TECHNIQUES HOW TO ENHANCE VISUAL DATA ANALYSIS AND ITS DESCRIPTIONS

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Abstract: This article discusses the essential techniques in writing visual data such as graphs, process writing and map descriptions.Moreover, in this article 3 types of visual data description are analyzed. Examples are also given for each type of the visual data in this research work.

Keywords: visual data, bar graph, pie chart, bar chart.

1.INTRODUCTION

Now and then, graphs and charts are great because they communicate information visually. For this reason, graphs are often used in newspapers, magazines and businesses around the world, meanwhile, visual data can be an insurmountable problem for learners. There's too much of it, too little time to apprehend it, or one simply can't see the data. If so, visual data analysis can help make sense of it all, by combining data analytics and data visualization techniques. However, it can be arduous to see the big picture or how one set of data relates to another. Visualization tools by themselves may make static mishaps and presentations of data easy to grasp. Yet they may lack the ability to drill down, tweak or explore. There are different forms of visual data. In this article four forms of visual data techniques will be discussed. They are a line graph, a bar chart, a table and a pie chart.

There are two ways of visual data description;

1. Language of changes which requires verb+adverb structure and adjective+noun structure.

2. Language of compare and contrast which requires comparative and superlative forms of adjective structure.

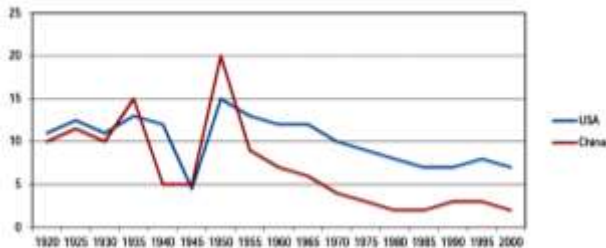### How to describe LINE GRAPHS and What is a trend?

The language of changes

A line graph is useful in displaying data or information that changes continuously over time. The points on a line graph are connected by a line. Another name for a line graph is a line chart.

Technique 1. Distinguishing the various parts of a line graph.

✓ *Title*: The title of the line graph tells us what the graph is about.

✓ *Labels*: The horizontal label across the bottom and the vertical label along the side tells us what kinds of facts are listed.

✓ *Scales*: The horizontal scale across the bottom and the vertical scale along the side tell us how much or how many.

✓ *Points*: The points or dots on the graph show us the facts.

Birth Rates in China and the USA

✓ **Lines**: The lines connecting the points give estimates of the values between the points.

What is a trend?

Trends are the *changes* or *movements* in facts and figures over a period of time.

There may be upward and downward trends. Trends may happen at different pace and with different momentum. Trends can be described by verbs, nouns, adjectives and adverbs. To describe line graphs we need to use the first structure. It is the language of changes.

Structure. For learners it is too important to know the structure. They do not have to describe all information word by word. In three-phase structure, there is an introduction, body, conclusion. they should choose information by comprehensive but selective, logical and usually chronological: using connective words; describing the trends period by period
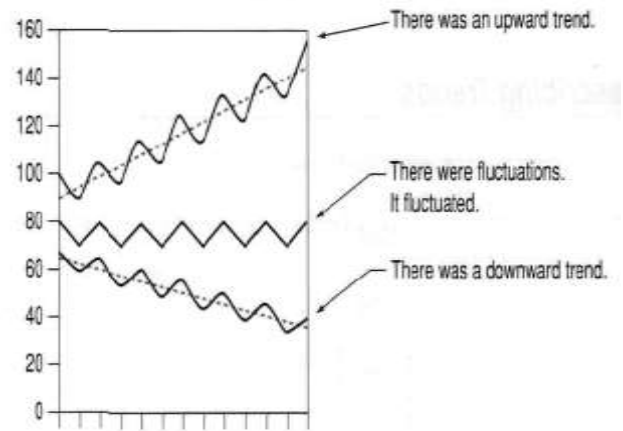
Technique 2. Using sentence structure accurately

In three-phase structure:	
Introduction:	**1 paragraph, 2 standard opening sentences, present (past tense, sometimes future tense)**
Body:	**1-3 paragraphs, past/present perfect tense**
Conclusion:	**1 paragraph, 1-2 sentences, past tense**

