

# KAMSC's

# 84



# *Steps*

# Senior Edition 2021

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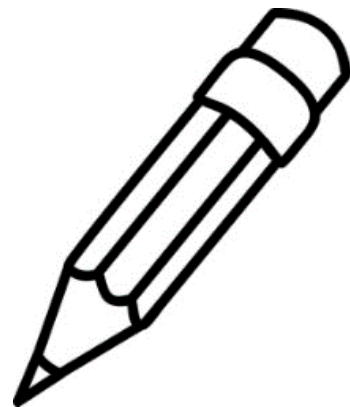
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# *Letter From The Editor*

Hello 84 Steps readers!

We are so excited to bring you this senior edition of 84 Steps. Through this difficult year, none of us faced quite as many obstacles and unconventional deviations from tradition as our seniors. This edition is dedicated to all of you soon-to-be KAMSC alumni. Your strength and determination to succeed even in the face of uncontrollable unfortunate circumstances inspires us all. We already know you are bound to do amazing things, and we can't wait to see what those things turn out to be! We wish you only the best in life, and as always, we hope you enjoy this edition of 84 Steps!

Thanks,  
Genevieve Kim  
and the 84 Steps Team



# *Best Memories from the Class of 2021*

*By Genevieve Kim*

Just in case the pandemic is having you feeling down, here are just a few favorite memories from the class of 2021 to cheer you up, warm your heart, and make you smile.

**Shelby Alexander:** My favorite KAMSC memory is probably playing Cards Against Humanity (KAMSC edition) at sci-fi film fest while making grilled cheeses as Dr. Tanoff keenly watched from a few feet away.

**Anna Buck:** I guess I'd have to go with when Eliza brought in a chocolate fountain for I believe Valentine's Day sophomore year? That was really fun because everyone got there early, and we just had chocolate and strawberries and stuff in the student lounge before class. It was a lot of fun; we had chocolate for breakfast.

**Keshavi Dave:** Being able to share my favorite baking recipes with the rest of KAMSC

**Kayla O'Donnell:** My favorite was when Alex Conway didn't use enough butter when he tried to make a grilled cheese sandwich at the sci-fi film festival, and it just didn't go well.

**Aiden Eichman:** I remember sleeping on the bench near the student lounge and then waking up past 8:00 and no one had woken me up to go to Mr. Milka's class, and then I was sprinting down the hallway imagining what the people in the office were seeing on the cameras.

**Emerson Wesselhoff:** There are so many... probably all the APES field trips during my junior year.

**Sam Rabick:** My favorite KAMSC moment of the year was attending the senior luncheon to see my classmates and teachers in person. It was great to catch up and hear everyone's plans for the Fall.

**Princess-J'Maria Mboup:** When someone broke the clock junior year, during class clash. I think we were playing dodgeball. That was too funny.

**Kohler Briggs:** My favorite memory was visiting the Kellogg Bird Sanctuary for AP Environmental Science during my junior year.

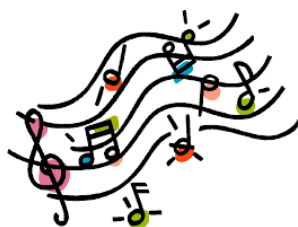
**David Jin:** My fondest memory from KAMSC will always be Dr. Tanoff's presentations about not vaping. "iT's LiKe DrInKiNg AnTiFrEeZe"

Oh, how we'll miss you, seniors.

# 10 KAMSC-Inspired Things to Do at Graduation Parties

By Devi DeYoung

1. Include peanut butter and duct tape... but not nuclear weapons. That will be one way to end your party way too soon. (Underclass students, these are the three greatest inventions of all time. Remember them!)
2. Have a mini lab practical! Arrange various lab or kitchen equipment around a few tables and time your guests at each station. Whoever gets the highest score gets an extra bag of teal and blue M&M's! This game will ensure that there is never a dull moment at your open house!



3. Play KAMSC dance favorites, like “Don’t Stop Believin’ ” and “Sweet Caroline”. We all get down to some “Bohemian Rhapsody”, too. Bonus points if you can get someone to crowd surf (how does someone always end up doing that?).

4. Have your guests play a fun party game where you figure out the equation of the parabola that will get a marble into a cup! Remember the high stakes and adrenaline from your time in Math II? What an exhilarating party game!
5. Display all of your research posters for your friends and family to see! You have worked so hard over the past four years and everyone will think you are very smart, even if you had a floating period or used “yorange” your ninth grade year. Well, maybe not if you used “yorange”. We were warned multiple times to avoid that color.
6. Make a photo backdrop! Remember how awesome the backdrops were at KAMSC dances? The Student Senate always put so much work into those. A fun “Harry Potter” or “Alice in Wonderland” backdrop might not fit the grad party mood, but you can always take inspiration from the ones that we have had in the past!

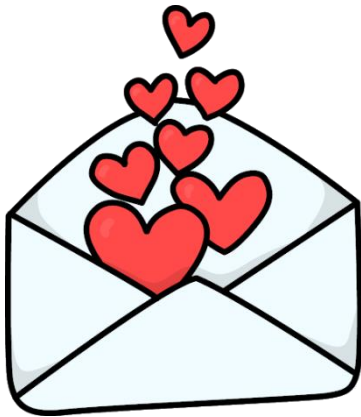


7. You can incorporate your home-school colors, KAMSC colors, and your college colors to represent where you have been and where you are going! Don't forget to display your medals!

