Hello, Marvelous Mathematicians!

We want to tell you again how proud we are of all of you. You have worked hard and learned a lot!

We don't want your math brains to become rusty over the summer. Below are lots of ideas for ways you can keep your math brains sharp including games, puzzles and other resources. Your parents are receiving this email as well, so they are aware of how they can support you this summer. As promised, we are also providing a summer packet. Please do NOT do it all in one or a few sittings, but rather work on it periodically over the course of the summer. If you would like to see examples of how to solve the problems and check your answers, please see the answer key.

Remember that you have brought home your dry-erase sleeve to keep. It has game boards and other practice sheets in there that can be reused over the summer. If you have lost any sheets or you need more copies, please use the links below to download and print. Here are the contents of the sleeve:

Clear the Board	Reasoned Rounding	The Factor Game
Under a Million	Rolling for Sums & Differences	Quotients Count
The Greatest Product	Fraction Four in a Row	Battleship

Skills Practice - Rounding, Subtraction, Compatible Numbers

Skills Practice - Decimal and Fraction Multiplication Division

Buzzmath accounts will remain active until 1 August (students who are not returning to ASL next year will have access until 15 July). The NRICH site is also a great source for interesting problems and explorations. This site, Summer Medley, also has some interesting problems to try.

Please share this information with your grown ups. All the bits below are written especially for them (although you're welcome to read it, too!)

Please let us know if you have any questions.

Enjoy your summer!

Mrs. Spurr and Ms. Yeo :)

Rising Grade 6 Summer Math Ideas

This article from the Harvard Graduate School of Education shares research about why kids lose math knowledge over the summer, and how families can work to counteract it.

Below is a chart indicating some of the key skills your child will need at the start of Grade 6. Though these skills have been taught this year, we know that every child progresses at a different rate in their learning and some students will be more confident with certain skills than others. Please encourage and support your child wherever they are in their learning journey.

	Start of Grade 6
Addition / Subtraction	Applying appropriate strategies for addition and subtraction problems (e.g. thinking about the numbers in a problem and whether an algorithm or alternate strategy will be more efficient).
Multiplication / Division	- Estimate products and quotients of whole number problems using compatible numbers. - Multiply a four digit by a one-digit whole number, and multiply two two-digit numbers, and find whole-number quotients and remainders with up to four-digit dividends and one-digit divisor using strategies based on place value. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
Fractions / Decimals	- Generate and recognize equivalent fractions, add and subtract fractions with like denominators and compare decimals to hundredths. - Add, subtract and multiply fractions and decimals using strategies based on place value and an understanding of fractional parts. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. - Estimate sums and differences of fractions and decimal problems, and the products of decimal problems.

Online Practice Students can access their **BuzzMath** accounts to review any topics. They may also wish to continue using the different websites they've used in class this year to practice their skills. Here are a few web-based games:

- Area Maze (logic, multiplication and division) *There are also Area Maze puzzle books that can be purchased if you prefer offline practice.*
- The Factor Game (factors and multiples) *There is also a printable game board here for offline practice.*
- 24 Game (order of operations) *The physical card game can be purchased if you prefer offline practice.*
- Solve Me Mobiles (logic, all operations)
- KenKen Puzzles (logic, all operations) *There are many websites that have free printable puzzles.*

Offline Practice Having a deck of cards or dice will lend itself to many math games. Remove the face cards and an ace can be used to represent 1, or use the digit cards in an Uno deck. If you don't have dice, there are a lot of virtual dice apps. Here are some games we've played this year:

- Reasoned Rounding (rounding)
- Under a Million (exponents)
- Rolling for Sums & Differences (place value and estimation)
- Target 2,000 (subtraction)
- Four in a Row (equivalent fractions, fraction +/-)
- Dobble (equivalent fractions)
- The Greatest Product (estimation, multiplication)
- Quotients Count (estimation and division)
- Clear the Board (order of operations)
- Name that Number (order of operations)
- Admult Dice (math facts and order of operations)
- Battleship (coordinate planes)
- Salute (math facts)
- Skyscraper Puzzles (spatial reasoning)
- Zukei Puzzles (geometry)

Don't forget any commercial games you might have at home! (e.g. *Monopoly, Cluedo, Prime Climb, backgammon*)

Talking Math With Your Kids

We know that for children to grow as readers, they need to read every day. What can we do to help them grow as mathematicians? Talk about numbers and shapes as they arise in our daily lives! Math isn't just about computation. Pattern finding, estimation, reasoning and an awareness of how math is important in our everyday lives can be engaging without being intimidating, and the summer is full of opportunities for rich mathematical conversations.

