JOSE MARTI TECHNICAL HIGH SCHOOL PROUDLY CELEBRATES 41 YEARS 1977-2018

José Martí awardees and past students at the school's 41st Founders' Day celebrations.

Arranging business travel

HYACINTH TUGMAN
Contributor

ALTHOUGH TECHNOLOGY is providing opportunities for meetings to be held via electronic media, there still will be occasions when travel is necessary in order to conduct a company's business.

One of the many duties one may be asked to do in the office is to make travel arrangements, especially when employed as an assistant administrator. This needs to be done accurately with the objective of having everything accomplished on time, accurately and efficiently.

The traveller should be able to concentrate on the purpose of the trip and be able to create a positive image of the organisation without worry.

MAKING ARRANGEMENTS FOR TRAVEL

1. RESERVATIONS

All the necessary travel information should be on hand before the reservation is made. This includes:
- Name of traveller.
- Private and business addresses and telephone numbers.
- Purpose of travel.
- Type of carrier.
- Places to be visited.
- Dates of departure and return.
- Times of travel.
- Overnight accommodation.
- How accounts are to be paid.
- Transportation (if required) locally and overseas.

Reservations should be made through a travel agency by giving accurate information. Preparations for reservations made without the help of travel agencies are usually complex. The agency will provide confirmation, giving the check-in time, travel time and arrival time.

DETERMINING TIME ACCORDING TO LOCATION

International flights are usually shown by the 24-hour clock. It is, therefore, important to be familiar with the way in which time is recorded and be able to convert either way.

Examples: 1700 hours would convert to 5 p.m.
11:20 p.m. would convert to 2320 hours.

Hotel reservations should be made as soon as possible. These are normally made by telephone and confirmed in writing. When hotel reservations are made, the name, address and telephone number of the guest should be given and the name of the caller given as reference.

2. PREPARING THE ITINERARY

A travel itinerary must be prepared, especially when several destinations are to be covered in the same trip. The information should be organised so that the purpose of the trip is clear. The itinerary should give the route to be taken, where the individual is staying and should also give a brief description of the specific activities with times, dates and locations.

Departure and arrival times should be detailed, hotels listed, and confirmed reservations indicated. An itinerary should be logically and neatly arranged.

Here is an example of an itinerary.

ITINERARY FOR MR B. FRANCIS
MONDAY, JANUARY 29

0900 hours	Depart head office by car
0945 hours	Arrive Norman Manley Airport for check-in
1055 hours	Depart Norman Manley
1540 hours	Arrive Amsterdam – met by Mr Harris and driven to Ritz Hotel, Dam Place
1630 hours	Dinner at Ritz with Dutch exporters
	Overnight at Ritz Hotel

TUESDAY, JANUARY 30

1000 hours	Meeting at Ritz with Dutch agents
1300 hours	Luncheon at Den Haag Restaurant with Amsterdam Chamber of Commerce
1515 hours	Check-in at Schiphol Airport
1550 hours	Depart Schiphol Airport
2040 hours	Arrive Norman Manley

3. PREPARING THE TRAVEL FOLDER

It is important that the items chosen for the travel folder be appropriate for the specific situation. These include:
- Tickets, itinerary maps, confirmation of letters for accommodation, relevant documents, for example, speeches and handouts.
- Names, addresses, telephone numbers, job designations and business names of all persons with whom appointments have been made, confirmation of rental cars, emergency numbers, travellers' cheques, foreign currency, passport, visa, tax clearance certificate, expense sheets.

Junior Gooden (left) and Cyril Hinds took on the job of defending the good name of their school, Brown's Town High.

4. DOCUMENTS REQUIRED FOR TRAVEL

These include passport, visa, entry permit, health certificate (if required), tax clearance certificate (where necessary).

I will define for you two of the required documents.

- Passport – A passport is an official identification document issued by a government after the appropriate documents have been submitted. Passports are necessary for immigration purposes.
- Visa – This is a special document required by some countries prior to entry. Visas are usually obtained from the embassy of that country, prior to embarkation. These countries will not allow a traveller to enter the country unless a passport and visa are offered as identification.

Continue to study hard and have a good week.

The role of the stock exchange

YVONNE HARVEY
Contributor

GOOD DAY to you all. So how did you fare with the putting together of your personal budgets? I hope you made them as realistic as possible, and even though times are tough, you still budgeted something for savings.

The topic under consideration this week is from the section of the Business Finance syllabus which we started a few weeks ago. Many persons have heard about stock exchanges, but they do not know very much if anything about them. If you are in that situation, I hope that after reading this lesson you will be more enlightened on the topic.

A stock exchange (formerly a securities exchange) is a corporation or mutual organisation which provides 'trading' facilities for stockbrokers and traders to trade stocks and other securities. Stock exchanges also provide facilities for the issue and redemption of securities as well as other financial instruments and capital events, including the payment of income and dividends.

The securities traded on a stock exchange include shares issued by companies, unit trusts, derivatives, pooled investment products, and bonds. To be able to trade a security on a certain stock exchange, it has to be listed there. Usually, there is a central location at least for record keeping, but trade is less and less linked to such a physical place, as modern markets are electronic networks, which gives them advantages of speed and cost of transactions. Trade on an exchange is by members only.

The initial offering of stocks and bonds to investors is, by definition, done in the primary market and subsequent trading is done in the secondary market. A stock exchange is often the most important component of a stock market. Supply and demand in stock markets are driven by various factors which, as in all free markets, affect the price of stocks.

Stock exchanges have multiple roles in the economy and may include the following:

RAISING CAPITAL FOR BUSINESSES

The stock exchange provides companies with the facility to raise capital for expansion through selling shares to the investing public.

MOBILISING SAVINGS FOR INVESTMENT

When people draw their savings and invest in shares, it leads to a more rational allocation of resources because funds, which could have been consumed, or kept in idle deposits with banks, are mobilised and redirected to promote business activity with benefits for several economic sectors such as agriculture, commerce and industry, resulting in stronger economic growth and higher productivity levels and more productive firms.

FACILITATING COMPANY GROWTH

Companies view acquisitions as an opportunity to expand product lines, increase distribution channels, hedge against volatility, increase market share, or acquire other necessary business assets. A takeover bid or a merger agreement through the stock market is one of the simplest and most common ways for a company to grow by acquisition or fusion.

REDISTRIBUTION OF WEALTH

Stock exchanges do not exist to redistribute wealth. However, both casual and professional stock investors, through dividends and stock price increases that may result in capital gains, will share in the wealth of profitable businesses.

CORPORATE GOVERNANCE

By having a wide and varied scope of owners, companies generally tend to improve on their management standards and efficiency in order to satisfy the demands of these shareholders and the more stringent rules for public corporations imposed by public stock exchanges and the government. Consequently, it is alleged that public companies (companies that are owned by shareholders who are members of the general public and trade shares on public exchanges) tend to have better management records than privately held companies (those companies where shares are not publicly traded, often owned by the company founders and/or their families and heirs, or otherwise by a small group of investors).

CREATING INVESTMENT OPPORTUNITIES FOR SMALL INVESTORS

As opposed to other businesses that require huge capital outlay, investing in shares is open to both the large and small stock investors, because a person buys the number of shares he or she can afford. Therefore, the stock exchange provides the opportunity for small investors to own shares of the same companies as large investors.

## GOVERNMENT CAPITAL RAISING FOR DEVELOPMENT PROJECTS

Governments at various levels may decide to borrow money in order to finance infrastructure projects, such as sewage and water treatment, works or housing estates, by selling another category of securities known as bonds. These bonds can be raised through the stock exchange whereby members of the public buy them, thus loaning money to the government. The issuance of such bonds can obviate the need to directly tax the citizens in order to finance development. Although securing such bonds with the full faith and credit of the government instead of with collateral, the result is that the government must tax the citizens or otherwise raise additional funds to make any regular coupon payments and refund the principal when the bonds mature.

BAROMETER OF THE ECONOMY

At the stock exchange, share prices rise and fall depending, largely, on market forces. Share prices tend to rise or remain stable when companies and the economy in general show signs of stability and growth. An economic recession, depression or financial crisis could eventually lead to a stock market crash. Therefore, the movement of share prices and, in general, of the stock indexes can be an indicator of the general trend in the economy.