8. Hang up pictures of you and your friends throughout the years. One of the best parts of KAMSC (other than the teachers and how much you get to learn) is the friends you make along the way. Your graduation party should celebrate all of the good times you've had while you were in high school! You could use clothespins to hang pictures along string lights to be extra fancy.



9. Host a Kahoot! We all love Kahoot at KAMSC. If the Kahoot music does not get your guests all fired up, I don't know what will. You can make the Kahoot on cellular functions, the periodic table, or on fun facts about you.



10. Have your guests write down notes of encouragement and advice and put them in a jar for you to read later. We have been thinking about the big picture since our first college and career presentation ninth grade year, and it might be nice to have a reminder of that big picture and how many people love and care about you when the going gets tough.

We will miss you, Class of 2021! Congratulations on your major accomplishment, and good luck on the next step in your journey!

# Uncommon Ice Cream Summer Horrorscopes

By Celia Baublis and Genevieve Kim

One of the best parts of summer is having ice cream. While there's a lot of great flavors, there's also some weirder ones, like cheese ice cream. Below is a list of uncommon ice cream flavors I've heard of over the years with some thoughts on each.



## Sour Patch Ice Cream - March 21-April 19

Personality: At Treat Street all the time. You're likeable because your sourness balances well with the creamy vanilla ice cream, so it isn't overpowering. You may be feeling burnt out, but push through! It will eventually get easier.

## Spicy Ice Cream - April 20-May 20

Personality: I haven't had spicy ice cream to my recollection, but I think it sounds like a good idea. Hard to get to know and with an initial spiciness, but that's pretty temporary and not too overwhelming and you end up being cool, though you're not probably not that fun when the temperature goes over 90°. You are the opposite of Aries. You are likely feeling extremely calm right now. Bad call. Check your calendar.

## Chai Ice Cream - May 21-June 20

Personality: You're a really nice mix of warm personality and cool outfits. (My dad worked at an independent food consulting firm, and though he left, they had a party a while back for all of the families. One of the activities was guessing the flavors of experimental homemade ice cream. The chai ice cream was one of my favorites)

Your current internal monologue is screaming. While that's fair, given the circumstances, take a deep breath. It's summer. It's ok.



## Grape Lime Ice Cream - June 21-July 22

Personality: Never met one, but according to a friend, you're great! You keep to yourself but you're a real hidden gem (grape ice cream is rare because it is difficult to freeze without adding a significant amount of a chemical in the skin of the grape.)

You are or are on the path to relaxation. It's almost summer, so why wouldn't you be? But you might want to check up on your friends. They don't seem to be doing too well.

## Honey Ice Cream - July 23-August 22

Personality: You're very authentic and the absolute sweetest person. (I've never seen honey ice cream manufactured commercially, but one of my sister's friends made honey ice cream. Apparently it was fantastic. If you have the means to make ice cream and experiment, it may be worth a try.)

Ah, summer. The perfect time to explore biology! The cicadas emerge from their 17-year slumber this year. Scream with them. Become the cicada. Scream until your voice is gone. Then get some ice cream!



### **Pineapple Ice Cream – August 23-September 22**

Personality: You are very particular about the people you get along with. You have a few prominent interests and you dedicate yourself fully to them. (I'm not talking about pineapple frozen yogurt or popsicles or anything like that. I'm talking about genuine ice cream with pineapple chunks. I've had it once and it was ok. The pineapples weren't canned, so there was the acidic taste which didn't mix well with the ice cream.)

While some people say that summer is the best time to relax, you say it's the best time to develop a new skill. I'm not saying that you're wrong, I'm just saying have caution with independent research experiments. Don't reanimate a corpse if you aren't prepared to handle the consequences.



### **Pop Rocks Ice Cream – September 23-October 22**

Personality: You're a bit of a firecracker. You have a temper but you're a whole lot of fun! (While pop rocks in ice cream sounds like a cool concept, I'm worried about what might happen when the ice cream starts to melt. Do the pop rocks start exploding as you hold your melting ice cream? I'd still like to try it, though.) Summer is the perfect time to find balance! Balance fun with work, land with sea, your diet, the weight of the sin you'll commit with those already committed by others, and most importantly, balance your schedules for next year as soon as possible!

### **Cheese Ice Cream – October 23-November 21**

Personality: You're understated and quiet so some people don't think to approach you at first glance. However, you're well-traveled and loyal beyond compare. (Yes, cheese ice cream is a thing, and it's very popular in the Philippines. It's an interesting concept that seems odd at first glance, but since I don't know anyone who's tried it, I can't judge the taste. Given the chance, I think I'd try it.)

Try and make a new friend this summer. You won't regret it down the line while you commit various minor crimes in order to make a chair. You should probably take a woodworking course soon.

### **Blue Moon Ice Cream – November 22-December 21**

Personality: The ultimate Midwesterner. Everyone here knows you, but everyone outside the Midwest thinks you're crazy.

This summer is a great time for literary research! Experiments can be a little time consuming and you've seen Virgo before. You'll have a great summer with your curiosity, except for a specific person. You know who you are. You need to stop appearing in my room all the time. It's annoying.

