



Background:

Before the National Weather Service, the Signal Service reported the weather from various stations around the country. The highest signal service station was on Pikes Peak from 1873 – 1888. The mission for the men stationed atop Pikes Peak was to report the weather, and gather enough information to predict weather patterns. Initially, weather reports were made via telegraphic summaries sent to Washington, D.C. from the various observation sites around the nation, then distributed out to the public via railroad stations and news media outlets. The Pikes Peak mountain observation site was connected to the city of Colorado Springs down below by telegraph line #99. Harsh winds and heavy snow fall often downed the line, at times the poles themselves.

Activity:

Using the wind chill chart from the National Weather Service, students can investigate the discrepancy between the recorded temperature from the top of Pikes Peak and the reported temperature in the news article. The results can lead to a discussion about the advancement in meteorological technologies.

Questions to Consider:

1. According to the *Colorado Springs Weekly Gazette*, what was the low temperature in Colorado Springs? What was the high temperature in Colorado Springs?
2. According to the *Colorado Springs Weekly Gazette*, what was the low temperature at the Signal Service Station on Pikes Peak? What was the temperature at 5:00 am at the Signal Service Station on Pikes Peak?
 - a. According to the *Annals of the Astronomical Observatory of Harvard College*, what are the temperatures on November 20, 1880? Why do you think they differ from the news article?
3. Why were they keeping record of the weather on top of Pikes Peak? Who could benefit from the records?



Colorado Springs
PIONEERS MUSEUM

"Coldest Weather on Record." Colorado Springs
Weekly Gazette. November 20, 1880. Pikes Peak
Library District Newsfinder.

SPGS WKLY Gazette Nov 20, 1880 6:6

COLDEST WEATHER ON RECORD

THE MERCURY AND AROMA MOUNTAIN PAINTED TO CONQUER.

The recent cold snap is probably the
coldest wave that has visited our city in
several years, and judging from reports
received from other sections of the state
the storm must have been very general.

It was somewhat of a surprise to many
yesterday to learn that the thermometer
had in the night previous descended to 25
degrees below zero, that being the lowest
point reached. During the entire day
yesterday the air was cold and crisp and
although the sun shone brightly during
the most of the day, 6 above zero was the
highest point reached by the mercury.

Mr. E. L. Jones, the signal officer sta-
tioned at the peak, says that Tuesday
night was one of the coldest ever experi-
enced by him on the peak. The thermometer
showed a minimum of 36 degrees be-
low zero during the entire night and at
five o'clock yesterday morning it was 31
degrees below. Observations taken yes-
terday showed the following at 107 p.m.
19 degrees below, and at 6 p.m., 22 de-
grees below. At eight o'clock last night
the thermometer in front of E. E. Robin-
son's drug store registered 15 degrees be-
low.



ANNALS OF HARVARD COLLEGE OBSERVATORY.

NOVEMBER, 1880.

METEOROLOGICAL OBSERVATIONS MADE ON THE SUMMIT OF PIKE'S PEAK, COLORADO.

