Pattern A

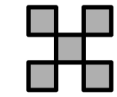

Figure 1

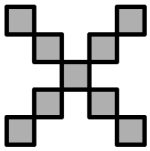

Figure 2

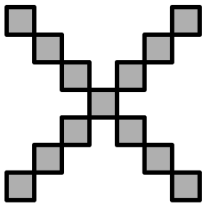

Figure 3

Figure	Number of Tiles
1	5
2	9
3	13
4	

Pattern B

Figure 1

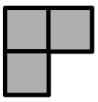

Figure 2

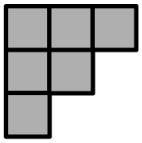

Figure 3

Figure	Number of Tiles
1	1
2	3
3	6
4	

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Unit A1.1, Lesson 2: Supplement Name _____

Pattern C

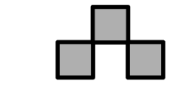
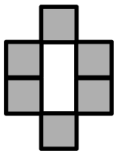


Figure 1



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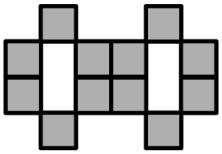

Figure 3

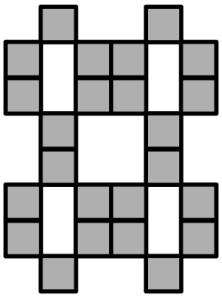

Figure 4

Figure	Number of Tiles
1	3
2	6
3	12
4	24

Make Your Own

Figure	Number of Tiles
1	4
2	7
3	10

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Science Mom Lesson 2

Unit A1.1, Lesson 3: Supplement Name _____

Screens 1–5

Figure 1

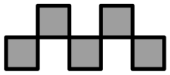

Figure 2

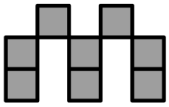

Figure 3

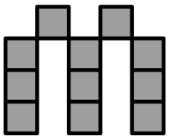

Figure	Number of Tiles
1	5
2	8
3	

Screens 6–8

Figure 1

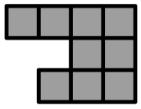

Figure 2

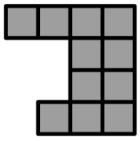

Figure 3

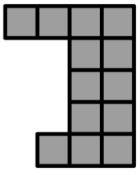

Figure	Number of Tiles
1	9
2	11
3	13

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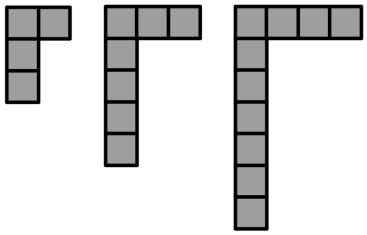
Unit A1.1, Lesson 3: Supplement Name _____

