1 Introduction to Representations

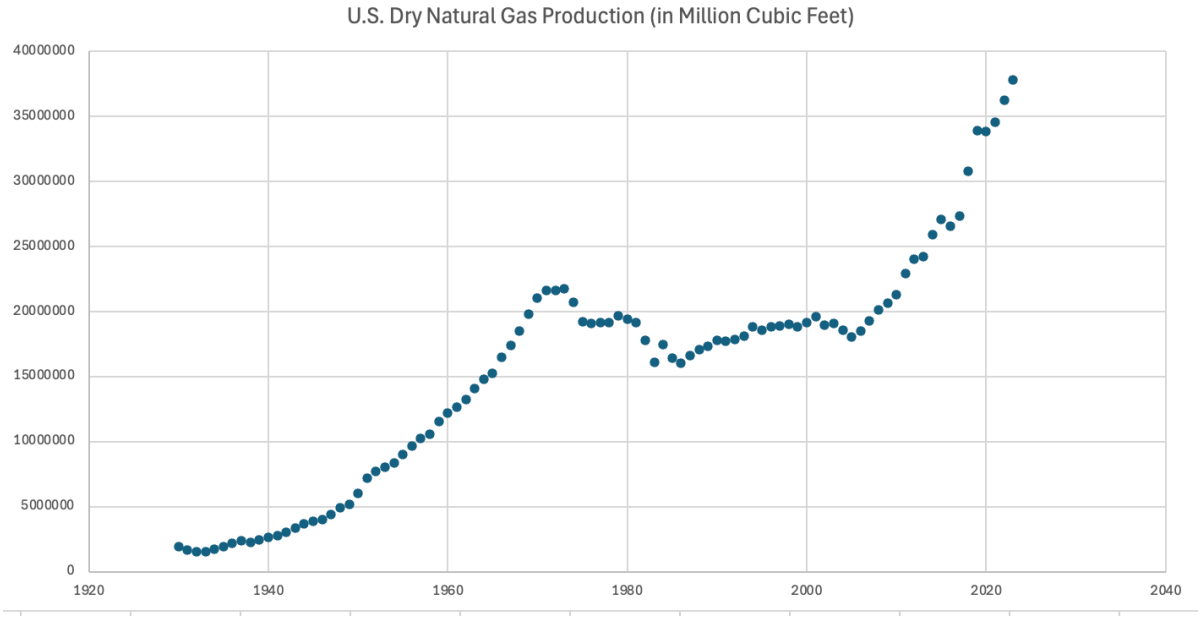
Take about 10 minutes to individually review the representations. [1]
For each representation, answer the following questions.

(a) What type of representation was used?

(b) What measurement(s) are involved in the representation?

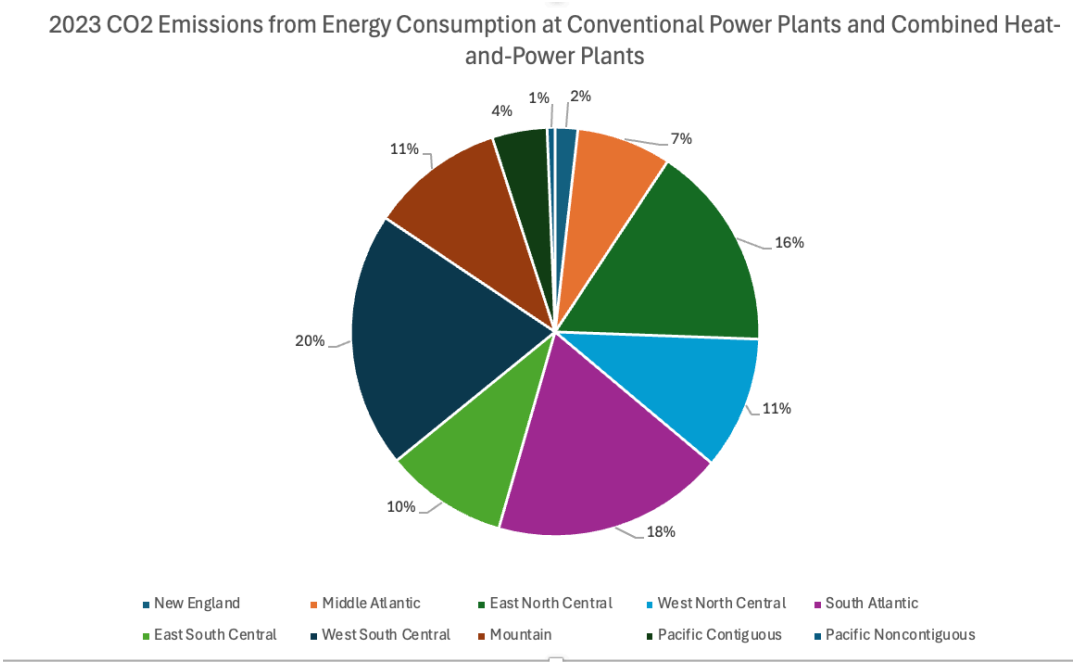
(c) What pattern(s) are conveyed by the representation about those measurements?

