HOT SUMMER… COLD WINTER **Name**_____

The U.S. has been recently experiencing one of the hottest summers on record. July 2011 may set a record for the hottest July on record. Not only have the summers been extreme, so have the winters. Quoting www.worldclimatereport.com: "For the second year in a row, the winter temperature when averaged across the contiguous United States came in below the average temperature for the 20th century. This marks the first time since the winters of 1992-93 and 1993-94 that two winters in a row have been below the long-term normal, and it makes for the coldest back-to-back winter combination for at least the past 25 years." With all this extreme heat timeliness we decided to look at the record highs and lows in each U.S. state. Use the data in the two tables to answer the questions on the following page.

State high temperature records

State	Temp(F)	Date	Station	Elevation (ft)
Ala.	112	Sept. 5, 1925	Centerville	345
Alaska	100	June 27, 1915	Ft. Yukon	420
Ariz.	128	June 29, 1994	Lake Havasu	505
Ark.	120	Aug. 10, 1936	Ozark	396
Calif.	134	July 10, 1913	Death Valley	N/A
Colo.	118	July 11, 1888	Bennett	5,484
Conn.	106	July 15, 1995	Danbury	450
Del.	110	July 21, 1930	Millsboro	20
Fla.	109	June 29, 1931	Monticello	207
Ga.	112	July 24, 1952	Louisville	132
Hawaii	100	April 27,1931	Pahala	850
Idaho	118	July 28, 1934	Orofino	1,027
Ill.	117	July 14, 1954	E. St Louis	410
Ind.	116	July 14, 1936	Collegeville	672
Iowa	118	July 20, 1934	Keokuk	614
Kansas	121	July 24, 1936	Alton	1,651
Ky.	114	July 28, 1930	Greensburg	581
La.	114	Aug. 10, 1936	Plain Dealing	268
Maine	105	July 10, 1911	N. Bridgton	450
Md.	109	July 10, 1936	Cumberland and Frederick	623 and 325
Mass.	107	Aug. 2, 1975	New Bedford and Chester	120 and 640
Mich.	112	July 13, 1936	Mio	963
Minn.	114	July 6, 1936	Moorhead	904
Miss.	115	July 29, 1930	Holly Springs	600
Mo	118	July 14, 1954	Warsaw and Union	705 and 560
Mont.	117	July 5, 1937	Medicine Lake	1,950
Neb.	118	July 24, 1936	Minden	2,169
Nev.	125	June 29, 1994	Laughlin	605
N.H.	106	July 4, 1911	Nashua	125
N.J.	110	July 10, 1936	Runyon	18
N.M.	122	June 27, 1994	Lakewood	N/A
N.Y.	108	July 22, 1926	Troy	35
N.C.	110	Aug. 21, 1983	Fayetteville	213
N.D.	121	July 6, 1936	Steele	1,857
Ohio	113	July 21, 1934	Gallipolis	673
Okla.	120	June 27, 1994	Tipton	1,350
Ore.	119	Aug. 10, 1898	Pendleton	1,074
Pa.	111	July 10, 1936	Phoenixville	100
R.I.	104	Aug. 2, 1975	Providence	51
S.C.	111	June 28, 1954	Camden	170
S.D.	120	July 15, 2006	Kelly Ranch/Usta	2,339
Tenn.	113	Aug. 9, 1930	Perryville	377
Texas	120	Aug. 12, 1936	Seymour	1,291
Utah	117	July 5, 1985	Saint George	2,880
Vt.	105	July 4, 1911	Vernon	310
Va.	110	July 15, 1954	Balcony Falls	725
Wash.	118	Aug. 5, 1961	Ice Harbor Dam 475	475
W. Va.	112	July 10, 1936	Martinsburg	435
Wis.	114	July 13, 1936	Wisconsin Dells	900
Wyo.	116	Aug. 8, 1983	Basin	3,500