Screen 9

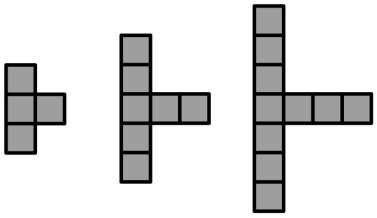
A

Figure 1 Figure 2 Figure 3



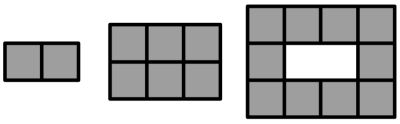
B

Figure 1 Figure 2 Figure 3



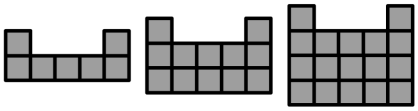
C

Figure 1 Figure 2 Figure 3



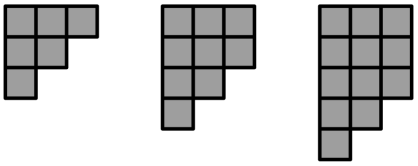
D

Figure 1 Figure 2 Figure 3



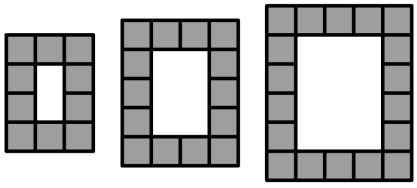
E

Figure 1 Figure 2 Figure 3



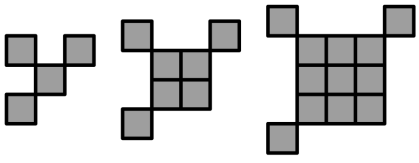
F

Figure 1 Figure 2 Figure 3



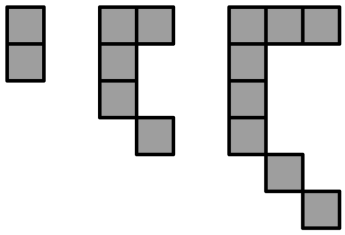
G

Figure 1 Figure 2 Figure 3



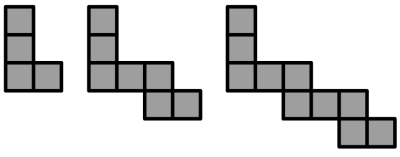
H

Figure 1 Figure 2 Figure 3



I

Figure 1 Figure 2 Figure 3



Temperature

The average global temperature has always varied from year to year. In the past half century, the average temperature has risen. An increase of a couple degrees may seem small, but such differences have huge impacts on the climate, natural systems, and sea levels.

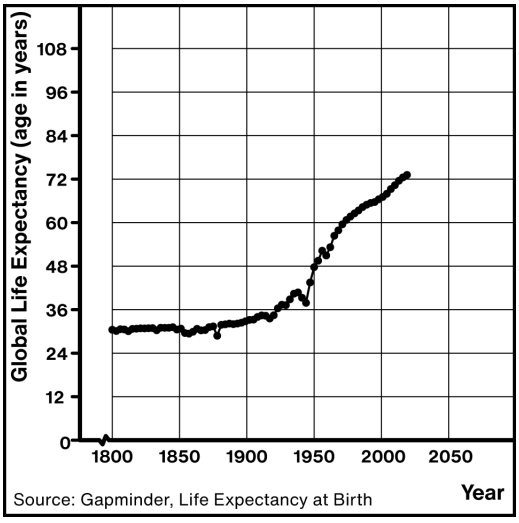
In recent years, countries have set goals to limit the rise of the global temperature. As of 2015, the goal is to limit the rise to "well below 2 °C" relative to the temperature before 1900.

Life Expectancy

Life expectancy is a measure of health that tells us the average age of death in a population. Before the 1800s, life expectancy was about 30 years everywhere in the world.

Advances in medicine, nutrition, and sanitation have helped increase life expectancy, although not equally. As of 2022, Japan has the highest life expectancy, about 85 years. In many countries, life expectancy is between 50 and 60 years.

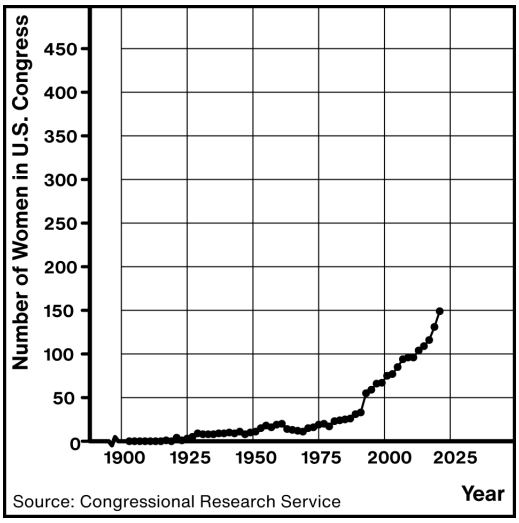
The life expectancy in the U.S. is about 78 years, but this varies widely within the country. Many factors, including pollution and access to medical care, mean that U.S. life expectancy ranges from 57 to 97 depending on zip code.



Women in Congress

For much of U.S. history, only men could vote. Congress consisted entirely of men, too, until Jeanette Rankin was elected to Congress in 1917. In 1920, the U.S. added the 19th amendment to the Constitution, which granted White women in all states the right to vote. The 1920s saw 11 more women in Congress.

New laws over the next several decades continued extending the right to vote to more and more women. The Voting Rights Act of 1965 in particular removed many barriers to voting, including discrimination on the basis of race. As of 2022, women make up 27% of the 535 members of Congress.



