

Extended Problems Answer Key

Big Ideas: Extended Problems

Use or adapt the feedback in this Answer Key as you grade each student paper. Answers will vary. Therefore, you must examine each answer based upon its own merits. Representative examples are shown here.

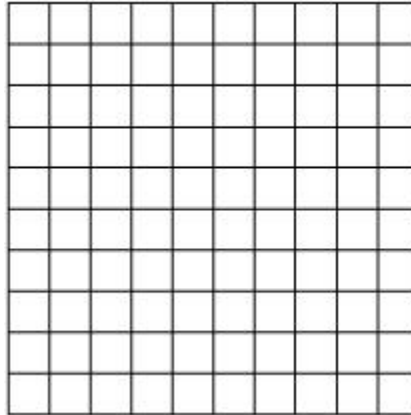
Total Score: 25 points

Kiki and Natalie are studying climates of different locations in the world.

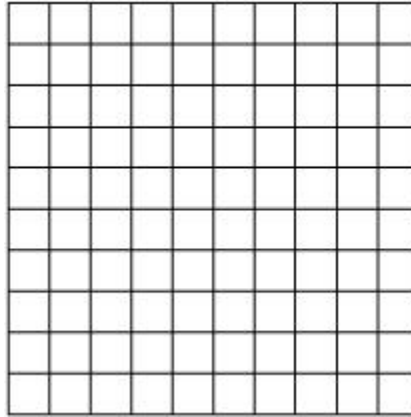
1. The girls research some of the driest locations in the world. They list their findings in this table.

Location	Average Annual Precipitation (inches)
Iquique, Chile	0.2
Ica, Peru	0.09
Aolef, Algeria	0.48
Pelican Point, Namibia	0.32
Africa, Chile	0.03

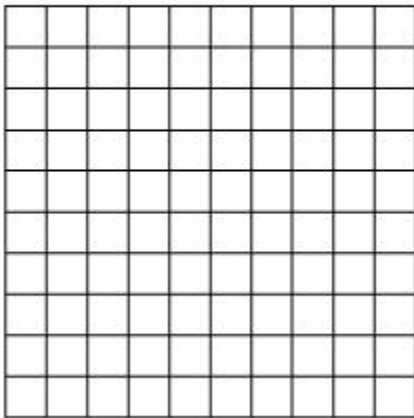
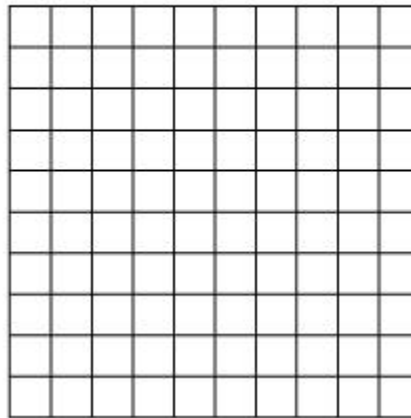
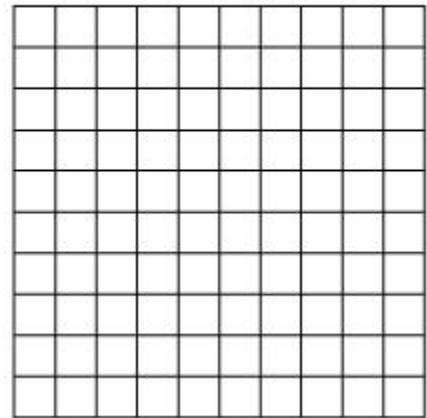
- (a) Shade this model to represent the average annual precipitation in Pelican Point, Namibia. Explain why you shaded the model in this manner.



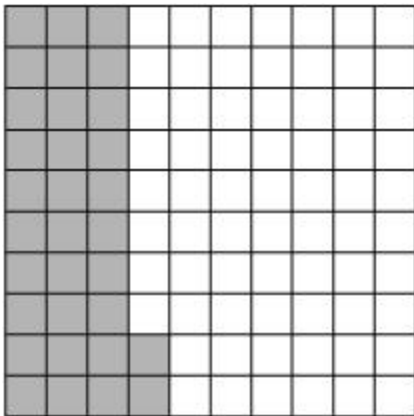
- (b) Write a fraction in simplest form to represent the number of inches of precipitation that Pelican Point receives each year. Show your work.
- (c) Shade this model to represent the average annual precipitation in Iquique, Chile. Explain why you shaded the model in this manner.



