colour outside the lines.

Kaoshi

"HOW WILL YOU BE CELEBRATING CANADA DAY?"

IN WHICH CANADA TURNS 150 YEARS OLD BUT STILL HASN'T CLEARED MUM'S FACE OFF THE CURRENCY...

It's the sesquicentennial tomorrow! Canada's been an officially recognized, mostly independent nation for a hundred and fifty years now. I'm gonna take a second to point out that the University of Waterloo is situated on the Haldimand Tract, which was promised to the Six Nations 83 years before Canada was even a twinkle in England's eye.

I know it's easy to spend Canada Day all wrapped up in your Trudeau-induced smugness, but it's important to recognize that our country's history isn't all sunshine and roses either. **mathNEWS** acknowledges that we are on the traditional territory of the Neutral, Anishnawbe and Haudenosaunee peoples.

Not that being Canadian doesn't look pretty good right now, on a world stage. We should all take a second to be thankful that we don't live in a war zone, that we have the ability to study at this solidly okay university, our water runs clear and we have affordable access to health care. I think we can strike a balance between being mindful of what remains to be done, but thankful for all that we have.

In other news, I'm sure you've seen Kaoshi's lovely cover art for this issue, and been shocked by the innovative new colour technology we're implementing. This week, the cover is a sort of do-it-yourself adventure: if you want to help finish the cover, you can slide your best art attempt under your door, and we might give you a prize if we like it. Or, more likely, we'll just use it to decorate MC3030. But then at least your art will be canonized forever?

I hope you all have a great long weekend, **mathNEWS** readers, however you may choose to spend it. And for those of you reading this Tuesday morning, hungover, jetlagged and late to the class that you forgot you had that day - hey remember that homework you forgot to do over the long weekend? Your professor sure does!

tbdED

Editor, **mathNEWS**

Zethar	I should probably spend the holiday going on the secret missions that I've been putting off for a while... There's one where I need to travel 3000 years back in time to learn enough cuneiform to troll GeorgeED and submit that article that he has been so 'patiently' waiting for. Oh yeah, along the way I'll need to stop some rogue time travellers and fix history, but honestly, that's like ancillary. I'll probably have enough time when I get back to curl up in bed and read a good book as well.
Ice Nine	Playing Dominion
Theodore Bear	Going to CIF celebrations... and drinking maple syrup out of the bottle while listening to Stompin' Tom Connors' "Canada Day Up Canada Way"
Beyond Meta	Going to Vimy Ridge
Diminutive Rex	More like Canada D'Eh amirite?
Viceroy Butterfly	Creeping Justin's socks.
TheUndecidED	Probably going to CIF and doing fun things there. And eating poutine without feeling guilty about it, because I have to be patriotic.
tbdED	Turning 23!
TurnipHeadED	Going on dates and wishing happy birthday.s

LAST WEEK'S gridWORD SOLUTION:

Did you know that mathNEWS isn't older than Canada?

HEATHER STONEHOUSE, mathNEWS EDITOR FOR SPRING 2017
ALONG WITH SHAUNDALEE CARVALHO AND CAMERON ROACH

CELEBRATE CANADA ALL WEEK LONG WITH ICSN!

The International and Canadian Student Network (ICSN) is planning a week long Canada's 150 extravaganza.

We start on June 29th (Thursday) with Canadian Trivia at Bomber, followed by All-You-Can-Eat Great Canadian Feast on June 30th, Celebrating Canada Day at CIF on July 1st, a trip to Niagara Falls on July 2nd, a Canoe Trip on July 3rd and to wrap it all up we are ending with a Make your Own poutine night on July 4th. Tickets can be purchased at ICSNCanada150.ticketfi.com.

ICSN Executive

A HASTILY-WRITTEN RECOUNT OF PRIDE TORONTO 2017

On Friday, I went with the GLOW center to the Trans March - except the bus ride got cancelled, so I had to sloppily dress up after class and hop on a GO bus to Toronto in order to catch the tail end of said march. I emerged under cloudy skies to see a bunch of people in very colorful clothing walking down the street together. Joining them, I walked for several minutes before I realized it was actually just a bunch of garishly-dressed stage performers heading to dinner after a production of Hairspray.

On Saturday, I went down with my friend to the so-called Gayborhood (or Gaybourhood if you subscribe to the British spelling) [ED: Or, y'know, the Canadian…] which I thought was going to be a set containing an open set, until I got there and realized it was more like "open" as in the phrase "open about your sexuality". I ate overpriced street food, went to a bar once it was night, and head-banged to trap remixes of all the latest AT40 hits.

On Sunday, I made my way to the Allen Gardens and met up with the GLOW center's delegation to the parade. We practiced a dance to Shakira's Try Everything from Zootopia, which was fitting because a little way down from where we were marching were a bunch of men wearing very little except for leather dog masks. Then Feridun showed up, and we waited in line behind other marchers for, like, two hours before marching down Yonge Street while waving our rainbow flags, and every few minutes reliving our Orientation experiences by dancing a very simple and under-practiced dance in front of lots of people.

Long story short, I spent the weekend staring at rainbow flags until all I could see while trying to go to sleep on Sunday night was Roy G. Biv's sweaty, topless body. It was awesome.

Paru-Paro

SUMMER GAMES DONE QUICK 2017!

Next week, starting on Sunday at noon, Summer Games Done Quick 2017 is starting! It's a week long charity video game speedrunning marathon where they run for donations to charity. The charity this time is Doctors Without Borders. You can check it out at www.gamesdonequick.com to see it. Here are the runs I'm looking forward to this year:

· Metroid Prime 100%, Castlevania Symphony of the Night Any% Glitchless and Guacamelee 100%. I love metroid-vanias, and most of these have really intricate movement and interesting routing.

· Portal: Inbounds. Most Portal speedruns are basically a blur because of going out of bounds so often that you just zip to the end of the run. This time we might get to see some of the actual game!

· Tetris: The Grand Master block. Tetris The Grand Master is a series of some of the most brutally hard versions of tetris ever created. In this block there is an 8 way completion race, a 2v2 race where each is 2 players on a single controller, and finally we finish it off with Kevin**DDR** playing through Tetris TGM3: Terror Instinct on Shirase mode, the fastest most absurd version of tetris that exists. By the end of it you are playing blind.

· The Legend of Zelda: Link to the Past Swordless. I have no idea how you beat this game without a sword, but I'm excited to learn!

· Super Mario Series Warless Relay Race: Lots of fast Mario games in a row.