1.



[1] Sources for the representations are from the EIA Power and Natural Gas data.

2.

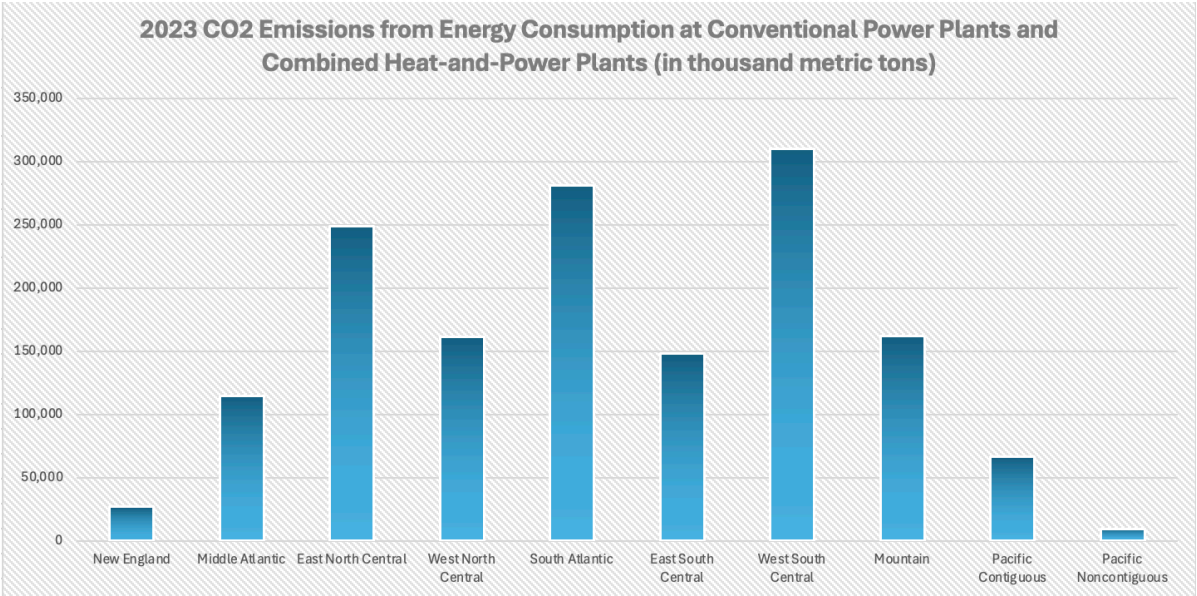


3.