- (d) Write a fraction in simplest form to represent the number of inches of precipitation that Inquique receives each year.
- (e) Use the models in parts (a) and (c) to compare the average annual rainfall in Pelican Point and Iquique. Explain.
- (f) Complete these models to represent the average annual rainfall amounts in Ica, Aolef, and Arica.

ICA**Aolef****Arica**

- (g) Refer to the models in parts (a), (c), and (f) to write the average rainfall amounts from least to greatest.

Sample response for Part (a)

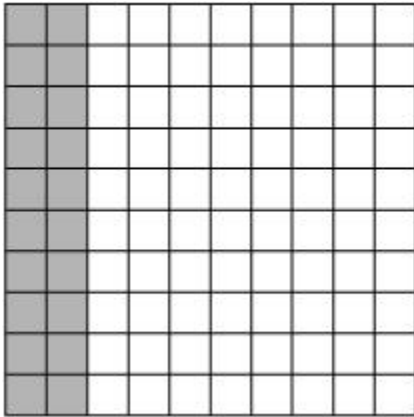
The decimal 0.32 means 32 out of 100. There are 100 squares in the model, so I shaded 32 out of 100 squares.

Note: Students may shade any 32 squares in the grid.

Sample response for Part (b)

$$\frac{32}{100} = \frac{8}{25}$$

Sample response for Part (c)



The decimal 0.2 means 2 out of 10. There are 10 columns in the model, so I shaded 2 out of 10 columns.

Note: Students may shade any 2 columns or any 20 squares in the grid. Students may also explain that 0.2 is equivalent to 0.20, which means 20 out of 100. Therefore, they shaded 20 squares.

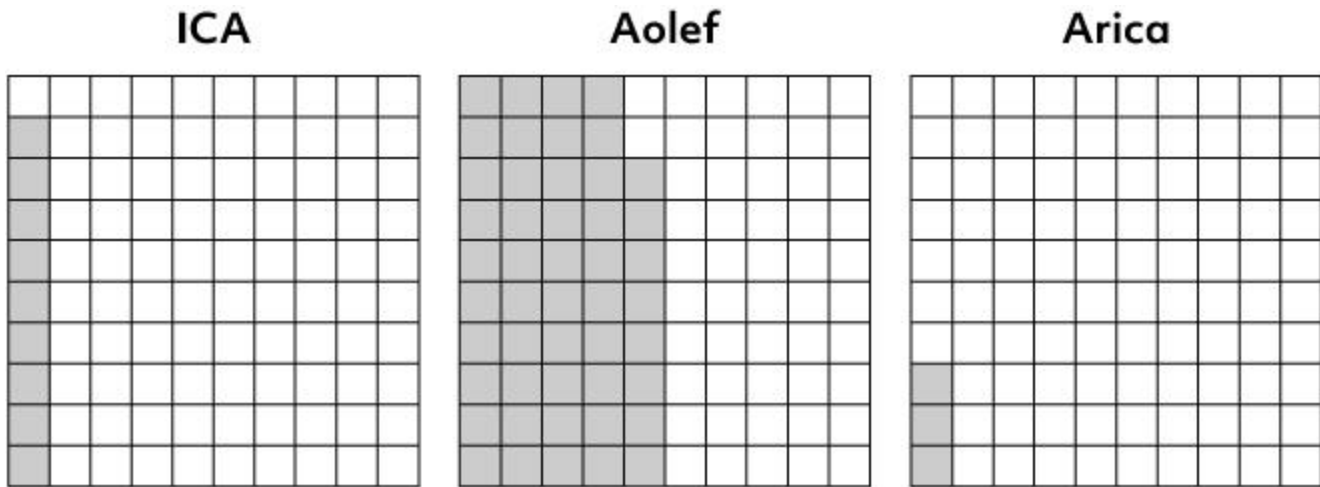
Sample response for Part (d)

$$\frac{2}{10} = \frac{1}{5}$$

Note: Students may also simplify the fraction $\frac{20}{100}$.

Sample response for Part (e)

The area of the shaded region in the model of the average rainfall in Pelican Point is greater than the area of the shaded region in the model of the average rainfall in Iniquique. $0.32 > 0.2$. On average, Pelican Point receives more rainfall annually than Iniquique.