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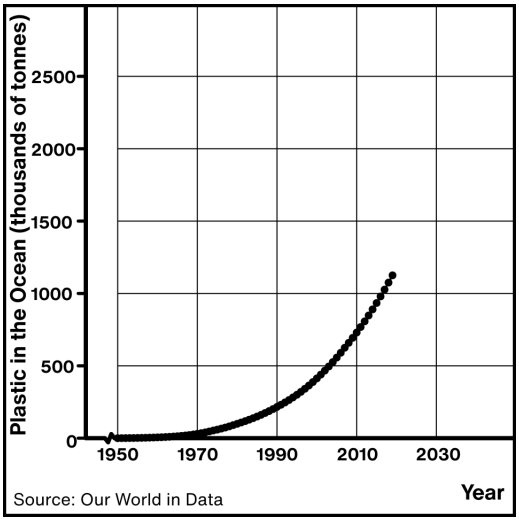
Unit A1.1, Lesson 11: Supplement

Ocean Plastic

Global plastic production grew rapidly beginning in the 1950s. Over the next 65 years, annual production of plastics increased from 2 million tonnes in 1950 to 381 million tonnes in 2015.

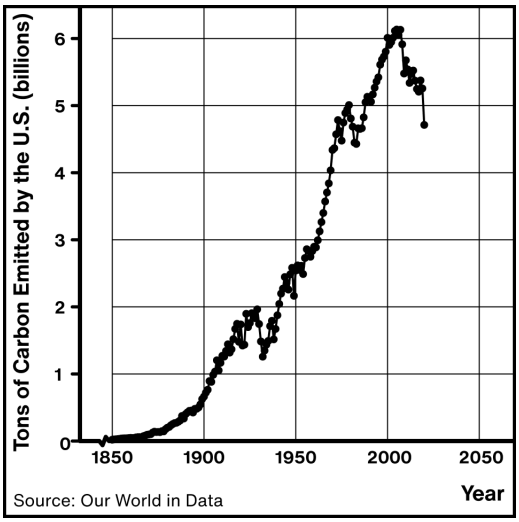
The world has struggled to figure out what to do with used plastic, such as single-use water bottles. Most plastics end up in landfills or get incinerated. Some plastic is mismanaged and ends up in rivers, which spill out into oceans. Once plastic is in the ocean, it breaks down into smaller particles, which can be hard to remove.



Carbon Emissions

This data shows the amount of carbon dioxide emitted by the U.S. each year since 1850. Every country, including the U.S., has seen an increase in carbon emissions during this time. This is due to a growing population, as well as a rise in other carbon-emitting activities.

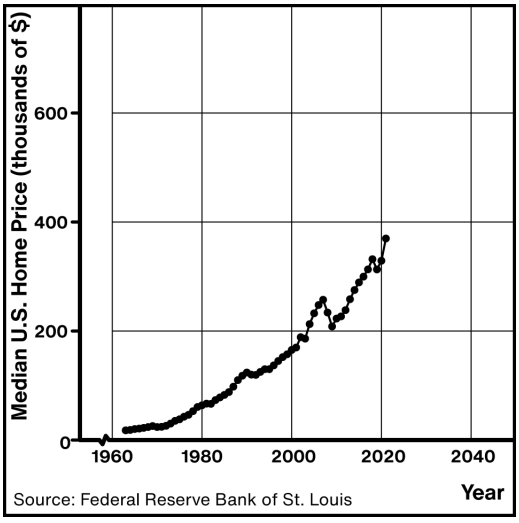
Countries across the world are seeking to reduce their carbon emissions. U.S. carbon emissions peaked around 2007 and have been trending downward ever since. Along with other countries, the U.S. has a goal of getting to 0 carbon emissions by 2050.



House Prices

The graph shows the median sale price of a home in the U.S. each year since 1962. Many factors explain the general rise in price.

First, *most things* get more expensive over time. Housing has gotten especially expensive, though. Partly, that is because many cities have not built enough houses to keep up with the increase in population (there are many reasons for this, including zoning laws and expensive materials). When housing is scarce, people are willing to pay more for homes and so the price goes up.



Learn more about these topics and others at OurWorldInData.org.

desmos Science Mom Lesson 13

Unit A1.2, Linear Equations and Inequalities: Notes Name _

Lessons 8–9: Linear Relationships in Equations, Tables, and Graphs

Summary

Equations, tables, and graphs are different ways to model a situation.

Situation: A lemonade stand sells lemonade for $3 per cup and cookies for $2 each. They made $12. Let be the number of cups of lemonade sold and be the number of cookies sold.

Show the steps to solve $3 + 2 = 12$ for .

