Welcome to the April 2023 Clyde Hill Math Challenge!
Submit by April 28, 2023!

Remember from last time: We believe **math is for everyone**! No one is born "bad" at math - we all have different learning styles and obstacles to overcome - but with motivation and practice we can all build a good math foundation that will help us with many life skills. Cooking, art, music, gaming, budgeting, construction, boating, and sports all benefit from mathematical foundations. Just like you do drills in soccer to build your foundational soccer muscles, we encourage math practice to build your math muscles!

Also just like with your favorite sport or music or art - practice and drills can be fun! These Math Challenges are designed to show the many ways puzzles and games use and reinforce math concepts. We love math and want to share our excitement with you! If there are other challenges you want to see in the future - please let us know!

If you would like the challenge translated into another language, please email us at math-challenge@clydehillpta.org.

How does the Math Challenge work?

Every month we will post 6 math challenges that focus on different skills. You can do as many or as few as you like. Even if you don't find the solution - that's ok! Our growth mindset lets us try our best and improve in steps. Trying is our first step! Our goal is to encourage participation, learn and have fun! At the end of each month, during the monthly assembly we will announce the class that has the most participants that month. At the end of the year, the grade that participated the most during the school year will have a special prize!

How do I participate?

You have two ways of submitting your entry **by April 28, 2023**:
1. You may scan/take a photo of your entry and email it to math-challenge@clydehillpta.org
2. You may drop your entry off at a mailbox in the front office

Your entry must contain:
- Your name, grade and teacher (We need to know who you are!)
- Your work on at least one of the challenges. (To participate, you only have to try!)

We will post the solutions after the announcement at the monthly assembly!

Thank you! Gracias! 谢谢！どうもありがとう! 감사합니다! धन्यवाद ! спасибо! Благодаря!

Before going to this month's questions, I wish to extend many thank yous to everyone who helped me get the Math Challenge off the ground and into as many languages as possible!

Thank you! Gracias! 谢谢！どうもありがとう! 감사합니다! धन्यवाद ! спасибо! Благодаря!

AJ Decostanza

Shera Myers

Principal García de León

Vice Principal Hook

Lizie Piazza

Charu Jeevanandam

Rajesh Sugumaran

Shoba Girish

Debyani Ghosh

Anu Bandi

Meg Kitsarova

Kathy Bessler

Bo Su

Kayo Takashima

Yuji Ono

Junho Yamamoto

Joy Maeng

Jaehong Min

Karam Nam

Hyejin Cho

Suh Hyun Choi

Pavel Bronnikov

Member Name(s)	Email	Phone

Thank you again everyone!

Jennie Cochran-Chinn and Clyde Hill PTA

Thank you! Gracias! 谢谢！どうもありがとう! 감사합니다! धन्यवाद ! спасибо! Благодаря!

Name:_____

Grade: ____ 　　　　 Teacher:_____

Shapes in other languages

Remember this chart from the March Math Challenge? We will use it today to think about the names of shapes.

Below we have the names of shapes in various languages. We also have drawn different shapes. Your job is to draw lines from the shapes to the different names for the shape. The number chart to the right can give you clues.

Afterwards - draw a picture with these shapes and think about how your pencil or pen or crayon or paintbrush feels on the paper.

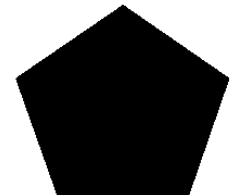|	English	Russian	Chinese	Korean
1	one	один (odin)	一 (yī)	일 (il)
2	two	два (dva)	二 (èr)	이 (i)
3	three	три (tri)	三 (sān)	삼 (sam)
4	four	четыре (chetire)	四 (sì)	사 (sa)
5	five	пять (pyat')	五 (wǔ)	오 (o)
6	six	шесть (shest')	六 (liù)	육 (yuk)
7	seven	семь (sem')	七 (qī)	칠 (chil)
8	eight	восемь (vocem')	八 (bā)	팔 (pal)
9	nine	девять (devyat')	九 (jiǔ)	구 (gu)
10	ten	десять (decyat')	十 (shí)	십 (sip)

三角形

треугольник

오각형

pentagon

octagon

육각형

五边形
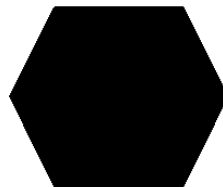
восьмиугольник

삼각형
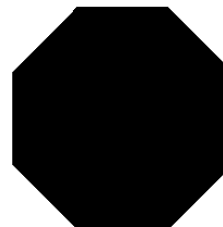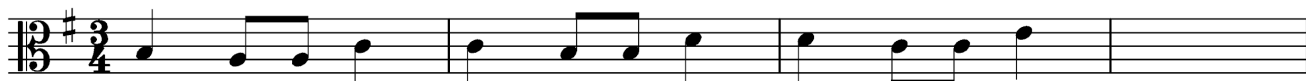
八边形

팔각형　　hexagon

triangle

шестиугольник

пятиугольник

六边形

Name:_____
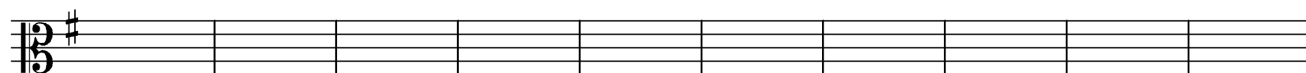
Grade: ____   Teacher:_____

Patterns in Music

Music and math are close friends. Both like to find patterns and then tweak them to see what happens. Find the pattern in the music and fill in the next measure.