Choosing information	
Comprehensive	**describe the whole graph fully**
Selective	**focus on the major trends only, divide the graph into main parts**

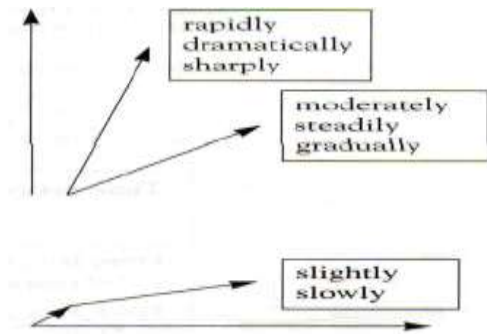| Language of changes (trends) MODEL SENTENCE STRUCTURES (according to the IELTS assessment system)		
Sentence 1	IELTS 5	There graph shows some similarities between the birth rates of China and the USA from 1920 to 2000.
	IELTS 6	The graph provided reveals some surprising similarities between the Chinese and the US birth rates during the period from 1920 to 2000.
	IELTS 7+	A glance at the graph provided reveals some striking similarities between the Chinese and the US birth rates during the period from 1920 to 2000.
Sentence 2	IELTS 5	Clearly, the birth rates of both countries fluctuated dramatically, with lows in the 1940sand highs in the 1950s.
	IELTS 6	It is evident that the fertility rates of both nations fluctuated considerably, with lows during the 1940s and highs during the 1950s.
	IELTS 7+	It is evident that both nations saw considerable fluctuations in fertility, with lows during the

			1940s and highs during the 1950s.
Sentence 3	IELTS 5		First, China's birth rate increased from about 10 percent in 1920 to 15 percent in 1935. Then it decreased sharply to just 5 percent in the 1940s.
	IELST 6		China's birth rate increased from approximately 10 percent in 1920 to 15 percent in 1935, then plunged to a low of just 5 percent in the 1940s.
	IELTS 7+		Increasing from approximately 10 percent in 1920 to 15 percent in 1935, China's birth rate then plunged to a low of just 5 percent in the 1940s.
Sentence 4	IELTS 5		IELTS 5 Then the US birth rate increased markedly to over 15 percent in 1950.
	IELST 6		There was then a marked increase in the US fertility to over 15 percent in 1950.
	IELTS 7+		IELTS 7+ The US then saw a marked increase to over 15 percent in 1950.

The forms of line graph

160	There was an upward trend.
140	
120	
100	There were fluctuations. It fluctuated.
80	
60	There was a downward trend.
40	
20	
0	

Academic vocabulary				
Verbs to describe downward movement	Verbs to describe upward movement	Verbs to describe stability	Adjectives to specify the pace or degree of changes	Connective words
Decline Decrease Drop Fall Slide Weaken Lose Ground Dive Plummet Plunge Crash Collapse Take a fall	Grow Rise Increase Climb Gain Strengthen Surge Jump Soar Rocket Go through the roof	Flatten Out Hold Steady Level Off Even Off Bottom Out Stabilise Recover Bounce Back Rally	Slow Gradual Steady Slight Moderate Marginal Rapid Fast Sharp Dramatic Exponential Heavy Massive Enormous Remarkable Nervous Perilous Disastrous Heavy Massive Enormous Remarkable Nervous Perilous Disastrous	The graph shows … The graph represents As can be seen from the graph, As indicated by the graph, However, In contrast, In comparison, After, before, until In sum, To sum up, In concluding, In conclusion, From the graph it can be safely concluded that… We are safe in concluding that …

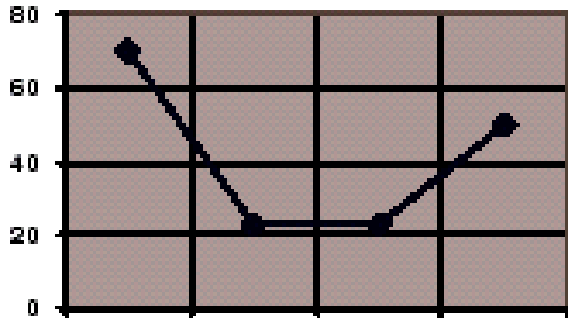*The forms of adverbs to describe changes*

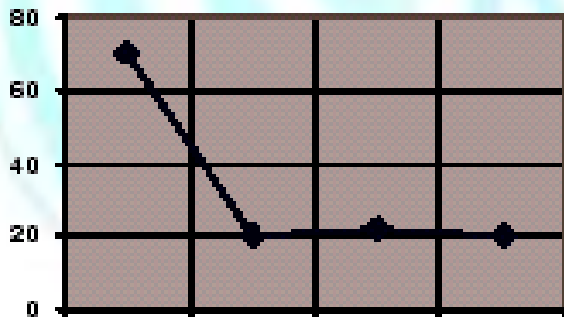*Technique 3. Using Academic vocabulary and grammar structure properly*

Here we have some examples for a line graph.