### **Blueberry Muffin Ice Cream – December 22-January 19**

Personality: You are very eclectic and outgoing. You are always surprising people and trying new things. (This was another flavor at the food consultant party. The blueberry and lemon mixed together well, and the ice cream was a pretty lavender color.)

If you take a road trip, don't allow backseat driving to happen. Do what you need to do. Most people aren't in a position to judge.





**Burnt Caramel Ice Cream – January 20-February 18**

Personality: You are obsessed with Australia. People are always excited to meet you and you can adjust how fiery you are based on who you're meeting. You have an older sibling who everyone loves, and no one's sure you can live up to their image. (Who doesn't love a good salted caramel?)



Maybe you should check your certifications. Do you remember CPR? The Heimlich maneuver? How to conduct open heart surgery blindfolded? How to use someone's epi pen on them? Maybe take a class on plant edibility this summer. Who knows what will happen next year.

**Basil Ice Cream – February 19-March 20**

Personality: You're very refreshing, but some consider you boring. You're upscale and elegant and unique in a good way.

All of the above applies. Good luck. If you haven't lost your mind yet, try and keep pieces of it.

**Fish Ice Cream – February 30-31**

Personality: You luckily don't exist in the United States. You are unwelcome. That is all.

**Bonus!!**

**Avocado Ice Cream**

My sister showed me a video on Pinterest with avocado ice cream. While the presentation was nice (the pit was a chocolate ball), she's also apparently tried some. It does not come with any positive recommendations.

**Lemon Chip Ice Cream**

This is a flavor I've never seen but personally think has potential. Think of mint chocolate chip ice cream, but with a lemon ice cream. Citrus and chocolate go well together, why not make a chocolate lemon ice cream?

**Lychee Ice Cream**

My dad and sister have tried this fruity ice cream. My dad claims that it's the worst while my sister claims it tastes great. My dad is also known to eat month old chili, though, so take these recommendations with caution. Now it's just going to be called the T.



# *Graduation Puns*

*By Claire Keegan*

After twelve years of carrying books to school, three of which involved going up 84 steps, you're well prepared for a career in backpacking.

Why did the M&M want to graduate college?  
Because he wanted to be a Smartie.

Why did the freezer never graduate?  
Because it was set on 0 degrees.

What do you call it if a math major can't seem to hold down a job after their graduation?  
It's just a horrible after-math of the situation.

Why are halls where graduation ceremonies are conducted so warm?  
There are thousands of degrees packed in there.

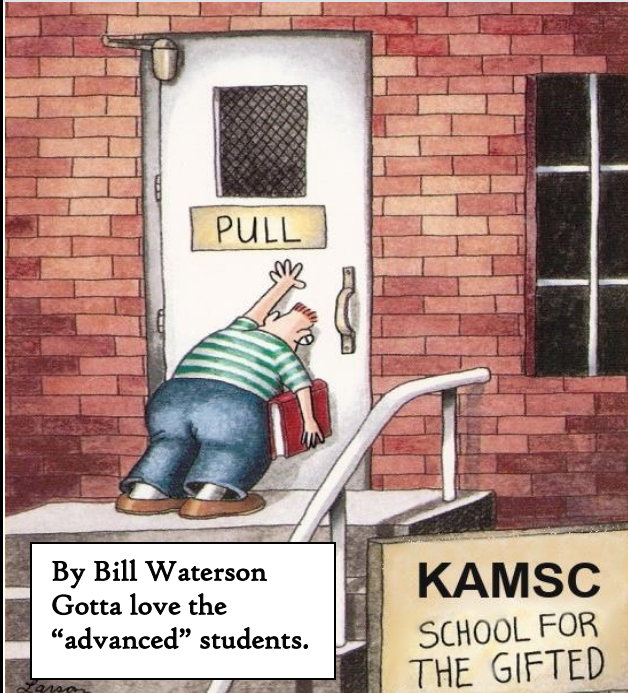
When mathematics students graduate, do they get a degree or a radian?

What school teaches you how to greet people?  
Hi School.

Did you hear there is no longer an essay requirement on the SAT?  
Now it's just going to be called the T.