If you can, check it out. Also, if you donate at certain times you will be entered in draws, plus you'll be helping Doctors Without Borders.

IceNine

hbd @Canada, luv u boo!

AN EDITOR WHO THINKS CANADA
LOOKS HELLA FINE FOR 150

PROJECT VOX

Mary Astell, Lady Masham, Margaret Cavendish, la Marquise Du Chatelet, and Anne Conway.

These names probably don't mean much to you, but if I were to list Descartes, Leibniz, Locke, and Hume, you'd probably know- if not their exact philosophies, then that they were some of the great "modern" philosophers (writing between the 17th and 19th centuries). However, these ladies were in correspondence with philosophers, inspirations for philosophers, and philosophers in their own right. These women produced a treasure trove of writings, including their own philosophical publications, correspondences with friends and philosophers, as well as poems, plays, and fiction. Though many of their writings did not last into the present; either falling out of print; getting lost in improper citations, or due to publishing anonymously for social reasons; or not having their work attributed to them at all.

In recent years, however, more and more philosophers have been working to bring these lady philosophers to light. Their letters are being understood as a rich playground of ideas in which they helped not only themselves but the pre-eminent philosophers of their day, develop their ideas. Their works are being dusted off and translated so that new philosophers can take part in the discourse around their work. Their plays, fictions, and poems are being rediscovered as another form of expression for Female thought and philosophy at the time.

Project Vox is an effort by Duke University to bring to the classroom the works of the five ladies: Mary Astell, Lady Masham, Margaret Cavendish, la Marquise Du Chatelet, and Anne Conway. There are many other ladies out there who have yet to be rediscovered as authors, playwrights, and philosophers, but for now Duke has chosen these ladies to focus on due to the availability of documentation of their lives and their writings. It should also be mentioned that there are most certainly many women throughout history across the globe that contributed to philosophy, however, documentation is difficult to come by, so those women of the noble class, and those who wrote in languages that are easier to translate will, by necessity and lack of resources, come first. I hope they open the door for yet more diverse voices to come through, but they are a good start.

Do with this information what you will, but I know that the next time I'm looking for some philosophical theories to tickle my grey matter with, I'm going to go for a voice that more closely resembles my own.

GBAD

DATING SIMS HAVE RUINED THE CHOOSE AN X GENRE

Okay but like what if you want to have a game that's like "A cute orphan child gets to pick which Dad they want" where they can choose sporty dad, nerdy dad, business dad, or eccentric dad? That would be a great game. It would hit everyone square in the daddy issues.

But the problem is, the current only member of the choose-an-x genre is dating sims, to the point where game devs have to go to wild lengths to shoehorn their wholesome choose-an-x game into the dating genre. Can anyone say pigeon dating sim? [ED: I'll fight you. No one mocks Shuu on my watch!]

What we need is a choose-an-x game that can be popularized where it's absolutely impossible to relate it back to romance or sexuality. I'll leave discovering a topic that absolutely no one can sexualize as an exercise for the reader.

Once we have that, we can slowly broaden the choose-an-x genre by relating new titles back to that game, so they are associated with wholesome non-sexuality instead of romantic filth. Only then can this broad category of games be truly explored.

VICEROY BUTTERFLY

WHY DON'T THEY CLEAN IT?

Personally, I prefer to use the computer labs on the second floor of MC (way better chairs than the ones on the third floor), but I've started to notice that apparently these labs aren't cleaned (even though they are closed on weekends for who know what reason). I mean, the only thing reliably done is organizing the chairs every day.

Meanwhile, the labs on the third floor seem to be cleaner in general. I have seen the persons in charge of cleaning them when I stay late (something I've never seen on the second floor).

NONACANADIAN

RETRACTIONS IN MATHEMATICS

A SOMEWHAT BRIEF CHERRY-PICKING OF EXAMPLES

In academia, the dissemination of knowledge (such as results, studies, etc.) is currently done almost entirely through journals. In order to get your work out, you write it up nicely, send it to a journal, and the article hopefully goes through the following process, give or take some particulars:

Your article passes the minimum standard of the journal, and is accepted for review by an editor of the journal.

Your article is peer-reviewed, usually by two knowledgeable and anonymous researchers in the field.

Your article is accepted for publication in the journal, and eventually it makes its way into an issue (or maybe online).

If it fails at any step, it's usually because your article is not up to snuff for any number of legitimate reasons: your results aren't important at all, or are utterly trivial; they've already been found by someone else, and you honestly didn't know even after a literature review; there were issues with your methodology[1]; etc. This is quite reasonable, because academia is focused on spreading facts and theorems, not falsehoods and incorrect inferences, and this process helps prevent the latter. Sometimes, if there are only minor errors, the reviewers will accept the paper, subject to its revision.

However, sometimes this process fails. Journal articles are occasionally published that don't meet the requirements for rigour and truth in academia. When this happens, sometimes no one notices, sometimes for years! This could be because the reviewer didn't (or couldn't!) notice, or because of the author's reputation, or even because the error was so subtle that everyone missed it. Eventually, though, someone does notice, and when the journal is alerted to a problem, they start the retraction process, which is a formal rescinding of the paper, acknowledging that the article has irreparable flaws and should not have been published.

Sometimes, retractions go over very well, like this example from last week. A March 2017 paper by Dr. Francis Johnson in the journal Communications in Algebra, was retracted for not containing sufficiently new material. He had proved properties of specific types of group rings that he had termed "weakly finite". However, this type of group ring has been studied before, under the name "stably finite", and since the properties "discovered" are nothing new, the paper was retracted. Moreover, Dr. Johnson had no issue with it, except to comment that the results are all perfectly fine. As a topologist, and not an algebraist, he was unaware of the other term. The reviewer missed this too. Why? Perhaps because the study of group rings and these properties has been essentially stagnant for 30 years. It was an honest mistake, and life goes on. Sometimes editors issue retraction notices, on behalf of the editorial board, and sometimes the authors realize an error

in their arguments. In a situation where the mistake is honest, everything is usually fine.

Other retractions don't go over so well. For instance, a Democratic state senator in Illinois, Senator Daniel Biss, published some very high-profile papers in the 1990s (one in the Annals of Math!), and recently had one of them retracted, and two others issued errata. Biss worked as a professor at the University of Chicago for a time before becoming a senator, and when he was contacted about the retraction notice, he had nothing to say. Hmmmmm. A more threatening situation might be that of Mostafa Khater, an Egyptian mathematican who published an article in a somewhat less-reputable journal in 2015. When his article was retracted in the summer of 2016, on the grounds of plagiarism (a very, I repeat, VERY serious offense) of a 2014 article on a similar subject, he threatened to sue the journal. Uh oh. The fun part about all of this is that the paper is about reducing a PDE to an ODE using travelling waves; something that we touch on in AMath 353, if I recall correctly. Pretty inconsequential stuff.