Make your own beat or music pattern! Think about how you feel with you hear the musical sounds.

Name:_____

Grade: _____   Teacher:_____

Equation Search

In the equation search below, there are 30 equations to find. The equations can be addition or subtraction equations. The first 2 equations have been found and circled as an example. Can you find the rest of the equations?

Think about how the numbers look as your eyes see them.

4	23	13	36	80	3	76	79
4	2	7	9	40	30	70	45
8	12	6	18	40	4 + 6 = 10		
20	14	10	11	15	26	39	5
35	28	7	7	3	4	29	5
23	15	3	64	12	4	8	32
4	13	22	35	48	0	11	48
19	31	50	99	60	25	85	80

Name:_____

Grade: _____   Teacher:_____

Brownies and baking pans

Do you like the edge brownies or the inside brownies? Let's think about the area and perimeter of the baking pan to get more of the edges - or more of the insides. If you have enough brownie batter to fill a pan that is 4 by 9 and you space your cuts an inch apart so that brownies are all 1 inch by 1 inch - then you can have 4 corners, 2 x 7 = 14 insides brownies, and 2 x 2 + 2 x 7 = 18 edge brownies.

If you want more edge brownies, but don't have more batter, what size rectangular pan might you choose that still gives you a total of 36 1 inch by 1 inch brownies, but more than 18 edge brownies? (You still have to have at least 1 inner brownie for your sibling/cousin/friend that likes the inners.)

What if you like the inner brownies the best? What size rectangular pan might you choose that still gives you a total of 36 1 inch by 1 inch brownies, but more than 14 inside brownies?

What if you could choose the shape of your pan? What shape pan would you choose in order to get as many inside brownies as possible?

Think about the taste on your tongue as you eat good food.

Name:_____

Grade: _____   Teacher:_____

Pet Yeast Burps

Have you ever seen or smelled bread rise? Did you know bread rises from itty bitty yeast burps?
Yeast are teeny tiny organisms that help make bread and other tasty things to eat and
drink.   You can buy yeast, but I have pet yeast that live in gooey flour paste and help
me make delicious bread.

Q. If my pet yeast burp 1000 times every minute, how many burps will fill my home from
the time I wake up at 6:45am until I go to bed at 9:15pm?

My pet yeast - named Lloyd - lives in their flour paste which is usually in my fridge.
The cold fridge means they grow slowly and only need to eat once a week. If Lloyd
lived on my warm kitchen counter, they would need to eat every day.
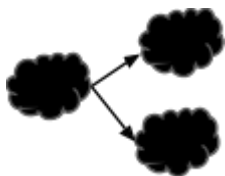
Q. If Lloyd is on my counter with enough food, they will double
the number of yeast in their gooey home every 90 minutes. After I feed them and
put them on the counter at 8:30am, Lloyd starts with 3 billion yeast in the goo. How
many billion yeast will be in the goo at 4:30pm?

To feed Lloyd, I take 100 g of the goo and add 100 g of unbleached flour and 100g of
water - and mix. Lloyd will start to bubble as the yeast in the paste eat and burp
and multiply! I can even give my friends some of Lloyd, and they can start taking
care of their own pet yeast. What happens if your friend gives you some of their
pet yeast?
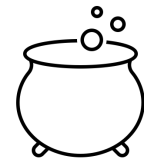
Q. On day 0 you start with some yeast paste from your friend. Your friend's pet
yeast is named Alpha. You name your pet yeast Beta. On day 1, before feeding,
Beta contains 100% Alpha. To fee, you take 100 grams of the paste and feed the
yeast with 100 grams of flour and 100 grams of water. Now the Beta-paste
contains 1/3 of the Parent Alpha-paste by mass (100g Alpha / (100gAlpha + 200g
fresh paste = 1/3) . This means, on day 2, when you take 100g of the Beta-paste, then about 33.3
grams of it will be Alpha-paste.   If you feed Beta every day (and mix thoroughly), how much of the
original Great-great-great-grand-Alpha-paste will the Beta-paste contain after feeding on day 5? What
is an expression that tells us how much of ancestor Alpha-paste that the Beta-paste will contain after
feeding on day n?

What do you do with the rest of the goo you didn't feed? You bake with it!

Q. Let's say you have a recipe for bread that calls for 500g of flour and 350g of
water. You want to replace some of this flour and water with Beta instead of using
store-bought yeast to add more flavor. If you decide to use 100g of Beta paste,
how much flour and water from the recipe should you replace with Beta paste to
keep the ratio of flour to water the same?

Think about the smells in your kitchen as food cooks.

Name:_____

Grade:_____   Teacher:_____

Missing Factors

Oh No! We are missing the factors to these multiplication tables. Can you help fill them in?

If we start with the below table, we can see that 5 is probably part of the factor of column 1, 4 is probably part of factor of column 2, and 3 is probably part of a factor of column 3. We might guess 40 as a factor for row 1, some multiple of 5 for row 2 and a multiple of 6 for row 3. After breaking the numbers down into their factors, we find the solution.

200	160	120
225	180	135
240	192	144

➡️

	5	4	3
40	200	160	120
45	225	180	135
48	240	192	144

1/3	4/9	5/9
3/8	1/2	5/8
2/5	8/15	2/3

Warmup - what are fraction factors for this multiplication table? (There are multiple solutions.)

What about this table? What are the fraction factors here? There are also multiple solutions - can you find one where all the fraction factors are less than 1?

1/4	3/5	2/3
5/18	2/3	20/27
5/16	3/4	5/6

Think about how you feel as you work on something hard. You can do hard things!