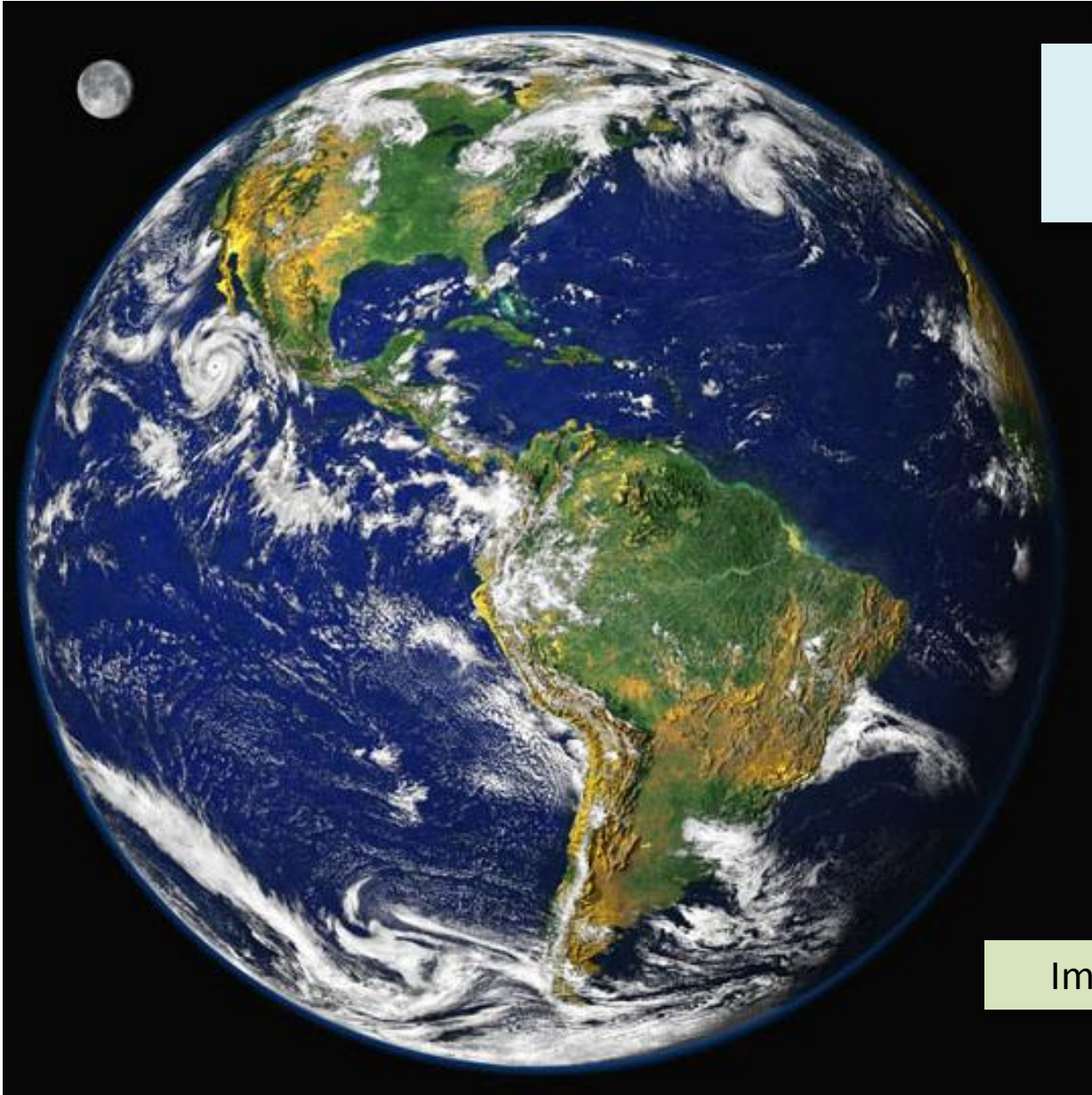# Sea Level Rise

Unit 5
Investigation 2

Algebra I
Model
Curriculum

Image Source: NASA

Sea Level Rise

The table shows the annually averaged sea level change since 1888.

