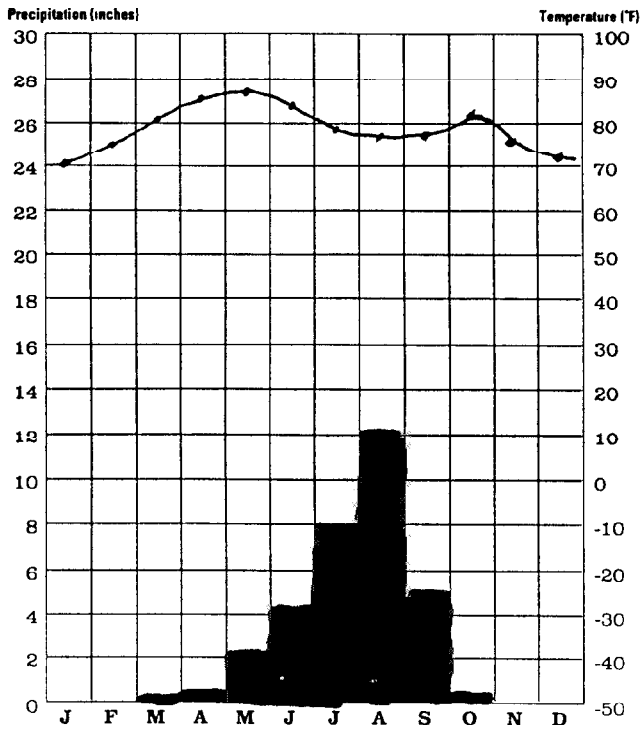


(Answers)

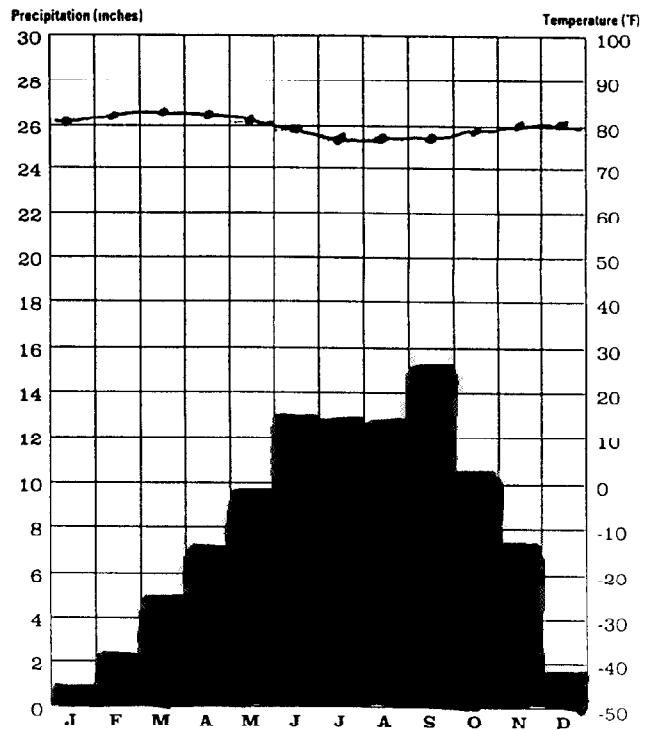
(Kano)

STATION 1



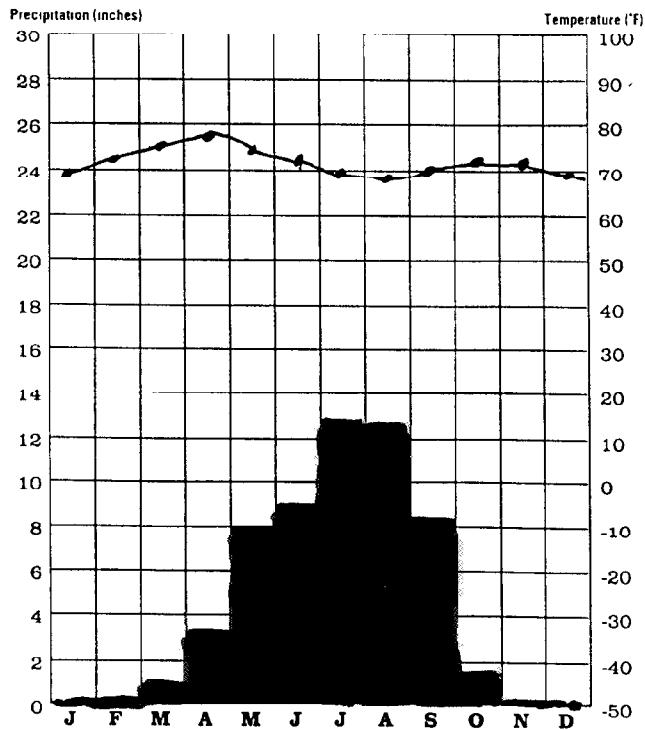
(Port Harcourt)