Do you feel a little more enlightened? Good! Next week, we will cover another topic from this same section of the syllabus. When the entire section is complete, I will present a simple test so you can see how well you have grasped the topics in this section. Bye for now.
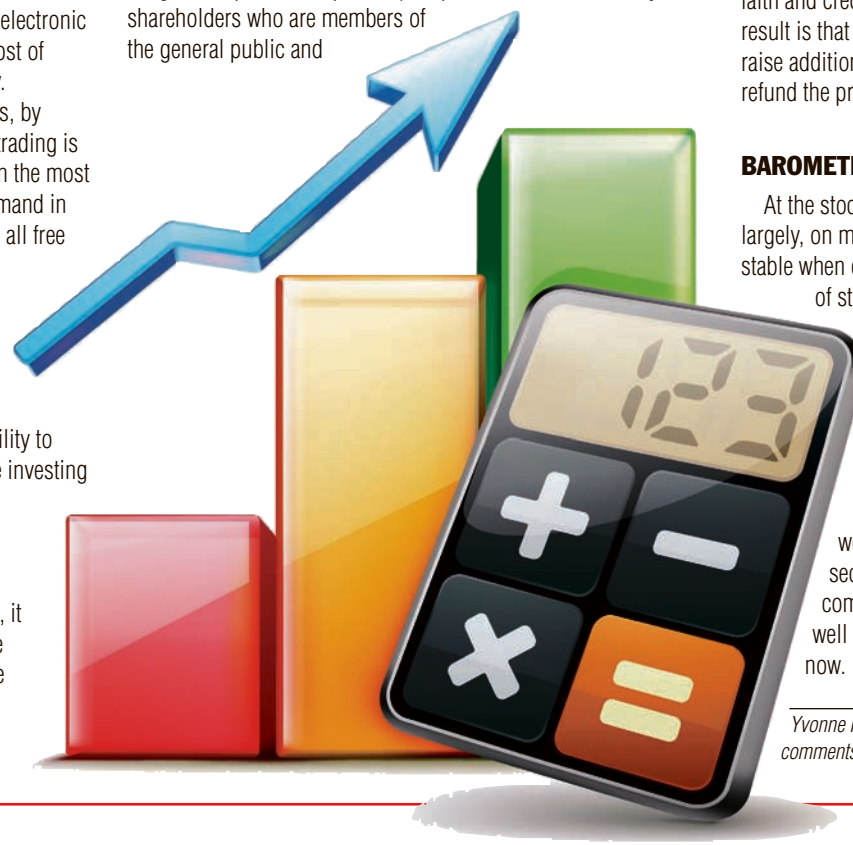
Accounting ratio and interpretation of final accounts

ROXANNE WRIGHT
Contributor

THIS WEEK, I will focus on another topic on your external syllabus. I recommend that you remember the concepts and certainly how and when to apply each.

Concepts	Definitions	Formulae
Mark-up	• Profit as a percentage of cost of goods sold • Indicates the amount to be added to the cost to ascertain the selling price	$\frac{\text{Profit} \times 100}{\text{Cost of goods sold}}$
Margin	• This is gross profit percentage of sales. • It is expressed as a percentage of sales. • It indicates the gross profit earned for each dollar of sales in a year.	$\frac{\text{Profit} \times 100}{\text{Sales}}$
Working Capital	• This is the capital which is used to meet the day to day expenses related to the running of the business. • It's important to have sufficient amount of working capital to enable trade without financial difficulties.	Current Assets – Current Liabilities
Working Capital Ratio OR Current Ratio	• This ratio shows the extent of financial stability. • Too high working capital may mean idle cash or under trading. • Too low may mean buying much more than can be sold. in this case the firm needs to reduce purchases and increase sales.	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$
Liquid Ratio OR Acid Test Ratio OR Quick Ratio	• Stock has to be excluded since it's difficult to convert stock into cask quickly. • This ratio compares liquid assets with current liabilities. • It can be used to reflect the solvency position of the firm.	$\frac{\text{Current Assets – Stock – Prepayments}}{\text{Current Liabilities}}$
Net Profit Percentage	• This has a particular value in controlling expenses. • Whenever gross profit percentage remains constant a decrease in net profit percentage shows that expenses have increased.	$\frac{\text{Net Profit} \times 100}{\text{Turnover}}$
Stock Turnover OR Rate of Stock Turnover	• This is the number of times in a year that stock is sold. • it measures the speed at which stock is cleared. • the rate of stock turnover may vary from commodity traded to commodity traded e.g. newspaper vendors clears stock every day. While, a furniture store stock turnover may reflect a low turnover on a daily basis.	Rate of Stock Turnover= $\frac{\text{Cost of Goods}}{\text{Average stock}}$ Average Stock: = $\frac{\text{Opening Stock + Closing Stock}}{2}$
Return on Capital Employed	• This tells the businessman how much he is getting from his investment in the business. • the owner is able to compare it with his rate on return if he had invested in a bank.	Percentage = $\frac{\text{Net Profit} \times 100}{\text{Capital}}$
Debtor / Sales Ratio	• this is very important since it is resources tied up in debtors. • it assesses how long it takes the debtor to pay the firm.	No. of days = $\frac{\text{Debtors} \times 365 \text{ days}}{\text{Credit Sales}}$
Creditors/ Purchases Ratio	• This ratio assesses how long the business takes to pay their creditors.	No. of days = $\frac{\text{Creditors} \times 365 \text{ days}}{\text{Credit Purchase}}$

WORKED EXAMPLE

Question: Charles Balfour is in a business of buying and selling goods on credit. The following information is available:

	$
Cost of Sales	640000
Inventory at October 1, 2014	50000
Inventory at September 30, 2015	130000
Expenses	120000
Trade Receivables	140000
Trade Payables	150000
Bank Overdraft	30000
Mark-up	25%

You are required to calculate the following for the year ended September 30, 2015:
a. Profit for the year.
b. Rate of turnover of inventory.
c. Gross profit to sales percentage.
d. Net profit to sales percentage.
e. Working capital ratio/current ratio.

SOLUTION

	Formula	
a.	Gross Profit: = Cost of sales x mark-up	$640000 x 25% = $160000
	Profit for the year: =Profit - expenses	$160000 − $120000 = $40000
b.	Rate of Turnover : = $\frac{\text{Cost of Sales}}{\text{Average Stock}}$	Average Stock: $\frac{$50000+ 130000}{2} = 90000 = $\frac{$640000}{$90000} = 7.11 \text{ times}$
c.	Sales = Cost of Sales + Profit	$640000 + 160000 = $800000
	Gross Profit to Sales percentage: = $\frac{\text{Gross profit} \times 100}{\text{Sales}}$	$\frac{$160000 \times 100}{$800000} = 20\%$
d.	Net Profit: = Gross Profit - Expenses	$160000-120000=$40000
	Net Profit to sales percentage: = $\frac{\text{Net Profit} \times 100}{\text{Sales}}$	$\frac{$40000 \times 100}{$800000} = 5\%$
e.	Working Capital Ratio: = $\frac{\text{Current Asset}}{\text{Current Liabilities}}$	$\frac{$130000+140000 =$270000}{$150000+30000 = $180000}$ = $\frac{$270000}{$180000} = 1.5:1$

This is where we will end for this week. Come back next week as we continue to complete the syllabus. Grasp the concepts and retain them well. You will need them as you progress to excellence. See you next week.

*Roxanne Wright teaches at Immaculate Academy. Send questions and comments to **kerry-ann.hepburn@gleanerjm.com***

Preparation and properties of gas

FRANCINE TAYLOR-CAMPBELL
Contributor

BY WHAT METHODS ARE GASES USUALLY COLLECTED IN THE LABORATORY?

The method of collection of a gas depends on its solubility in water and its density. Gases that are insoluble or slightly soluble in water can be collected over water. Gases that are denser than air are collected by downward delivery, while those that are less dense are collected by upward delivery.
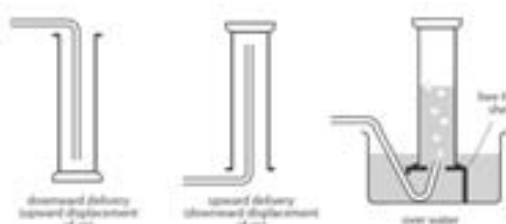
HOW IS OXYGEN PREPARED IN THE LABORATORY?

Use the diagram below to answer questions on the preparation of oxygen in the laboratory.
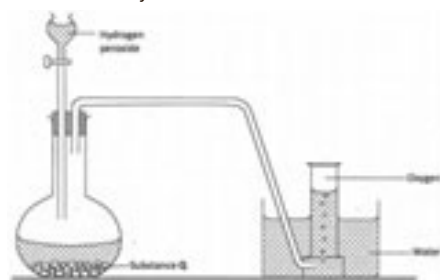
Identify substance Q and write an equation for the reaction with hydrogen peroxide.

Oxygen can be prepared in the laboratory from the decomposition of hydrogen peroxide. This process is slow, so a catalyst is usually added to speed up the decomposition process. The catalyst used is manganese (IV) oxide, which would be substance Q in the diagram. When the catalyst is added, the hydrogen peroxide breaks down to produce oxygen and water. The equation for the reaction is given below:

$2H_2O_2$ (l) $\rightarrow$ $2H_2O$ (l) + O_2 (g)

Remember: MnO_2 (catalyst) would not appear in the equation as it is unchanged at the end of the reaction.

WHAT IS THE METHOD OF COLLECTION OF THE OXYGEN GAS AND WHY?

The oxygen produced is collected by the downward displacement of water in a gas tube, and it is wet. To dry the gas, a drying agent such as concentrated sulphuric acid can be used to pass the gas through.

CITE THE PROPERTIES OF OXYGEN GAS THAT RELATE TO ITS USE.

