Preview of the Surface Tablet

7 York Mills C.I.

September October 2012 Issue

Stretching out your smartphone's battery life

PREMIERE ISSUE! Reviews of: Borderlands 2 & Resident Evil 6

BULLETIN BOARD

- Gaming club meets on Fridays! Answer your calling. Meet us in room 206 and 207 at lunch.
- If you would like to compete in ECCO, or just hone your coding, come to room 206 on Wednesday at lunch to practice with our three teams!

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Geek Tutorial

VOLUME I, ISSUE I

SEPTEMBER, OCTOBER

Welcome to the World of Technology!

While we become more and more dependent on our computers and smartphones, we are also required to make more and more decisions. Do I want that new phone or not? Do I agree with that webpage? And, how will it affect me?

This newsletter is created by a team of computer science students, with help from their teachers, to illustrate the vast scope of technology. We want to show you just how much you can do with the technology at your disposal. The possibilities are endless.



A typical circuit board

So what are you waiting for? Take a look. <u>Let us bring out the</u> <u>geek in you!</u>

Writers: Celina Jiang, Sanaz Evans, Ryan Garcia, Betty Gao Editor: Betty Gao Staff advisors: Mrs. Mihaila, Mr. Radulovich

Our CompSci. Teachers and Students



Mrs. Mihaila

Mr. Radulovich

Games

Borderlands 2

Developers: Gear Box Software

Publishers: 2K Games

By Ryan Garcia

It's not easy to make an amazing first person shooter with unique game play, quests, character/ character development, weapons and a good story.

A lot of Information from the first game is used to make this second one and the story continues to be great. Usually when someone talks about a first person shooter, the first thing that comes to mind is "Call of Duty." It takes an expert team of people to work on separate areas such as graphics, weapon design, and other gaming essentials. Learning basic programming skills helps in such cases, however if you are trying to get into designing monsters or the landscapes it would be a good idea to take up art. Adding to the difficulties in producing this game, two teams were required to make it both a down-loadable game onto your PC as well as playable on the console. I think that's enough about the production of the game; now lets actually get into talking about the gameplay.

The game is a much better improvement over the 1st one. They took player's opinions and

made it more suitable for a wider audience. People who like level up systems; we got it, people who like massive guns; we got it, people who like side quests rather than playing the major missions; we have loads of them. The character development of the game is also great as you have the choice of what ever "Vault Hunter" you like in the beginning. As the game goes on you get the feel of your comrades in the game and trust them as your partners when you see how bad-ass they are in combat. Some characters show up again in this game as in the last except in a different way.

As for the main objective of the game : It... keeps... changing!!!!!

In the beginning it's a simple task to kill 'Handsome Jack'. Then it progresses into around five to ten different tasks and then returns back to killing him depending how you want to look at it. There are some cutscenes but not a butt hurt amount to a point where it doesn't feel like you're playing anymore; no., no they put the cut-scene in just the right time at just the right moment. As for the rating itself; there is

no reason you have to take that in account to buy or try or look at this game! That rating is my rating and my rating alone on this game. Many who know me would know my style of gaming is rpg or solo games (NOT Fps (First person shooters)). Despite that, the execution of this game was excellent enough for me to play all the way through and as a final note: I very much enjoyed myself while playing this game.





I'm gonna win!" — Mario Kart 64

"I'm-a-Wario!

Resident Evil 6

Publisher: Capcom

By Celina Jiang, Sanaz Evans

It has been a decade since the infection in Racoon City spread all around the world, and the President of the United States decided to reveal the truth behind what took place in the Umbrella Corporation. Racoon City survivor, Leon S. Kennedy (In Resident evil series 2 & 4) was forced to shoot the president when the setting suffers a bioterrorist attack which infects the president. Leon was forced to face a President transformation and make the hardest decision ever! Simultaneously, Bioterrorism Security Assessment Alliance (B.S.A.A) member Chris Redfield (original RE series and Code Veronica) arrived in China, which was also under the threat of a bioterrorist

attack. With the world in danger the safety of the population is beyond hope!