Hilariously, sometimes mathematical mistakes propagate for a longer time than otherwise expected. For example, a paper by Grunwald in 1933 claimed to establish a general theorem, and was corroborated in 1942. Both proofs were wrong (in subtle ways), and corrected in 1948 and 1950 (twice!); another proof was given in 1974. And then there were more corrections, this time to the corrections, in 2007 and 2011. As mathematicians, but more generally as academics, we're interested in setting the record straight, as it were. Sometimes it just takes a bit of time, and that's okay. Interestingly, none of the above papers were retracted; they were simply fixed by later authors.

As an aside, this is a fun read: "How and Why Mathematics is Unique as a Social Practice", by Jody Azzouni. It discusses the — gasp! — sociology of mathematics. Super interesting. It's relevant here because of the conformity of mathematicians to the practice of getting things right (or at least establishing non-competing branches of math), instead of simply yelling at each other. Admittedly, the back half of the paper is a bit of a winding road.

If you're interested in keeping an eye out for retractions in academia (specifically math or otherwise), have a look at retractionwatch.com! They've got posts about all retractions that they hear about, and the comment sections aren't toxic. Most of the information in this article is either from my experience or from there.

Finally: I found two names that I knew when reading about these retractions, one at UVic and one at UW, which were both on the editor end of things. We're all in this together!

SCYTHE MARSHALL

[1] In some disciplines, this means that there are problems with your statistics or study procedure, or that you've used falsified data. In math, it means you screwed up a proof or calculation.

THE FIGHTER, THE WITCH, THE THIEF AND THE WHEELBARROW FULL OF WANDS

I came across a simple idea for an RPG adventure a while back. I'm not sure in how many editions this exists, (you can tell I'm an expert DM already!), but in 5e at least there's a spellcaster class where occasionally your spellcaster has to roll on a Wild Magic table, where something random that they didn't intend occurs along with, or instead of, the spell they were trying to cast.

The canon Wild Magic table has 100 entries, but a quick google search reveals somebody's homebrew d10,000 table of crazy magical effects, from "Summons the nearest paladin but not their clothes" to "Causes the nearest star to supernova", and this is the table that I used.

In this adventure, a wizard has manufactured 100 wands. Each wand emits a fairly low-powered bolt of energy, but each wand also has a random effect from the 10,000-entry table. Your mission: to test each of the 100 wands and determine what it does, and report back to the wizard for an absurd amount of gold.

It's something that would be ridiculous to implement in a regular campaign, because being able to reliably repeat some of the wildly powerful magical effects on that table is really broken. Being able to cast Wish (a reality-altering spell with near infinite power) once is insanely powerful endgame content. Being able to cast it as many times as you like is basically an instant ascension to godhood.

But, in my opinion, it works really well as a low-prep one-shot. All you need is an online dice roller, and the d10,000 table itself and you're good to go. It's as much fun to DM as it is to play, because you're reacting to random events just as much as they are. I ran it on a barebones kind of system: no character sheets, no real codified mechanics, I would just make them roll a dice to do something with a DC I had eyeballed based on what their character was good at and how hard the thing was to do.

The best part is you can run it multiple times, even with the exact same people, and you're never going to get the same adventure twice. I tested it out briefly with a friend of mine and when we broke off, he had abandoned his friends in a cylinder of cold air surrounded by angry sheep, while he ran off panicked blinking back and forth from the ethereal plane. Oh, also he had become king of the fae about half an hour earlier, although he didn't know it yet.

The one time I ran it all the way through, I was surprised at how well it flowed. Any time there was a natural lull, the characters would fill it up by trying the next wand. Sometimes they would get a wand that had no immediately obvious effects, like the wand that transferred the inhabitants of the nearest brothel into the nearest church - but this only served to make them warier when I ominously told them they couldn't detect any effects (and made them roll for effect).

That really helped me with world-building when they continued along their path and happened upon an all-out brawl outside a church between some modestly dressed country folk and a bunch of flashy elves. (They ended up convincing everyone there that the party was emissaries of the gods, forcing the folks to line up, and giving them each a wand to test in turn. Kind of ruthless, considering two of them died, one of them got a glimpse of hell, and one of them had their house crushed by a meteor.)

I can't promise this will happen every time, but when I ran it for the fighter, the witch and the thief I was surprised and pleased how they all got really satisfying endings.

The witch was initially the apprentice of the wizard who provided the wands, so her motivation was to learn more about magic. She ended up forging a familiar bond with a dragon, and after helping rescue the dragon from being turned into an inanimate gold statue the dragon agreed to take her to study at the draconic magic college. Oh, she also has the power to extend her neck to a length of six feet.

The thief had a revelation that he had a non-specific calling from god, and then almost immediately after a water elemental was summoned who thought the thief was his best friend. Almost immediately after that, they found the most valuable wand which they had been trying to identify for most of the session...

So the witch was keeping them all very regimented, meticulously writing down what the wands did by the number carved in them. Unfortunately, the witch and the thief hated each other (almost instantly, despite the players of those characters being happily dating in real life), and early in the session they each grabbed a handful of wands and fired them at each other. This had a number of interesting effects, including both of them now wearing ballerina outfits and the fighter becoming sexually attracted to dirt.

Anyway, turns out one of the wands the witch used caused the caster's home to become really well magically protected. It was lucky it was her who cast with it, because as the wizard's apprentice she lived with him and he was definitely going to notice amazing new wards popping up around his house. He alerted them, so they kept an eye out for it.

The water elemental was the one who eventually found the wand again, and he proclaimed that it would be pretty great if everyone could protect their homes with it. The thief, who was under the impression that the water elemental was a newly revealed god of which he was the first apostle, took up this cause with quite the zeal. They left together on what I suspect would be a monty-python-esque adventure to bring safe houses to the whole material plane, but not before the

thief gained the power to turn to snow, turned his skin purple, and had the top half of his ballerina outfit burned off.

Oh, and he caused one of his feet to grow to the size of a large dog, but a few minutes earlier the fighter had turned her boots into boots of holding so he just put one of those on and it conveniently worked itself out.