Oxygen gas is colourless, odourless, tasteless and slightly soluble in water. It is, therefore, essential for breathing, especially for aquatic animals. It supports combustion and is important for the burning of fuels. The test for oxygen is that it relights or rekindles a glowing splint.

HOW IS CARBON DIOXIDE PREPARED IN THE LAB? WRITE THE EQUATION FOR THE REACTION.
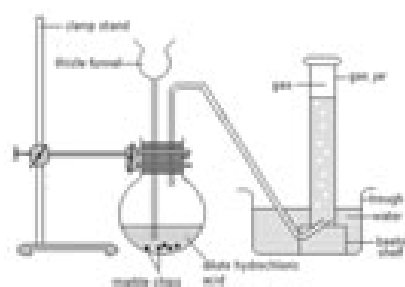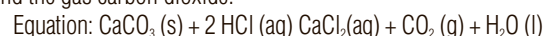

Diagram of Apparatus

In the laboratory, carbon dioxide is produced from the action of an acid on a carbonate. Reacting calcium carbonate (marble chips) with hydrochloric acid produces calcium chloride, water and the gas carbon dioxide.

Equation: $CaCO_3$ (s) + 2 HCl (aq) $CaCl_2$(aq) + CO_2 (g) + H_2O (l)

BY WHAT METHOD IS THE CO_2 GAS BEING COLLECTED IN THE DIAGRAM? HOW COULD THE GAS BE DRIED?

The wet gas is collected by the downward displacement of water. This is used for gases that are not very soluble in water. The gas could also be collected by downward delivery (displacement of air) as it is denser than air and so collects at the bottom.

In water, carbon dioxide produces a weakly acidic solution, carbonic acid.

CO_2 (g) + H_2O (l) $\rightarrow$ H_2CO_3 (aq).
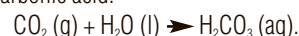
Since carbon dioxide is acidic, it can be dried by passing the wet gas through concentrated sulphuric acid.

WHAT ARE THE PROPERTIES OF CARBON DIOXIDE AND HOW CAN IT BE TESTED?

Carbon dioxide does not support combustion, so it is used in fire extinguishers. The gas, when cooled, forms dry ice (solid carbon dioxide) and is used as a refrigerant.

The test for carbon dioxide is that it turns calcium hydroxide (lime water) milky or cloudy. The cloudy appearance is due to the precipitation of calcium carbonate.

$Ca(OH)_2$ (aq) + CO_2 (g) $\rightarrow$ $CaCO_3$ (s) + H_2O (l)
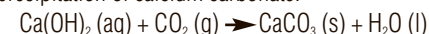
HOW IS AMMONIA PREPARED IN THE LABORATORY?

Ammonia is produced by the action of an alkali on an ammonium salt. When ammonium chloride and calcium hydroxide are heated, ammonia, calcium chloride and water are produced. The equation is given below:

$2NH_4Cl$ (s) + $Ca(OH)_2$ (s) $\rightarrow$ $2NH_3$ (g) + $CaCl_2$ (s) + $2H_2O$ (g)

NOTE: To dry the gas, calcium oxide (a base) is used instead of concentrated sulphuric acid or calcium chloride. Why? Ammonia is an alkaline gas and would react with the sulphuric acid.
$2NH_3$ (g) + H_2SO_4 (l) ? $(NH_4)_2SO_4$ (aq)
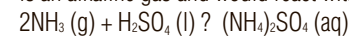
Ammonia also reacts with calcium chloride. Anhydrous calcium chloride is often used as a drying agent with neutral gases.

Why is ammonia collected by the upward delivery method?

Ammonia is very soluble in water and is also lighter than air. So, notice that it is collected by the method of upward delivery. Being alkaline, it will turn damp red litmus to blue. This is a test for the gas.

Ammonia dissolves in water to form a weak alkali, ammonium hydroxide. It is important in the formation of ammonium fertilizers and in the production of nitric acid.

How could hydrogen be prepared and tested in the laboratory? Write the equation for the reaction in the diagram.

Hydrogen can be obtained by the action of dilute acid on a metal. In the diagram, zinc and dilute hydrochloric acid react to produce a salt and hydrogen gas.

Equation: Zn (s) + 2 HCl (aq) $\rightarrow$ $ZnCl_2$ (aq) + H_2 (g)
The hydrogen produced can be tested with a lighted splint, which burns with a 'pop' (sound).

MONACIA WILLIAMS
Contributor

"The man who does not read has no advantage over the one who cannot read."

– Mark Twain

Nitrogen cycle

HOW ARE you this week? I hope you are in excellent health and spirit, willing and able to take on the world!

Last week, we began our study of nutrient cycles by taking a look at the carbon cycle. This week, we will be looking at the nitrogen cycle but, first, some recap.

Do you remember how we arrived at this point? Of course you do! We started out looking at soils and then discovered that soils had literally millions of organisms living in them, so we went on to look at the organisms living in the soil. We found out that these organisms fell into two groups, the detritivores and the decomposers.

I will pause here to let you know that some students have a difficulty in making a distinction between the two, but you, my readers, can free yourself from this confusion by bearing in mind that the detritivores are those organisms such as earthworms and woodlice that feed on partially decaying plant and animal material known as detritus. These detritivores feed on the organic matter, breaking it down further, and in so doing they increase the surface area of the material, enabling the next group, the decomposers, to complete their portion of the breakdown more easily. In other words, the decomposers complete the breakdown of the remnants of the organic compounds of dead and decaying organisms, as well as their wastes, to inorganic compounds, forming simple compounds that can be taken up by plants in the process. By doing this, the decomposers:

■ Allow for the reuse of certain elements and compounds.
■ Reduce the chances that these elements will be depleted.
■ Prevent the accumulation of substances which may become toxic or cause pollution.

Do you remember the types of organisms that fall into the category of decomposers? Did you say bacteria and fungi? If you did, then you are correct and are keeping up with the lessons! Remember that they are also known as saprophytes. What makes decomposers suitable for their role? Can you figure this out by yourself, using the knowledge that you have gained so far? Let me help you to organise your thoughts.

■ They do not have chlorophyll, so they cannot manufacture their own food.
■ They have the ability to secrete enzymes externally, which they use to digest the decaying material. Remember that the digestion is done externally, after which the end products of digestion diffuse into the organism.
■ They can respire anaerobically, hence, can live in conditions where there is a limited amount of oxygen.

Why have I given so much information on these organisms? I have done so because they happen to play very important roles in
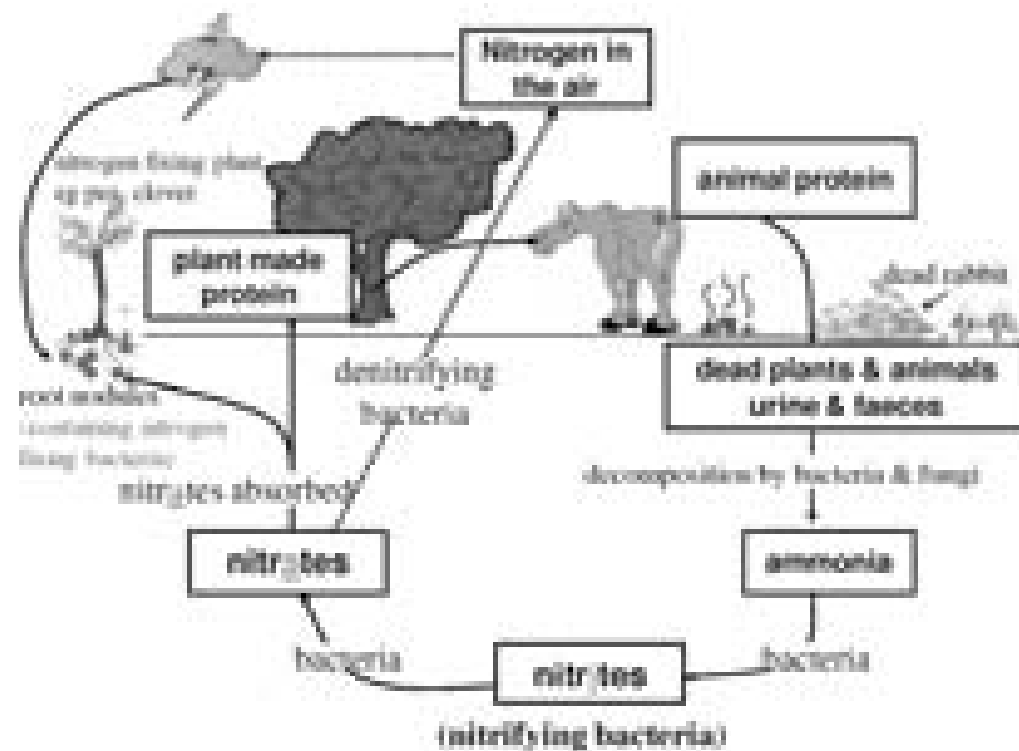

Figure 1

the cycle that we are going to look at next, the nitrogen cycle. The nitrogen cycle is a bit more complex than the carbon cycle and tends to be the focus of both multiple-choice and essay-type questions in your external exams. Students are often asked to discuss the role of decomposers in the cycle. You will find that different types of bacteria are involved in the cycle, but not all of them are decomposers.

