MINISTRY OF
EDUCATION

Putting Mathematics into Family Life

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Acknowledgements

The 'Putting Mathematics into Family Life' (PMFL), handbook is an initiative taken by the Ministry of Education to promote numeracy within the home of each citizen.

The content of the handbook is a departure from traditional texts thus representing a type of learning resource that the Ministry deems as particularly useful to parents. The material and arrangement will heighten the awareness of parents who sincerely immerse themselves in it.

The work done in this book is a synergistic of many minds. Therefore, the Ministry is grateful for the inspiration and wisdom of these thinkers. In this regard, the Ministry wishes to extend thanks to all individuals who prepared, planned and produced this document.

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Table of Contents

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Introduction

This booklet has been designed with you, the parents, in mind. It is meant to be a companion guide and support booklet for parents who are keen on using the home as a place to support the development of mathematical thinking in their children. In this booklet, there are many games and activities that we hope you will find useful and that you will adapt to meet the specific needs that exist in your home environment. The aim of the booklet is to support the current thrust of the National Mathematics Team (working through the Core Curriculum Unit) of **"Putting Mathematics into Family Life".** To use the booklet or the activities, you require no special knowledge of mathematics or of teaching the subject. All the activities can be readily included in the daily tasks and routines of most households, and the games require very few materials that are not usually found in most homes (such as dice, dominoes and a deck of playing cards). You can engage your children in these activities without much effort, expenditure, set-up time or pre-planning.

As you become familiar with the content of the booklet, you will appreciate that the activities and suggestions were selected with great consideration for parents who either have little time for, knowledge of, or skill in teaching the subject. All parents can access the content – from the highly proficient at mathematics to those who lack confidence in the subject and think that they are not capable of supporting their children.

Putting Mathematics into Family Life

Your children encountered mathematics long before they started school. They will also do far more mathematics than they are taught in school. Your children's interactions with their environment often involve mathematics, but unfortunately these interactions are taken for granted. For example, they will use a great deal of mathematics when they decide how to share a bag of sweets among themselves fairly. Additionally, deep mathematical thinking is involved when they decide to pay for a lunch that costs $315 with $515 (in order to reduce the number of coins that they receive as change). These examples, and many others that we could identify, verify that indeed the home and the family are spaces within which students are exposed to real, practical mathematics. Additionally, many of the routine tasks and activities associated with children's day-to-day responsibilities and interactions involve mathematical thinking. If you are interested in sparking your children's interest in mathematics, therefore, then a useful place to start is by incorporating mathematics into your family life through your conversations and interactions with your children.

We should hasten to point out that you need not worry about your mathematics knowledge; nor should you allow that to prevent you from talking to your children about mathematics. Perhaps you do not remember how to add two fractions and maybe your knowledge of mathematics only goes as far as adding, subtracting, multiplying and dividing. This is not necessarily cause for concern as the mathematics in which you will engage your children in the home need not be as formal as their experiences in the classroom. Asking your children to do any of the following activities (depending on their ages) would be beneficial even though each activity does not appear to be strikingly similar to those that your children do in their day-to-day classes:

- Ask your child to count the number of doors or windows in the house. Then ask: Is there a relationship between the number of doors/windows and the number of rooms in the house? Suppose we add another room to the house, how many doors/windows would we need?

- Allow your child to double the servings in a recipe and adjust the ingredients accordingly.

- Ask your child to count the number of steps he/she would take to walk from one room to the next. Then have him/her estimate the number of steps it would take to walk through the entire house.

- Put a number on the refrigerator every week and see how many times your child spots or uses that number during the week.

- Challenge your child to find a winning strategy for games such as checkers and dominoes.

- Allow your child to help you track the electricity bill over a period of months.

Homework

Homework plays an important role in your child's academic development. It helps your child to review what was done in class and prepares him/her for the next day's class. It allows your child to work on his/her own without peers' interference while keeping you, the parents, abreast of what is happening in your child's classroom. Homework is also used as a form of assessment to determine students' strengths and weaknesses.

Here are a few tips that you can use to help your child with his/her homework:

- **Show your child that you think education and homework are important**

  Talk with your child about the importance of doing homework. Your child needs to know that you value homework.

- **Set regular and adequate time for your child to do homework**

  When a schedule is in place, it helps your child to develop self-discipline and also encourages consistency. Ensure that your child gets enough time to complete assignments so that he/she gets enough time for recreational activities and sleep.