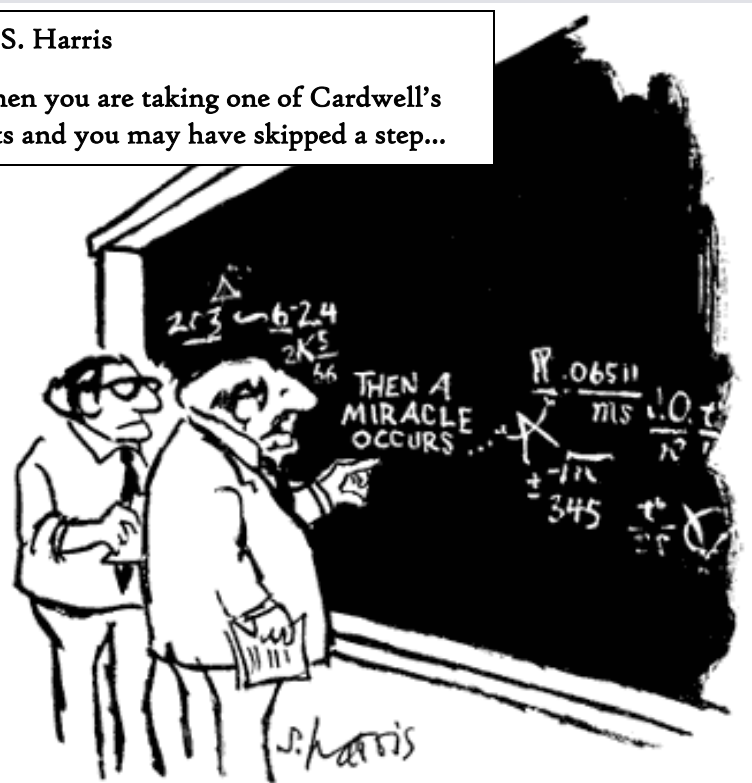
# Summer Comics

By Delaney Schultheiss

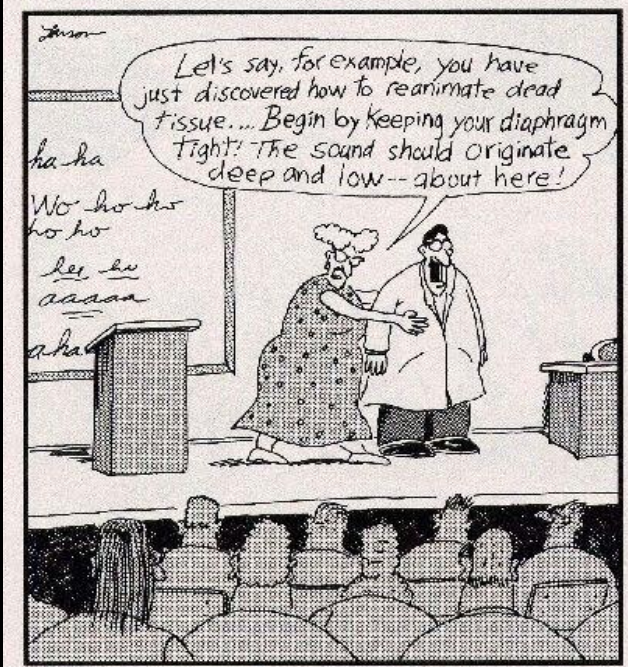


By Bill Waterson  
Gotta love the  
"advanced" students.

By S. Harris  
When you are taking one of Cardwell's tests and you may have skipped a step...



"I think you should be more explicit here in step two."



In their final year, all research science students are required to take one semester of Maniacal Laughter.



By Fitz Summons  
Passing the torch.....

By Gary Larson  
After taking one of Sinclair's classes this is very necessary



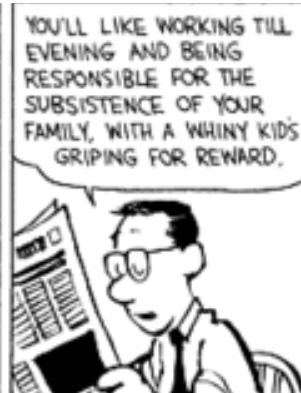
IT'S JULY ALREADY!  
OH NO! OH NO!



By Bill Waterson

Beginning of summer vs. end of summer. Enjoy it.

I DON'T WANT TO GO TO SCHOOL! I HATE SCHOOL!  
I'D RATHER DO ANYTHING THAN GO TO SCHOOL!



By Bill Waterson

# *Oh the Places They'll Go...*

First Name	Last Name	Sending High School	College	Career Interest
Shelby	Alexander	Comstock	University of Michigan LSA, SMTD	Theatre Technology
Ava	Apolo	Loy Norrix	Kalamazoo College	Womens' Health
Sawyer	Barton	Vicksburg	Grand Valley State U Honors	Veterinary Medicine
Alex	Blasen	Hackett Catholic Prep	University of Michigan LSA	Mathematics
Kohler	Briggs	Loy Norrix	University of Michigan LSA	Ecology
Anna	Buck	Loy Norrix	Kalamazoo College	Biochemical Research
Zach	Collard	Gull Lake	University of Michigan Engineering	Engineering
Alex	Conway	Portage Central	US Naval Academy	Computer Engineering
Keshavi	Dave	Portage Northern	Western Michigan University Honors	Statistics
Malee	Davis	Portage Central	University of Michigan LSA, Honors	Medicine
Lauren	DeHaan	Portage Central	Arizona State University Honors	Financial Planning
Aidan	Eichman	Portage Central	Columbia University	Computer Science
Finley	Green	Parchment	Michigan Technological University	Computer Science
Ellie	Grooten	Kalamazoo Central	Kalamazoo College	Medicine
Kyle	Gross	Portage Northern	University of Michigan LSA	Computer Science
Owen	Haddad	Kalamazoo Central	Bates College	Computer Science
Jane	Heystek	Loy Norrix	University of Michigan LSA	Pharmacy/Law
Charlie	Hinkley	Gull Lake	Purdue University	Mechanical Engineering
Simon	Holley	Portage Northern	U Michigan LSA	Finance