Many people believe that this increase is due to global warming.

Let x be the number of years since 1900.

Year (Since 1900) x	Sea Level Change (cm) y
0	1.5
10	1
20	3
30	4.5
40	7
50	9
60	11.5
70	12.5
80	13.5
90	14
100	17.5

Sea Level Rise

Year (Since 1900) x	Sea Level Change (cm) y
0	1.5
10	1
20	3
30	4.5
40	7
50	9
60	11.5
70	12.5
80	13.5
90	14
100	17.5

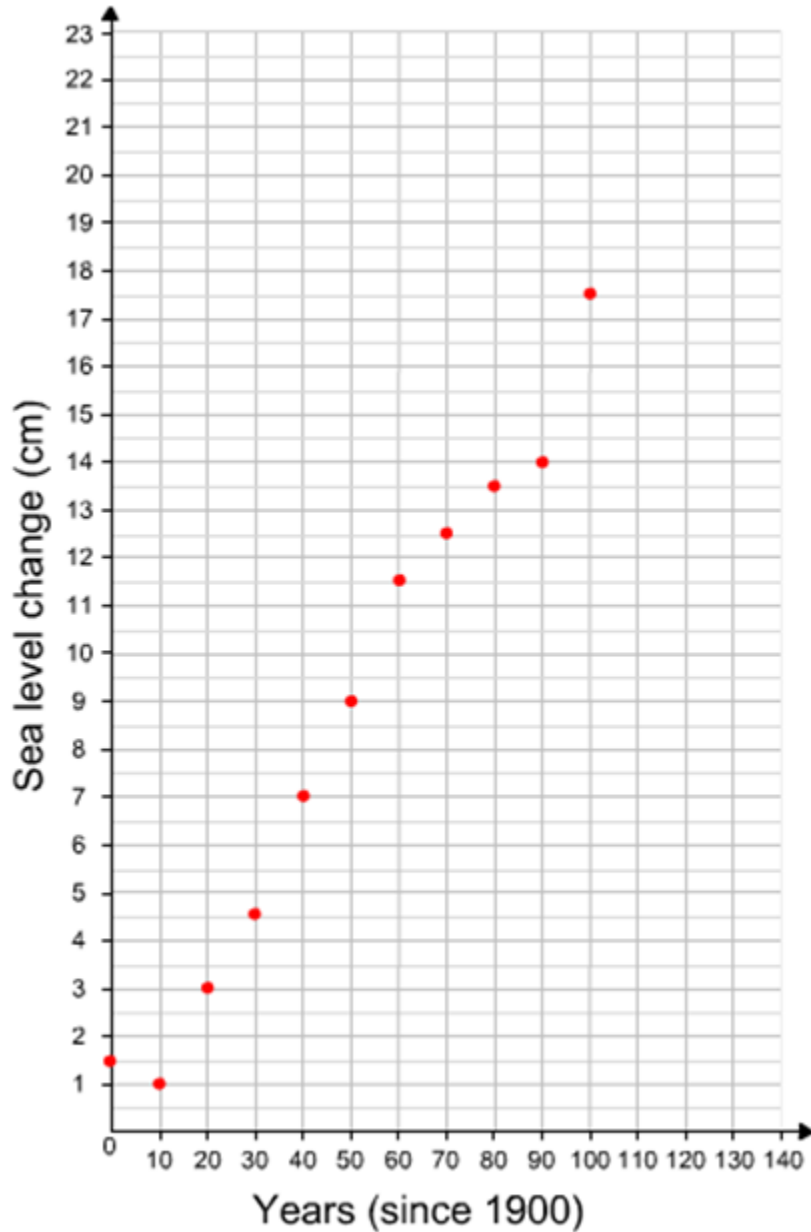If this trend continues, predict the amount that the sea level will change by 2010 and 2020.