THE NITROGEN CYCLE

Plants and animals need nitrogen to make proteins. Although nitrogen gas constitutes about 80% of the air around us, this nitrogen cannot be used by plants and animals; it has to be converted to useable forms. This is in the form of ammonium compounds or nitrates. Some bacteria have the ability to convert atmospheric nitrogen to nitrates. These bacteria are known as nitrogen-fixing bacteria. Plants use the nitrates to make proteins, and animals get the proteins when they eat the plants. Figure 1 shows the nitrogen cycle in the form of a diagram. Get familiar with the diagram; you never know when you may see it again!

The nitrogen cycle can be divided into three stages:
■ Nitrogen in the air is made available to plants by nitrogen

fixation. Nitrogen-fixing bacteria convert atmospheric nitrogen into nitrates. These bacteria include *Rhizobium* in root nodules of leguminous plants and *Azotobacteria,* found in aerated soil.
■ Ammonium ions from organic waste and dead organic remains can be converted into nitrites and finally nitrates by nitrifying bacteria such as *Nitrosomonas* and *Nitrobacter*.
■ Nitrate ions are absorbed by the plant roots. Some get leached into the groundwater or can be converted back to nitrogen gas by denitrifying bacteria. Denitrifying bacteria are found in waterlogged soils under anaerobic conditions.

Notice from the diagram that the role of the decomposers remains the same. The decomposers break down dead plant and animal remains, along with waste material, into ammonium ions which can be taken up by the plant or converted to nitrates by the nitrifying bacteria. They, in turn, incorporate some of this material into their bodies. When they respire, they return carbon in the form of carbon dioxide to the air; and when they die, their remains also contribute to the nitrates in the soil.

Interesting, isn't it? See you next week!

Monacia Williams is an independent contributor. Send questions and comments to kerry-ann.hepburn@gleanerjm.com

Location and time

FOCUS QUESTIONS

■ What is the time difference between meridians of longitude?
■ What is the earth's rotation?
■ What is the time of a place using the line longitude?

TIME DIFFERENCE BETWEEN MERIDIANS OF LONGITUDE

We know that the earth revolves about its axis once every 24 hours.

In other words, the sun completes its apparent revolution of 360° in 24 hours.

This means that the sun crosses each of the 360 meridians of longitude once every 24 hours. So, in 1 hour, the sun appears to move 15', in 4 minutes, it appears to move 1°, in 1 minute it appears to move 15°, in 4 seconds it appears to move 1'.

From this, it becomes obvious that there is a direct relationship between arc and time, such that 1 minute of time equals 15 minutes of arc.

CALCULATING LONGITUDE BY COMPARING TIME DIFFERENCE

If we have two accurate clocks, one calibrated to GMT and the other calibrated to local time, then it is an easy matter to calculate our longitude from the difference between the two times. For example, if the difference between GMT and local time is three hours, then the difference in longitude must be 3 x 15°. If local time is ahead of GMT, then the local longitude must be east of the Greenwich Meridian; and if local time is behind GMT, the longitude must be west.

Example: If it is 18 GMT when it is 09:20 local time on the same day, then local time must be 8 hours and 40 minutes behind GMT. Therefore, Long = - [(8 x 15°) + (40 ÷ 60 x 15°)] = - [120° + 10°] = -130° = 130° West

HOW TO CALCULATE LOCAL TIME

1. Work out the longitude difference.
2. Convert this to a time difference.
3. Adjust the time according to the direction of movement (east or west).

Example: What is the time in Calcutta (longitude 96° east) when it is 9 a.m. in Munich (longitude 11° east)?

1. Longitude difference = 85 degrees
2. Time difference 85/15 = 5 hours 40 minutes
3. Calcutta is east of Munich; therefore, the time is ahead. Thus, 9 a.m. plus 5 hours and 40 minutes = 2:40 p.m.

There are many ways of determining the longitude of a place. The simplest way is to compare the local time with GMT by listening to BBC radio.

For example, the captain of a ship in the midst of the ocean wants to find out in which longitude his ship lies. If GMT is 8 a.m. and it is noon in the local region, it means that he is four hours ahead of Greenwich, and must be east of Greenwich. His longitude is 4 x 15° or 60° east.

EARTH ROTATION

By definition, the earth's rotation is the amount of time that it takes to rotate once on its axis. This is, apparently, accomplished once a day – i.e., every 24 hours. The earth rotates about an imaginary line that passes through the North and South Poles of the planet.

■ This line is called the axis of rotation.

Earth rotates about this axis once each day (approximately 24 hours).

There are actually two different kinds of rotation that need to be considered here.

I. The amount of time it takes for the earth to turn once on its axis so that it returns to the same orientation compared to the rest of the universe.

II. How long it takes for the earth to turn so that the sun returns to the same spot in the sky.

The amount of time it takes for the earth to rotate once on its axis is known as a sidereal day – which is 23.9344696 hours. Because this type of day-measurement is based on the earth's position relative to the stars, astronomers use it as a time-keeping system to keep track of where stars will appear in the night sky, mainly so they will know which direction to point their telescopes in.

The amount of time it takes for the sun to return to the same spot in the sky is called a solar day, which is 24 hours. However, this varies through the year, and the accumulated effect produces seasonal deviations of up to 16 minutes from the average. This is caused by two factors, which include the earth's elliptical orbit around the sun and its axial tilt.

SUMMARY

A day is the time it takes the earth to spin around once on its axis.

An hour is $1/24^{th}$ a day, so the earth is divided into 24 standard time zones, each covering approximately 15 degrees of longitude.

The time of day depends on where you are on the earth. Hours are numbered from the prime meridian, or 0 degree longitude, which passes through Greenwich, England.

Time zones east of the Greenwich zone are ahead of Greenwich time.

This is because the earth spins toward the east, so that lands in the east get the sun earlier than Greenwich does. Time zones west of Greenwich are behind Greenwich time.

They get the sun later than Greenwich. The boundaries of the time zones usually follow straight lines over the oceans.

Every 15th degree of longitude marks a different time zone. On the continents, time zone boundaries usually zigzag.

Some countries are so large that they cover more than one time zone. Russia stretches across 11 time zones.

From the state of Maine to the state of Hawaii, the United States spreads across seven time zones.

To determine what time it is in another time zone, you must add or subtract, depending on whether you are going east or west.

■ First, determine the time for the time zone in which you live. Next, find the time zone you want and count how many time zones away it is from yours.

Now, determine if the new time zone is east or west of where you live.

■ If it is east, add one hour for each time zone away it is from your time.

■ If it is west, subtract one hour for each time zone away it is from your time.

For example, if it is 8 a.m. where you are and you go three time zones east, you add 3 to 8 and get 11 a.m. in the new time zone.

If it is west, it would be 8 subtract 3 for a time of 5 a.m.

Using this simple formula, will enable you to always know what time it is.

Answer the following questions:
1. The world is divided into how many times zones?
2. How many degrees of longitude is each time zone?
3. When going east, do you add or subtract one hour for each time zone through which you travel?
4. When going west, do you add or subtract one hour for each time zone through which you travel?
5. You are in Time Zone I. What time is it according to the map?
6. You live in Time Zone G. Your friend lives in Time Zone K. How many hours difference is there?
7. You live in Time Zone I. You want to call Time Zone D. How many hours difference is there?
8. If it is 6 p.m. in Time Zone F, what time is it in Time Zone M?
9. If it is 9 p.m. in Time Zone U, what time is it in Time Zone P?
10. You live in Time Zone H. Your friend lives in Time Zone O. If it is 2 p.m. in Time Zone H, what time is it at your friend's house?

Next class, we will look at coral reef.

The Haitian Revolution

DEBBION HYMAN
Contributor

OBJECTIVE

1. Assess the immediate and long-term effects of the Haitian Revolution.

THE FRENCH Revolution had an ideological influence – 'Liberty, Equality, and Fraternity'. The French Revolution was a contributing success as its principles of individual liberty and freedom of expression, equality before the law and security of property were applicable to all social groups in St Domingue. In addition, the natural rights of man and of the citizen were viewed as sacred and inalienable.

The *grand blancs* supported the revolution in France to the extent that it ensured they had greater power in running the colony and freedom of trade. They eventually gained control of the assembly in 1790 and excluded the mulattoes from participation. The power wielded by the *grand blancs* would end, as it was crushed by the small whites and the colonial authorities. The *grand blancs* would soon turn their rage on the mulattoes, who had offered the other whites assistance in their defeat.