How Can You Help?

Be curious, tolerant and supportive of your child's mathematical thinking, even if it might not match your own. Ask questions that you might not know the answers to so that you aren't listening for a 'correct' answer. Mathematicians don't quiz each other. They ask questions. If you aren't sure about how your child is thinking about an idea, try asking questions that encourage them to explain their thinking, such as: *How did you figure that out?*, *Does that always work?*, and *What would happen if...?* If your child is stuck, ask open ended questions such as: *What do you know?* and *What do you need to know?* might help without taking away the productive struggle.

How Do Mathematicians Grow?

We know that for children to grow as readers, they need to read every day. To help them grow as mathematicians, they need to talk about numbers and shapes as they arise in your daily lives. Math isn't just about counting and computation. Pattern finding, reasoning and an awareness of how math is important in our everyday lives can be engaging without being intimidating. Here are some activities that will allow you and your child to use and discuss essential math concepts in a natural, fun way while you are at home.

Estimating Collections Create collections of things around the home (e.g. pasta, paper clips, coins, Legos) and have your child make an initial estimate of the number of things in each collection. Then, have them refine their estimation using strategies like finding what ten or hundred looks like and comparing what you are estimating to the ten/hundred, clump counting, or scooping and count. Or have your child estimate things in the world around them! *(About how many birds just flew by? About how many people are in that queue?)*

Physical Activities If your child is interested in a specific sport, have them analyze or chart the statistics of their favorite team or player. They could even chart and graph their own stats if they're playing a sport during the summer, whether outside or inside (number of steps walked over several days, jumping jacks, etc.)

Shopping and Money

- Estimate costs (*Do you think we will have enough to get...?*)
- Practice rounding the costs of items.
- Practice addition and subtraction (*How much will these two items cost together?*, *How much change should you get?, How much more expensive is this than that?*)
- Compare deals 'How much do we save with the Buy 1 Get 1 Half Off deal?', and more.
- If your child receives an allowance, encourage them to keep track of how much they've saved and spent.

- If you're travelling to different countries or have different currencies at home, have them compare and contrast the currency. *(What do you notice about the different denominations of coins and notes?, If US$1.50 is about £1, how much would this cost in London?)*

Cooking and Food Have your child help out in the kitchen by measuring out ingredients *(comparing fractions of different ingredients, volume/weight measurement)*, scaling up or down recipes based on the serving size *(proportional thinking using multiplication/division)* , and figuring out how long things need to stay in the oven *(elapsed time)*.

Spatial Reasoning Building with blocks, Lego, or other loose parts (e.g. coins, pebbles) all help develop spatial reasoning and can be an opportunity to explore ideas like symmetry. Mazes, jigsaw puzzles, origami, pentominoes and tangrams are also great. Finally, have your child read or draw some maps! Mapping helps children develop their spatial reasoning skills and make sense of their world.

Distances / Area Help your child plot distances travelled by your family or other family members on a map, then figure out the actual distance travelled using the scale on the map. You could also have them convert distance travelled from kilometers to meters or estimate using other known measures *(e.g. How many football fields do you think could fit in this park?)*. If you're staying in London, have them figure out how far away family members or other loved ones live, or how far away places they're hearing about in the news are.

Weather Have your child figure out the daily temperature range based on the forecast, or calculate what the temperature is in Fahrenheit or Celsius. The rough conversion for °F to °C is (°F - 30) ÷ 2 = °C and for °C to °F is °C x 2 + 30 = °F

Reading Can you find the math in things you read? How about some Bedtime Math stories? Here are a few other math-related book lists and books:

A list of 10 non-fiction math books
Mathical Book Prize list
The Number Devil by Hans Magnus Enzensberger
Secret Coders by Gene Yang Luen
This is Not a Math Book by Anna Weltman
The Book of Perfectly Perilous Math by Sean Connolly
The Cat in Numberland by Ivar Ekeland
How Many Guinea Pigs Can Fit on a Plane? by Laura Overdeck