Resident Evil 6 is a [eye] ball dropping action packed game that will scare the heck out of you. It's a dramatic and frightening game with an extremely awesome plot mixed with survival horror. With three story lines the player can play as Leon S. Kennedy, Chris Redfield and Jake Muller [Wesker] (son of the late Albert Wesker). Finishing these campaigns will unlock Ada Wong's character storyline. For the players benefit, not only is she pretty but she has nimble skills and uses a crossbow. For the first time: Resident Evil 6 allows favourite characters Leon and Chris to join forces to face this unprecedented threat. Leon's storyline focuses on the theme of exploration

while mixing in frightening gameplay. Chris, on the other hand, is a straight shooter almost like army of two and Jake falls somewhere in between. They are joined by new characters, each with their own unique storyline and moves, all to find out who is responsible for the launching of these biological attacks. With Dramatic Cinematic effects and variation of zombies in different storylines (players will be battling with both fast and slow zombies), this game will entertain you and haunt you for months.



Upcoming games:

Game:

Assassin's Creed III WWE'13 Need for Speed MW Marvel's The Avengers BFE Halo 4 Call of Duty: Black Ops II New Super Mario Bros. U ZombiU Gears of War: Judgement All-Stars Battle Royal Hitman: Absolution Far Cry 3

Console:

Xbox 360/Playstation 3 Xbox 360/Playstation 3 Xbox 360/Playstation 3 Xbox 360/Playstation 3 Xbox 360 Xbox 360/Playstation 3 Wii U Xbox 360 Playstation 3 Xbox 360/Playstation 3 Playstation 3

Release Date:

October 30, 2012 October 30, 2012 October 30, 2012 October 30, 2012 November 6, 2012 November 13, 2012 November 18, 2012 November 18, 2012 November 19, 2012 November 20, 2012 December 4, 2012





- Pac-Man is actually designed to appeal to women
- The Playstation was originally a CD-ROM add-on for the Super Nintendo

Did You Know?

- } E.T. (the Extra Terrestrial) sold
 more units than Space Invaders
- } The voice actress for Princess Peach

in Mario also voiced Cortana's part in Halo

- In Super Mario Bros., the bushes and the clouds are actually the same shape. The only difference between them is the colour.
- In Super Mario 64, Boo's laugh is actually a faster version of Bowser's laugh.

towers in Playstation2's startup screen represent the player's saved games

Source: IGN.com

The uneven



The brand new Surface for Windows **RT**

The Gadget

"To catch the reader's attention, place an interesting sentence or quote from the story here." Surface Tablet

Microsoft has decided to enter the tablet war with its two new babies: Surface for Window RT and Surface for Window 8 Pro. As the first representatives of Windows hardware, the two sisters come with a glossy, sleet black finish and a sturdy built-in kickstand. Its angled edges are stylish and comfortable.

For the tablets' displays, Microsoft is one of the few companies to use optical bonding. This reduces glare and increases contrast. Users can also view two apps at the same time, with additional apps in the background. This gives the Surface tablets an edge over Android and Apple's iOS.

For people who like to work with keyboards in addition to the touch screen, Microsoft has created two thin, lightweight keyboards that also serve as covers for the tablet. The TypeCover comes with the familiar mechanical keys and a clickpad as well. Meanwhile, the pressure-sensitive TouchCover is only 3mm thick and is available in many funky colours. With magnets and clever aligning components to hold the cover in place, the TouchCover eliminates the slipping problem that people often experience with Apple's SmartCover.

Many people worry about the thickness of the Microsoft tablets. In reality, Surface for Window RT is no thicker than the 3rd generation iPad. Surface for Window 8 Pro, on the other hand, will be slightly thicker than other tablet, weighing 1.99 lbs with a thickness of 0.53 inch.

Not that it needs to worry, because its real competitors

are the Ultrabooks and laptops. With a laptop operating system, an Intel Core i5 processor, and up to 128GB of storage, Surface for Windows 8 Pro is powerful enough to handle serious work. Most of all, the only thing that people need to sacrifice for the convenience is screen size.

With so much expectation for the two Surface tablets, all we can do is wait for them to become available for the market. Surface for Windows RT, the elder of the two, is already available for ordering online at \$519 and up. Meanwhile, Surface for Windows 8 Pro will most likely become available early next year.