STATION 2



STATION 3

Jos, Nigeria



Climate Data Tables For Three Nigerian Locations

KEY

Station 1		
	F ^o	Precip.
J	70.9	0
F	74.7	0
M	80.8	0.1
A	86.6	0.4
M	87.0	2.5
J	84.2	4.4
J	79.2	8.0
A	77.4	12.4
S	78.7	5.0
O	80.8	5
N	76.8	0
D	72.0	0

Station 2		
	F ^o	Precip.
J	80.7	1.2
F	82.1	2.3
M	82.4	5.0
A	81.9	7.5
M	80.8	9.9
J	79.4	13.3
J	77.8	12.9
A	78.0	12.3
S	78.6	15.5
O	79.2	10.7
N	80.2	5.5
D	80.2	1.8

Station 3		
	F ^o	Precip.
J	69.6	0.1
F	72.5	0.1
M	75.7	1.0
A	77.4	3.5
M	75.2	7.9
J	72.2	9.1
J	69.6	12.9
A	68.6	11.6
S	70.4	8.4
O	72.2	1.6
N	71.9	0.1
D	69.8	0.1

Total Precip: 33"

Avg. Temp: 79.1°

Range of Temp: $\frac{87}{-70.9} = 16.1°$

(subtract to find the difference between highest & lowest monthly average)

Total Precip: 97"

Avg. Temp: 80.1°

Range of Temp: $\frac{82.4}{-77.8} = 4.6°$

(subtract to find the difference between highest & lowest monthly average)

Total Precip: 56.4"

Avg. Temp: 72.1°

Range of Temp: $\frac{77.4}{-68.6} = 8.8°$

(subtract to find the difference between highest & lowest monthly average)

source: Udo, Ken Geographical Regions of Nigeria, University of California Press, 1970 p. 3

Understanding Climate Graphs & Human Adaptation to Climate in Tropical Areas

With a pencil or colored pencil, lightly shade the rainy season (months with 2.5" or greater) at each station. Then, calculate the total precipitation, average temperature and range of temperature at each station. List them in the space above.

- (1) At which station are average temperatures warmest? Station 2
At which station are average temperatures coolest? Station 3
- (2) At which station is the range of temperature the greatest? Station 1
At which station is the range of temperature the smallest? Station 2
- (3) Which station is the wettest? Station 2 The driest? Station 1

(4) Compare the number of rainy season months:

Station 1	Station 2	Station 3
5	9	6

(5) Examine the wind direction maps.

Which city would be wettest? Port Harcourt Why? Winds in Diagrams 1 + 2 blow from over the ocean, making them moisture-bearing winds.

KEY

(6) What city has the highest elevation? Jos, at 900-1800m (2,950 - 5,900ft.)
 Which station is the coolest? Station 3
 Does temperature rise or fall as elevation increases?

(7) Areas with average monthly temperatures greater than 64.4 do not have "winter" as defined by Koopen, a geographer. Name some plants that could grow only in areas without winter.
*cocoa, bananas, coffee, tea
 pineapple, oranges, lemons, limes, palms, yam (not sweet potato)
 cassava, sugar cane, plantain*

(8) Besides sunshine and warm temperatures, what else is needed for crops to grow? Water

(9) In what months would there be enough moisture to plant crops in each place?

Station 1	Station 2	Station 3
late April May	Feb.	late March April

(10) If a crop requires 90 days to mature, which stations may have a long enough growing season and moisture to grow two 90-day crops? Stations 2 + 3

(11) Summarize: All of these cities are in tropical areas (5 N - 8 N). Explain how climate is not the same in all tropical areas.
Planting seasons begin with the onset of rain, unless there is irrigation. The onset varies, as well as the duration of the rainy season.

(12) In subsistence agriculture, food is grown and stored by each grower. Which months at each station are likely to be in the "hungry season"-- where new crops are not yet mature, but last year's supply is gone?

Station 1	Station 2	Station 3
March- May	?	March, Apr.

(13) In what months at each station might people have to conserve or use stored water if deep wells are unavailable?

Station 1	Station 2	Station 3
October- April	Dec - Jan	Oct March

(14) At each station, flooding may occur in what months?

