

2 Three Objects

Student Task Statement

Some different objects are launched into the air. The height of each object is modeled as a function of time in seconds.

- The height, in feet, of the first object is modeled by the function d and represented by the graph.



- The height, in feet, of the second object is modeled by the function f and represented by the table.

t	0	0.25	1	1.75
$f(t)$	14	18	18	0

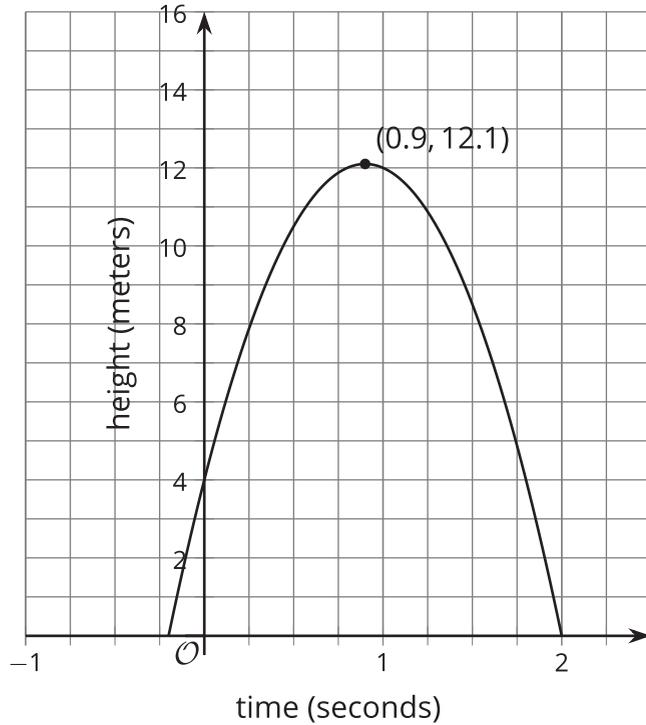
- The height, in feet, of the third object is given by the equation $g(t) = (16t + 4)(2.5 - t)$.

- For each object, from what height was it launched?
- For each object, how long was it in flight before it hit the ground?
- For each object, what was its maximum height and when did it reach its maximum height? If needed, give your best estimate.

3 Comparing Two Situations with Different Representations

Student Task Statement

Two objects are thrown into the air. The height of object M in meters is modeled by the function $m(x) = (5 + 10x)(1.5 - x)$ with x representing time in seconds. The height of object P in meters is modeled by the function p , represented by the graph.



1. For each object, determine:
 - a. the time at which the object hit the ground
 - b. the height from which the object was thrown
 - c. the maximum height of the object
 - d. the time at which the object reached its maximum height
2. Which object was launched from a greater height? Explain your reasoning.
3. Which object hit the ground first? Explain your reasoning.
4. Which object reached a greater maximum height? Explain your reasoning.