The fighter, through the course of the adventure, had managed to become incredibly sexy and incredibly strong. This came in handy when they accidentally flipped a mountain inside out, displacing an earth elemental. Not because the earth elemental was aggressive towards them, but because, as I mentioned before, she had become sexually attracted to dirt and as an earth elemental is basically a sentient pile of dirt she had found her true soulmate. [An OTP if ever there were. -TurnipHeadED]

She retired to help him rebuild his mountain, but not before gaining the ability to de-age by two years every time she broke a bone. Which, in a plane with magical healing, meant she could live for the rest of time with her new boyfriend if she managed things carefully. All-in-all, a happy ending for everybody.

This was my first time DMing something that wasn't prefab, and I really recommend trying it. My friends and I all had a good time, and I feel confident going forwards that I can rise to greater RPG challenges. Also, I feel like this is going to be something good to keep in my back pocket if I ever need to keep a group of 1-5 people entertained.

Go forth and imagine!

DIMINUTIVE REX

AIDING THE EXILE IS BROKEN

So Runescape (RS3, not 2007scape) has a certain class of events where you passively gather 'event coins' or 'doubloons' or 'flourishing seeds' each day, up to a cap of 1,000/day. The events usually last 2 weeks, and it takes 10,000 tokens to unlock all the cosmetic rewards. After you've unlocked the rewards, any extra tokens can be redeemed for 'mystery boxes' which usually contain bonus xp that can be redeemed in any skill.

Straightforward enough. They currently have an event on (at least, it's still on as of Tuesday) run on this format, but with a (lame) twist: because they just released the new city Menaphos, you have to train in Menaphos to earn the coins.

This led to an immediate outcry on reddit (although honestly you probably can't name a thing that more than five people know about and no one is decrying on reddit) that it was

unfair to 'force' people to spend time every day in this city to earn the coins (even though the rewards are only cosmetic...)

So the mods came up with a solution: there would be no more daily limit to how many coins you could earn, but coins still had to be earned in the city.
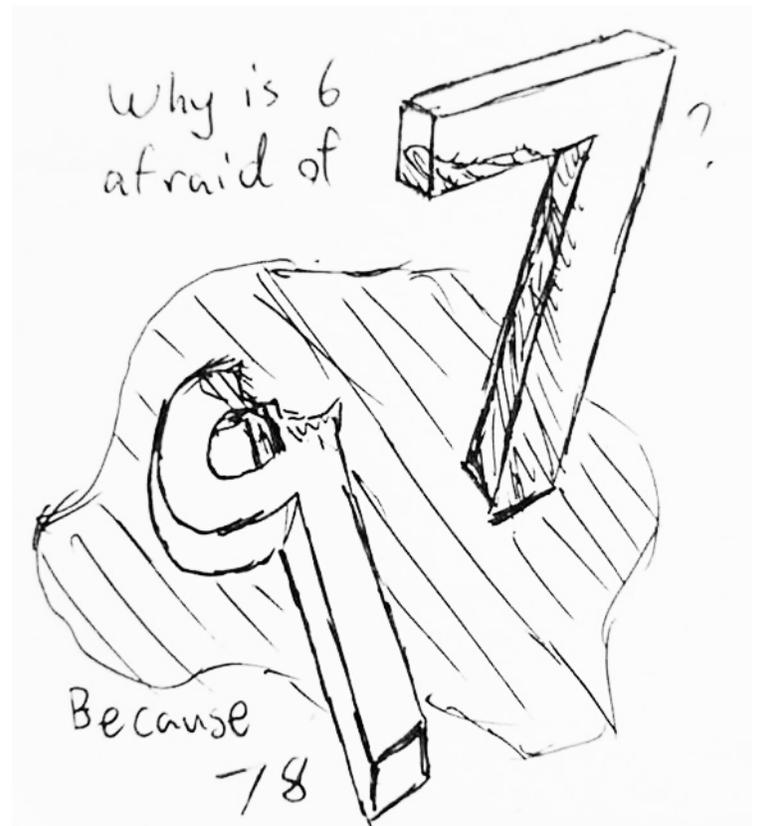
But remember how, after you've redeemed 10,000 coins for the cosmetics, you can redeem the rest for bonus xp mystery boxes? And now there's no daily limit on how many coins you can earn, so long as you're in the city?

And did I mention that one of the main activities in the city, fishing, is also the most afk-able skills in the game?

Long story short, everyone I know has been afk-ing fishing while browsing reddit all week and my clan is going to have more bonus xp than you could shake a stick at.

That's the problem when you introduce loopholes into obsessive grindy games like runescape: people feel obligated to take advantage of the best xp rates, especially if they're only available for a limited amount of time. I don't know what the moral of this story is, but if you come to W35 VIP before the event is over, I'll be the one with the Echo Wings and the rod-o-matic.

MOREO

why is 6
afraid of 7?

Because
-7/8

ADELEAS

TIPS TO AVOID NOISY NEIGHBOURS

Have you ever felt disturbed by loud neighbours, who just had one too many beers? Or decided to play Mario Kart at 2 am on Thursday morning? Or sing along that one obnoxious song? All the above? Have you called noise police, and they never arrived, or arrived, but after they left, the noise went up again? Fear not, for this article will prepare you for the most notoriously loud neighbours.

Stepping up the game isn't easy, but there are certain stages that guarantee your PEACE and TRANQUILITY. First and foremost, ask your neighbour nicely to be quiet. If that doesn't work, calling Waterloo Noise Police is always the way to go (if they are being unreasonably loud). If that is not working for you, DO NOT confront your neighbour. At this point, they proved that they do not care about your passive aggressive remarks at the elevator, noise complaints and fine threats by police, or basic human decency.

You need to noise proof your apartment, and for that you need to understand how noise works. According to the 1968 Manual of Popular Mechanics, the most common method of transfer of loud obnoxiousness is through airborne transmission. Sound from the source room reverberates through the walls, while the opposing walls vibrate back, responding to this unfortunate ripple effect as a skin of drum. All you need to do, is to cover up surfaces using absorbent materials, such as rugs, drapes and upholstered furniture.

Not satisfied that your drapes only deafen the back vocals of room 406's karaoke night? Can't afford an Azerbaijani rug? Have you never heard anyone (except your grandfather 4 years ago at family dinner on Thanksgiving) even talking about upholstered furniture? Fear not. You can up your game.

Next step is, you put on your faded dad jeans of uncompromised integrity and walk into local hardware store. You buy a ½ inch-thick insulation-type gypsum wallboard. Then you buy more of those bad boys. This baby will act as your erected sound barrier, assuming you can cover EVERY DAMN INCH of your wall (and/or ceiling). Trust me, if you don't want to move out, and your dignity is still intact, you will buy that hammer for $7 at your local Chinese convenience store and cover the ever-loving glory out of your space with the sweet, sweet gypsum board.