- **Provide a quiet place for your child to do homework**

  More homework is done when your child works in an environment that is free from distractions, such as televisions, video games, telephones, etc.

- **Provide the necessary resources your child needs**

  Provide basic mathematical resources such as pencils, eraser, counters, a geometry set and other materials that will ensure that your child is equipped to complete assignments properly.

- **Set a good example for your child by being involved in educational activities at home**

  Let your child see you reading books, newspapers, doing puzzles and other activities that require thinking. He/she will see that the skills he/she is learning will be an important part of his/her adult life.

- **Monitor your child's homework**

  When your child knows that homework is being monitored, then he/she is more likely to complete the assignments properly. Take time to look over completed assignments to ensure that they are done properly. In cases where your child is having difficulty, provide assistance or ask older siblings to assist.

  Provide opportunities for your child to share what he/she has learnt with other family members.

- **Reward your child**

  Your child will be more motivated to do homework if he/she knows that he/she will be rewarded. After your child completes the homework, allow him/her to watch television or play favourite games.

  Post marked assignments on the fridge or other designated areas as a means of motivating your child. Reward him/her for doing well.

Building Home-School Relationships

It is important that you attempt to build a relationship with your child's school. To do this, it is necessary that you understand your role and the roles of others in the school community. It also requires communication, and this means that you have to make yourself available to communicate with your child's school as well as make use of the opportunities to communicate that the school creates. Usually, this means that it is in your best interest if you:

- attend any orientation session that the school has; at such a session, you usually get a chance to meet your child's teacher and exchange contact information;

- attend as many Parent Teacher Association (PTA) meetings as you can; usually schools have monthly PTA meetings;

- attend any parent/teacher conferences and consultations to which you are invited. At these conferences/consultations, make an effort to engage your child's teacher in one-on-one discussion to determine your child's progress;

- make an effort to initiate meetings and consultations with your child's teacher. This may become necessary if you find that your child is not progressing at an acceptable pace.

Building a relationship with your child's mathematics teacher can take place in many ways. Whatever you choose to do, it is important that you realise that high levels of participation will be necessary. You have to commit yourself to making time before, after or during work to visit the school to attend meetings or lend support in some way or another. Some of the things that you can do are:

- Offer yourself as a support person for your child's mathematics class. This does not mean that you have to teach mathematics, even though with careful planning with the classroom teacher, you may choose to do this if you think you can. Being a support person for your child's mathematics class means that you may choose to do any number of the following activities:

  o schedule with the class teacher to visit at least one mathematics class per week/month to help the teacher monitor children's work and motivate children;

  o help teachers in providing after-school assistance to struggling children;

  o be prepared to participate in the learning process by sharing your experiences based on themes or topics;

  o determine what teaching resources are needed for the math class and work with the teacher and other parents to create or procure these resources.

- Volunteer some of your time to help run the school's mathematics homework centre;

- Attend Career Day and explain to children how you use mathematics in your career,

- Discuss with your child's teacher how you could monitor your child's progress. Ask the teacher for a checklist or guide that you can use to determine or monitor your child's progress.

As you consider forming a relationship with your child's mathematics class, the most important thing to remember is that you should not let any fear that you may have regarding mathematics stop you from making an effort. Remember, simply attending meetings and conferences and showing an interest in how your child is doing in mathematics is an important first step.

Helping Your Children to Develop an Interest in Mathematics

It is widely accepted that children should be exposed to early opportunities to develop literacy skills. Unfortunately, not much emphasis is placed on the development of numeracy skills in children. This is however just as important, as a solid foundation is integral if we want our children to develop competence in mathematics. Literacy and Numeracy should be seen as areas that complement each other. Children are exposed to a vast number of books during infancy which are read for fun as well as to develop literacy skills. However, books should be carefully selected to ensure that they also incorporate different mathematical concepts.

Books encourage children to think and reason mathematically and build their appreciation for mathematics and literature. Children love to listen to stories being read to them. Using story books, children are able to experience the wonder of mathematics in the same way they appreciate the wonders of a great story. Choose stories that will engage your children. Take the time to read books with your children which will bring out mathematical concepts. This will help your children learn the vocabulary of mathematics. They will never get a real feeling for mathematics nor learn more advanced concepts without an understanding of its vocabulary. Make a deliberate attempt to find mathematics stories that will entice them to read.