Date.	Pressure. Inches, 17.00+				Temperature in Degrees Fahrenheit.					Relative Humidity.		Wind.								
	A.M. 5.07 P.M. 1.07 Mean. 9.07				A.M. 5.07 P.M. 1.07 Mean. 9.07				Max. 5.07		Min. 1.07		Direction and Velocity in Miles per Hour.			A.M. 5.07 P.M. 1.07 P.M. 9.07				
1	.78	.76	.75	.76	22	26	17	22	26	14	72	63	67	NW	16	NW	4	NW	26	336
2	.73	.70	.64	.69	15	23	14	17	25	13	65	60	82	NW	24	NW	8	SW	14	432
3	.50	.50	.53	.51	11	12	9	11	14	9	60	100	57	NE	20	W	12	W	20	383
4	.48	.45	.45	.46	0	0	-12	-4	9	-12	100	100	50	W	18	W	10	W	10	423
5	.42	.45	.53	.47	-20	-10	-18	-16	-9	-21	30	54	33	NW	24	NE	30	NE	64	385
6	.60	.70	.69	.66	-12	8	8	1	10	-18	50	55	78	N	28	W	10	W	14	818
7	.66	.62	.53	.60	6	8	10	8	12	5	100	55	58	NW	6	NE	38	NW	32	323
8	.38	.35	.35	.36	7	11	1	6	12	1	77	100	100	NW	32	W	7	NE	40	667
9	.48	.50	.49	.49	-4	3	5	1	6	-5	65	46	75	NW	16	E	4	NW	20	474
10	.39	.43	.48	.43	2	2	5	3	7	2	72	100	75	W	16	W	14	W	16	331
11	.48	.52	.58	.53	-9	0	0	-3	5	-10	56	70	70	W	8	W	6	0	0	300
12	.58	.60	.66	.61	-7	-5	-7	-6	0	-8	59	63	59	W	7	NE	10	NE	18	154
13	.73	.75	.75	.74	-9	0	2	-2	3	-10	56	39	44	N	20	N	10	N	36	373
14	.75	.74	.83	.77	-5	2	6	1	6	-5	26	44	76	N	30	N	42	SW	30	648
15	.84	.73	.57	.71	10	14	11	8	15	6	79	64	100	SW	8	NE	4	NW	10	521
16	.26	.19	.22	.22	1	-6	-14	-6	11	-14	100	61	45	NW	16	S	6	S	6	274
17	.14	.26	.44	.28	-31	-19	-16	-22	-14	-36	36	30	39	SW	16	E	12	N	8	217
18	.47	.42	.31	.40	-9	-4	-5	-6	-3	-16	56	65	63	SW	12	W	32	W	56	292
19	.24	.23	.27	.25	-8	-4	-12	-8	-4	-12	58	65	50	W	50	W	24	W	36	761
20	.29	.37	.37	.34	-15	-5	-7	-9	-5	-15	42	63	59	W	58	W	38	W	30	636
21	.38	.46	.59	.48	-7	-2	-5	-5	0	-8	59	67	26	W	36	W	30	W	28	737
22	.60	.67	.68	.65	0	9	6	5	10	-5	39	36	52	W	44	NW	28	W	32	868
23	.62	.57	.50	.56	5	10	5	7	10	5	50	58	75	W	28	SW	40	SW	32	675
24	.44	.45	.47	.45	7	9	6	7	9	5	77	78	100	NW	12	SW	16	SW	6	612
25	.47	.39	.51	.46	6	7	-5	3	9	-5	100	77	63	0	0	NW	16		177	
26	.56	.53	.48	.52	-3	2	1	0	2	-5	32	44	42	NW	24	SW	24	SW	40	446
27	.43	.41	.39	.41	-3	4	0	0	5	-3	32	48	39	SW	48	SW	32	SW	22	917
28	.39	.38	.44	.40	-2	0	-5	-2	0	-5	67	70	63	SW	20	SW	20	SW	20	582
29	.46	.45	.37	.43	-7	0	-3	-3	1	-10	59	39	32	W	54	SW	44	SW	36	820
30	.18	.19	.28	.22	-5	-4	-4	-4	-3	-7	63	65	65	SW	46	NW	46	NW	56	1063
Means	.49	.49	.51	.50	-2.1	3.0	-0.2	0.1	5.6	-5.7	61	63	61	25	20	26	15645			

REMARKS.

Nov. 2. Snow, B. 5.15 P.M.; E. 6.50 P.M.
 3. " B. 8.00 A.M. At intervals. E. 1.40 P.M.
 4. " B. D.N.; E. 2.20 P.M.

Nov. 7. Snow, B. D.N.; E. 6.50 A.M.
 8. " B. 12.30 P.M.; E. D.N.
 10. " B. 12.10 P.M.; E. 1.35 P.M.

METEOROLOGICAL OBSERVATIONS.

NOVEMBER, 1880.

METEOROLOGICAL OBSERVATIONS MADE ON THE SUMMIT OF PIKE'S PEAK, COLORADO.