While you may cover the airborne noise, if you live in a cheap student housing, fashioned a la tenement halls, chances are your building's structural members aren't perfectly partitioned. The studs and joists, the pipes and floors must have material coverings around the fittings. Too bad that you can't do anything about it, since you can't legally change any structure without consulting your landlord… Or can you?

Perhaps you have a Greek neighbour who works in a shady Kitchener sponge business. Buy sponges, glue them to boards, create makeshift layers and cover your ceilings. If not, you can always use the good old army method and buy bags, filling them with sand. Apply sandbags liberally. The thicker your sand level, the less you will hear. And if you can still hear that awful karaoke rendition of "Wannabe" by Spice Girls from the neighbouring room 406, it is officially time to aggressively knock on the wall, for the 12th time this hour.

August Marauder

TACOBOT: THE STUPIDEST CHATBOT FOR A DUMB FUTURE

Last year, Taco Bell introduced a chat bot on the Slack Instant Messaging platform that allows people and teams to order meals for delivery.

Of course, it couldn't just be a simple ordering bot, one that worked by saying something like "here are your options, press 1, 2, or 3 for a different order"; instead, they had to involve "natural language processing" that uses predictive algorithms to determine what someone wants to order. This on its own is not necessarily a bad thing — I know how frustrating it can be to deal with a telephone bot with number orders — but consider an order where someone asks to "remove lettuce". The bot responds with "Sure thing. You're missing out, but it's up to you." This bot has goddamn sass built into it! Who the hell wants sass in a chatbot? You don't want a chatbot to be more human, because it just ends up being a shitty parrot! Chatbots shouldn't provoke negative emotional responses — that's just stupid. And since TacoBot's sass was likely explicitly programmed in, its responses are also likely pre-written, making entire thing insanely stupid.

Here's a quote from the website about the bot:

It's simple. Tacobot is a new friend and should be treated as such upon a quick install. Start asking it questions about our menu, see how it's feeling or find out what its favorite movie is.

Fuck this entire paragraph of nonsense. TacoBot is a simple script. Don't fall for their bullshit calling it "an advanced intelligence" or "a friend". Fuck off Taco Bell, and fuck this horrible future.

IceNine

math**NEWS: The best way to procrastinate.**

GROUND CONTROL TO MAJOR BAE: NOW IT'S TIME TO LEAVE THE LOO IF YOU DARE

Students at Waterloo who date, are no doubt familiar with this dilemma. You've found an amazing person, but you are looking down the barrel of another 4 months, 8 months, a year of not seeing them. Of course, at this point, you are both locked into your next co-op term and the study abroad you have planned after that. Or you just realized that you aren't on the same co-op stream after all. You're having that moment of panic; how are you supposed to keep in contact with someone when you have a 3-hour, a 6-hour, or a 12-hour time difference. How do you deal with the distance that Waterloo forces you to put on your relationship? Hell, is your relationship going to survive the distance?

After a few promenades around this particular block, I'd like to think I have a couple of things figured out. (Not that I feel very prepared for the not-seeing-each-other thing that's peeking around the corner at me again.) Here's what I've learned so far.

These next few months are gonna be shitty. At times. When you have a bad day and just need a hug or have an itch that you need scratched, those are gonna be shitty days. And yeah, you might feel a little disconnected, but boy, have I got news for you. That phone you carry in your pocket? The one that has a terrible plan that doesn't get you long-distance? Yeah, it still has data. Messaging bae throughout the day- even when they don't respond is still the same as when you message them while they live with you in Waterloo and they are studying. Oh, and Video chat? That shit is like gold, you can actually talk to this person. Okay, so you won't be able to hold their hand, or hug them, or touch them, but at least you can talk to them.

Here's where the 'when I was your age' speech comes in. (Not me, I'm your age, but I have parents, and I think you do too.) My parents like to tell me all about how when my mum went to Spain for a semester, they had to survive with one phone call a week, a couple of postcards, and having to live their own lives for the months that she was gone. My grandparents like to tell me all about how when they moved away from home, all they had was one letter a week, a couple of phone calls, and having to live their own lives for the years that they were away from their families. (You get the idea.) I'm not trying to say – well, actually, I am kind of saying "Suck it up, Buttercup", but I mean it in the nicest way possible.

Yeah, the next couple of months are gonna be shitty, but make some new friends and tell bae all about your day, anytime you want. You have the power to leave messages throughout the day, they can pick up their phone and message back whenever they have a moment. If it gets to the point that you really need a hug, that's what friends are for. Just don't give up on bae. If they are who you think they are, they're gonna be going

through the same thing on their end. And if you take a little longer to answer one of their messages than normal, or vice versa, y'all were probably in the middle of something, or you couldn't sneak away from work long enough to respond. So calm yourself down, and remember that y'all need to trust each other the same when you're apart as when you are together.

Major Bae to Ground Control: The stars look very different today.

GBAD

PIXEL PERFECT

This has been bugging me for a while.

So the Planck Length is the smallest length that it makes any sense to refer to - any length shorter than that, and you aren't talking about physical space any more, but quantum effects.

And the Planck Time is the shortest amount of time it makes any sense to refer to, which is defined as the amount of time it takes to go the Planck length at the speed of light.

But wait. That means it isn't possible to move any slower than the speed of light. If you're going slower the speed of light, and you move at that speed for a Planck instant, then you'll have moved a distance that's less than the Planck length.

But you can't move a distance that's less than the Planck length, because that's the shortest distance that can meaningfully exist.

Which means it's like moving across a screen at a rate slower than moving 1 pixel every screen refresh (since, of course, moving a Planck length every Planck instant would be the equivalent of moving at the speed of light, which is the universal maximum).

Some refreshes you move a single pixel, some you don't, and the average number of pixels you move per refresh multiplied by the number of refreshes per second gives your speed in pixels/second.

Which means, if you could slow the universe down and watch it, we're all stuttering across space in discrete, pixelated jumps. Tiny jumps - a Planck length is to a proton as a proton is to England.

So our universe has pixels and a static refresh rate and no such thing as continuous motion. But sure. We don't live in a simulation.

D**IMINUTIVE** R**EX**

INVESTIGATIVE JOURNALISM! IS THE SLC/PAC EXPANSION ACTUALLY BUILDING A PLACE TO HIDE A DINOSAUR?

Greetings, my loyal readers! It's Theodore Bear, back again with more investigative journalism. You see, everybody reading this article is going to get some investigative journalism, whether they like it or not. So, in the spirit of investigative journalism, let's begin!