Here are some examples of stories and the mathematical concepts that they emphasize:

- *There Were Ten in the Bed* by Susan Chapman Calitri and Mary Gruetzke: Addition

- *A Fair Bear's Share* by Stuart J. Murphy: Division

- *Give me Half* by Stuart J. Murphy: Fractions

- *Divide and Ride* by Stuart J. Murphy: Division and Multiplication

- *Get Up and Go* by Stuart J. Murphy: Time

- *Snow White and the Seven Dwarfs* by Random House Disney: Addition

When children read or listen to stories being read they will ask questions that encourage them to use higher level thinking. Invite children to use the pattern of the story to create a new or similar story. In addition to reading stories, engage children in reading labels and highlighting units of measurement. Get them to read receipts, bank vouchers, utility bills, etc. The newspaper is a great reading tool as well, as it will allow children to hunt for different things in mathematics such as numbers, sales, discounts, information about the weather which may include temperatures and rainfall amounts, etc.

Similarly, children can also develop an interest in mathematics through the use of technology and

songs. Engage your children in singing songs at home which encourage mathematiccal concepts. When children sing these songs which reinforce mathematical concepts they find that they can easily re-member the concepts from the song.

Examples of some songs are:

- *Ten Green Bottles*
- *This Old Man*
- *One – Two – Buckle My Shoe*

In addition, there are a wide variety of commercial CDs with math songs available on the market.

As we move further and further into the technological age, the uses of technology cannot be over-looked. Children spend a great deal of their time watching television, playing video and computer games and using cellular phones. Ensure therefore, that your children watch mathematics related television programmes and DVDs as well as play mathematical games. Some of these mathematical games can be downloaded free of cost from the Internet.

Here are some examples of computer games :

- Sudoku
- Math Games Multiplication
- Math Quiz

Your Children and the Metric System

The metric system is the system of measurement that is officially used in Jamaica. As a parent, it is likely that you are more familiar with measuring length and distance in inches, feet and yards; in mea-suring weight in pounds and in measuring liquid using quarts and pints. Your children, however, are not likely to learn about feet, inches and pounds in school as they are expected to learn the metric system. In the metric system, your children will measure length and distance in millimetres, centime-tres, metres and kilometres and they will measure weight in grams and kilograms. It would be very good if you are able to engage your children in activities around the home that allow them to estimate distances and weights in metric units. The following acts as a guide for you to follow as you try to get your children to think about metric:

- A centimetre (cm) is used to measure short lengths; it is a bit less than half inch. It is about:

    o   the width of the tip an adult 'pinky' (little) finger, or

    o   the width of a paper staple
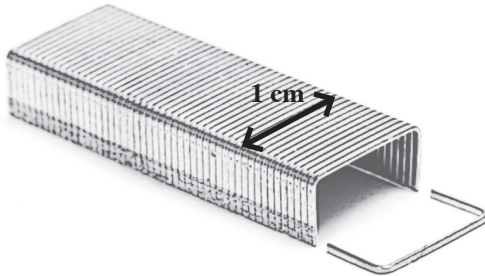
- A metre (m) is used to measure lengths such as the height of a person or the distance which someone runs. It is just a little more than 3 feet or 1 yard. Some things that are about a metre long are:

    o   the width of a regular size doorway, or

    o   the height above the floor of the top of a regular kitchen counter
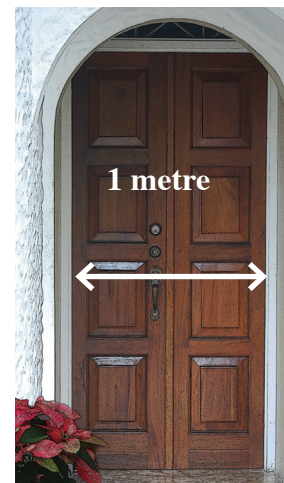
- A kilometre (km) is a long distance and is usually used to record distances between places, for example, between towns and cities. A kilometre is a little over half mile and is about the distance you could walk in 12 minutes or so.