The mulatto revolt was led by Vincent Ogé. The mulattoes sought to gain rights (such as the right to vote) that were being refused by St Domingue's Colonial Assembly. The number of fighters Ogé had at his disposal was quite limited and, as a result, he ended his fighting and fled to Santo Domingo. [He would be sent back to St Domingue, where he was executed]. The ensuing conflict between the mulattoes and the whites gave the enslaved Africans an opportunity to fight for their freedom. The revolt began under the leadership of Boukman. After the death of Boukman, François, Biassou and later Toussaint L'Ouverture continued the revolt.

Toussaint entered into an alliance with the French to defeat the Spanish and the British. Toussaint was seen as a superb strategist and tactician, as he continuously defeated enemies (French, British, Spaniards, coloureds) although outnumbered and out-gunned. He served as a unifying force as he succeeded in creating a disciplined and efficient army out of a mob of slaves. Blacks were bound to Toussaint by loyalty, discipline and respect. He was also a good judge of ability, as he proved competent in choosing lieutenants. Toussaint recognised the abilities of Dessalines and Christophe and could delegate responsibility. He was also an opportunist, as he changed sides when necessary. For example, desertion of the Spanish in 1794 when the English looked dangerous, and breaking with France in 1801 when Napoleon's imperial ambitions were putting an end to the gains made under the revolutionary Jacobins.

Toussaint formed an alliance with the Spanish and was able to gain control over the entire north of St Domingue, except for Le Cap. The British, who were fearful of the spread of slave rebellion and French radicalism, invaded St Domingue in 1793. By the end of the year, two-thirds of the colony were either in Spanish or British hands. Toussaint would later end his alliance with Spain.

CONTRIBUTED PHOTO

Five students living with sickle cell disease and currently attending tertiary institutions have received financial assistance totalling $450,000 from the FLOW Foundation. From left: Christine O'Leary, Sanjay Williams, Avia Aiken, FLOW Foundation Chairman Errol Miller, Ashleigh Gordon and Sherona Smith at the presentation ceremony, held at FLOW headquarters in Kingston.

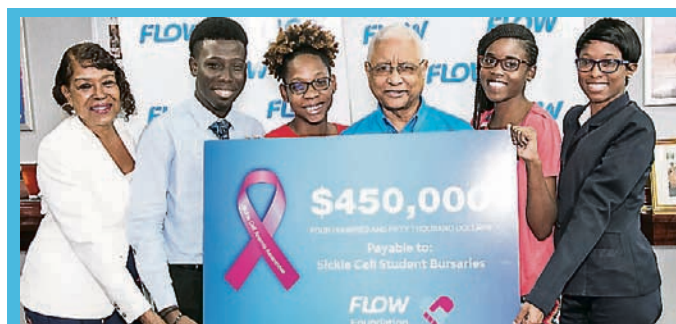## EFFECTS OF THE REVOLUTION – IMMEDIATE IMPACT ON HAITI

Emancipation of the populace – Haiti became the first free black/coloured state in the Caribbean. It became a magnet and refuge for other emancipators and revolutionaries, for example, Alexandre Pétion's aid to Simón Bolívar in 1816.

ECONOMIC DEVASTATION

1) Division of lands - Sugar plantations were divided into coffee and ground food small holdings. This proved socially advantageous but was economically disastrous, as the main production crop was impacted. For instance, sugar production fell from 163 million pounds in 1791 to 1.8 million pounds in 1818.

2) Significant damage to farm lands – The conflict resulted in severe damage to dams and the country's irrigation system. This had the resultant effect of damaging agricultural lands.

LONG-TERM IMPACT ON HAITI

1) Devastation of local economy – The economy never again returned to its pre-1791 prosperity. The economy was not only affected by problems within the agricultural sector, but also by external factors. The French and the Americans instituted a ban on commercial trade with the new republic. Additionally, France outlined that it would have to receive compensation for French enslavers who lost property during the revolution; it was only at this point that it (France) would recognise Haiti's independence. By 1825, Haiti completed negotiations with France to pay a compensation package of 150 million francs – an act that stifled the young republic economically.

2) Political instability – The revolution made every Haitian a politician and legitimised usurpation and force. After 1818, instability and dictatorship marked Haiti's history.

IMMEDIATE IMPACT ON THE CARIBBEAN

1) Sympathetic revolts – The revolution inspired sympathetic revolts in Jamaica (Maroons), St Vincent (Black Caribs), and Grenada (Fédon) in 1795.

2) Rise in sugar prices – following the loss of St Domingue's sugar production, the British Caribbean prospered temporarily.

3) Emigrés expertise – The planters of St Domingue fled to Jamaica, Cuba and Puerto Rico. They brought their expertise in coffee production, for instance, to islands such as Jamaica.

4) Santo Domingo/Dominican Republic – After suffering various military invasions during the Haitian Revolution, Santo Domingo declared itself independent of Spain in 1821, only to be immediately annexed by Pétion's successor, Jean Pierre Boyer, in 1822. The period of Haitian rule (1822-1844) was marked by a harsh anti-Spanish and anti-white policy. The period also witnessed continued economic decline even though there had been attempts to redevelop the cattle ranching and sugar sectors. The end result was a continued white exodus, further reducing Santo Domingo's meagre population (half that of Haiti) and the creation of a largely mulatto populace.

LONG-TERM EFFECTS ON THE CARIBBEAN

Black inspiration – The successful outcome of the revolution and the prowess of its black heroes (particularly Toussaint) provided downtrodden enslaved Africans elsewhere in the Caribbean with pride and hope that they too could end, in their respective territories, the system of chattel slavery.

Last one was 2016, next should be 2021

MAUREEN CAMPBELL
Contributor

OBJECTIVES

■ Describe how political parties prepare for elections.
■ Outline the factors that influence the outcomes of elections.
■ Describe the factors that influence voter participation in elections.

"Elections matter, but how much they matter depends entirely on how free, open and fair they are."

– Elliott Abrams

POLITICAL PARTIES

A political party is defined as an organised group of people, with similar political aims and opinions, that seeks to influence public policy by getting its candidates elected to public office.

Political parties are institutions of democracy. They are essential as, by competing in elections, parties offer citizens a choice in who will govern, and while in opposition they help to hold governments accountable. Most citizens will join political parties, volunteer their time, donate money and vote for their choice leaders. In doing this, they are exercising their basic democratic rights. Participation of citizens in political parties offers unique benefits, including opportunities to influence policy choices, to choose and engage political leaders, and to run for office. The role of political parties is, therefore, of extreme importance.

Political parties perform key tasks in a democratic society, such as:

1. Amassing and expressing the needs and problems as identified by members and supporters of the party.
2. Socialising and educating voters and citizens on the functioning of the political and electoral system.
3. Activating and mobilising citizens into participating in political decisions and channelling public opinion from citizens to government, behaving as a mediator.
4. Recruiting and training candidates for public office, and using them to help citizens in each constituency in fulfilling their needs and expectation as much as possible within the law.

As mentioned before, political parties may be described as institutionalized mediators between civil society and those who decide and implement decisions. This gives them the opportunity to enable their members' and supporters' demands to be represented in parliament and in government.

CANDIDATE

This is a person who is selected by others as a contestant for an office; in this case, to become a member of parliament or a parish councillor.

It is, therefore, apparent that political parties and their candidates are key stakeholders in elections. They are the ones competing for public office, carrying out election campaigns, and trying to convince persons to vote for them. From another perspective, the final validation of the election result is, in practice, in the hands of the political parties and candidates. If they do not accept the results due to real or perceived electoral fraud or irregularities, the legitimacy of the resulting legislature or government is threatened.

Parties and candidates are also described many times as actors who have the potential to be destructive. Practices of vote buying or illegal party finance, the proliferation of defamation and hate speech in campaigns, voter intimidation by party workers, corruption in decision-making, and the systematic exclusion of certain sectors of society constitute examples of where political parties threaten the functioning of democratic systems rather than support it. Laws and regulations regarding campaigning, funding, and functioning of political parties have been developed to minimise the potential disruptive influence of political parties while still allowing them enough freedom to contest elections.

PREPARATION FOR ELECTIONS

Since political parties are part of the democratic system in the Caribbean, where elections are held every five years in most countries, they must prepare for elections so they can win and be the next government.

1. Candidate selection: Candidates will be selected to represent the party or a constituency.
2. Campaigning/fundraising: Funds will have to be raised legally to help in campaigns.
3. Monitoring of performance: Parties will look on important issues and this will include monitoring the party in power or in opposition.
4. Monitoring of electoral process: The careful monitoring of the electoral processes will be very essential, so too encouraging public opinion polls to gain support for the party.
5. Party manifesto: Each party is required to publish a manifesto which is a public declaration of policies and aims of the party.

FACTORS INFLUENCING VOTER TURNOUT

Voter turnout is affected by many variables – from family and community factors to election competition and mobilisation.