The code

Would you like a surprise? Simply copy this code into a Java compiler and run it to see what it does. Behold, our code of the month:

}

```
import java.awt.*;
import java.applet.*;
public class MovingDot extends Applet{
          public void paint(Graphics g){
                     g.fillOval(500,0,50,50);
                     for(;;){
                                for (int i=0;i<=1000;i++){
                                          for(int j=0;j<100000;j++);
                                          if (i<=500){
                                             g.clearRect(i,0,50,50);
                                             g.fillOval(i+1,0,50,50);
                                          }
                                           if (i>=450){
                                             g.clearRect(i+50,0,50,50);
                                             g.fillOval(i+51,0,50,50);
                                          }
                                }
                                g.clearRect(1000,0,50,50);
                     }
          }
```

The Code

Cool Google Easter Eggs

A quirky and fun-loving company, Google has embedded many "Easter eggs" into its products. These are very interesting to watch, especially when you discover them by chance.

Here are some known Easter Eggs in Google applications (they work especially well with chrome):

- In Google search engine, type in "do a barrel roll". The page will do a barrel roll before you even finish typing.
- In Google map get directions, type in any transpacific trip, and Google will tell you to sail across the pacific ocean. It also arranges a break for you in Hawaii.
- If you go to Google StreetView and look near the Antarctica Peninsula, you will find a dot that is slightly larger than the others. When you place the yellow icon on that spot, the little person will turn into a penguin, As a bonus, you will also be able to explore the island as if it was a street. (see right)

The Trick



How to stretch your smartphone's battery life

I) Turn down and turn off the screen

Studies measuring smartphone power consumption in real life situations have found that screens account for between one-third and two thirds of overall power consumption. Since a brighter screen uses more energy, probably the best way to extend battery life is to turn down the brightness of your screen. Full brightness is really only required when you're out in the sun and can often be too bright under normal indoor lighting conditions. My recommendation is to use your phones auto-brightness function which will adjust the screens brightness based on ambient light settings.

In addition to turning down the brightness, I recommend having your screen turn off automatically after a short period of inactivity. On my Android device, the screen can be set to turn off in as quickly as 15 seconds and as long as 30 minutes. Obviously the quicker the screen shuts off after the last activity, the more useful battery life you will have. I have set my screen to go to sleep after 30 seconds.

2) Turn off Bluetooth

When you activate Bluetooth on your phone, you turn on a radio which is always on and always consuming power. To save upwards of an hour a day of battery power, my advice is to take the Bluetooth headset out of your ear and talk on the phone the old fashioned way. If you listen to music or watch videos on your device, it's best to avoid Bluetooth earplugs and go wired. I find the only time Bluetooth is necessary is when hands-free operation is required – such as when you are making calls while driving. Of course, always remember to plug in your smartphone when you get in your car so you can recharge it while driving.

3) Turn off WiFi

Like Bluetooth, when you activate WiFi on your smartphone, you are turning on a radio receiver and transmitter which is running continuously. When you're on the bus or subway or in public places where WiFi is not available then turning off your phones WiFi radio can greatly extend battery life.

In analyzing power consumption on my Android phone, I found WiFi was the second biggest power drain after the screen. To cut power consumption, I installed a widget on my home screen which allows me toggle Bluetooth and WiFi on and off with a single touch of the screen. Highly recommended!

4) Turn off GPS

The GPS unit inside your phone is a wonderful feature when searching for nearby restaurants or when you are using a navigation app; but it's always-on aspect can make it a significant consumer of precious battery power.

5) Turn off unnecessary apps and notifications

Simply speaking, the more applications and more notifications you are running on your phone, the more energy you are consuming. Applications can be quickly turned on so if you are not using them, then turn them off.

6) When all else fails, pack extra power

If you've implemented all of the suggestions above and still find you can't get through the day without recharging your smartphone then consider buying a portable power pack. Packs are simply portable rechargeable batteries which plug into your smartphone and transfer energy from the power pack to your phone. Most power packs can provide up to an additional four hours or so of extra run time to your average smartphone. As an added bonus, the power packs can also be used to recharge other portable devices, such as an iPod or Nintendo DS. Power Packs from the likes of Energizer and Duracell, which can charge and discharge about 500 times, are available from bigbox retailers for between \$30 and \$40.

(by Hugh Thompson, the Globe and Mail)

"Technology has the shelf life of a banana." - Scott

McNealy

The Digest



The Digest (Cont.)

" Getting information off the internet is like taking a drink from a fire hydrant." — Mitchell Kapor

Pentagon plans to buy iPhones, Android in threat to Blackberry's market share

The Pentagon is planning to open its network for the first time to Apple iPhones and devices running Google's Android operating system, a threat to BlackBerry maker Research in Motion.