## *Continued...*

First Name	Last Name	Sending High School	College	Career Interest
Sydney	Hyde	Portage Central	U Michigan LSA, Ross	Business/Computer Sci
Daniel	Isacksen	Loy Norrix	Kalamazoo College	Biology
David	Jin	Portage Central	University of Michigan LSA, Honors	Psychology
Freya	Kailing	Kalamazoo Central	Oberlin College	Biology
Ashley	Keltsch	Loy Norrix	Hope College	Science
Alexander	Kish	Comstock	Kalamazoo College	Engineering
Anna	Kitagawa	Portage Central	Caltech	Computer Science
Cole	Koryto	Portage Central	Kalamazoo College	Data Engineering
Xavier	Langsdale	Kalamazoo Central	University Michigan Engineering	Computer Science
Mason	Loc	Portage Northern	University of Michigan Engineering	Biomedical Engineering
Ava	Loncharte	Loy Norrix	Kalamazoo College	Museum Curation
Stephen	Loparo	Portage Northern	Michigan Technological University	Engineering
Tingfeng	Luo	Kalamazoo Christian	University of Illinois Urbana-Champaign	Research Science
Lesly	Mares-Castro	Kalamazoo Central	Kalamazoo College	Chemical Engineering
Princess-J'Maria	Mboup	Loy Norrix	University of Michigan LSA	Wildlife Veterinary Science
Ben	Miller	Portage Central	Johns Hopkins University	Biomedical Engineering
Alex	Morrison	Parchment	Western Michigan University	Engineering
Addison	Nachtigal	Loy Norrix	Western Michigan University	Engineering/Finance
Raili	Nelson	Loy Norrix	University of Michigan LSA	Engineering/Medicine

## *Continued...*

<b>First Name</b>	<b>Last Name</b>	<b>Sending High School</b>	<b>College</b>	<b>Career Interest</b>
Stefanie	Nizzardini	Kalamazoo Central	Kalamazoo College	Engineering
Malin	Nordmoe	Loy Norrix	Kalamazoo College	Social Sciences
Kayla	O'Donnell	Portage Central	Massachusetts Institute of Technology	Physics Research
Felix	Owina	Kalamazoo Central	Michigan State University	Neuroscience
Evan	Pollens-Voigt	Loy Norrix	Kalamazoo College	Biomedical Science
Samuel	Rabick	Comstock	Michigan State University Honors	Electrical Engineering
Matthew	Salinas	Kalamazoo Central	University of Michigan LSA	Earth Science
Andrew	Salisbury	Hackett Catholic	University of Michigan Engineering	Astronautical Engineering
Anna	Schuppel	Schoolcraft	University of Nebraska	Civil Engineering
Simon	Schwachter	Kalamazoo Central	University of Michigan Engineering	Engineering
Abdulaziz	Shebrain	Portage Central	Western Michigan University Honors	Healthcare
Madelyn	Sheehan	Loy Norrix	Michigan State University	Clinical Psychology
Khadijah	Siddiqui	Portage Central	University of Michigan LSA	Medicine/Engineering
Bennett	Skurski	Portage Central	Michigan State University	Business/Finance
Kyle	Wagner	Portage Central	Kalamazoo Valley Community College	Mechanical Engineering
Evan	Wahmhoff	Portage Northern	Michigan State University	Environmental Science
Emerson	Wesselhoff	Loy Norrix	Kalamazoo College	Congress
Dalton	Wilkins	Comstock	Western Michigan University Haworth College	Business

# Continued...

First Name	Last Name	Sending High School	College	Career Interest
Andrew	Wilks-Millard	Galesburg-Augusta	University of Michigan Engineering	Software Engineering
Adele	Wilson	Vicksburg	Kalamazoo Valley Community College	Actuarial Science
Katherine	Xenzova	Portage Northern	University of Michigan LSA	Genetic Consulting
Jessaly	Zhu	Portage Central	University of Michigan LSA, Honors	Physics/Computer Science





# Top 10 Things to Do For Seniors

By Claire Keegan

As the school year comes to a close, seniors graduate and get ready for college. If you do not know what to do for the seniors in your life, you have come to the right place. Here are the top ten things you can do for a senior in your life:

1. Make something handmade! Handmade gifts are always super special and are often more meaningful than a store-bought one. Examples could be a craft project with their future school's colors, an ornament with their graduating school's colors, or a handmade card.
2. Take them out to eat. Spending time with a senior may be the best thing for both of you! Find a park and go have a picnic, or get some takeout and eat it in your car. Talk about the future, or live in the moment, whatever the senior needs.



3. Think of ways to keep in touch! If the graduate is moving far away, pick a day each month to facetime or find a way to visit during their first semester! Make sure you have ways of keeping in touch.
4. Attend online graduations. Many schools are limiting the number of tickets each senior can use at their graduation. If they are streaming it, watch their graduation on your computer from the comfort of your home.
5. Create a college care package. Fill a basket with all of the college essentials. You can include pencils, ramen noodles, granola bars, a planner, and a gift card to their favorite coffee shop.
6. Get some matching college merch. Represent your friend's college by getting a hat or hoodie. You will feel connected to them even if they live far away.

7. Attend their grad party or do a drive-by parade. Although things are starting to open back up, it is still important to stay safe! If the graduate is having a grad party and you feel comfortable going, go for it. If you do not feel comfortable, or they aren't having one, organize a drive-by with signs and balloons.



8. Write them a letter. A letter about how much the senior means to you will be so meaningful and valuable to both you and the senior. Favorite memories and well wishes for the future are great things to write about.



9. Get a thoughtful gift. Although handmade gifts were mentioned, a specialized gift would be perfect too! Find out what they are planning on majoring in and get something that pertains to them. For example, if they are going to school for biology, get them a lab coat or some goggles!