- A gram (g) is used to measure the weight of very small quantities. A gram is about:

    o   the weight of a paper clip, or

    o   the weight of a pinch of salt
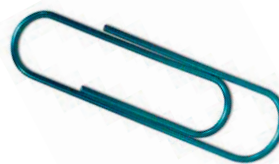
- A kilogram (kg) is used to measure heavier quantities. Roughly, 1 kilogram makes a little over 2 pounds. Some things that are approximately a kilogram are given below:

  o   3 regular cans of tinned Baked Beans, or

  o   two loaves of regular size hard-dough bread
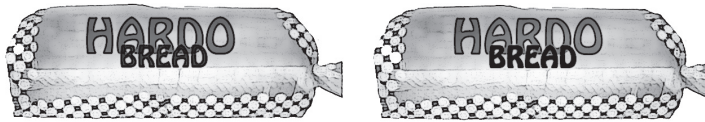
- A millilitre (ml) is used to measure the amount of liquid inside a container. A millilitre is a very small quantity of liquid. A millilitre of milk, for example, would not fill a teaspoon – it would take about 5 millilitres of milk to do so. A ml is about:

  o   15 drops of water from a leaking pipe, or

  o   about 4 to 5 drops of liquid from a medicine dropper

- A litre (l) is also used to measure liquid. A litre is just a bit less than a quart and is about a quarter of a gallon. Some things that contain about a litre are:

  o   a bit more than two 'box-drinks', or

  o   3 regular size glasses of water

Mathematics in the Home

Children 6 to 8 Years Old (Grades 1 and 2)

Children at this age are either at the exploratory or developmental stage of numeracy. These stages of numeracy are characterised by the development of basic but important number facts as children work with concrete material to learn to count and operate with numbers. Some of the ideas that your 6 – 8 year-olds will learn are outlined below:

Math Skills – Grade 1

By the end of Grade 1, your child should be able to:

- Count up to 100;

- Read and write numbers up to 100;

- Count by twos or by tens (2, 4, 6, 8… or 10, 20, 30, 40…);

- Correctly use the words first, second, third …;

- Know 'one more than' and 'one less than' facts (1 less than 8 is 7);

- Use the phrases 'greater than' and 'less than';

- Know numbers that add up to 10;

- Add and subtract one or two-digit numbers 'carrying' or 'borrowing';

- Identify Jamaican money;

- Add Jamaican coins/notes to make different amounts;

- Describe objects using 'tall', 'long', 'short', 'narrow', 'wide', 'thick', 'thin', 'heavy', 'light', 'near', 'far' correctly;

- Group objects based on their similar attributes or features such as length, weight, shape, etc.;

- Identify the larger or smaller, taller or shorter, etc. of two objects in any setting;

- Name and describe plane shapes (squares, rectangles, triangles, etc.) and relate them to real life objects found in their environment;

- Group objects in tens and ones (such as 'there are 2 tens and 7 ones in 27');

- Tell the time on the hour.

Math Skills – Grade 2

By the end of Grade 2, your child should be able to:

- Identify the number of 100s, 10s and 1s in a three-digit whole number. For example, 145 has 1 hundred, 4 tens and 5 ones;

- Place any set of numbers up to 999 in order of size;

- Add or subtract three-digit numbers;

- Write a part of a whole as a fraction;

- Arrange objects in rows and columns to show multiplication facts;

- Use money to buy and sell different items and to make correct change;

- Solve problems which require the addition and subtraction of money related to a purchasing situation;

- Tell the time using a clock;

- Measure the weight or length of objects, the amount of liquid that a container can hold as well as temperature using metric units.

Math in Daily Life – Grades 1 and 2

Children at this age are very curious and enthusiastic and are thrilled by the fact that they can help 'Mommy' or 'Daddy'. You can capitalise on this by asking them to help you with or participate in certain tasks that can help them think about mathematics. Some of these activities are outlined below.

- Shopping with your child provides many opportunities for mathematics skills to develop. Try to engage the child in the following activities as you shop:

    o   If you are buying a large number of the same item (say 6 packs of biscuits), ask the child to carry them from the shelf to the trolley 2 or 3 at a time. Discuss the number of trips that were made to carry all the packs of biscuits.

    o   Use language that describes the physical features of products with your child. For example, instruct your child to pick up the round can or the rectangular pack of biscuits and watch to see if he/she chooses the correct one.

    o   When unpacking grocery, ask your child to find other items that are heavier, lighter or approximately the same weight as a certain tin/parcel. Can they arrange these items in order of size or weight?

    o   Identify the outline/shapes of items that are bought – some packs of biscuits are rectangular; canned goods often have ends which are circular, etc. Challenge them to find any packaged item that is triangular.