Hubbard Glacier, Alaska June 2005

Sea Level Rise

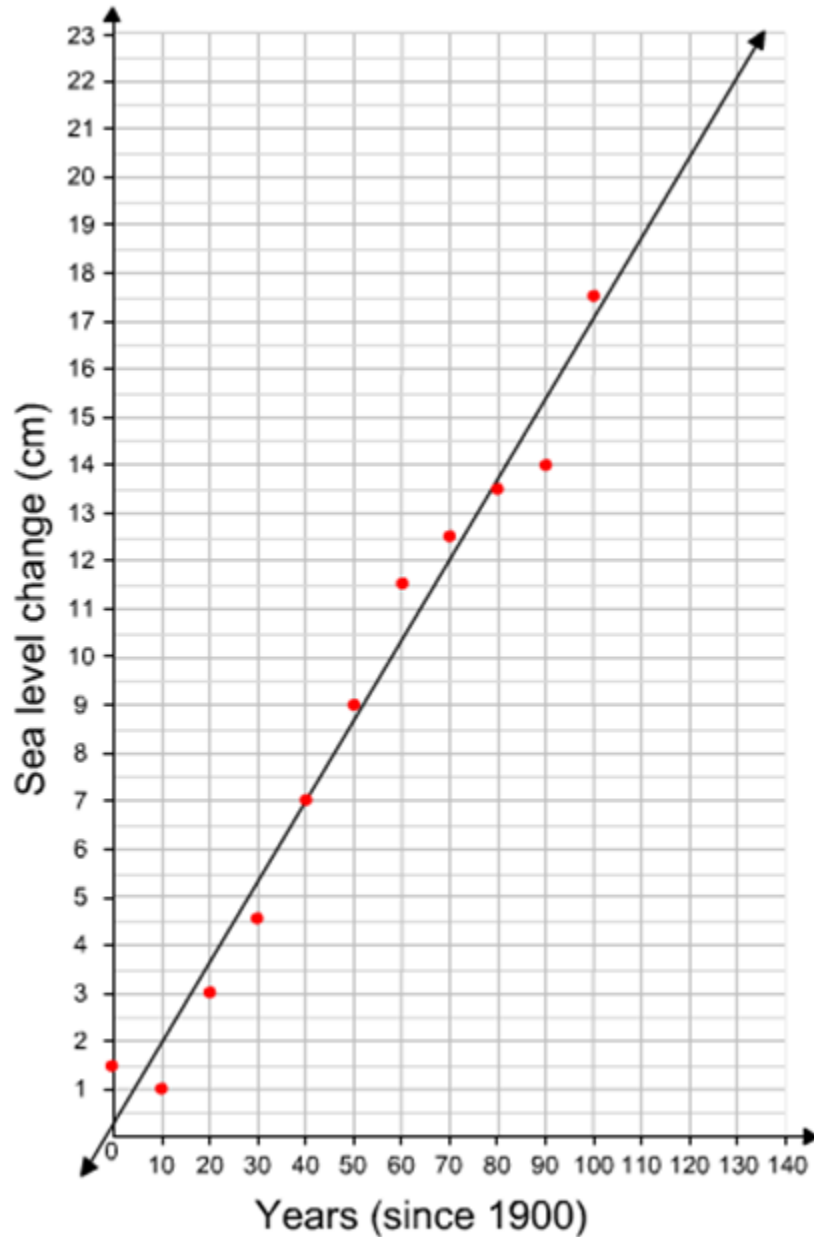| Year (Since 1900) x	Sea Level Change (cm) y
0	1.5
10	1
20	3
30	4.5
40	7
50	9
60	11.5
70	12.5
80	13.5
90	14
100	17.5

One approach to making our prediction is to graph the data in the table to determine if there is a trend.