Equation in Standard Form

$3 + 2 = 12$

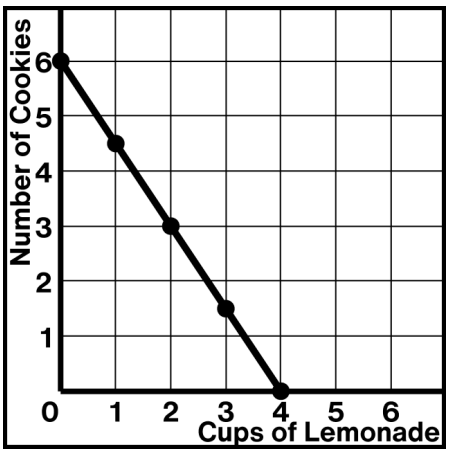
Equation Solved for

$= 6 - \frac{3}{2}$

Table

	0	2	4
	6	3	0

Graph



Explain how each form of the equation is connected to the situation, table, or graph.

The equation $3 + 2 = 12$ is connected to the _ _ _ _ _ _ _ _ because _ _ _ _ _ _ _ _

The equation $= 6 - \frac{3}{2}$ is connected to the _ _ _ _ _ _ _ _ _ because _ _ _ _ _ _ _ _ b

---

Things I Want to Remember

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Unit A1.2, Linear Equations and Inequalities: Notes Name _____

Lessons 8–9: Rewriting Two-Variable Equations

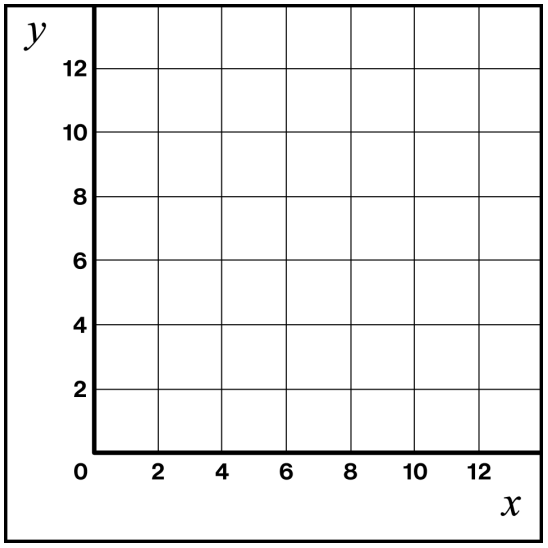
Try This!

Here is an equation in standard form: $4 + 2 = 24$.

1. Solve $4 + 2 = 24$ for .

2. Graph the equation $4 + 2 = 24$.

   Make a table if it helps with your thinking.



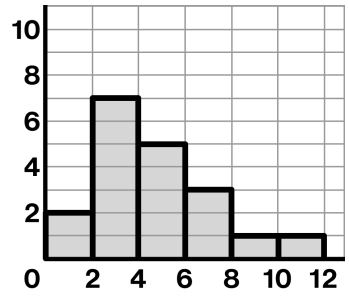
3. Write a situation that $4 + 2 = 24$ could represent.

   Write what and represent in your situation.

- ☐ I understand that the graph of a linear equation represents all the solutions to the equation.
- ☐ I can solve an equation for one of its variables and connect my new equation to its graph.
- ☐ I can make connections between equations, tables, descriptions, and graphs.
- ☐ I can write two linear equations to represent the same situation.

Unit A1.3, Lesson 4: Activity 3 Cards

A



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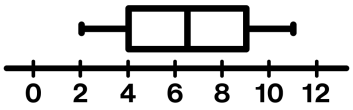

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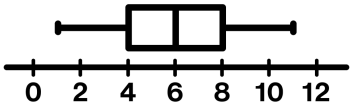

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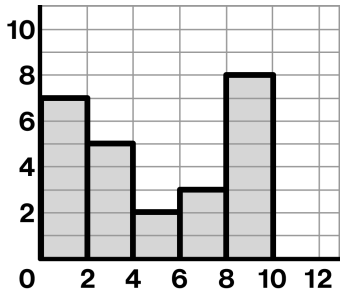

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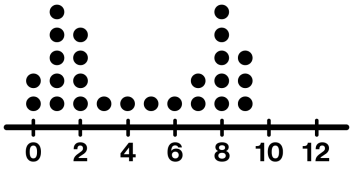