    o   Counting is crucial at this stage and therefore the child should count as often as possible. It is useful if the child is able to count items and not just count out loud up to a predetermined number. In shopping, therefore, it is ideal if the child counts items as they are bought, such as the number of tins of milk in the trolley or the number of onions which make up the kilogram.

    o   If you shop in a supermarket, look for numbers that advertise specials and prices. Can the child identify the digits in these numbers? Can he/she call out these numbers?

    o   If it is possible, with your supervision, have your child pack a bag with items that he/she thinks it would be possible to carry. This helps the child to develop an appreciation for the relationship between the size of items and their weights.

- There are also many opportunities around the home for the children to think about mathematics. Some of these are outlined below:

o   Allow your younger children to explore the shapes of common objects in the environment.

o   Ask your children to tell you the shape of a plate, mirror, bath mat, place mat, clock, etc.

o   Using a measuring tape that shows centimetres, take turns measuring the lengths of different objects around the house; the length of a sofa or bed, the width of a table, the height of a door or a cabinet.

o   On the back of a door or a wall, keep track of your children's heights as they grow. Each member of the family can take turns to have his/her height measured on a regular basis.

- There are many opportunities for children to count each day. Some of these are:
  - Counting the number of glasses of water they drink;
  - Counting the number of ads that come on during a TV programme;
  - Counting the number of stoplights from home to school;
  - Counting the number of houses on the block in which they live;
  - Counting the number of steps taken in walking from one point to the next;

- Create situations where efficiency in counting is required. For example, in counting the number of grapes on the table, you might encourage children to create groups of 5 or 10.

- Let your children dial numbers on your phone for you; either write down the digits and have them read out and dial the number, or simply read them to the children and have them dial them.

- Children at this age should know the various coins and notes in circulation and should be able to tell the value of a set of coins and notes. Providing them with opportunities to interact with money helps to develop these skills. Some of the activities that achieve this are:

  o   Encourage your children to save by providing each with a piggy bank/saving pan. Periodically, have children estimate the amount of money in the saving pan and open it to verify the amount;

  o   Allow your child to select notes and coins which amount to a specific value. For example, place a pile of notes and coins on a table and tell the child to take out $30 to buy a snack.

o   Give your child some money (between $50 and $100) and with your supervision, allow him/her to decide how to spend it at the supermarket or in some other environment where prices are displayed. Make it clear that you will not supplement it if he/she buys something that costs more than the money that he/she has.

- Other activities could be:

o   In activities that can be sequenced, have your child tell you what happened first, second, third, etc.

o   Have your child measure the length of the settee, table, fridge, stove, bed, etc., by counting the number of tiles that the piece of furniture covers on the floor. Discuss which is longer, shorter, wider, bigger, etc.

o   Make sure there is a calendar in your child's room. Have your child identify on the calendar the date of his/her birthday plus the dates of the birthdays of other persons in the family. Challenge him/her to remind you when a person's birthday is approaching. For example, at the start of each month, he/she can tell you which family member has a birthday in that month.

o   Show your child a drinking glass and a bottle and ask him/her to estimate how many glasses of water would be needed to fill the bottle. Have your child fill the bottle and see how close his/her estimate is. Repeat this activity often, using different bottles or containers of various sizes and shapes to give your child many opportunities to develop his/her estimation skills.

Mathematics Games – Grades 1 and 2

Number Difference

✳ Taking turns with your child, choose a number between 1 and 10 and write it down.

✳ Roll a die and write down the number on the die.

✳ Find the difference between the number you chose and the number on the die. For example, you may have chosen 7, and then when you rolled the die you got a 2, so the difference between the numbers is 5.

✳ After each person has had 5 chances (choose a different number each time), add up the differences. The person with the smaller sum of the differences wins.

✔ *For smaller children you may use counters or a number line to help with the calculations. While for older children you may choose to find the product of the numbers.*

Bawl out 10

✳ Taking turns, roll a die. See how quickly you can say the number that is needed to be added to the number on the die to make 10. For example, if a 4 is rolled, you need a 6 to make 10. The first person to shout out 6 scores a point.