1. Voter apathy, meaning voters' lack of interest, enthusiasm or concern for politics or towards a candidate.
2. Family and friends: Voting as a cultural and civic tradition and voter loyalty to political parties. Those who grow up around family members who vote and discuss politics frequently are more likely to vote themselves.
3. Voter education: Education has always been a significant factor in a person's likelihood of voting. The more educated the person is, the more likely it is that he/she will vote.
4. Voter attitudes towards the government: People are less likely to vote if they don't believe that their vote will be counted, or if they don't trust the government. A loss of faith in the electoral process leads to a belief that a person's vote doesn't really matter.
5. Campaign issues and how far-reaching these issues are, and how much they affect individuals.
6. Voters' age will also affect their voting; younger persons will have to be encouraged

ACTIVITIES

1. Complete the table below:

Factors that influence the outcomes of elections	Impact of these factors on elections
Media coverage	
Campaign advertising	
Public opinion polls	
Voter turnout	
Voter attitude to government	
Campaign strategy	
Campaign spending	

SOURCES

http://aceproject.org/ace-en/topics/pc/onePage
http://www.nonprofitvote.org/voter-turnout-factors.html
Syllabus for Social Studies CSEC
Political parties: https://www.ndi.org/what-we-do/political-parties

Maureen Campbell is an independent contributor. Send questions and comments to kerry-ann.hepburn@gleanerjm.com

Error recognition

FOR THIS lesson, I will focus on error recognition. This section of Paper 01 tests your ability to recognise if there are redundancies, mixed metaphors, clichés, poor use of diction (word choice) and grammatical errors in given sentences. I have provided you with a refresher of specific terms that you may come across in this section.

MIXED (MISUSED) METAPHORS

Mixed metaphors are different metaphors – occurring in the same utterance, especially in the same sentence – which are used to express the same concept. They are usually illogical (contradictory). Mixed metaphors often, but not always, result in a conflict of concepts.

EXAMPLES

1. We saw the writing on the wall and realised it was not a level playing field.
2. All at once he was alone in this noisy hive with no place to roost.
3. Instead of biting the bullet, many Jamaicans prefer to throw in the towel.
4. If we can hit the bull's eye, then the rest of the dominoes will fall like a house of cards.

CLICHÉ

A cliché is an expression, idea, or element of an artistic work which has become overused to the point of losing its original meaning, or effect, to the point of being trite or irritating. This especially occurs when, at some earlier time, it was considered meaningful or novel.

EXAMPLES

1. What goes around comes around.
2. Make hay while the sun shines.
3. The early bird catches the most worms.
4. Out of sight, out of mind.
5. Action speaks louder than words.

MALAPROPISM

A malapropism (also called a dogberryism) is an absurd or humorous misuse of a word, especially by confusion with one of a similar sound. An example is Yogi Berra's statement: "Texas has a lot of electrical votes," rather than "electoral votes".

EXAMPLES

1. Students should be punished when they validate the school rules.

2. Parents will not want to send their children to a school with a bad repetition.
3. He needs to make his own discussion and not depend on others to influence him.
4. She suffered from a serious migration and had to take painkillers regularly.

PROVERB

This is a brief, popular saying that gives advice about how people should live or expresses a belief that is generally thought to be true.
1. Empty barrels make the most noise.
2. Don't count your chickens before they hatch.
3. Birds of a feather flock together.
4. When trouble come, pickney shut fit you.
5. The early bird catches the most worms.

IDIOM

This is an expression that cannot be understood from the meanings of its separate words but has a separate meaning of its own together.

EXAMPLES

Kick the bucket (die)
Spilled the beans (let out a secret)
Feeling blue (sad)
An arm and a leg (very expensive)

ACTIVITY

Some of the sentences below are incorrect because they contain one of three types of error. Each incorrect sentence contains only one type of error. Some of the sentences are correct as they are. Select the letter that best describes each sentence:
a. If the sentence is too wordy, that is repetitive or contains redundancies.
b. If the sentence contains clich*s or misused metaphors.
c. If the sentence is incorrect grammatically or faulty in diction.
d. If the sentence is acceptable as it stands.

1. In the early years of one's life, one must sow and build in order to reap the harvest of achievement before the final curtain.
2. There is no doubt in our minds about the person who committed this heinous and criminal act.
3. Donald and me are very disappointed with the outcome of the games.
4. Any disease such as diabetes or cancer which are difficult to cure must be researched.
5. The consensus of opinion was that the test was the easiest they have had in years.
6. The team fought tooth and nail to avoid being defeated.
7. She was recommended for the position because of her efficiency and diligence.
8. The principal and the parents launched the project as a rocket, but could not keep pace with its speed above water.
9. Though he seems to walk with an air of arrogance, he is a down-to-earth person who has never lost the common touch.
10. It is important that we identify the causes of truancy in our schools.

Until next week, take care!

VOCABULARY TOP-UP

loquacious – talkative.
lucrative – profitable.
ludicrous – absurd or ridiculous.

Send questions and comments to ***kerry-ann.hepburn@gleanerjm.com***

From left: Dylan O'Brien, Thomas Brodie-Sangster, Giancarlo Esposito, Dexter Darden and Rosa Salazar star in 'Maze Runner: The Death Cure'.

Short stories – Cont'd

BERYL CLARKE
Contributor

AS WE continue to 'talk' about Olive Senior's wonderful story, we need to think about the narrator. It is through her at-first unspoilt and innocent eyes that the narrative is told. She it is who shows us, the readers, that there are at least two separate realities in the country.You know that many children are curious but have limited experience of life. They learn by asking questions and by observing what takes place around them. Each visit that the child narrator of our story pays to a grandmother, yields more information.

When she goes to Grandma Del's house, she notices the photographs that are prominently displayed. She also sees those that are not, so she becomes aware that one that she expects to be there – a wedding picture of her grandmother and her husband – is missing. The reaction of her grandmother to her question tells us that it is a touchy subject. The granddaughter still had no clue as to the truth of the situation because her experience is of children being born to married couples. The writer also uses the incident to prepare us for Eulalie's later disclosures.

What we hear about is through the regular chat sessions that the child has with her mother. The questions she asks and the 'confidences'/gossip that she shares, inform us and move the story forward. You must have noticed that her mother does not reply, but later developments let us know that she is cooperating with her daughter.

When she tells her mother that Grandma makes church dresses and a hat for her, we find out that her parents do not attend church. This is made even clearer when she tells her that Grandma sends her to Sunday school and wants to know if her mother had gone to Sunday school. That she often repeats comments that her grandmothers say which could create conflict, is evidence of her innocence. This is evident in instances such as the following:

'S*he says she cannot imagine how a girl-child (that's me) can leave home with nothing but blue jeans and T-shirts and shorts and not a single dress.'* (Grandma Del)

'*Other than that, your Grandmother Del is a country bumpkin of the deepest waters, and don't quote her goddam sayings to me.'* (Grandma Elaine)

As she grows older and begins to lose her innocence, she begins to make judgements and they are not in favour of the simple, rustic way of living. She becomes conscious of and attracted to Towser's type of lifestyle. It is not that she did not find the way Towser dresses and looks admirable before, but she was not then drawn to them. She did not like the change(s) in Melody after she attended charm school for the first time but later, as she gets older, she alters her attitude. She is certainly not going to miss Melody's party so that she can get to Grandma Del's house early the next day!

Do you blame her for modifying her position towards Pearlie? Why do you think she does so? She spends her time indoors when she goes to Grandma Del. What reasons does she have for doing so?

I would like you to find and list incidents in this story that make you laugh; in other words, humorous goings-on. Afterwards, see how many of them are caused by the granddaughter's naivete.

One of the questions that arises about the family in this story is, 'what about love?' It appears that, among the adults, we have gossiping, colour and class distinctions, lack of responsibility and selfishness. Among the teens, we find poverty and abuse, irresponsibility and lack of self-control. It does not appear as if Grandma Towser loves or is in love with any of the three men with whom she is involved in the course of the tale. Their material possessions and appearance attract her to them. Does she love her granddaughter? It is hard to tell, for she cannot find time to spend with her and does not even clean up her expression to accommodate the child.

We see and hear of no interaction between the child's parents. In fact, she says towards the end of the narrative that her father doesn't have time for anyone anymore and questions whether there is ever a time nowadays when he is at home. However, we have to take into account that persons of the grandmothers' generation did not always show their affection with hugs and kisses, but rather with the things they do for their children and grandchildren. Grandma Del demonstrates her feeling towards her grandchild by making dresses and a hat for her. In her own way, Grandma Towser shows she cares by suggesting that her grandchild should attend charm school. What do you think?

The young child we meet at the start of the story is certainly different in outlook by the time the story ends. Next time, we intend to 'chat about' this. Don't hesitate to start up your study group. Walk good and God bless!

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System and application software

NATALEE A. JOHNSON
Contributor

GOOD DAY, students, this is lesson 17 in our series of lessons. In this week's lesson, we will conclude looking at system and application software and begin a new unit.

GRAPHICAL USER INTERFACE

A graphical user interface (GUI, commonly pronounced 'guey') is a human computer interface (HCI) based upon a graphical display. GUIs are most commonly found on workstations or PCs fitted with graphics adapters able to support high-resolution graphics. GUI is a variation of the menu-driven system of selecting commands with the use of the mouse and pointers, along with the use of windows. Thus, this interface is often summarised using the acronym WIMP, which stands for windows, icons, menus ('pop-up' and 'pull-down') and pointers. A mouse is used to click on an icon to execute some operation or select options from a pop-up or pull-down menu.