Station 1	Station 2	Station 3
Aug.	June-Oct	June-Sept

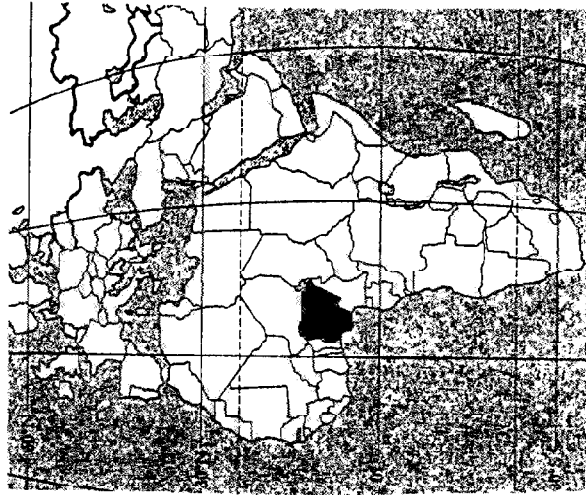
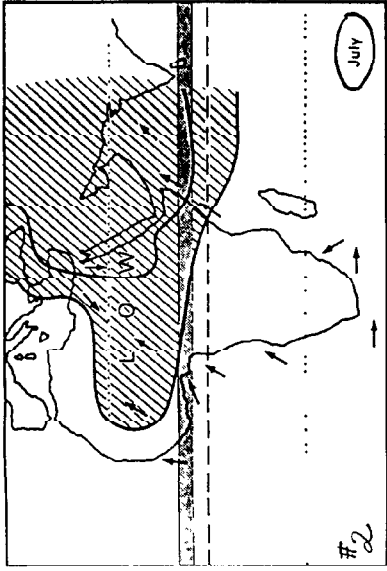
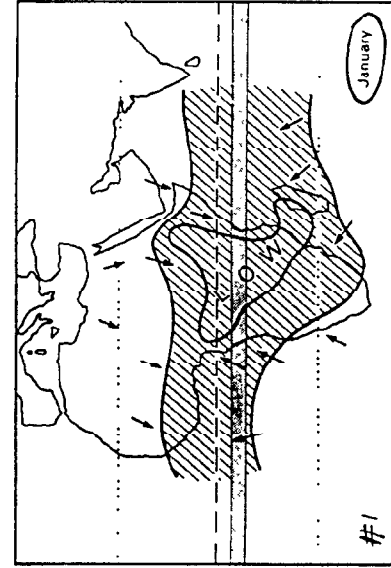
(15) How can homes and cities be designed to deal with heavy rain?
*Homes: adequate drainage away from homes with roof overhangs.
 Cities need to avoid building in low areas + provide drainage.*

FINAL ANSWERS: MATCH the STATIONS to these three Nigerian cities:

