

TOMORROW Magazine Volume 1: Houston 2035

Environmental Education Program

POPULATION AGE STRUCTURE DIAGRAMS – Teacher Instructions

Introduction: To project population numbers for different areas, demographers look at the profile of the areas residents. Graphs such as these also indicate the impact of events, such as natural disasters, immigration, wars, drought...etc, on populations. The marketing industry uses demographic data to develop strategies for target populations. Students will compare age structure diagrams of Houston, Harris County, Texas, and the country and suggest reasons for differences in the patterns.

Objectives:

- Calculate percentages for each age group in a given population.
- Construct a population age distribution graph for one of the regions.
- Compare the distribution and growth patterns between regions.
- Identify what factors that affect population growth may account for regional differences.
- Correlate the shapes of the graphs with growth patterns.
- Make predictions on future population growth patterns.

Materials:

Student Page and Reflection Questions; one of the population charts;
Calculator, graph paper, ruler, pencils; or computer access

Procedure:

1. Assign each student or a group of students the data for one region.
2. The figures in one column on the worksheet represent the population of each age group for an area. Students must first calculate the percentage of the population of each gender in each age group. This step may be eliminated if you provide the students the second chart which has the percentages already calculated.
3. Students can use graph paper or an Excel spreadsheet on the computer to construct a population age structure diagram or bar graph. This graph will be a modified version of what you see for most age structure diagrams because the sexes are not differentiated. The age groups will run up the Y axis with the youngest at the bottom, oldest at the top. The percentages of the population will be plotted along the X-axis.
4. Notice that the age group distribution for the under 5 year old category is different than the rest of the intervals of 10 years. This will make the bar for this age bracket about half the size of the rest of the bars.
5. Have students compare age distribution diagrams from each region in small groups or as a class.
6. In class or small group discussion, suggest reasons that may account for differences between the regional graphs.
7. Correlate differences in the graphs with differences in growth patterns.
8. Make predictions comparing the future population growth rate for each region. Which is growing faster?
9. Utilize the reflection questions for independent student work, group work, or as a basis for class discussion.

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POPULATION DATA CHARTS

(Without Percentages Calculated)

POPULATION (2000) – Source: U.S. Census Bureau								
Age Group	Houston		Harris Co.		Texas		USA	
	Population	%	Population	%	Population	%	Population	%
Under 5	160,797		281,361		1,624,628		19,175,798	
5 to 14	294,329		547,601		3,285,376		41,077,577	
15 to 24	300,516		507,436		3,175,636		39,183,891	
25 to 34	354,444		573,939		3,162,083		39,891,724	
35 to 44	305,738		562,437		3,322,238		45,148,527	
45 to 54	235,249		436,575		2,611,137		37,677,952	
55 to 64	79,055		139,393		896,521		24,274,684	
65 to 74	59,438		98,941		701,669		18,390,986	
75 to 84	93,086		146,123		1,142,608		1,236,180	
85 and older	53,439		81,199		691,984		4,239,587	
TOTAL	1,953,631	100	3,400,578	100	20,851,820	100	281,421,906	100
Male	975,551	49.9	1,693,882	49.8	10,352,910	49.6	138,053,563	49.1
Female	978,080	50.1	1,706,696	50.2	10,498,910	50.4	143,368,343	50.9

(With Percentages Calculated)

POPULATION (2000) - Source: U.S. Census Bureau								
Age Group	Houston		Harris Co.		Texas		USA	
	Population	%	Population	%	Population	%	Population	%
Under 5	160,797	8.2	281,361	8.3	1,624,628	7.8	19,175,798	6.8
5 to 14	294,329	15.1	547,601	16.1	3,285,376	15.7	41,077,577	14.6
15 to 24	300,516	15.4	507,436	14.9	3,175,636	15.2	39,183,891	13.9
25 to 34	354,444	18.1	573,939	16.9	3,162,083	15.2	39,891,724	14.2
35 to 44	305,738	15.6	562,437	16.5	3,322,238	15.9	45,148,527	16.1
45 to 54	235,249	12	436,575	12.8	2,611,137	12.5	37,677,952	13.3
55 to 64	79,055	4	139,393	4.1	896,521	4.3	24,274,684	8.6
65 to 74	59,438	3	98,941	2.9	701,669	3.4	18,390,986	6.5
75 to 84	93,086	4.8	146,123	4.3	1,142,608	5.5	1,236,180	4.4
85 and older	53,439	2.7	81,199	2.4	691,984	3.3	4,239,587	1.5
TOTAL	1,953,631	100	3,400,578	100	20,851,820	100	281,421,906	100
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Data: U.S. Census Bureau, <http://factfinder.census.gov>

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The mission of Houston Tomorrow is to improve the quality of life in the Houston region.

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POPULATION AGE STRUCTURE DIAGRAMS – Student Page

Introduction: To project population numbers for different areas, demographers look at the profile of the areas residents. Graphs such as these also indicate the impact of events, such as natural disasters, immigration, wars, drought...etc, on populations. The marketing industry uses demographic data to develop strategies for target populations. Students will compare age structure diagrams of Houston, Harris County, Texas, and the country and suggest reasons for differences in the patterns.

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- Make predictions on future population growth patterns.

Materials:

Student worksheet (reflection questions and data sheet)

Calculator, graph paper, ruler, pencils; or computer access

Procedure:

1. Calculate the percentages of total population for each age category in the region assigned to you.
2. Construct an age structure diagram or bar graph. The age groups will run up the Y axis with the youngest at the bottom, oldest at the top. The percentages of the population will be plotted along the X-axis.
3. This graph will be a modified version of what you see for most age structure diagrams because the sexes are not differentiated.
4. Notice that the age group distribution for the under 5 year old category is different than the rest of the intervals of 10 years. This will make the bar for this age bracket about half the size of the rest of the bars.
5. Compare age distribution diagrams from each region.
6. Suggest reasons that may account for differences between the regional graphs.
7. Correlate differences in the graphs with differences in growth patterns.
8. Make predictions comparing the future population growth rate for each region.
9. Answer the reflection questions on the back of this page.

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Reflection Questions:

1. What are the steps you used to calculate a percentage?
2. Regarding the age distribution graph that you constructed, which age group has the largest percentage of the population? Is this the same for all of the graphs?
3. Which region exhibits a younger population over all?
4. What patterns in birth rate, death rate, and immigration rates might account for this difference?
5. What other factors might account for differences between these regional graphs, such as education levels, economic levels, or race differences?
6. How could you document a correlation between these factors (identified in the previous question) and differences in population distribution patterns?
7. Which region would you predict has a higher growth rate? Why?
8. If you were interesting in marketing a new type of TV, would you design your marketing strategies differently for the Houston region than your national campaign?
9. Look at the data chart. What do you think accounts for the difference between male and female percentages within the populations?