✔ *You may extend the activity by deciding that the numbers should add up to 20, 50 or some other number rather than 10.*

✔ *You may also use two dice and try to tell the third number needed to give the required sum. The first player to give this number gets the point.*
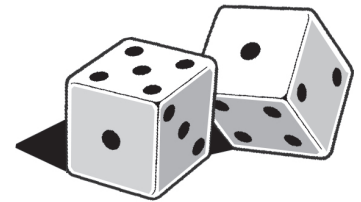
Cross-out Sum

✸ Draw four circles on a sheet of paper. Write a number between 3 and 18 in each of the circles. Roll a die three times and add together the three numbers that you get.

✸ If the sum is one of the numbers in the circle, cross it out. The first person to cross out all his/her sum wins.

Coin Toss

For this game you will need to create a board like the one below.

(See appendix for a larger version.)

✸ Start at 1.

✸ Take turns tossing a coin. If it shows heads, move your marker 1 space. If it shows tails add 5 to your current position and say it out loud. If you are correct, move to that position. If not stay where you are.

✸ The first player to make it to the bottom row wins.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

10 Pairs in Time

For this game, a time piece is needed.

✸ From a set of playing cards, take out the cards that show the numbers 0 to 10 (use Queens as 0 and Aces as 1). Include in your set 2 cards showing 5. In total, then you should have 12 cards.

✸ Shuffle the cards and give them to your child.

✸ Time how long it takes him/her to find all the pairs that sum to 10.

✸ You may repeat the game on another day and see if he/she is able to beat the previous time.

Put in Order

✱ The aim of this activity is to form 6 two-digit numbers and arrange them in ascending or descending order of size on a piece of paper. To play, each person draws six circles in a row on a sheet of paper.

✱ Taking turns, each person rolls two dice and uses the numbers to form a two-digit number. For example, if you roll a 3 and a 5 you can make either 35 or 53. Write your two-digit number in one of the circles.

✱ When it is your turn again, roll the dice and form another two-digit number. Remember the numbers must be placed in order of size – either from smallest to largest or largest to smallest.

✱ Be careful! Once a number is written in a circle, you cannot change the number in any way. The first person to fill all 6 circles with numbers in either ascending or descending order wins. Play 3 games and see who wins most often.

Beanie Product

For this game you will need a pile of dried beans.

✱ Take turns rolling two dice. Find the product of the two numbers and say it out loud.

✱ If you are correct you get a bean. The first person to get 15 beans wins.

Knockout 20!
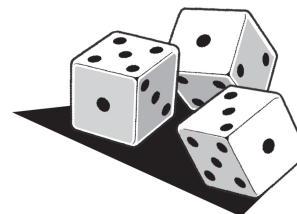
✱ This is a game for 2 - 3 players. Each player will need a different set of counters. Three dice are also going to be needed to play the game.

✱ Write the numbers from 0 to 20 on a sheet of paper. Each person does not need to write a different set of numbers; one set is sufficient. Write the numbers large enough so that counters or coins can be placed on them.

✱ Take turns rolling 3 dice. Add the numbers on the 3 dice. Put a coin/counter on the number that when added to the sum of the 3 dice gives you 20. For example, if you roll 6, 4 and 1, then 6 + 4 + 1 = 11. Therefore, cover 9 on the paper.

✸ If someone else already has a counter on the number, take it up and replace it with your own!

✸ The first person with counters on six different numbers wins.

✸ You may also use two dice and cover the third number needed to give the required sum.

Brawta

✸ Take turns to choose a two-digit number less than 50 and write it down. This number is called your target number.

✸ Now determine the number by which you are going to skip-count (for example, if you are counting by 4, then count as follows: 4, 8, 12, 16, etc.). You can count by any number from 2 – 6.

✸ Get as close to your target number without going over. For example, if your target number is 42, get as close as possible to 42; you may even get to 42, but do not go beyond it.

✸ Find the difference between the number you counted to and your target number. Record this as your score for Round 1.

✸ Play a few more rounds. You must choose a different number on each turn. The first person to have a total score of exactly 12 points from the rounds wins!

Add in a Flash

✸ This is a game for 2 players. A judge/caller is also needed.

✸ You will need a pack of cards from which the face cards have been removed.

✸ Cut the deck in two and give half to each player. Ensure that each person shuffles his/her cards properly and that the cards are held face down.

✸ The caller instructs each person to draw a card and, without looking at it, to place it on his/her forehead so the other player can see it.