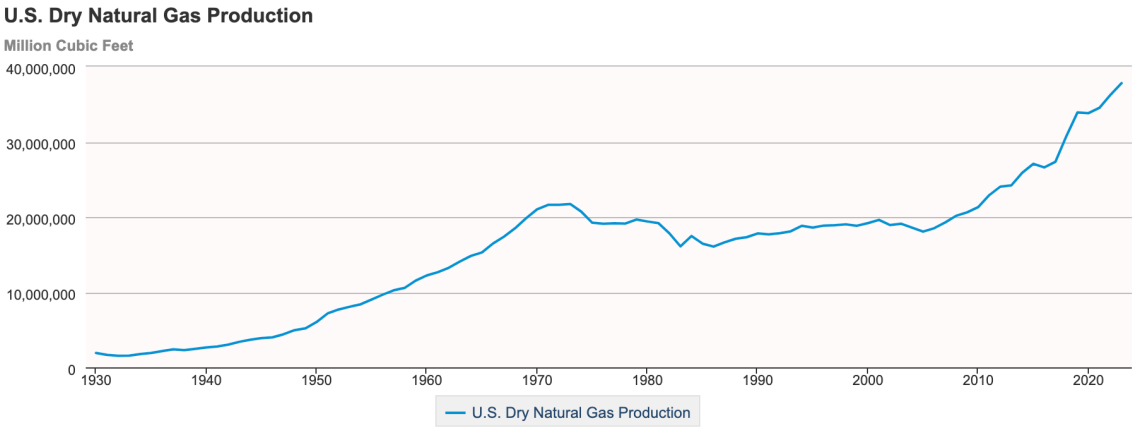
U.S. Dry Natural Gas Production (Million Cubic Feet)

Decade	Year-0	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9
1930's	1,903,771	1,659,614	1,541,982	1,548,393	1,763,606	1,913,475	2,164,413	2,403,273	2,284,863	2,464,637
1940's	2,654,293	2,778,061	3,026,694	3,393,743	3,672,156	3,882,066	3,987,488	4,393,439	4,938,512	5,195,404
1950's	6,022,198	7,164,959	7,694,299	8,056,848	8,388,198	9,028,665	9,663,910	10,246,622	10,572,208	11,547,658
1960's	12,228,148	12,661,579	13,253,006	14,076,412	14,824,027	15,286,280	16,467,320	17,386,791	18,494,523	19,831,680
1970's	21,014,229	21,609,885	21,623,705	21,730,998	20,713,032	19,236,379	19,098,352	19,162,900	19,121,903	19,663,415
1980's	19,403,119	19,181,261	17,820,057	16,094,463	17,466,477	16,453,853	16,059,030	16,620,581	17,102,621	17,310,645
1990's	17,809,674	17,697,802	17,839,903	18,095,460	18,821,025	18,598,679	18,854,063	18,902,389	19,023,564	18,832,232
2000's	19,181,980	19,616,311	18,927,788	19,098,544	18,590,891	18,050,598	18,503,605	19,266,026	20,158,602	20,623,854
2010's	21,315,507	22,901,879	24,033,266	24,205,523	25,889,605	27,065,460	26,592,115	27,340,583	30,774,274	33,899,021
2020's	33,811,129	34,529,276	36,254,942	37,803,268						

4.


2023 CO2 Emissions from Energy Consumption at Conventional Power Plants and Combined Heat-and-Power Plants (in thousand metric tons)
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
New England
Middle Atlantic
East North Central
West North Central
South Atlantic
East South Central
West South Central
Mountain
Pacific Contiguous
Pacific Noncontiguous

5.


U.S. Dry Natural Gas Production
Million Cubic Feet
40,000,000
30,000,000
20,000,000
10,000,000
0
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
U.S. Dry Natural Gas Production

2 Representations Summary

As a group, use your individual observations to brainstorm a list of qualities that describe each type of representation.

Representation	Good For...
Table	
Line Graph	
Bar Chart	
Scatter Plot	
Pie Chart	

1. When creating your own representations, it is not only important to pick a representation that fits the type of data that you have, but also think about how you will design that representation. Looking at the examples above,

(a) what was done well to communicate data patterns clearly?

(b) what could be improved to communicate the data more clearly?

3 Choosing a Representation

For each scenario below, discuss in your group which representation you think would be most appropriate, and why.