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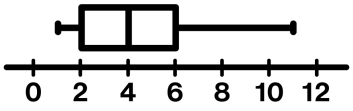

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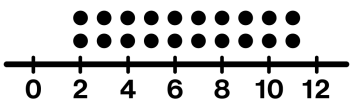

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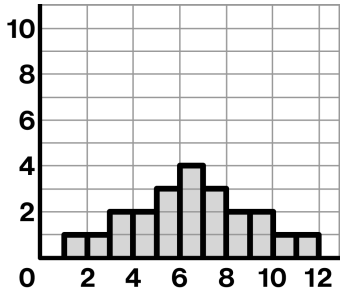

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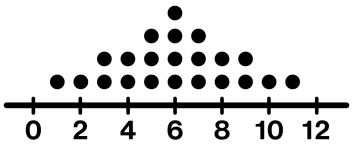
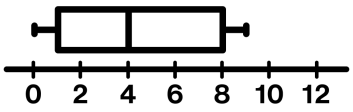
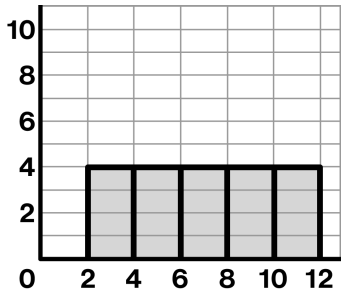
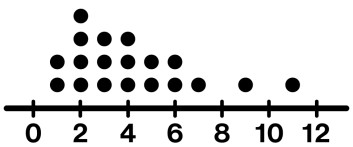
Unit A1.3, Lesson 4: Activity 3 Supplement Name _____

Activity 3: All the Representations

	Dot Plot	Histogram	Box Plot	Description
Data Set 1				☐ Skewed ☐ Symmetric ☐ Bimodal ☐ Bell-shaped ☐ Uniform
Data Set 2				☐ Skewed ☐ Symmetric ☐ Bimodal ☐ Bell-shaped ☐ Uniform
Data Set 3				☐ Skewed ☐ Symmetric ☐ Bimodal ☐ Bell-shaped ☐ Uniform
Data Set 4				☐ Skewed ☐ Symmetric ☐ Bimodal ☐ Bell-shaped ☐ Uniform

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Unit A1.3, Lesson 4: Activity 3 Supplement Name _____

Explore

For each situation below, say which data set from the previous page is most likely to describe it.

1.1 Students were asked: How much do you like baseball on a scale of 0–10?

1.2 Students in a class were each given a carton of eggs to take home. One week later, they recorded how many eggs were left in each carton.

2. For the two remaining data sets, write survey questions that might have produced the data.

Consider these five descriptions for the shapes of data sets.

Skewed	Uniform	Bell-shaped	Bimodal	Symmetric

3. Prisha noticed that a data set can sometimes have **more than one** shape. She wondered whether a data set could be both bimodal and symmetric. Make a dot plot of such a set, or say why it's not possible.

4. What are some other combinations of data shapes that are possible?

5. What are some combinations that you think are **impossible**?

Unit A1.3, Lesson 6: Starting Salaries Name _____

Activity 1: Four Companies

1. Work with the members of your group to fill out each card on the supplement. Use a graphing calculator to help you.

When you are finished, work with the members of your group to answer:

2. Why might someone want to determine the mean or median salary of a company?

3. The mean for Company B is much larger than the median. Why do you think that is?

4. What other companies had a mean that was much different from the median?

5. Data sets that have a mean that is very different than the median tend to have similar shapes. Circle the word that best describes the shape of these distributions.

skewed uniform symmetric bimodal bell-shaped

Activity 2: Best Pay

Ashley and Santino are writing a newspaper article about the four companies.
They disagree over which company offers the best pay.

Ashley says:	**Santino says:**
Company B offers the best pay because it has a mean starting salary of $\$34\,312.50$, which is the greatest mean salary.	I don't agree. Company B doesn't offer the best salary because its median salary is $\$29\,000$, and that is less than other companies.

1. Who do you agree with? Explain your thinking.

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Unit A1.3, Lesson 6: Starting Salaries Name _____

Here is a headline Ashley and Santino are considering for the newspaper.

2. Why is this headline misleading?

3. Why do you think the mean salary for Company C is lower than the median?

4. Ashley and Santino decide to use the median to describe the center of the data for Company C because the data is skewed. For the other companies, decide whether it would be more appropriate to use the mean or the median to describe the center of the data set.