As everybody on campus knows from the construction site outside of MC, the SLC expansion project is currently underway. The expansion, voted for by students, was brought about by a partnership between the University of Waterloo, the Federation of Students, and the Graduate Student Association, in an effort to increase student space. However, while a lot of information about the expansion is already available, I have seen nobody asking the most important question about this undertaking: is the expansion actually building a place to hide a dinosaur under the SLC?

As anybody who reads **mathNEWS** and has seen my previous articles knows, Feds is no stranger to conspiracies. I mean, just last year, they conspired with German Chancellor Angela Merkel to control the world's supply of churros (though thankfully, I was able to stop them)! With such a shifty organization involved in the SLC/PAC expansion, how can we not be sure that this isn't actually a secret plot to hide a Barosaurus beneath the university campus?

Another suspicious aspect of the expansion is its size. According to the university, the additions will add over 63000 square feet of space to improve the student experience. This will include 4500 square feet of social space, 11000 square feet of fitness space, and 3000 square feet of recreation studio space. A Tyrannosaurus Rex, on the other hand, would be roughly 40 feet long and even less wide, and it is one of the largest theropods. Other dinosaurs would take up even less space. Perhaps some of that 63000 square feet has been secretly allocated for an Allosaurus pen?

Also, keep in mind that this expansion is for both the SLC and the PAC. There is a lot of space Feds could secretly be using, right now even, to hide any dinosaurs they wish. How many times has a squash court been booked even though you're pretty sure no one's inside? Maybe there was something inside, just not something human. As well, one of professional sources has told me that some parts of the PAC, like the small gym, have been closed down due to construction. The empty gym would be the perfect place to hide any Velociraptors Feds has obtained before the new space to house them has been built. How long before it escalates to students being forced to share their swimming pools with a Liopleurodon?

The new space will also contain a bookable event space with 150 seats. You know what would certainly be an event? Feds showing off their secret dinosaurs in secret to their mysterious allies who remain shrouded in mystery. It's interesting that the space contains 150 seats. 150 divided by 10 is 15, which last semester I learned was the code to the safe containing the President's catalogue of secrets, which allows the President to order any item from Sears at a special discount! How do we know that Feds isn't planning to book the event space so that they may bring out an Apatosaurus for the entertainment of themselves, and whoever they may extend an invitation to?

A total of 345 dining seats will also be added during the expansion. Is this indicative of Feds plans to start feeding students to their dinosaurs? Who knows? Could you one day be eating lunch alone at one of these new tables, only to suddenly find yourself falling through a trapdoor as the soon-to-be dinner of a Dilophosaurus? The answer: unlikely. However, these new seats will encourage more students to eat at the SLC, meaning more food thrown into the garbage, meaning more to feed the dinosaurs they are hiding nearby. Who would suspect that their half-eaten teriyaki was going to feed a Pterodactyl?

It's clear that there are many unanswered questions about the SLC/PAC expansion that Feds and the University of Waterloo have so far remained silent on. When this expansion finally opens — whether it meets its proposed Fall 2018 opening or not — we should consider whether we are walking several hundred feet over the secret underground laboratory containing living dinosaurs when we walk through this new building. Since we will be paying 18$ each per term, it's our right to ask these questions, and demand answers!

Theodore Bear

BOO

Due to an unfortunate incident that is in no way related to my recent attempts to obtain magical powers, I have shuffled off my mortal coil and become a ghost. It's actually oddly liberating. No need to eat or drink[1], no need to take care of a physical body, and instead of having to walk places, I can just lazily float there[2]. I'm also basically immortal, assuming no-one bothers to resolve whatever unfinished business is keeping me here.

On the less liberating side of things, I'm now bound to haunt the university for eternity, so that's a bit of a downer. Hopefully my wifi credentials don't expire[3].

Ethereally yours,
s,τ∈{2κ,κ∈Z}, 144

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1. I will still avail myself of **mathNEWS** pizza, of course
2. I don't even need to walk around obstacles or anything!
3. Like I have.

SHITTY REVIEWS NO ONE WANTS: VERY SPECIFIC BRAND OF SUNSCREEN NOT AVAILABLE IN NORTH AMERICA

Have you ever wanted to feel extremely disappointed, intense buyer's remorse, and possibly be in a moderate amount of pain because of a purchase? Wow, do I have a product for you!

Introducing: La Roche-Posay Sun Cream or "la crème solaire" as they say in Paris. 50 SPF protection in a tube of substance whose only distinguishing feature from a tube of excrement is it's slight citrus smell.

The pale, brown lotion spreads over you skin like very sticky playdough. Who would want sun cream that easily covers ones skin? The cream will have your skin acquire a tint reminiscent of the illustrious president of the United States.

The product also provides a multi-day experience of still getting the sun burns you would otherwise have gotten, regardless of its use.

This useless product costs 16.50 Euros or 25.50$ Canadian for a small bottle 40 ml of sun cream. Never will this be money well spent.

We recommend instead getting that tacky tourist scarf. it was only 3 euros. Why didn't we buy the scarf or a rainbow flag? That would have been fabulous.

The only thing about this product that resembles sun cream is that it encourages sun screams.

Beyond Meta

ALLERGIES ARE THE WORST

The past three weeks have been an itchy, watery, drowsy pile of sadness. You know those commercials where there's that lady in an allergy test facility whose ready to use a rake on her itchy eyes and palate, or that illustration of the leaky tap that you just want to hit with a stick? That was the waking reality these past few weeks.

Allergies are probably the most stupid bodily functions out there. You are reacting to natural, environmental stimulants, like they are going to kill you. (Okay, Autoimmune diseases probably take the cake for stupid shit your body pulls on you, but external allergies are up there too.) My body thinks that

the pollen from some tree (we never could find out exactly what I was allergic to when we did the allergy test a few years ago) is out to get me. The tree never did anything to me. It's not the descendant of Alexander the Great or Hannibal and his conquering horde. This tree never hunted my people down, or tried to kill my ancestors. It's just sat there, for it's whole life, in the same spot. It's my body that threw a fit when it detected this pollen. Just flipped the tables, threw down the gauntlet and pulled up the hatches.

So hey, Osmosis Jones, if you're in there somewhere, I've got a job for you (after you pop the pimple I've got on my face- just please not at some helpless person). Ozzy, you gotta figure out why I react to my environment like it's trying to poison me. I know I didn't send Drix, but I sure sent you a lot of Cetirizine Hydrochloride. My only other option is to pray to the dryads of greek myth and hope that they help my body get more used to the plants around here.