ADVANTAGES OF GUIS

1. Its user-friendliness results in less anxiety on the part of the user.
2. Icons/symbols easier to recognise and provide the user with a context.
3. Fewer command errors.
4. Reduce typing.

DISADVANTAGES OF GUIS

1. It may consume more screen space.
2. For programmers, the design of GUIs is more complex.
3. Increased use of computer memory can lead to slower processing.

We have now officially concluded the Fundamentals of Hardware and Software unit and will begin a new unit: Problem-solving and program design.

PROBLEM-SOLVING AND PROGRAM DESIGN

Betty Williams had quoted, "There's no use talking about the problem unless you talk about the solution."

You will certainly apply this notion to this unit, as you will be given computer-related problems for which you will have to determine their solutions.

SO, WHAT DOES PROBLEM-SOLVING INVOLVE?

The business dictionary defines problem-solving as the process of working through details of a problem to reach a solution. Problem-solving may include mathematical or systematic operations and can be a measure of an individual's critical-thinking skills.

In our everyday life, we actually solve simple problems. For example, you have a problem meeting your deadlines. How would you solve this problem?

1. Examine the problem – determine why you are having difficulty meeting your deadlines.

2. Determine possible solutions to the problem, such as using reminders on your phone, workbook, etc., for the deadlines you have to meet; getting your parents involved in reminding you about your deadlines; completing the tasks assigned as soon as you get them, etc.
3. Evaluate to determine the best solution to the problem.
4. Choose the best solution to your problem.

Similarly, the computer is designed to solve problems for you, the user. How is this possible? A computer solves end-user problems by following a set of instructions given to it by the programmer and producing the specified results.

The computer programmer creates the instructions for the computer to follow. These instructions are referred to as computer programs.

A computer program is a finite set of clear and specific instructions written in a programming language.

PROBLEM-SOLVING ON THE COMPUTER

The design of any computer program involves two major phases:
■ The problem-solving phase.
■ The implementation phase.

The problem-solving phase includes the following steps:
1) Define the problem.
2) Find a solution to the problem.
3) Evaluate alternative solutions.
4) Represent the most efficient solution as an algorithm (An algorithm may be defined as a sequence of logical steps used to solve a problem).
5) Test the algorithm for correctness.

The implementation phase is comprises the following steps:
1) Translate the algorithm into a specific programming language.
2) Execute the program on the computer.
3) Maintain the program.

DEFINING THE PROBLEM

Defining the problem is a way to help the programmer understand what he or she is required to do. It involves breaking down the problem into three key components:
1. What is given (the input).
2. The expected results (the output).
3. The tasks that must be performed (processing).

These three components can be illustrated using what is a called a defining diagram. Some texts may refer to this as the Input Processing and Output (IPO) chart. The defining diagram is a formal approach to defining a problem. The defining diagram is a table with three columns, which represent the three components: input, processing and output.

INPUT	PROCESSING	OUTPUT

We have come to the end of this lesson. See you next week, when we will continue to look at problem-solving and program design. Remember, if you fail to prepare, you prepare to fail.

Natalee A. Johnson teaches at Ardenne High School. Send questions and comments to kerry-ann.hepburn@gleanerjm.com
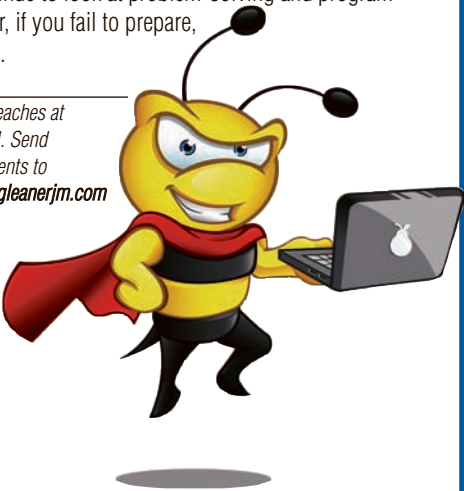
CLEMENT RADCLIFFE
Contributor

THIS WEEK, we will complete the review of algebra by considering aspects of graphs. Specifically, it is my intention to elaborate on the solution of quadratic equations using a graph.

REMINDERS

■ A quadratic equation is represented graphically by a curve.
■ The curve is usually plotted against perpendicular x and y axes.
■ The axes should be labelled and appropriate scale(s) used.
■ A curve should be drawn by free-hand sketch.
■ The x axis has the equation $y = 0$, and the y axis has the equation $x = 0$.
■ Given the curve $y = f(x)$ and the line $y = g(x)$, then the points of intersection of both are represented by:

$y = f(x) = g(x)$
$f(x) = g(x)$

If $f(x) = x^2 + 2x - 3$ and $g(x) = 0$ (x axis)

Then the points of intersection of the curve and the line are represented by : $x^2 + 2x - 3 = 0$

Therefore, the solution of this equation is the x coordinates of the points of intersection of the curve and the x axis.

If $f(x) = x^2 + 2x - 3$ and $g(x) = 2x - 2$

then the points of intersection of the curve and the line are also represented by: $f(x) = g(x)$.
$x^2 + 2x - 3 = 2x - 2$
$x^2 + 2x - 2x - 3 + 2 = 0$
$x^2 - 1 = 0$

The x coordinates of the points of intersection are, therefore, the solution of the equation $x^2 + 2x - 3 = 2x - 2$ OR $x2 - 1 = 0$.
The following are the graphs of f(x) and g(x) illustrating the points of intersections.
$y = x2 + 2x - 3$
$y= 2x - 2$

x	− 4	−3	−2	−1	0	1	2	3
y	5	0	− 3	− 4	−3	0	5	13

x	0	1	2
y	−2	0	2

GRAPH 1

Points A and B represent the points of intersection and have coordinates, A(1 , 0) and B (-1 , - 4). The x coordinates, 1 or - 1, are the solutions.

Algebra

The following is another example for your review.

EXAMPLE

Using an appropriate scale, please plot the curve $y = 3x^2 - 2x - 1$. Hence, solve the equations:
a) $3x^2 - 2x - 1 = 0$
b) $3x^2 - 2x - 1 = 4x - 1$

SOLUTION

Given the equation $y = 3x^2 - 2x - 1$, we complete the table:

x	− 2	− 1	0	1	2	3
y	15	4	− 1	0	7	20

GRAPH 2

a) Given the curve $y = 3x^2 - 2x - 1$, the solution of the equation $3x^2 - 2x - 1 = 0$ is the x values of the points of intersection of the curve $y = 3x^2 - 2x - 1$ and the line $y = 0$ or the x axis.
The solution is x = 1, - .33

b) Given the curve $y = 3x^2 - 2x - 1$, by plotting the line $y = 4x - 1$, then the points of intersection of the curve and the line will represent the solution of the equation $3x2 - 2x - 1 = 4x - 1$.
Using the same axes, plot the line $y = 4x - 1$.

From the graph, the solution is x = 0 or 2.

POINTS TO NOTE

■ Given the curve $y = 3x^2 - 2x - 1$, then the curve may be used to solve any equation as long as $3x^2 - 2x - 1$ is on one side of the equation.
■ Given $3x^2 - 2x - 1 = 4x - 1$, then the equation may be reorganised as follows:

$3x^2 - 2x - 1 = 4x - 1$.
$3x^2 - 2x - 1 - 4x + 1 = 0$
$3x^2 - 6x = 0$
$3x(x - 2) = 0$

The solution of $3x^2 - 2x - 1 = 4x - 1$ and $3x(x - 2) = 0$ is the same, that is, x = 0 or 2.

EXAMPLE

Given the curve $y = 2x^2 - x - 3$, solve the equation $2x^2 - 2x - 5 = 0$.

SOLUTION

If you are to use the graph, $y = 2x^2 - x - 3$, then $2x^2 - x - 3$ must be on one side of the equation.
By reorganising the equation $2x^2 - 2x - 5 = 0$, it follows that:
$2x^2 -x -x - 3 -2 = 0$
$2x^2 -x- 3 - x - 2 = 0$
$2x^2 -x- 3 = x + 2$

Then the solution of $2x^2 - 2x - 5 = 0$ is the x coordinates of the points of intersection of the curve $y = 2x^2 - x - 3$ and the line $y = x + 2$.
By plotting the line $y = x + 2$, the solution of the given equation is found by reading off the points of intersection.

PRACTICE EXAMPLES

i) Given the plot of the graph $y = x^2 + 3x + 2$, use it to solve the equation $x^2 +2x +1 =0$
ii) Given the plot: $y = 2x^2 - 3x + 4$, hence solve $2x^2 - 5x + 1 = 0$

Let us now review the application of graphs to find maximum and minimum values.

Given the function $f(x) = 2x^2 -x- 3$, the minimum value may be found using the graph $y = 2x^2 -x- 3$. This value is found by the determination of the coordinates of the turning points of the curve. Given the turning point M (x , y), then the x coordinate is the position of the minimum value and the y coordinate is the minimum value of the function f(x).