Company	A	B	C	D
Which measure of center is more appropriate to use?			Median	

5. TBD

Explore

In 2020, Amazon released information about the pay of their U.S.-based employees:

- The median salary was $37 930
- The mean salary was $48 345

Why do you think many newspapers reported the median salary?

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Unit A1.3, Lesson 6: Starting Salaries Name _____

Lesson Synthesis

Discuss both questions below with a partner. Then select one to answer.

Use the example if it helps you show your thinking.

- ☐ When are the mean and median likely to be far apart?
- ☐ When is the median more appropriate than the mean for describing the center of a data set?

Company A Salaries (dollars)

30 000	30 000	30 000	31 000
33 000	33 000	33 000	36 000

Mean: 32 000 **Median:** 32 000

Company B Salaries (dollars)

27 000	27 500	28 000	28 000
30 000	32 000	32 000	70 000

Mean: 34 312. 50 **Median:** 29 000

Cool-Down

desmos Science Mom Lesson 25

Unit A1.3, Lesson 8: Wavering Weather Name _____

Warm-Up

Use screen 1 of the digital supplement to see the high temperatures in 11 cities on June 28th, 2021.

Activity 1: Portland vs. Phoenix

Use screen 1 of the digital supplement to help you answer the questions below.

1. List the three hottest cities on June 28th, 2021.

   _____ _____ _____

2. Jacy says: *Portland had the highest temperature, so it must be the hottest city*.

   What would you say to Jacy to help them understand why this might not be true?

Jacy and Neo wondered which city is hotter: Portland or Phoenix.
They decided to compare the high temperatures on each day in 2021.

3. Use screen 2 of the digital supplement to help you complete the table.

City	Minimum (°F)	Maximum (°F)	Median (°F)	Mean (°F)	Standard Deviation (°F)
Portland, OR	30				15.93
Phoenix, AZ			88	88.23	

4. Discuss: *What does each statistic tell us about the temperatures in the city?*

5. Which city is hotter: Portland or Phoenix? Use the statistics above to support your argument.

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Unit A1.3, Lesson 8: Wavering Weather Name _____

Activity 2: Phoenix vs. Orlando

It is sometimes hotter in Portland than in Phoenix. However, Phoenix has the hotter weather in general. Jacy and Neo wondered how Phoenix's weather compared to another hot city: Orlando.

They decided to compare the means and standard deviations of the temperatures.

1. Do you agree with their choice of statistics? Why or why not?

2. Use screen 3 of the digital supplement to help you calculate these statistics for Orlando.

City	Mean (°F)	Standard Deviation (°F)
Phoenix, AZ	88.22	15.11
Orlando, FL		

3. How do the temperatures in Phoenix compare to the temperatures in Orlando? Use statistics to support your argument.

4. Neo noticed that the standard deviation in Orlando is lower than the standard deviation in Phoenix. Does this surprise you? Why or why not?

   Make dot plots or box plots of the data in the digital supplement if that helps with your thinking.

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Unit A1.3, Lesson 8: Wavering Weather Name _____

Activity 3: Comparing Temperatures

1. Pick two cities from screen 4 of the digital supplement to compare.

   City A: _____ City B: _____

2. Circle 2–3 statistics that would help you compare the temperatures in these places.

   Minimum Maximum Median Mean Standard Deviation

3. Label each column with the statistics you chose. Then use screen 5 to help you calculate the statistics for each city you chose.

	Statistic 1:	Statistic 2:	Statistic 3:
City A:			
City B:			

4. How do the temperatures in City A compare to the temperatures in City B? Use statistics to support your argument.

Explore

An extreme heat wave affected much of western North America from late June through mid-July 2021. On June 28, 2021, Portland, Oregon, recorded its hottest-ever temperature of $116°$F. The average high temperature in Portland during the month of June was $82°$F.

What might be the impacts of this extreme heat wave on people in western North America?

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Unit A1.3, Lesson 8: Wavering Weather Name _____

Lesson Synthesis

Select one question and respond below.

- ☐ What can the mean/median help us compare about temperatures in different places?
- ☐ What can the standard deviation help us compare about temperatures in different places?
- ☐ What new questions do you have about temperatures around the United States?