Sea Level Rise
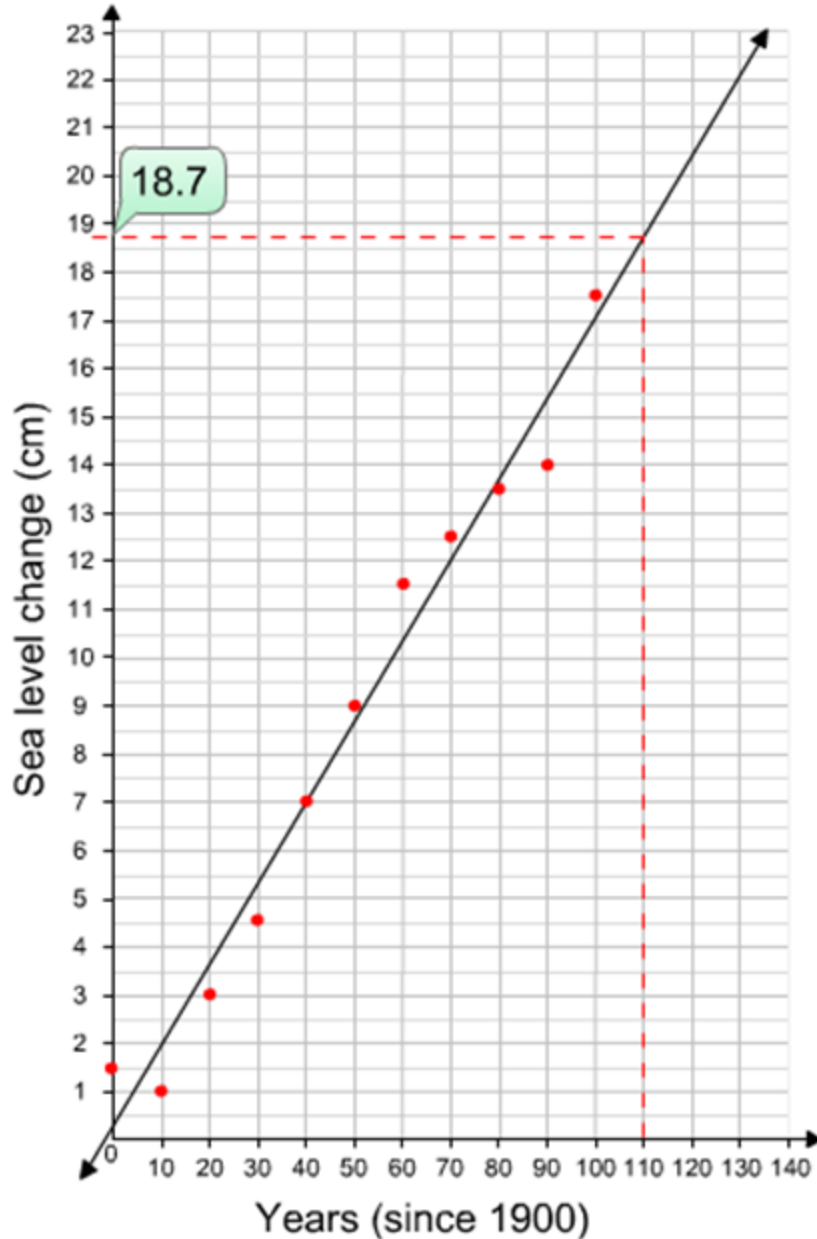

How can we effectively use this scatter plot to make our predictions?