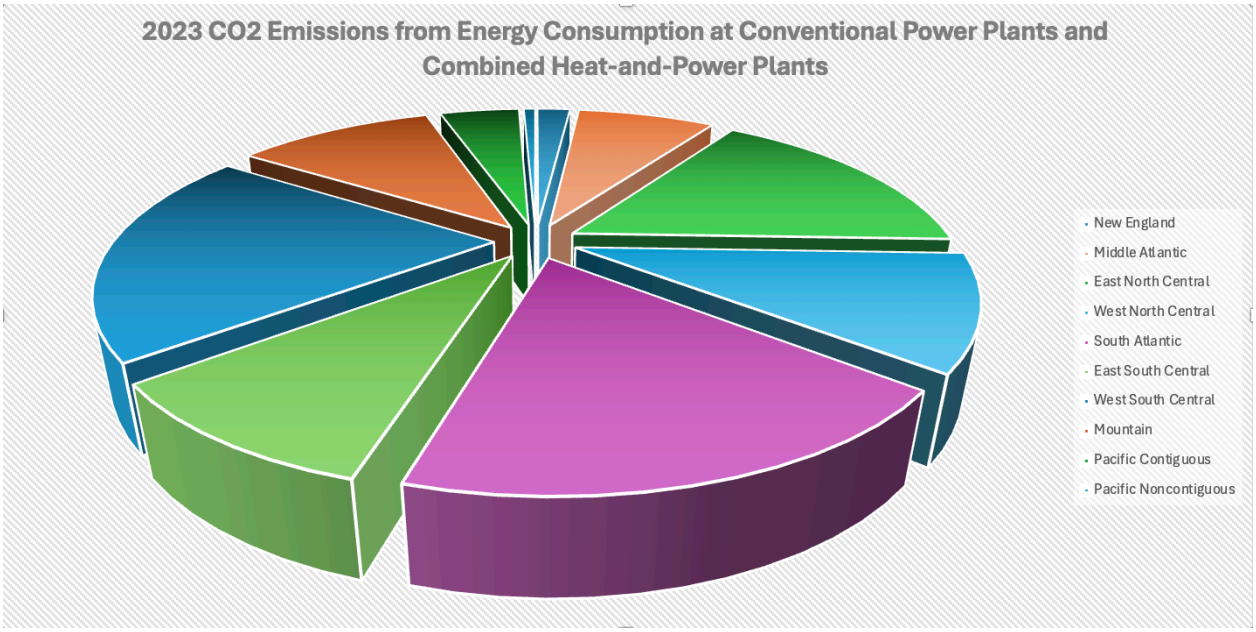
1. You have measurements of the amount of energy used per household in your city over a given month. You'd like to present the measurements in a way that emphasizes the neighborhoods in your city which used the most energy in that month.

2. You have measurements of SO2 emissions in your county for the last decade, measured every quarter of a year. You'd like to emphasize that the SO2 emissions are consistently greater in one particular quarter of the year.

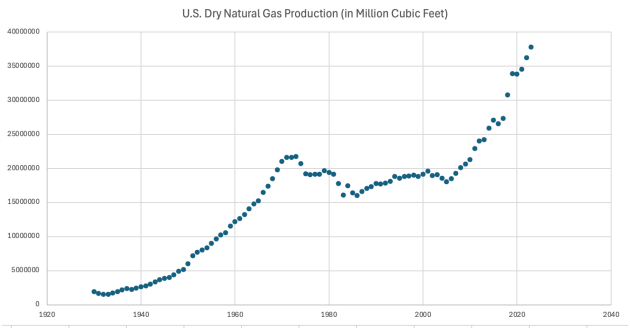
3. You have measurements of the mass of an iceberg for the last 50 years. You'd like to emphasize how this mass has changed over that time period, particularly in the last 20 years.