10. Most importantly, ask the seniors what they want to do; it is their special time after all!

Remember, this is not an exhaustive list, anything that helps make seniors feel special will be perfect!



# *The Great Fun of Virtual Classes*

*By Owen Davis*

This year has certainly been a curveball for all of us, online learning is completely different from the school time we're accustomed to in a normal year. This year was not the year that we were expecting or hoping for however, it still had some smiles and fun times exclusive to the online classes we participated in. So here are some fun stories that our students remembered from this odd year!

"My favorite memory from online KAMSC would have to be one day in Advanced Calculus when we were listening to a lecture and had some down time due to technical difficulties. Mr. Alshehri had to leave the Zoom meeting for a while and AJ and I just ended up playing tic tac toe through the Zoom chat for the entire time."  
- Anna Buck

"My favorite virtual moment was in AP Statistics. Mrs. Kalnins finished the lesson and dramatically told us that KAMSC had had a special guest come by for a tour. She moved onto the next slide to reveal the "Bernie in mittens" meme edited into the KAMSC commons. The next several slides saw him in various classrooms and even the student lounge. The quality was astonishing. Most notably, however, was that, in the background of the student lounge picture, there was a bag of mine that I realized I must have left there for an entire year! I sent Mrs. Kalnins a quick email after class asking when the picture had been taken and picked it up later that week." - Sam Rabick

"My favorite memory of online school this year was when we were learning about communism in IB 20th World History. Our teacher was teaching us through Peardeck and one of the slides asked us to draw something that reminded us or symbolized communism, so naturally, I drew a tomato! because according to Mr. Sinclair, tomatoes are communist fruits. Our teacher then went through the slides and she was so confused by it. She tried to ask us what the tomato meant and how it had any connection to communism but the other KAMSC students in my class and I were all laughing too hard to answer her" - Anna Tai

# Summer Word Search

By Fayyaz Razi

J X S I U L E W A B Q T C H E M K N B V  
U W X U T H N K N F E K V Z C D M E V H  
L Y S F N F C M Y S P A J M J E Y U Q S  
Y O Q W Q S J F W C T C C Z B H V B N J  
J Q D O I O H L F R L A M H M U Q O H M  
K T E C R M Q I B E K M F I S H I N G K  
X A S F E V M W N T H P E W A V E S D R  
K U B D F E O I P E H I I Y X P Q W D L  
W G X A Y B E L N U C N X C A U G U N C  
W U Z Y R F W S L G M G H Y E V C E H R  
O S R A E B H O N E U J P P I C N I C S  
V T Z R L J E O W T Y A A G E V R B V C  
A X S C L T U Q K T D B V Y N J R E U A  
C D Z C Z M C N U O H G A B M F C I A Z  
A C W Q V Z A T E E T Z V L M P N A O M  
T W V Y B K J Z F A S X Z M L C H R A Q  
I J R F N G B P M S U M M E R E K K I N  
O G P B N R K L H E T U J E R T Y D B G  
N C M M D G M F I L S A S H C M P H G R  
C K P Y N H B N J N Y K S E A U C M F Z

VOLLEYBALL

BARBEQUE

AUGUST

ICE CREAM

PICNICS

BEACH

SUNSHINE

FISHING

WAVES

SWIMMING

CAMPING

JUNE

VACATION

SUMMER

JULY

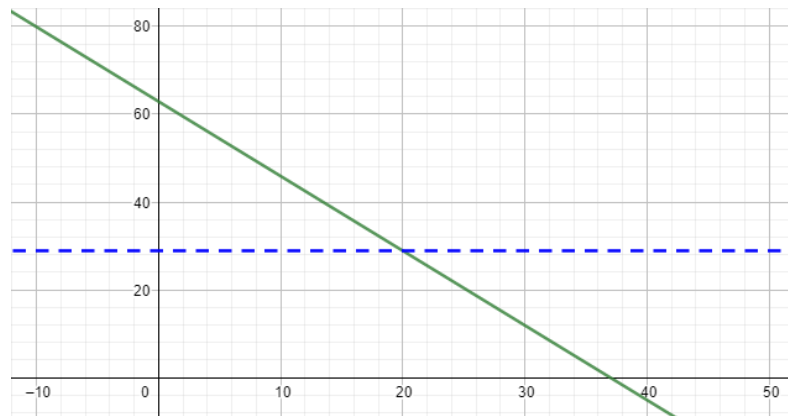
# Dear Math

By Benjamin Whitsett

Dear Math:

I often write you about concepts in pure theory, with only tangential reference to application. In this letter I'll take it in a bit of a different direction, since the up-and-down temperatures of spring are moving into those warmer summer numbers which mean not-cold wind and general discomfort. I couldn't resist diving into the numbers behind these phenomena of temperature, so here's a discussion of my research's results.

Isaac Newton determined that the rate at which thermal energy exits (or enters) an object is proportional to the object's surface area multiplied by the difference in temperature between the object and its surroundings. This is commonly denoted as  $Q = hA(T - T_{env}) = hA\Delta T$ , where  $Q$  is measured in watts,  $A$  is measured in  $m^2$ , and Temperature is measured in Kelvins (or Celsius, because  $\Delta K = \Delta C$ ). As human sensory systems cannot determine temperature, only a change thereof (try putting your hands together and realizing the futility of determining the warmer one) we may apply this formula to our situation involving the "feel" of temperature by a human.