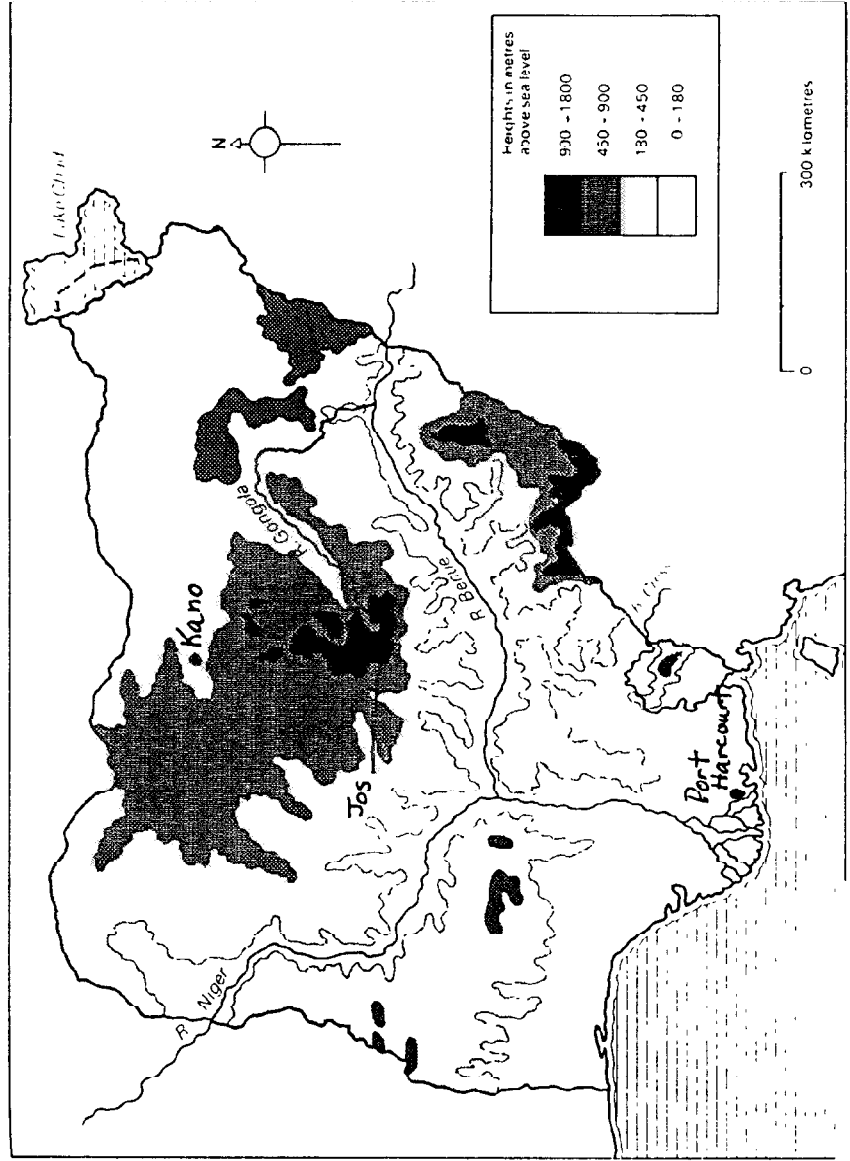
Kano 12 N Port Harcourt 5 N Jos 9 N

Station 1	Station 2	Station 3
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Diagrams 1 and 2 show wind direction in January and July.



Location of Nigeria in Africa



Physical Map of Nigeria

Climate Data Tables For Three Nigerian Locations

Station 1		
	F ^o	Precip.
J	70.9	0
F	74.7	0
M	80.8	0.1
A	86.6	0.4
M	87.0	2.5
J	84.2	4.4
J	79.2	8.0
A	77.4	12.4
S	78.7	5.0
O	80.8	.5
N	76.8	0
D	72.0	0

Station 2		
	F ^o	Precip.
J	80.7	1.2
F	82.1	2.3
M	82.4	5.0
A	81.9	7.5
M	80.8	9.9
J	79.4	13.3
J	77.8	12.9
A	78.0	12.3
S	78.6	15.5
O	79.2	10.7
N	80.2	5.5
D	80.2	1.8

Station 3		
	F ^o	Precip.
J	69.6	0.1
F	72.5	0.1
M	75.7	1.0
A	77.4	3.5
M	75.2	7.9
J	72.2	9.1
J	69.6	12.9
A	68.6	11.6
S	70.4	8.4
O	72.2	1.6
N	71.9	0.1
D	69.8	0.1

Total Precip:

Total Precip:

Total Precip:

Avg. Temp:

Avg. Temp:

Avg. Temp:

Range of Temp:

Range of Temp:

Range of Temp:

(subtract to find the difference between highest & lowest monthly average)

(subtract to find the difference between highest & lowest monthly average)

(subtract to find the difference between highest & lowest monthly average)

source. Udo, Ken Geographical Regions of Nigeria, University of California Press, 1970 p. 3

Understanding Climate Graphs & Human Adaptation to Climate in Tropical Areas

Plot the data on the attached climate graphs. Make a line graph for temperature; a bar graph for precipitation. With a pencil or colored pencil, lightly shade the rainy season (months with 2.5" or greater) at each station. Then, calculate the total precipitation, average temperature and range of temperature at each station. List those numbers in the space above.

- (1) At which station are average temperatures warmest? _____
At which station are average temperatures coolest? _____
- (2) At which station is the range of temperature the greatest? _____
At which station is the range of temperature the smallest? _____
- (3) Which station is the wettest? _____ The driest? _____
- (4) Compare the number of rainy season months:

Station 1	Station 2	Station 3
- (5) Examine the wind direction maps.
Which city would be wettest? _____ Why?

- (6) (use physical map) What city has the highest elevation? _____
 Which station is the coolest? _____
 Does temperature rise or fall as elevation increases?
- (7) Areas with average monthly temperatures greater than 64.4 do not have "winter" as defined by Koopen, a geographer. Name some plants that could grow only in areas without winter.

- (8) Besides sunshine and warm temperatures, what else is needed for crops to grow? _____

- (9) In what months would there be enough moisture to plant crops in each place?

Station 1	Station 2	Station 3

- (10) If a crop requires 90 days to mature, which stations may have a long enough growing season and moisture to grow two 90-day crops?
- (11) Summarize: All of these cities are in tropical areas (5 N - 8 N). Explain how climate is not the same in all tropical areas.

- (12) In subsistence agriculture, food is grown and stored by each grower. Which months at each station are likely to be in the "hungry season"-- where new crops are not yet mature, but last year's supply is gone?

Station 1	Station 2	Station 3

- (13) In what months at each station might people have to conserve or use stored water if deep wells are unavailable?

Station 1	Station 2	Station 3

- (14) At each station, flooding may occur in what months ?

Station 1	Station 2	Station 3

- (15) How can homes and cities be designed to deal with heavy rain?

FINAL ANSWERS: MATCH the STATIONS to these three Nigerian cities:

Kano 12 N Port Harcourt 5 N Jos 9 N

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Blank Climographs