Cool-Down

Two cities recorded their high temperature each day in 2021. The mean and standard deviation of these temperatures are shown in the table.

How does the temperature in Hartford compare to the temperature in Hilo?

Use mean and standard deviation to support your argument.

City	Mean (°F)	Standard Deviation (°F)
Hartford, CT	62.64	18.98
Hilo, HI	82.4	2.86

desmos Science Mom Lesson 27

Unit A1.3, Lesson 11: Dynamic Decades Name _____

Warm-Up

Use screen 1 of the digital supplement to see the minimum wages for each state in 2020.

Activity 1: Minimum Wages

1. Consider the minimum wage data from the warm-up.
   Write a question you *could* use this data to answer. Write one you *could not*.

Question You Could Answer	Question You Could Not Answer

Omari wondered: *How has the minimum wage in the United States changed over time?*

2. Omari thinks the minimum wage was more consistent across states in 2010 than in 2020.
   Which statistic could Omari use to help him back up his claim?

3. Use screen 2 of the digital supplement to complete the table for 2020. You can see how Omari completed the row for 2010 in the folder "Omari's Work."

Year	Minimum	Maximum	Median	IQR	Mean	Standard Deviation
2010	$5.15	$8.55	$7.25	$0.15	$7.39	$0.48
2020	$7.25	$15				

4. Help Omari answer: How has the minimum wage in the United States changed over time?

   Use statistics about center and spread to support your ideas.

5. Discuss: Did the minimum wage change in the ways you expected or were you surprised?

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Unit A1.3, Lesson 11: Dynamic Decades Name _____

Activity 2: Change in the 2010s

1. Choose one question to investigate.

   - ☐ How has the median rent changed from 2010 to 2019?
   - ☐ How has the percentage of people who are school-aged changed from 2010 to 2019?
   - ☐ How has the percentage of people with Internet access changed from 2013 to 2019?

2. Use screens 4, 5, or 6 of the digital supplement to make a dot plot, histogram, or box plot for both years. Describe the shape of the data for each year (symmetrical, skewed, etc.).

Year:	**Year:**
Shape of data:	**Shape of data:**

3. Do you think it would be better to compare the mean/standard deviation or the median/IQR to help you answer your question? Why?

4. Make a poster of your work to answer your question. Your poster should include:

   - ☐ The question you are trying to answer.
   - ☐ A data visualization of each data set (dot plot, histogram, or box plot).
   - ☐ Whether or not there are any outliers in the data sets.
   - ☐ Measures of center and spread (mean/standard deviation or median/IQR) for each year.
   - ☐ Your answer to the question.
   - ☐ Two new questions that you have after analyzing the data.

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Unit A1.3, Lesson 11: Dynamic Decades Name _____

Lesson Synthesis

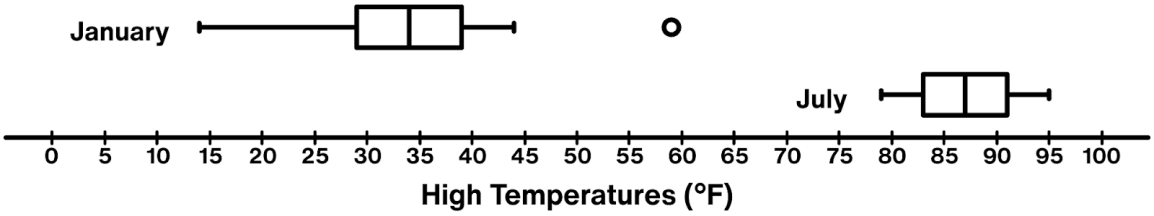
Select one question and respond below.

- ☐ What statistics did you find most helpful for comparing data sets in this lesson? Why?
- ☐ Why might it be important to study how things like the minimum wage or median rent are changing over time?
- ☐ After seeing the work of other groups, what new questions do you have about how things have changed in the United States in the last 10–15 years?

Cool-Down

The information below describes the high temperatures in Burlington, Vermont, in part of 2020.[1]

Month	Mean (°F)	Standard Deviation (°F)	Median (°F)	IQR (°F)
January 2020	33.8	8.5	34	10
July 2020	87.3	4.5	87	8



How did the temperatures in January compare to the temperatures in July? Use statistics about center and spread to support your ideas.

[1]National Weather Service, Weather.gov, https://www.weather.gov/wrh/climate.

Tables Template