The Defense Department plans to hire a contractor to build a system that will manage and secure at least 162,500 Android devices and Apple products such as the iPad, according to a document posted online Oct. 22. The system may be expanded to handle 8 million devices, the department said.

The project is "a significant step towards delivering a secure mobile communications capability" to the entire agency, according to the document.

The plan opens the door for the military to provide alternatives to BlackBerrys, which already are used on the Pentagon's network. RIM has clung to government business as an area of strength as consumers and some businesses switch to rival devices with bigger touch screens and faster browsers.

For the year ended March 3, RIM's sales in the United States, its biggest market fell 47 percent compared with the previous year.

The Pentagon wants to allow employees to access its network with a broader range of mobile devices so it can "take advantage of the increasing wireless capabilities that exist and that are developing in the marketplace," according to the contracting document.

While the Defense Department is not insisting that contractors propose systems that can manage RIM devices, it "desires" a system that can also handle BlackBerrys, the document stated.

Paul Lucier, vice president of government solutions for Waterloo, Ontario-based RIM, said in an e-mailed statement that the military left BlackBerry compatibility off its requirement list because it already has a RIM system to manage the devices.

The Pentagon's Defense Information Systems Agency plans to award the mobile device management contract to a single company by April. The contract will probably be for one year with options to extend it an additional two years. Bids are due Nov. 27. The Pentagon did not give the potential value of the contract.

Natalie Harrison, a spokeswoman for Cupertino, Calif.based Apple, declined to comment. An e-mail and a phone call to Mountain View, Calif.based Google were not immediately returned.

In an acknowledgment of inroads made by rivals, RIM in April released BlackBerry Mobile Fusion, software that lets organizations manage iPhones and Android devices alongside BlackBerrys on their networks.

"We are excited for the op-

portunity to include BlackBerry Mobile Fusion" in the military's portfolio, Lucier said in his statement.

Even with its total sales decline, RIM's market share among U.S. government agencies was probably increasing, the company's senior vice president of BlackBerry security, Scott Totzke, said in an April interview in Washington.

"Compared to the enterprise over the last year and a half or so, the federal business on whole is up," he said at the time. "The employee base is shrinking, so if we're looking at a market with fewer employees and our install base is stable to slightly up, that would seem to indicate that we have an increasing market share."

(By Nick Taborek, the Washington Post)

Google Signs Deal With Warner Music

Google got one of the key pieces of its digital music puzzle in place over the weekend when it finally signed a deal to bring the catalog of the Warner Music Group — with Green Day, Madonna, Neil Young, the Red Hot Chili Peppers and hundreds of other acts — to its Play store.

The news of the deal was tucked in a Google company blog post on Monday that was mostly about new models of its Nexus phones and tablets. But for Google's music service, which has struggled to gain traction against iTunes, Amazon and the myriad of other digital services, it is an important step. It means that Google's millions of Android users — whose devices do not have iTunes — will finally have an essentially complete catalog of MP3s to buy. "We're now working with all of the major record labels globally, and all the major U.S. magazine publishers, as well as many independent labels, artists and publishers,"Andy Rubin, the company's senior vice president for mobile and digital content.

Google also announced in its blog post that its music store will open in Western Europe on Nov. 13.

In Europe, it will introduce "scan and match," a crucial feature for cloud music. It matches songs on a customer's computer to a master database on Google's servers, allowing users to skip the laborious task of uploading every single song. (The feature will not be ready in the United States until "soon after" its introduction in Europe on Nov. 13, Mr. Rubin wrote. Warner controls about 15 percent of the world's recorded music market, according to the trade publication Music & Copyright. But it was absent when Google announced its MP3 store last November; Warner was also the last of the big record labels to sign a deal with Spotify, the digital music service.

In March, Google consolidated its MP3 store, along with the Android app marketplace and stores for movies, television and magazines, under the Play umbrella. Its branding efforts included a truck that gave out free ice cream at the Celebrate Brooklyn concerts in New York this summer.