GBAD

N WAYS TO RESPOND WHEN SOME GUY GIVES YOU A POP-QUIZ ON YOUR NERDY ACCESSORY

Just because I'm a girl wearing a Doctor Who t-shirt doesn't mean you get to quiz me on William Hartnell's middle name. Nerd purity tests are for insecure losers.

- Oh, you're wearing a polo shirt? I bet you can't even tell me how long a chukka is.

- Nice green shirt. Tell me, what's the wavelength of green light?

- You wear jeans? Can you tell me what Levi Strauss' birth name was?

- Huh, beats headphones. Tell me, what's an additive time signature?

- A Christmas sweater? You're not a real Jesus fan if you can't tell me Revelations 3:16.

- You're not wearing a shirt? Do you even know Aristotle's four theories of being?

Fake Nerd

horror**SCOPES**: CANADA EDITION

ActSci: You get into a conversation with a friend about how long Canada will last. Pulling out your actuarial tables, you decide to get to the bottom of things. Your unlucky number is: 22 more years, then dying quietly surrounded by loved ones.

AHS: Unfortunately, keeping people from stupidly injuring themselves falls under your jurisdiction, as you are the only member of your group with any understanding of what the human body can endure. Your unlucky number is: 14 fireworks extinguished before they set Bill's head on fire.

AMATH: You're changing your name to EH-MATH for the duration. You find yourself having to explain the joke a lot more often than you initially thought you would. Your lucky number: 10 free beers from amused engineers!

Arts: Time to celebrate! Your hometown commissions a mural on a historic building, and invites local artists to contribute. Your lucky number is: 3 hours of fun, painting and collaborating with strangers.

Bioinformatics: In a bid to create the most patriotic mascot, you successfully cross-breed the most Canadian animals for the bulk and antlers of a moose, the tail and adorableness of the friendly beaver, and the wings and attitude of four dozen geese. Your unlucky number is: 2 hands, made forever unclean by the blood of hundreds of innocents.

C&O: There has to be a way to hit all the parties, right? Scheduling is a class you took, dammit! Your (un?)lucky number is: 7 hours of fun, seeing all of your friends, and a hangover that lasts twice as long into the next day.

CS: You get a sweet one-off gig writing the code for a small-town fireworks display. Things go great until your great friend Steve, changes your delay increment from 0.001 to 0.000, and doesn't tell you. Your unlucky number is: 417 fireworks going off simultaneously. Run, Steve. I know where you live.

Double Degree: Double the degrees means double the classes means double the friends means double the invites for the long weekend. Your unlucky number is: 11 friends you'll have to let down, maybe 12 if you count the one you're hanging out with.

ENG: It's hot and you don't want to carry all the party supplies to your friend's place. This could be automated! Your lucky number is: 4 stomping mech legs on your wagon of beer, maple syrup, and flags. The most patriotic of robots.

ENV: Thanks to the outpouring of people taking to parks across the nation for festivities, they all get cleaned up beforehand. Your lucky number is: 2.5 glorious days where everything green is garbage-free.

MathPhys: Trajectories are your bread & butter — all your abstract math friends know that. So when they decide to launch a roman candle battle down the street, you get roped into figuring out how to shoot them accurately. Your lucky number is: 8 people on your street half-convinced you are a demigod of fire.

PMATH: You've somehow been roped into running a booth at the UW Canada Day celebrations. You're super excited to try your hand at face painting, or maybe you'll be at the turban booth? Your unlucky number is: 3 hours as the 'onstage volunteer' for the children's performer.

SoftEng: As the softest ENG program, you've decided to join the humanities. Your lucky number is: 1 Arts party!

Stats: After your big family party splits off into groups, everyone gathers the next morning to find dents in your aunt's new Fiat. You try to argue that since Aunt Helen can't find her glasses, it could be nothing, but the fallacy of denying aunty-see-dents is not accepted by your family. Your unlucky number is: 3 hours spent listening to a lecture on logical equivalencies.

Teaching: The summer class you're helping with gets sidetracked into a talk about Canada's history. Your unlucky number is: 28 kids with unexpectedly poignant questions about where all the natives went.

Undecided: You've finally made a decision: you're going to go see the fireworks at Columbia Lake! Unfortunately, everyone else has made that same decision. Your unlucky number is: 5 smoking engineers, directly downwind.

prof**QUOTES:**

PMATH 464: SATRIANO

❝ I made the mistake of googling 'radical idealism'. I may have ended up on some Canadian watch-lists.

ENGL 306A: FORRESTER

❝ Ratchet is the opposite of fleek.

❝ Animals don't ruminate about a government controlled by unicorns.

CLAS 201: KROEKER

❝ Was that a rant? I think that was a rant... I'm probably a Neo-Marxist.

INTRODUCING THE gridWORD CLASSIC

This issue, I tried to do something that follows slightly more crossword conventions, except I sort of failed. I ran out of time, and thus had to resort to combing obscure words in the OED to finish some parts of the grid. I would like to apologize in advance to all the solvers, especially the extremely esoteric 35A and 51D, although plenty of other words in the grid aren't too much better. Even if you don't know, there is no shame in guessing: the knowledge domains referred to in the clues and words is also wider than usual. Hopefully I still see some ardent solvers take a stab at this issue's grid.

I had received three submissions for last issue's **gridWORD**, with the following responses to the **gridQUESTION**, "If you can impose a rule that everyone has to follow for a day, what would you impose (and why)?"

Simon, Letian, Baily, & Reila: "Everyone in the world must give me their earnings for that day. Just 1 days worth of income is a very large sum of money & I'll be rich."

Nick Lee: "Don't be a jerk to others! Why? The reason is trivial & so is left to the readers."

Christian Ieritano (on behalf of the entire Hopkins Lab): "Stock all campus washrooms with 2-ply toilet paper."

The only answerer to submit a perfect crossword is {Simon, Letian, Baily, & Reila}, so please drop by the **mathNEWS** office and badger the editors for a prize.