Example 1. After a considerable drop in the first two quarters, production bottomed out at 20. Since then it has started to bounce back, reaching 50 in the last quarter.

Example 2. There was a rapid drop in production (from 70 to 20) in the first quarter, but it bottomed out at about 20 in the remainder of the year.

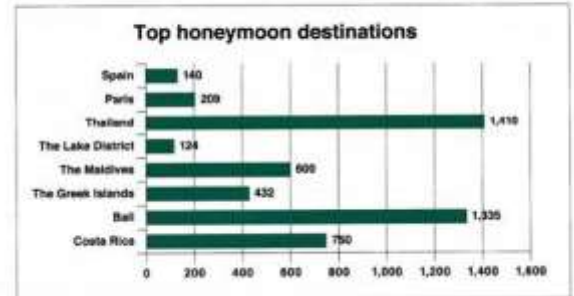## How to describe BAR GRAPHS, PIE CHARTS and TABLE?
The language of COMPARE AND CONTRAST

Technique 2. How to describe Bar Graphs and Pie Charts

Bar Graphs display data by using bars of equal width on a grid. The bars may be vertical or horizontal. Bar graphs which employing rectangles (bars) that are placed in parallel are used for comparisons.
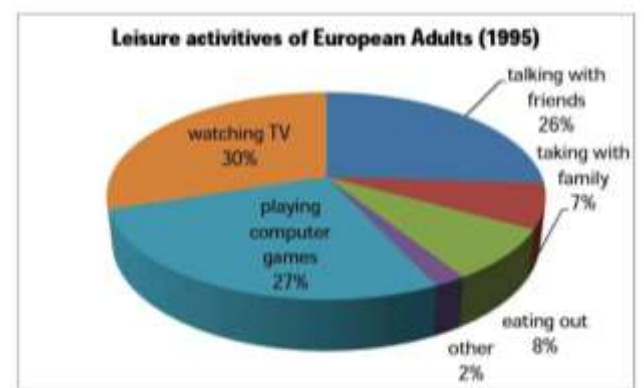
Bar graph

This chart shows the top eight honeymoon destinations for newlywed British couples in 2010. The results come from a survey of 5,000 couples.

The height indicates the frequency of that data. Bar charts allow numerical information in a clear and orderly manner, to communicate it to others. With the information displayed on graphs the learner can quickly and visually interpret the information, facilitating further analysis. A bar graph is useful for comparing facts. The bars provide a visual display for comparing quantities in different categories. Bar graphs help us to see relationships quickly. Another name for a bar graph is a bar chart. Each part of a bar graph has a purpose;

✓ *Title:* The title tells us what the graph is about.
✓ *Labels:* The labels tell us what kinds of facts are listed.
✓ *Bars:* The bars show the facts.
✓ *Grid lines*: Grid lines are used to create the scale.
✓ *Categories:* Each bar shows a quantity for a particular category.

Circle graph/pie chart

It is a circle diagram that visually represents information into imaginary slices of cake. A circle graph, or a pie chart, is used to visualize information and data. A circle graph is usually used to easily show the results of an investigation in a proportional manner by "%". Reading a pie chart is as easy as figuring out which slice of an actual pie is the biggest. A learner will see that some data have larger slices than others. So he can easily decipher which data is more important to his audience than others.

What are tables and graphs? Tables and graphs are visual representations. They are used to organise information to show patterns and relationships. A graph shows this information by representing it as a shape. Researchers and scientists often use tables and graphs to report findings from their research.

What is a chart table?

A **table chart** is a technique of arranging data in rows and columns. The use of **tables** is spreading widely throughout an area or a group of people throughout all communication, research and data analysis.