Date.	Precipitation.				Clouds; Kind, Amount, and Direction from which they move.								Weather.	
					Upper.				Lower.					
	A.M. 5.07	P.M. 1.07	P.M. 9.07	Total.	A.M. 5.07	P.M. 1.07	P.M. 9.07	A.M. 5.07	P.M. 1.07	P.M. 9.07	A.M. 5.07	P.M. 1.07	P.M. 9.07	
1	.	.	.	.	0	C	3	0	0	0	0	0	0	Cr Cr Cr
2	.	.	.04	.04	0	K	5 NW	Hidden	KS 5 NW	0	s	10	sw	F F Cy
3	.	.04	.01	.05	Hidden	Hidden	0	KS 10	N 10	s 8	Cy	LS	Cy	
4	.12	.04	.02	.18	Hidden	Hidden	0	N 10 w	N 10	s 3	HS	LS	Cr	
5	.	.	.	.	0	0	0	0	0	0	Cr	Cr	Cr	
6	.	.	.	.	0	0	0	Hidden	KS 8	KS 3 NW	s 10	Cy	Cy	
7	.30	.02	.	.32	Hidden	cs 3	cs 10	Hidden	N 10 NW	s 3 NE	0	LS	F Cy	
8	.	.04	1.12	1.16	Hidden	Hidden	s 10 NW	N 10	N 10	N 10	Cy	LS	H	
9	.75	.	.	.75	Hidden	0	Hidden	D. Fog	0	ks 10	Fy	Cr	Cy	
10	.	.02	.01	.03	Hidden	Hidden	0	D. Fog	N 10 w	s 5 w	Fy	LS	F	
11	.	.	.	.	cs 3	0	Hidden	0	ks 5 sw	s 10	Cr	F	Cy	
12	.	.	.	.	cs 3	0	0	0	0	0	Cr	Cr	Cr	
13	.	.	.	.	0	0	0	0	0	0	Cr	Cr	Cr	
14	.	.	.	.	0	0	0	Hidden	0	0	Fog	Cr	Fy	
15	.	.	.25	.25	Hidden	Hidden	0	D. Fog	ks 10 w	N 10	Fy	Cy	LS	
16	.70	.05	.	.75	Hidden	Hidden	0	N 10 NW	D. Fog	s 10	HS	Fy	Cy	
17	.08	.	.	.08	0	0	0	s 3 sw	0	0	Cr	Cr	Cr	
18	.	.	.	.	0	cs 2	cs 3	0	0	0	Cr	Cr	Cr	
19	.	.	.08	.08	0	cs 3	Hidden	0	D. Fog	D. Fog	Cr	Fy	Fy	
20	.	.	.	.	0	ck 3	Hidden	0	s 7 w	D. Fog	Cr	Cy	Fy	
21	.04	.	.	.04	0	Hidden	cs 2	s 5 w	s 10 w	0	F	Cy	Cr	
22	.	.	.	.	0	cs 7	0	0	0	0	Cr	F	Cr	
23	.	.	.	.	cs 3	cs 10	0	0	0	0	Cr	Cy	Cy	
24	.	.	.01	.01	Hidden	Hidden	0	D. Fog	D. Fog	N 10	Fy	Fy	LS	
25	.30	.03	.	.33	Hidden	Hidden	0	N 10	D. Fog	0	LS	Fy	Cr	
26	.	.	.	.	0	0	0	0	0	0	Cr	Cr	Cr	
27	.	.	.	.	0	cs 3	0	0	0	0	Cr	Cr	Cr	
28	.	.	.	.	Hidden	Hidden	0	D. Fog	D. Fog	Fog	Fy	Fy	Fy	
29	.	.	.	.	0	0	0	0	0	0	Cr	Cr	Cr	
30	.	.	.	.	Hidden	0	0	D. Fog	0	0	Fy	Cr	Cr	
Total	2.29	.24	1.54	4.07										

REMARKS.

Nov. 15. Snow, B. 5.10 P.M.; E. 6.00 A.M. of 16th.
 17. " B. D.N.; E. D.N.
 19. " B. 5.15 P.M.; E. 7.15 P.M.

Nov. 21. Snow, B. D.N.; E. D.N.
 24. " B. 8.10 P.M.; E. 6.20 A.M. of 25th.



NWS Windchill Chart



		Temperature (°F)																		
		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	
Wind (mph)	Calm	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63	
	5	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72	
	10	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77	
	15	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81	
	20	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84	
	25	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87	
	30	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89	
	35	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91	
	40	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93	
	45	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95	
	50	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97	
	55	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	

Frostbite Times  30 minutes  10 minutes  5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01