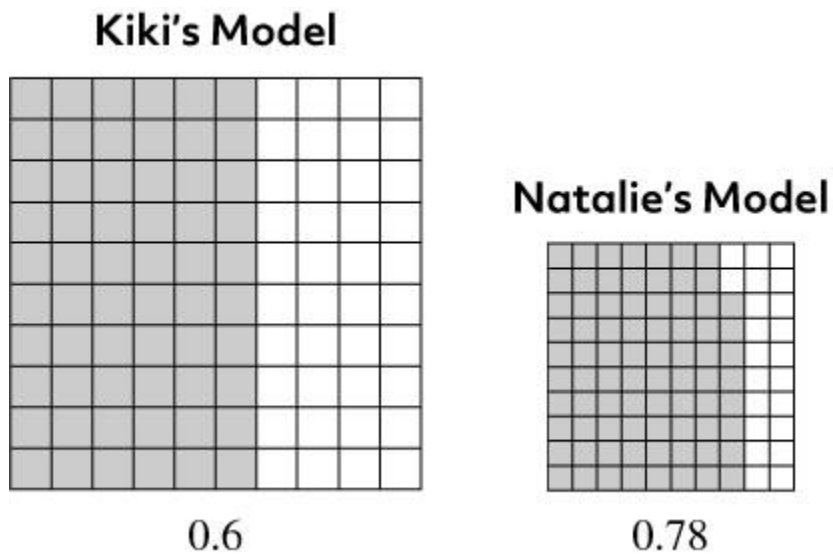
Sample response for Part (f)

Note: Students may shade any 9 squares in the model for Ica, any 48 squares in the model for Aolef, and any 3 squares in the model for Arica.

Sample response for Part (g)

From least to greatest: 0.03 in. (Arica), 0.09 in. (Ica), 0.2 in. (Inquique), 0.32 in. (Pelican Point), 0.48 in. (Aolef)

2. Kiki and Natalie do some more research and find that the southern portion of the Rub al-Khali Desert in Saudi Arabia gets an average of 0.6 inches of rainfall per year, and the Gobi Desert of China and Mongolia gets an average of 0.78 inches. Kiki draws a model to represent the annual rainfall in the Rub al-Khali Desert. Natalie draws a model to represent the annual rainfall in the Gobi Desert. Their models are shown here.



The girls compared the models and concluded that $0.6 > 0.78$ because the area of the shaded region in the model of 0.6 is greater than the area of the shaded region in the model of 0.78. Are they correct? Explain.

Sample response for Problem 2

The girls are not correct. Kiki's model and Natalie's model are not the same size, so the decimals cannot be compared. Decimals can only be compared when they refer to the same whole. If Natalie's model was the same

size as Kiki's model, then the area of the shaded region in the model of 0.78 would be greater than the area of the shaded region in the model of 0.6. Therefore, $0.6 < 0.78$.

3. While doing their research, they find other annual rainfall amounts. These amounts are recorded in this table. Complete the table to show equivalent measurements in meters and centimeters.

Annual Rainfall Amounts

Meters	Centimeters
	100
4	
7	

Sample response for Problem 3

Annual Rainfall Amounts

Meters	Centimeters
1	100
4	400
7	700

4. They also find annual snowfall amounts. These amounts are recorded in this table. Complete the table to show equivalent measurements in feet and inches.

Annual Snowfall Amounts

Feet	Inches
3	
5	
8	

Sample response for Problem 4**Annual Snowfall Amounts**

Feet	Inches
3	36
5	60
8	96

5. Natalie and Kiki discovered a couple of interesting weather events that took place.
- (a) The greatest annual rainfall ever recorded in the United States occurred in 1982 on the island of Maui, Hawaii. That year, about 58 feet of rain were recorded. Find the number of inches of rain that fell there that year. Show your work.
 - (b) The heaviest hailstone ever recorded fell in Bangladesh on April 14, 1986. The hailstone weighed about 2 pounds. Find the hailstone's weight in ounces. Show your work.
 - (c) The greatest amount of snow to fall from a single storm in the United States occurred in 1959 on Mount Shasta in northern California. During this storm, about 5 meters of snow fell. Find the number of centimeters that fell. Show your work.

Sample response for Part (a)

$$58 \times 12 = 696$$

About 696 inches of rain fell.

Sample response for Part (b)

$$2 \times 16 = 32$$

The hailstone weighed about 32 ounces.

Sample response for Part (c)

$$5 \times 100 = 500$$

About 500 centimeters of snow fell.