Plotting the graph $y = 2x^2 -x- 3$

x	−2	−1	0	1	2	3
y	7	0	−3	−2	3	12

GRAPH 3

From the graph, the turning point is (1/4, - 13/4)

The minimum value of f(x) is - 13/4 and at the point is (1/4, - 13/4).

The axis of symmetry is the vertical line through the turning point. In this case, it is x = 1/4.

A similar approach is used to find the maximum value of $f(x) = - 2x2 +5x+ 3$

Please attempt the following example on your own:

1. Given the function $f(x) = - 4x^2 + 3x + 2$, solve:
i) $- 4x^2 + 3x + 2 = 0$
ii) $- 4x^2 - x + 1 = 0$

Please explain your method.

Fallacies – Part 1

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Contributor

THIS WEEK, we will look at the practical application of what we have covered in our research lessons, in relation to internal assessment, and begin our two- part journey into the world of fallacies.

You will recall that for your portfolio, you will be required to conduct some actual research on the topic you have chosen. It is highly recommended that you use a mixture of primary and secondary sources for your research. We have looked at what these are. You should choose sources that will be able to provide you with reliable, trustworthy information. Try to identify and avoid biases where possible. Fallacies, which we will look at over two weeks, should also be avoided in your reasoning, and in your presentations, whether they are written or oral. You may be burning to ask 'What are fallacies?'

FALLACIES

A fallacy is a misconception resulting from incorrect reasoning. It is an argument which seems to be correct, but contains at least one error, which is sometimes difficult to find and, as a result, produces an incorrect result or conclusion. Fallacies most often occur in persuasive reasoning where inductive reasoning is being used. Inductive reasoning is a conclusion which is often based on observations and specific experiences. In the absence of mathematical or scientific evidence, there are several errors which may occur in the reasoning.

You will recall from a previous lesson on types of discourse, that there are three appeals that generally guide persuasion. They are the appeal to logic (logos), the appeal to the emotions (pathos) and the appeal based on the credibility/authority of the speaker (ethos). Each appeal runs the risk of containing a fallacy. This week, we will look at a few fallacies which affect content and logic, as presented by McDermott (2008) in **CAPE Communication Studies**.

FALLACIES AFFECTING CONTENT AND LOGIC (LOGOS)

1. *Non sequitur* ('It does not follow')
The writer's/speaker's conclusion does not logically follow, based on the facts presented. This usually occurs because one step in the argument has been omitted or is implied.

Example: Sanjay is from a famous cricketing family, so he will be a world-class cricketer in the future.

Attendees at the Jamaica Moves road tour, held in St Elizabeth last year.

2. BEGGING THE QUESTION

The writer/speaker restates a claim, giving the impression that by simply doing so it proves the argument presented.

Example: Because violent movies are not fit for public viewing, the violent movie **Kill Them All** should be banned in this city.

3. RED HERRING

The writer/speaker introduces an irrelevant point to divert the readers'/listeners' attention from the main/relevant issue.

Example: Before you can talk about greater productivity in this country, Mr Prime Minister, you need to deal with the boatloads of Haitian refugees that have landed on our shores.

4. POST HOC ('AFTER THIS/THEREFORE, BECAUSE OF THIS')

This is based on the erroneous assumption that a causal (cause and effect) relationship exists between two things simply because one event follows another in time. The second event is thought to be caused by the first which preceded it.

Example: Since the track team got new outfits, there has been a transformation. They got the new gear in September and for the whole term, they have never lost a single track meet.

5. EITHER/OR SYNDROME

An attempt to convince the reader/listener that there are only two ways of viewing or understanding an issue – one right and one wrong – when there are, in fact, other possibilities.

Example: Yes, daddy, I admit that this is the most expensive dress in the store, but you didn't expect me to go to the ball looking like a nobody?

6. STRAW MAN

The writer/speaker selects the opposition's weakest or most insignificant point to argue against, in order to divert attention from the real issues.

Example: I won't even waste time talking about the jobs my opponent claims he has created in this city. I don't accept his apology for being late for this meeting and you should not. A good leader is never late.

As you read the newspaper this week, listen to the news and review the information collected from your sources for your internal assessment, try to identify whether there are fallacies presented in the content and logic presented.

Trudi Morrison-Reid is an independent contributor. Send questions and comments to kerry-ann.hepburn@gleanerjm.com

Caribbean art forms

GOAL

For students to evaluate the ways in which the arts and popular culture impact Caribbean society.

OBJECTIVE

1. Assess the ways in which Caribbean art forms are retained in the diaspora.

Major cities in the North Atlantic (USA, Canada, England) are heavily populated with Caribbean nationals. Caribbean nationals and their 'offprints' make up a considerable segment of the population of England, Canada and the United States of America, hence, forming what is known as the Caribbean diaspora. The Diasporic Caribbean refers to a group of people who reside in another geographical location, for instance, people of Caribbean ancestry who share an emotional connection to their homeland.

Festivals in the Caribbean diaspora play an integral role in the lives of the migrants, since this is a time when they get to experience authentic Caribbean cuisines, music, fashion and the general culture. At these carnivals in England, Canada and the USA, the parade is made up of bands, revellers dressed in costumes depicting a common theme, along with participants jumping to the music while competing for 'Band of the Year' title. Along with the parade is the calypso monarch competition (best calypso performer). There is also a junior carnival competition – (inculcation of carnival traditions so it won't die). Popular diasporic festivals include the Brooklyn Labour Day parade in USA, Notting Hill Carnival in England, and Caribana in Canada.

NOTTING HILL CARNIVAL

The event originated in 1964 as a way for Afro-Caribbean communities in the UK to celebrate their cultures and traditions, similar to the Caribbean carnivals of the early 19th century. These types of carnivals were hugely popular in Trinidad and were generally a celebration of the abolition of slavery. During the period of slavery, festivals were forbidden, so the residents took full advantage of their new-found freedom.

The first-ever Notting Hill Carnival was arranged as a showcase for popular steel band musicians who played in Earl's Court every weekend. The festival music drew residents out on to the streets, reminding many of the Caribbean homes they had left behind. The well-known tradition of elaborate costumes began as an element of parody, mimicking the European fashions of their former masters. Today, this tradition has evolved into 15,000 handmade costumes every year, requiring one million hours to create and decorate them all!

CARIBANA

The Toronto Caribana Festival began in 1967 as one of the first Caribbean festivals held outside of the region. Originally known as the Canadian Centennial festivals, Caribana was meant to share West Indian and black Canadian culture and traditions with the community, and to help fund the building of a West Indian cultural centre. Since then, every summer Toronto, Canada, comes alive to the pulsating rhythm of calypso steel pan music. The atmosphere is also enlivened with elaborate masquerade costumes. This two-week festival attracts over a million participants and tourist annually. The festival today includes the music, dance, food and costumes of Jamaica, The Bahamas, Brazil and other cultures present in Toronto.

BROOKLYN LABOUR DAY PARADE/ WEST INDIAN DAY PARADE

The West Indian Day Parade is held every Labour Day and runs down Brooklyn's Eastern Parkway. It is part of the West Indian-American Carnival celebrations which take place during and before Labor Day

weekend. It includes concerts, contests, children's pageants and private parties in addition to the main event, the parade. Brooklyn's carnival initially came out of Trinidad's carnival tradition and, as such, steel bands are one of the most commonly heard sounds at the parade. Over time, other Caribbean traditions and music have been added, including reggae from Jamaica, spouge from Barbados, cadence from Dominica, and merengue from Haiti. Many food vendors set up in the streets surrounding the parade, offering curried chicken, oxtail, patties, roti, fried plantains, ginger beer and coconut juice, to name some of the many refreshments available. Other kinds of vendors also set up stalls at the parade, selling many different goods, including crafts from the Caribbean, African sculptures and beadwork.

Send questions and comments to kerry-ann.hepburn@gleanerjm.com

HOMEWORK

1. The functions P(x) and Q(x) are defined as:

$P(x) = 3x - 4 /2$

$Q(x) = 1 + x2$

i) Evaluate P(5)

ii) Determine the inverse of P(x)

iii) Determine PQ(x)

2. Given the function $f(x) = 2x^2 - 9x - 5$, solve:

i) $2x^2 - 9x - 5 = 0$

ii) $2x^2 - 10x - 7 = 0$

3. Given that $h(x) = 4x^2 - 8x - 1$

By plotting the function h(x), find:

■ Its minimum value.

■ The value of x for which h(x) is a minimum.

Please continue to practise, using exercises from your textbook.

Enjoy the rest of the week.

Clement Radcliffe is an independent contributor. Send questions and comments to **kerry-ann.hepburn@gleanerjm.com**

Elaine Thompson (centre) powers away from the field to the win the Women s 60m Invitational Open, clocking 7.17 seconds, at the Queens /Grace Jackson Track and Field Meet, held at the National Stadium recently.