Sea Level Rise

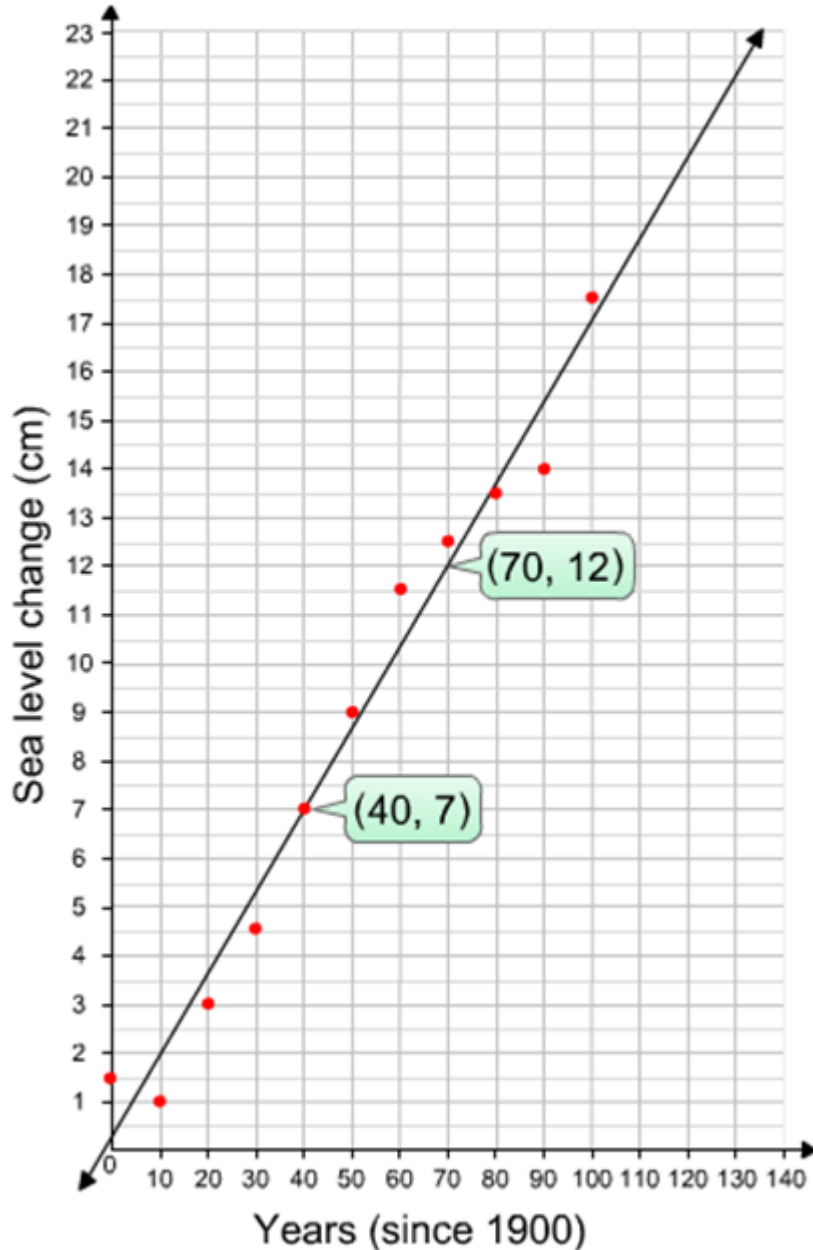How do we use the trend line to help us make our predictions?

Sea Level Rise

What will the sea level change be in the year 2010?

We can use the trend line to answer this question.

Sea Level Rise

Find the equation of the trend line.

(a) Find the slope:

$$m = \frac{12 - 7}{70 - 40} = \frac{5}{30} = \frac{1}{6}$$

The equation can be written as:

$$y = \frac{1}{6}x + b$$

(b) Find the y-intercept, b. Let's use the coordinates $(40, 7)$.

$$(7) = \frac{1}{6}(40) + b$$

$$7 = \frac{20}{3} + b$$

$$b = 7 - \frac{20}{3} = \frac{21}{3} - \frac{20}{3} = \frac{1}{3}$$

So, the equation of the trend line is:

$$y = \frac{1}{6}x + \frac{1}{3}.$$

Sea Level Rise

We can use the equation of the trend line to make predictions.

The year 2010 corresponds to x = 110.