(By Ben Sisario, New York

Times)

"To err is
human; to
really foul
things up
requires a
computer."
— Bill
Vaughan

What's new inside the iPhone 5

Apple CEO Tim Cook speaks in front of an image of the iPhone 5 during the product launch in San Francisco on Sept. 12, 2012.AP Phil Schiller, senior vice president of worldwide marketing at Apple Inc, speaks about iPhone 5 pricing during Apple Inc.'s iPhone media event in San Francisco, California September 12, 2012Reuters

Perhaps the biggest changes to the new iPhone – dubbed the iPhone 5 – are external. The phone is longer, lighter and thinner that its predecessor, addressing a criticism Apple faced last year when it introduced the iPhone 4S - a phone that looked exactly the same as the previous iteration. However, hoping to avoid complaints from other smartphone users who found larger devices too cumbersome to operate with one hand, Apple has made no changes to the width of the phone.

Apple claims the new iPhone is the thinnest smartphone in the world, at 7.6 millimetres thick. The phone is also about 20 per cent lighter than its predecessor, at 112 grams.

The phone is slightly longer than the iPhone 4S – long enough to make room for a fifth row of icons on the home screen.

Apple has already updated most of its firstparty apps, such as the iWork suite of tools, to take advantage of the taller screen, which also features the ultra-crisp, high-resolution "retina" screen. Apps made for older versions of the iPhone will run letterboxed on the new

device.

As expected, the new iPhone will handle LTE, the next-generation wireless network that's many times faster than existing networks, and in some cases faster than wireless and wired Internet connections. The move could have some downside for Apple, given that Samsung is reportedly planning to sue the company over LTE-related patents, but few observers expected the iPhone 5 to miss out on the wireless technology, regardless of the potential courtroom implications.

The new wireless technology works across several LTE standards, and will be available on most Canadian carriers including Rogers, Bell, Telus and the sub-brands Koodo, Virgin, Fido. Wind Mobile and Videotron wireless signals appear to be incompatible according to early reports.

In virtually every respect, the iPhone 5 is an improvement over its predecessor – but not in any revolutionary way. The battery lasts longer, the processor is more powerful and the onboard cameras come with various enhancements, including a "panorama" mode that takes massive, sweeping pictures.

But besides changing the size of the screen, Apple has largely left the traditional iPhone formula intact. In fact, even the presentation itself stuck to the same script used by the company's late founder, Steve Jobs, with current CEO Tim Cook kicking things off with a slew of statistics touting Apple's dominance in the mobile marketplace, before unveiling the new phone.

Some features that were expected to be announced on Wednesday never materialized. The iPhone will not come with NFC, a wireless technology that allows for uses such as phone-based payment systems. Apple is also ditching its wellknown connector cable, which it had used for nine years dating back to the iPod. Instead, the iPhone 5 will need a new, slimmer connector. While that will likely prove to be a headache for those who have the old cable and docking devices using the old standard, the company said it is building an adapter.

The iPhone 5 will be available in two colours, black and white. Pre-orders for the phone in Canada and the U.S. start on September 14, with shipping set for a week later. The new phone will be priced the same as the current iPhone, starting at about \$200 with a contract. Canadian pricing without a contract is starkly different \$699 for the 16GB model and \$799 for the 32GB model and \$899 for the 64GB model.

Perhaps more importantly for Apple's attempts to capture the low-end of the smartphone market, both the iPhone 4S and the older iPhone 4 will both see a price drop, with the latter device essentially priced at \$0 with a contract.

According to Apple, the companion iOS 6 software will be available on Wednesday, September 19 as a free update.

(By Omar El Akkad, the Globe and Mail)

This month's special: Message from our computer science teachers

As society's use of the computer continues to expand, with the growth of the Internet, the Web, new applications and embedded systems, the need for computer scientists grows with it. New and innovative uses of computer technology have kept the demand high for strong, current and flexible computer education programs taught by highly trained faculty. Today's information technologies extend human knowledge and solve

ence at thrilling speeds, with dazzling perfection. The possibilities are limitless for technologies that so closely parallel the way we think, imagine and create. This is a science of exhilarating potential. The mission of the Computer Science Department is to provide students with an understanding of computer science concepts, processes and tools, and to equip students with the analytical, design and communication skills necessary to be successful in the technological era that

Why Computer Science?

we live in today. The applied nature of computer science necessitates involving students in software development projects, research projects, different assignments and activities (as well as hands-off activities), as part of their learning experience. Scholarly investigations, software development and research are an integral part of the department's instructional mission.

"Computer Science is no more about computers than astronomy is about telescopes." – E.W.Dijkstra

What is CompSci?