In order to apply this formula, we plug in the average body temperature ( $37^{\circ}\text{C}$ ), the average surface area of a human ( $1.7m^2$ ), and standard room temperature ( $20^{\circ}\text{C}$ ) to this equation. We let  $Q_0 = h * 1.7 * (37 - 20) = 28.9h$  be a baseline for our calculations. To start, we'll examine this thermal flux as temperature changes. If we plug in standard temperature ( $0^{\circ}\text{C}$ ) as the environment temperature, we determine a value of  $Q = 1.7h(37 - 0) = 62.9h$ . As  $Q_0$  is naturally balanced by our internal heat production, we will shift all measurements by it, so we interpret  $Q(0^{\circ}\text{C})$  as  $Q_0 + 34h$ . We may plug any number of temperature values into this equation and extract the shifted coefficient of  $h$ , done over a wide range of values in the graph at right, with temperature in Celsius on the x-axis and the  $Q$   $h$ -coefficient on the y-axis. The blue dotted line denotes  $Q_0$ , our baseline for temperature "sense." Perhaps my initial choice of sign for  $\Delta T$  may have been suboptimal, but it's too late now to change convention.

So this graph makes sense, but there's something way more interesting for us to attack here using a *little* bit of Calculus. We can quickly derive how this quantity changes as a result

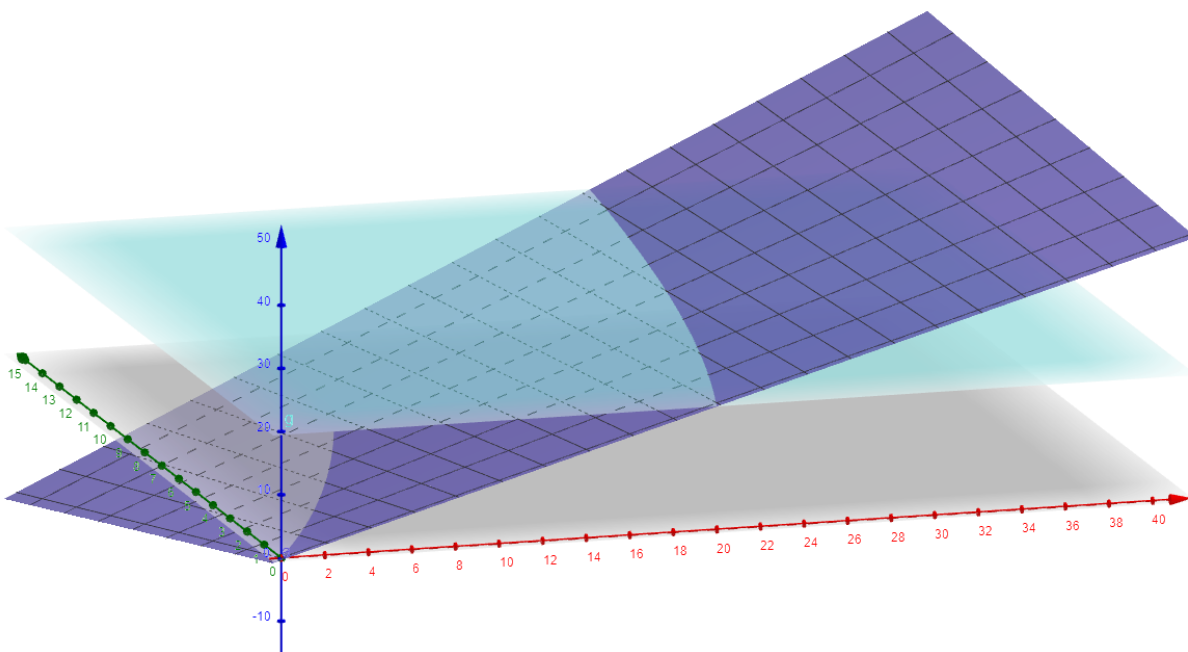
of wind, which could give us a sensible model for wind chill in the winter and those random stifling breezes which whisk by in late summer. By no means should these calculations be accepted as “true,” because my research ends here, and this is all just my own personal derivations.

In order to consider wind, which behaves in three dimensions, we assume our surface area is projected into a volume  $V$  by a constant height  $k$ . We examine  $Q = hA\Delta T$  over a small quantity of time,  $\Delta t$ , to apply wind. With no wind, we effectively consider  $V$  to “refresh” itself at the end of each  $\Delta t$ . If we consider wind at, say,  $w$  m/s, then we add  $w$  to the side length of a small portion of the area. We will need a little bit of Calculus here, so bear with me. We consider a very small area  $\Delta A$  to be modeled by  $\Delta x\Delta y$  in two coordinates. We therefore express the stretching via wind by replacing  $\Delta x$  by  $\Delta x + w$ , so  $\Delta A$  becomes  $\Delta x\Delta y + w\Delta y$ . We apply an integral to this small quantity (summing the small components, for those of you not familiar with the notation) and evaluate  $\int \int dx dy + \int w dy = A + wy$ . Modeling  $A$  as a square (an assumption, I know),  $A$  becomes  $A + wr\sqrt{A}$ , provided that we interpret  $w$  as a unit of meters given a period of  $1s$  to ensure cancelation of units, and allow  $r$  to be some arbitrary constant resolving to the inability to directly go from  $y$  to  $\sqrt{A}$  (which I may or may not have added just to make the model work).