When a learner has such visual data presentation (pie charts, bar graphs or chart tables), he should use the language of compare and contrast; comparative and superlative forms of adjectives and adverbs. He should have a range of vocabulary how to describe percentages, linking devices. The following table represents useful language for learners.

The table below provides statistics on several major metro (MRT) systems around the world.

Summarise the information by selecting and reporting the main feature and make comparisons where relevant.

Write at least 150 words

City	Year completed	Total length (km)	Carrying capacity per year (millions)
London	1863	1100	548
Paris	1890	594	850
Tokyo	1904	149	1434
Washington DC	1921	114	70
Kyoto	1980	11	11
Los Angeles	2001	14	90

Language of compare and contrast MODEL SENTENCE STRUCTURES (according to the IELTS assessment system)		
Sentence 1	IELTS 5	Interestingly, the newer metro systems are *shorter than* the older ones
	IELTS 6	It is interesting to note that the more recently established metro systems are *far shorter* than the older ones.
	IELTS 7+	One particularly interesting fact highlighted by the figure is that the more recently established metro systems are *considerably shorter than* the older ones.
Sentence 2	IELTS 5	The London metro was finished in 1863. It is the *oldest* metro system in the table and also the longest, at 1100 *kilometres.
	IELTS 6	The London underground was completed in 1863. It is the *oldest* of the metro system listed and also the *longest*, stretching for 1100 kilometres.
	IELTS 7+	Completed in 1863, the London underground is the *oldest* of the metro system listed and also the *longest*, extending for 1100 kilometres.
Sentence 3	IELTS 5	The metro systems mentioned in the table are very different in terms of how many passengers they can transport each year.
	IELST 6	The metro systems mentioned vary greatly with regard to yearly

		carrying capacity
	IELTS 7+	With regard to yearly carrying capacity, the metro systems mentioned in the table vary greatly.
Sentence 4	IELTS 5	At the same time, the Paris metro can transport the second *largest* number of people, at 850 million.
	IELST 6	Meanwhile, the Paris metro has the second largest carrying capacity, at 850 million.
	IELTS 7+	With 850 million, meanwhile, the Paris metro has the second *largest* carrying capacity.

In conclusion we can say that, using visual data description while showing presentations is important because people usually comprehend the information when they see it with their eyes. All this information will be helpful for young learners who have just taken in acquiring this knowledge.

The list of words which are useful in visual data description

Significant	To dip	Lowest point
Rapid	To go down	Compare to
Dramatic	To plummet	In comparison with
Considerable	A decrease	Relative to
Sharp	A fall	Second/third highest/lowest
Sudden	A decline	Approximations
Steep	A drop	Approximate more less
Significantly	A dip	Roughly
Rapidly	Upward & downward movements	Approximately
Dramatically	Verbs nouns	Almost
Considerably	To fluctuate	Nearly
Sharply	To vary	About
Suddenly	A fluctuation	Around
Steeply	A variation	Exactly
Slight	Little or no change	More than
Slow	Verbs nouns	Well over
Steady	To remain the same	Just above
Gradual	To remain static	Just over
Moderate	To remain unchanged	A little more than
Marginal	To stabilize	A large proportion
Slightly	To level out	A significant majority
Slowly	A period of stability	Less than
Steadily	Collocations	Well below
Gradually	Verb – adverb adjective + noun	Just below
Moderately	Increased significantly	Just under
Marginally	Rose steeply	Slightly less than
To increase	Improved considerably	A small proportion
To rise	Jumped suddenly	A insignificant minority
To improve	Fluctuated slightly	Percentages
To grow	Fell rapidly	6% - a small proportion
To climb	Dropped dramatically	23% - just under a quarter
To jump	Dipped sharply	27% - approximately a quarter
To peak	A dramatic improvement	48% - almost a half
To go up	A sudden increase	50% - exactly a half
An increase	A rapid rise	53% - more than half
A rise	A steady growth	72% - slightly less than three quarters
An improvement	A slight fluctuation	77% - roughly three quarters
Growth	A gradual decrease	85% - well over three quarters
A climb	A steep drop	98% - a significant majority
A jump	A sharp decline	
A peak		
Downward movement	Other useful phrases	
Verbs nouns	Upward trend	
To decrease	Downward trend	
To fall	Highest point	
To decline		
To drop		

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