If we're feeling formal...

problems in business and sci-

Computer Science is a broad discipline concerned with the science and technology of information processing. It includes areas such as:

- Theory of Computation: what can (and cannot!) be computed, the complexity of problems, models of computation;
- Computing Systems: Architectures and devices for implementing computations, including parallel and distributed computation and computer networks;
- Applications: Web technology, Artificial Intelligence, Databases, Computer Graphics, Animation, Desktop Publishing,
- And much, much more...

and if we're not...

Computer Science is the **hottest, most dynamic and most exciting** field there is. From chatter bots to filter bots, protocols to predicates... Computer Science is limited only by your imagination.

CompSci as an Occupational Field

The 2012 Final Statistical Report from WPI's <u>Career Development</u> <u>Center</u> (CDC) shows that computer science has the highest number of job listings at the CDC. Computer science also has the second highest average bachelor's degree starting salary, at about \$58,000. <u>Business Week Online</u> <u>reports (July 25, 2005)</u> reports that" The latest data from the Bureau of Labor Statistics contain a pleasant surprise: The ranks of 'computer and mathematical occupations,' which include many programmers, actually rose in the second quarter by a robust 7.5%, to 3.2 million, compared with the previous year. While software companies themselves boosted jobs by a modest 3.3%, employment at establishments providing custom programming services increased by 5.6%. By contrast, tech manufacturing jobs were up just a tad and telecoms are still cutting staff."

Computer Engineering



Computer Engineering at York Mills C.I. combines the exciting and dynamic fields of electrical engineering and computer science to develop computer-controlled systems that allow you to create almost anything that you can imagine. Learn how a CPU works, design and build your own circuit boards or put it all together to construct your own robot from scratch! Computer engineers often have



an academic background in computer science, information science, mathematics or engineering. Additionally, skills in research and design, communication, decision-making and a technical aptitude are all strongly desirable.



"I have been impressed with the urgency of doing. Knowing is not enough; we must apply. Being willing is not enough; we must do."

A Career in Computer Engineering

COMPUTER ENGINEERS:

- Improve Internet security to help protect your information and make it safer to buy things online
- Design faster processors to help make HDTV and 3-D TV watching and video gaming experiences better
- Develop biomedical systems to help monitor patients in hospitals
- Implement sensor networks to help make robots more human-like
- Create the smart power grid to help manage energy distribution to households

across the country

 Work with digital forensics to help police and the FBI track and catch cyber criminals



Our Concern

The Computer Science Department is very concerned about the low numbers of women and racial minorities who are enrolling in our program. Unfortunately this is a nationwide phenomenon. Many talented students are opting not to move to the next level of their education. Research and education are tightly connected in the YMCI Computer Science Department. We now teach concepts that were considered cutting edge research just a few years ago. Computer Science moves quickly, and we move with it. An essential part of educating computer scientists is to expose them to current research and the research process: we do this early and often. Research team members at YMCI Library (Mr. Keogh, ACL of Library) can be involved in tasks ranging from delving into research literature, to the design, implementation, testing and evaluation of individual algorithms or large-scale systems.



Technology Joke

At a recent software engineering management course in the US, the participants were given an awkward question to answer. "If you had just boarded an airliner and discovered that your team of programmers had been responsible for the flight control software how many of you would jump off the plane immediately?"

Among the ensuing forest of raised hands, only one man sat motionless. When asked what he would do, he replied that he would be quite content to stay onboard.

With his team's software, he said, the plane was unlikely to even taxi as far as the runway, let alone take off.



HOW TO CONTRIBUTE

We need you!

We need your opinions, stories, how-to's, reviews, and anything else that you want to tell your fellow students about the exciting field of computer science and engineering. Send your articles in MS Publisher or Scribus format to: **ISSUE #2**

Deadline: Sunday Dec 9, 2010

articles.for.YMCI.newsletter@gmail.com

Picture of the Month: What is this?



Answer to be posted next issue.



Computer Science Newsletter 2012/2013 Issue #1



Courses offered at York Mills C.I. ICS2O Introduction to Computer Studies, Grade 10 ICS3U Introduction to Computer Science, Grade 11 ICS4U Computer Science, Grade 12 TEJ3M Computer Engineering Technology, Grade 11 TEJ4M Computer Engineering Technology, Grade 12





Please sign off your computer and come

downstairs for something to eat. Love, Dad."

Last one out, turn off the computer!