The year 2020 corresponds to x = 120.

$$y(110) = \frac{1}{6}(110) + \frac{1}{3}$$

$$y(110) = \frac{110}{6} + \frac{1}{3}$$

$$y(110) = \frac{110}{6} + \frac{2}{6}$$

$$y(110) = \frac{112}{6}$$

$$y(110) = 18.\overline{6} \; cm$$
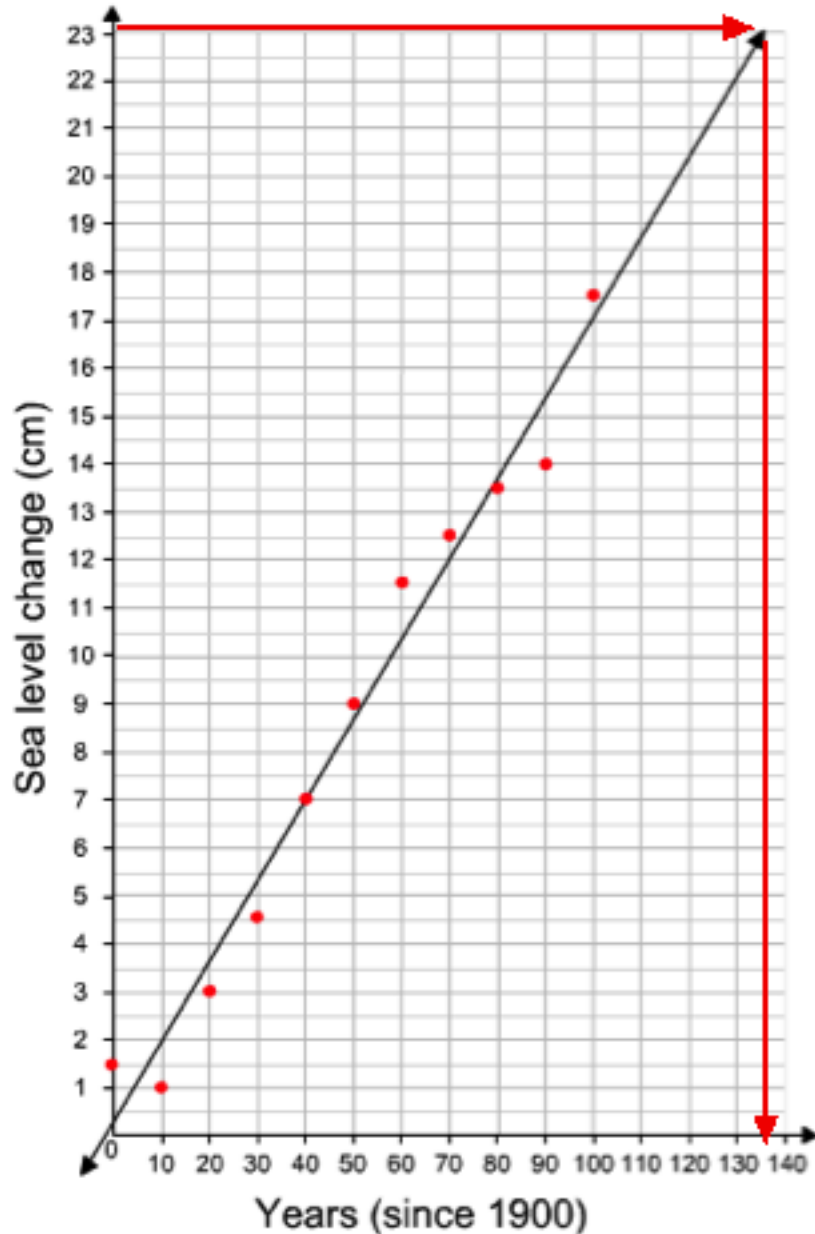
$$y(120) = \frac{1}{6}(120) + \frac{1}{3}$$

$$y(120) = \frac{120}{6} + \frac{1}{3}$$

$$y(120) = \frac{120}{6} + \frac{2}{6}$$

$$y(120) = \frac{122}{6}$$

$$y(120) = 20.\overline{3} \; cm$$

Sea Level Rise

Use the graph to predict by which year the sea level will have risen 23 cm since 1888.

If this trend continues, by 2036, the sea level will have risen 23 cm since 1888.