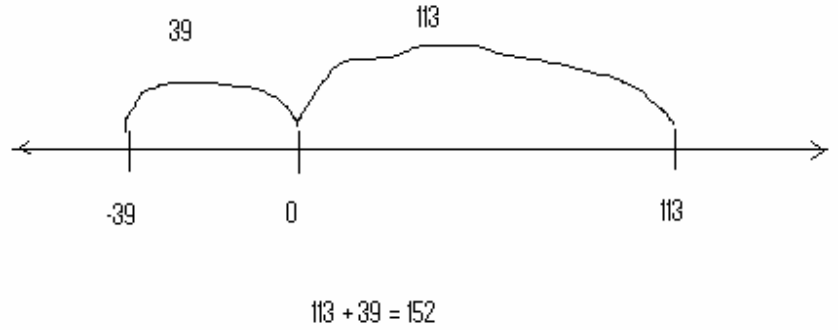
State by state low temperature records

State	Temp(F)	Date	Station	Elevation (Ft)
Alabama	-27	Jan. 30, 1966	New Market	760
Alaska	-80	Jan. 23, 1971	Prospect Creek	1,100
Arizona	-40	Jan. 7, 1971	Hawley Lake	8,180
Arkansas	-29	Feb. 13, 1905	Pond	1,250
California	-45	Jan. 20, 1937	Boca	5,532
Colorado	-61	Feb. 1, 1985	Maybell	5,920
Connecticut	-32	Feb. 16, 1943	Falls Village	585
Delaware	-17	Jan. 17, 1893	Millsboro	20
Florida	- 2	Feb. 13, 1899	Tallahassee	193
Georgia	-17	Jan. 27, 1940	N. Floyd County	1,000
Hawaii	12	May 17, 1979	Mauna Kea	13,770
Idaho	-60	Jan. 18, 1943	Island Park Dam	6,285
Illinois	-36	Jan. 5, 1999	Congerville	722
Indiana	-36	Jan. 19, 1994	New Whiteland	785
Iowa	-47	Feb. 3, 1996*	Elkader	770
Kansas	-40	Feb. 13, 1905	Lebanon	1,812
Kentucky	-37	Jan. 19, 1994	Shelbyville	730
Louisiana	-16	Feb. 13, 1899	Minden	194
Maine	-48	Jan. 19, 1925	Van Buren	458
Maryland	-40	Jan. 13, 1912	Oakland	2,461
Massachusetts	-35	Jan. 12, 1981	Chester	640
Michigan	-51	Feb. 9, 1934	Vanderbilt	785
Minnesota	-60	Feb. 2, 1996	Tower	1,430
Mississippi	-19	Jan. 30, 1966	Corinth	420
Missouri	-40	Feb. 13, 1905	Warsaw	700
Montana	-70	Jan. 20, 1954	Rogers Pass	5,470
Nebraska	-47	Feb. 12, 1899	Camp Clarke	3,700
Nevada	-50	Jan. 8, 1937	San Jacinto	5,200
New Hampshire	-47	Jan. 29, 1934	Mt. Washington	6,288
New Jersey	-34	Jan. 5, 1904	River Vale	70
New Mexico	-50	Feb. 1, 1951	Gavilan	7,350
New York	-52	Feb. 18, 1979*	Old Forge	1,720
North Carolina	-34	Jan. 21, 1985	Mt. Mitchell	6,525
North Dakota	-60	Feb. 15, 1936	Parshall	1,929
Ohio	-39	Feb. 10, 1899	Milligan	800
Oklahoma	-31	Feb. 9, 2011	Nowata	709
Oregon	-54	Feb. 10, 1933*	Seneca	4,700
Pennsylvania	-42	Jan. 5, 1904	Smethport	est. 1,500
Rhode Island	-25	Feb. 5, 1996	Greene	425
South Carolina	-19	Jan. 21, 1985	Caesars Head	3,100
South Dakota	-58	Feb. 17, 1936	McIntosh	2,277
Tennessee	-32	Dec. 30, 1917	Mountain City	2,471
Texas	-23	Feb. 8, 1933*	Seminole	3,275
Utah	-69	Feb. 1, 1985	Peter's Sink	8,092
Vermont	-50	Dec. 30, 1933	Bloomfield	915
Virginia	-30	Jan. 22, 1985	Mountain Lake	3,870
Washington	-48	Dec. 30, 1968	Mazama	2,120
West Virginia	-37	Dec. 30, 1917	Lewisburg	2,200
Wisconsin	-55	Feb.4, 1996	Couderay	1,300
Wyoming	-66	Feb. 9, 1933	Riverside	6,650

1. List the five warmest state high temperatures. List each of the five states and their corresponding high temperature:

2. List the five lowest state record low temperatures. List each of the five states and their corresponding low temperature:

In this activity we will be working with signed numbers. An **open number line** is a useful tool to help you operate with signed numbers. Lets say that I want to find the difference between (range of) Ohio's record high (113) and record low (-39) temperatures. You can place each value on a number line like in the example below. Notice that the values are not placed on the number line to scale and I have not included any other intervals. I have made sure that the values are in relative order to each other and zero. Now I can find the distance from -39 to zero and the distance from 0 to 113. Finally, I can add these values together as I have done below.



This number line model also helps me understand why I am actually adding when I am subtracting a negative value. In this example you should see that the difference between 113 and -39 or 113 - -39 is actually the same math as 113 + 39.

In these problems we will be looking for the positive difference or **absolute value**. This means when we are finding differences we should always take the positive difference. Using absolute value in our subtraction problems will ensure that we always have computed the positive difference. For example a student may have done -39 – 113 = -152. Using absolute value gets us… $|-39-113| = |-152| = 152$

Try the following problems. Remember to use an open number line or absolute value if helpful.

3. According to the data, which state has the greatest range in temperature between its record high and record low? What is that range?

4. According to the data, which state has the least range in temperature between its record high and record low? What is that range?

5. According to the data, what is the range in temperature between the record high and record low for the entire U.S.? What is that range?

6. What is the range in record temperatures for the state that you live in now?

7. I have always thought of California as a warm place, especially after living in Illinois most of my life. Which of these two states has had a lower record cold temperature? Write a math sentence to find the positive difference between their record low temperatures.

8. Find as many pairs of record low temperatures that have a difference of 30 degrees. Write and solve math sentences to confirm or show that they have a difference of 30 degrees.

9. Go online and find the record high and low temperatures for the area that you live in. How do these records compare to the records for your state or states in your region?

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