As always, potential **gridWORD** submitters should submit their solution either physically to the BLACK BOX (currently aliased to "sliding it under the door to the **mathNEWS** office, located in MC 3030") or via email to mathnews@gmail.com before 1830 hrs on July 10, 2017. For this issue, answering the bonus question "what is this issue's unofficial **gridWORD** theme?" counts as a letter for determining this issue's winner. Submissions should include an answer to the **gridQUESTION**, as my favorite answer to the **gridQUESTION** shall be the tiebreaker in the event of a tie for most correct submission. This issue's **gridQUESTION** is "What are you excited about?"
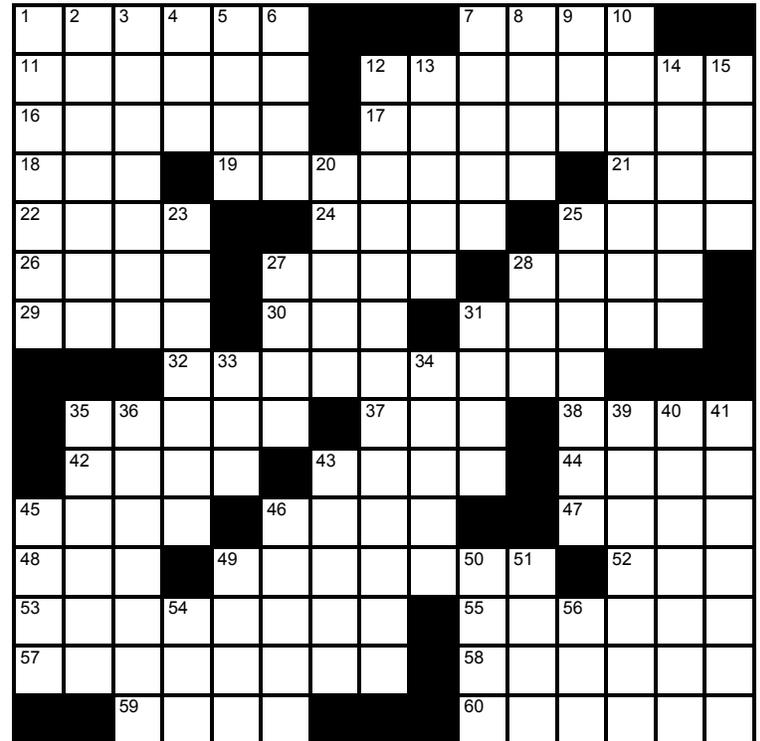
Good luck,

Zethar

ACROSS

1. An angled religious overseer?
7. A New Zealand mathematician who discovered an exact solution to the Einstein field equation of general relativity
11. Beasts in the border
12. Natural light
16. More green
17. Ciliate division
18. Cellular currency?
19. Phoenix event
21. Publisher of the OED
22. BEL output
24. Genetic chains
25. Steep
26. Part of a pod
27. A Scottish promise
28. Spanish Professionals and Autonomous Workers' Union abbr.
29. Muslim weight
30. Equilibrium level abbr.
31. Small petrel
32. Stirring
35. A Shakespearean-era mild oath
37. Big Apple inits.
38. Cut
42. "-zoic" things
43. Letter opener
44. (1-e^-2x)/(1+e^-2x)
45. Office drone
46. Chaps
47. Locale
48. Underwater warfare branch abbr
49. Glowing
52. Grassland
53. Varnish-making resin

55. Diligent
57. Crepuscular active time
58. Meager
59. 2nd longest river in Ulster
60. Tighter

DOWN

1. Dwell on
2. Not yet delivered
3. Conjecture
4. Royal letters
5. Unique chap
6. Funeral inferno
7. Interlocks
8. Tallinn native
9. Resistivity
10. Italian-style pilaf
12. Founder of western monasticism?
13. The lesser pilgrimage to Mecca
14. This polynesian langauage is spoken on The Rock
15. Spot
20. Edge
23. A citizen with free association with the US
25. Taps
27. [sigh]
28. Keats wrote on one
31. Bitter prefix
33. Puzzle filler abbr.
34. Lake Malawi is still known as this instead in Tanzania
35. Plaything for two
36. Dessert square
39. Padded envelopes
40. Ardent
41. Play ground?

43. Illegal drugs in Penang
45. No longer tense
46. Substantial in size
49. Precipitate

50. Avian dwelling
51. Old tip or type?
54. London light metro abbr
56. Black-belt grade

lookAHEAD

SUN 2	MON 3	TUE 4	WED 5	THU 6	FRI 7	SAT 8
ICSN Niagara Falls Trip tbdED's Birthday!!!!!!!	ICSN Canoe Trip	ICSN Make-Your-Own America Day		UW Farm Market TurnipHeadED's Birthday!!!!!!!!!		Math 2.0 Day

SUN 9	MON 10	TUE 11	WED 12	THU 13	FRI 14	SAT 15
	Production Night for Issue 134.5		WatSFiC Movie Night	UW Farm Market		University Choir: Island Music

PREZSEZ

Hey Mathies! It is I, your gracious and loving dictator. Haha, just kidding. I have not very much real power! But you know who does? YOU! You have all the power! You could impeach me, or dissolve the society, or allocate all our funds to buy Paninos for the whole school! All you have to do is come up with a motion for the General Meeting, and email it to me at fatema.boxwala@uwaterloo.ca. Then just make it to the comfy on Tuesday July 11th at 6:30pm and get your motions passed. Easy! Power! Fun! FREEEEE Pizza!

FBOX

ARTICLES OF THE ISSUE

Well, TurnipHeadED chose the winners again this week, but I have been chosen to write this article.

ICSN CANADA 150 EXTRAVAGANZA!

The ICSN (International and Canadian Student Network) is planning a week of exciting events to help YOU celebrate the 150th!

Yesterday they kicked off with Canadian Trivia at Bomber. Today (the 30th) they've got an All-You-Can-Eat Canadian Feast. On Canada Day, of course, there will be celebrations at CIF.

After Canada Day, they'll be hosting a Niagara Falls trip on the Sunday. On Monday, there will be a canoe trip, and on the 4th they have a Make Your Own Poutine night.

If you want tickets to any of these events, go to ICSNCanada150.ticketfi.com. Hope to see you there!

LORD OF THE PLANS

This week's informative article of the issue goes to GBAD for Ground Control to Major Bae: Now It's Time To Leave The Loo If You Dare. I've been fretting about friends leaving for a bit, but GBADs article helps remind me that it's all going to be okay in the end. Also because maybe this will convince her senpai to come back to Waterloo because we all miss him.

This week's humorous article of the issue goes to Tips To Avoid Noisy Neighbours by August Maurader, because while we were editing TurnipHeadED kept distracting me by cracking up and proposing increasingly unlikely places we could hide sand in our office.

Birthday of the Issue goes to me, because my birthday is this Sunday. Consider this your official warning to get me a present. I accept sushi, money, and funny articles for next issue! TurnipHeadED turns older soon too, so wish him well as well. Just not as well as me!

TBDED