This new area-equivalent factor means that we may model  $Q = h(A + wr\sqrt{A})\Delta T$ . This formula may feel awkward and counter-intuitive, I certainly thought so when I first looked at it, but think about the intuitive feeling that wind increases in effect as an object shrinks, and you’ll start to see why it makes sense. If we plug this in to the inverse function with  $w = 0$  and tinker around with the value of  $r$  (I settled on  $0.05$  to approximate some online wind-chill data), we obtain a graph such as the one below, with wind speed along  $x$ , external temperature along  $y$ , and “felt” temperature along  $z$ .

I know that this model is far from perfect, and I’m sure those of you more familiar with thermal physics are likely shaking your heads at me for my errors, but it’s always fun to see where the math takes us, right? Happy  $Q$ -measuring this summer!

Benjamin Whitsett



# *An Ode to The Class of 2021*

*By Devi DeYoung*

“These next four years will fly by!”  
“It will all be over quick!”  
“These are the best four years of your lives!”  
“What college are you going to pick?”

You’ve heard all of these statements before  
You’ve probably sighed at a few  
From teachers, parents, friends, and more  
You never believed the words were true

You’ve been through so much since you all started your ninth grade year  
You started out with the bog, the peanut butter sandwich, the pig  
You moved onto computers, a surprise breakfast, the MSU sphere  
Began physics, picked electives, your dreams becoming so big

You cried together, laughed together, supported one another,  
Made Quizlets, watched Crash Courses, and held study tables  
(To the junior class, you have big shoes to fill at the end of this summer)  
To us, you’ve always been smarter, cooler, and more capable.

We are so sorry that the world had to turn upside down  
Right as you were about to take it on full force  
Luckily, in each other, a home has been found  
You stuck with KAMSC, and with each other, of course  
You haven’t let the state of the world hinder your light  
You have continued to work hard, reach your goals, and achieve your dreams!  
No other class can say that they had to put up such a fight,  
Had to push themselves onward, have grit, and stare at way too many screens

Your resilience, your attitude, your intelligence, your character  
You have so much to offer the world, you always give everything your all  
You inspire us to be better, you make us abandon general terms  
There isn’t a word eloquent enough to complement you that I can recall

Class of 2021, these four years did fly by  
It was all over quick  
These probably were not the best four years of your lives (thank goodness)  
And you are going to love the colleges that you picked  
Thank you for mentoring us, and for showing us the way  
When you walk across that stage in a few short weeks  
Remember each other, remember us, and remember your dreams

# Letter To the Seniors

By Genevieve Kim

Dear Class of 2021,

Congratulations! If I could throw you a party on a page, I would. I can think of few better reasons to celebrate. You have officially made it through arguably one of the worst years of the 21<sup>st</sup> century. As we watched event after event be shut down and attended classes through a computer screen, the light at the end of the tunnel often seemed distant – and very often nonexistent – but you have finally, *finally* reached it. I think I can speak for the rest of my fellow KAMSC underclass students when I say that we have been rooting for you during every second. I cannot begin to express how proud I am that you have come through this year not only intact, but somehow even better than before.

I have known many of you since my ninth-grade year at KAMSC, though admittedly it was at first only as abstract names attached to faces I couldn't keep straight whose voices unfortunately blended together like those of adults in Charlie Brown movies. Slowly, I began to know you as friendly individuals, then intelligent classmates, and finally, spectacular friends. Through panicked study sessions, research all-nighters, and extreme stress, you were there to give me advice and make anything and everything seem possible. I can honestly say I am honored to have known you: the people whose minds are home to hundreds of brilliant ideas you will inevitably share with the world.

Through each year at KAMSC, you have guided me, inspired me, and reminded me that it is possible to come back from a failing grade in Physics. But, even more than that, you have left your mark even for those who may never meet you. Your names line the hallway with CS awards, your faces light up Mrs. Chap's room from her picture walls, and your stories will be told fondly by KAMSC teachers for years to come. As much as KAMSC has left its mark on you, you have left your mark in return. You have become woven into the fabric of a community of truly remarkable people, and – lucky you – now you're stuck with us.

Before you go off on your adventures, I want to give you one last thank you from the class of 2022. Thank you for never believing in the impossibility of anything. Thank you for meeting every challenge with determination and grit. Thank you for pushing through these years of high school and deciding that KAMSC was worth it, because watching you succeed made it worth it to us.

I already know you will do wonderful things with your lives. That's a given. I wish you the very best in the future. You're all headed into colleges and careers that will be challenging but rewarding, and I can't wait to see you take over the world.

Much love,  
Genevieve Kim and the Class of 2022



## *Come Write With Us*

Hey KAMSC students! We love being the editors for 84 Steps, but we can't do it without you. If you'd like to help us make every edition full of interesting articles, come write with us! You can write just once, or a few times, or in every edition. If you want to write in every edition, you can even contact us about being added to our list of columnists. If you want to write with us, or you're even considering it, just email [kamsc84steps@yahoo.com](mailto:kamsc84steps@yahoo.com) or talk to Genevieve Kim!

Sincerely,  
The Editors

# *Thank You To All Our Contributors!*

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### **Acknowledgements**

Thanks to our faculty advisor, Mr. Sinclair, and to Dr. Tanoff for his support. Finally, a huge thank you to our senior writers. We'll miss you!

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