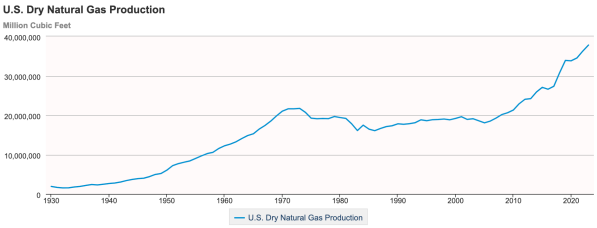
4 Misleading Representations

In your group, discuss the cases provided below.

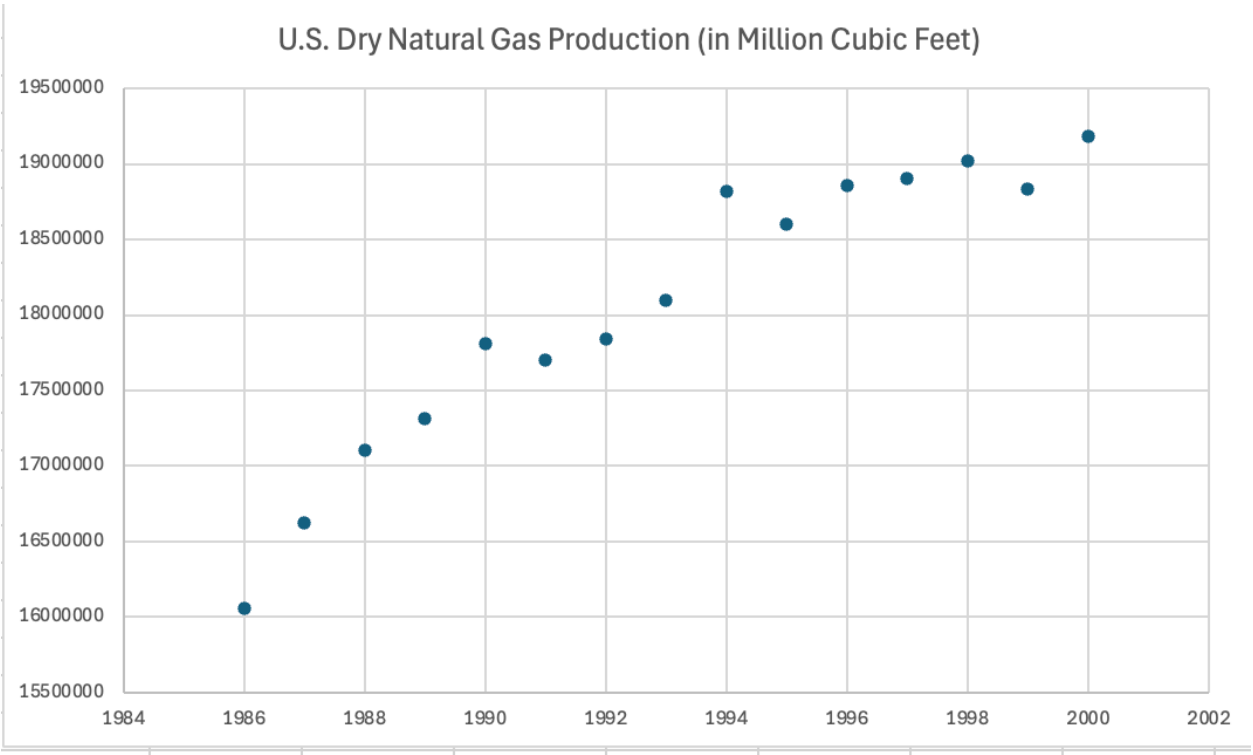


1. The pie chart above is the same pie chart presented in Worksheet 1. Compare and contrast the two representations. Can you identify anything that may be misleading?





2. The scatter plot and the line graph from Worksheet 1 represent the same data, and are shown above. Compare and contrast the two representations. Can you identify anything that may be misleading?



3. The scatter plot above uses the same data as the scatter plot in Worksheet 1, but just of the years 1986-2000. Compare and contrast the two representations. Can you identify anything that may be misleading?