✸ The caller/judge will then add the two numbers together and call out the sum so that both individuals can hear. The player who can first give the number on the card that he/she has on his/her forehead wins that game and gets a point.

✸ Play 5 games and see who wins most often.

✔ *Instead of adding the number, the players can decide that they will multiply or even subtract the numbers.*

Spot Your Number

✳ Pick a different number for each person in the car. As you drive around the city, each person looks for his/her number on doors, bus stops, billboards, etc.

✳ The person who sees his/her number most often wins.

Fraction String

✳ The aim of the game is to amass points by thinking of a number that can be halved many times without resulting in a decimal.

✳ For example, when 20 is successively halved, it results in a number string with only 2 new numbers being produced (20 – 10 – 5).

✳ Each player thinks of a number and halves it repeatedly as many times as possible (until no more halves are possible without getting a decimal or until he/she is stuck).

✳ He/she gets 1 point for each new number in the number string.

Children 9 to 10 Years Old (Grades 3 and 4)

At this age, children are performing operations with numbers with greater ease. They also start measuring objects using instruments and are able to construct and interpret graphs and charts. Some of the important ideas that they will be introduced to at this age are listed below:

Math Skills – Grade 3

By the end of grade 3, your child should be able to:

- Round off a two-digit number to the nearest 10. For example, 18 is approximately 20;

- Put a group of three-digit numbers in order according to size;

- Identify numbers just before or after a given number;

- Perform addition and subtraction of two-digit numbers mentally (without pencil and paper);

- Add whole numbers up to 6 digits;

- Name parts of whole using fractions;

- Place fractions with the same numerator in order;

- Convert mixed numbers to improper fractions;

- Recognise that repeated addition, for example, (3 + 3 + 3 + 3) is the same as multiplication (4 × 3);

- Perform mental multiplication up to their '5 times table';

- Multiply any number by 1;

- Say which pair of a multiplication sentence will have the same answer. For example, 3 × 4 and 2 × 6;

- Multiply three-digit numbers by one-digit numbers;

- Appreciate that the order in which numbers are multiplied does not change the result (3 × 4) is the same as (4 × 3);

- Solve problems involving division;

- Divide any number by 1;

- Divide objects into equivalent sets;

- Write amounts of money using the symbol '$' and the decimal point;

- Tell the time using the clock;

- Calculate ages in years and months;

- Read and tell the time in the format: _____ minutes past the hour;

- Identify twelve objects as 1 dozen;

- Differentiate between the uses of metric units;

- Measure the perimeter of various objects;

- Read and interpret information given in a table or pictograph.

Math Skills – Grade 4

By the end of grade 4, your child should be able to:

- Distinguish between value, face value and place value of a number;

- Read and write numbers up to 7 digits;

- Solve simple problems involving addition, subtraction, multiplication and division;

- Recognise various instances when $^1/_2$ of a quantity is being discussed;

- Read and write time in the hour : minute format (for example, 2:45 p.m.);

- Estimate, measure and record distance (in kilometres, metres, centimetres), mass/weight in (kilograms and grams) and capacity in (litres and millilitres);

- Estimate and measure temperature in degrees Celsius;

- Explain the relationship among units of time;

- Identify parallel, perpendicular and intersecting line segments;

- Multiply four-digit numbers by two-digit numbers (for example, 1,436 × 38);

- Divide five-digit numbers by two-digit numbers (16,000 ÷ 25);

- Know their multiplication table up to their '10 times table';

- Multiply a number by multiples of 10;

- Interpret simple graphs displaying data;

- Write and interpret numbers between 0 and 1 (for example, 0.75);

- Solve simple problems (for example, 'John has 12 mangoes; he gives Peter 4 and gets 6 from Paul. How many does he have now?');

- Divide so that zero is a part of the answer or is the answer.

Math in Daily Life – Grades 3 and 4

At this age, children are likely to be anxious to demonstrate for their parents what they are learning in school. The link between their school mathematics and their home/street mathematics needs to be reinforced by giving them many opportunities to compute, measure and predict. Some of the activities that you can engage your children in are outlined below.

- Shopping with your children provides opportunities for you to allow them to use numbers in real situations. While shopping, children have the chance to practise and develop their mental computation and their estimation and measurement skills. Some of the activities you could have them do while shopping are:

o   At the market, allow your children to guess how many of one item will give a particular weight. Let them pick the items that they think would give this weight; if the desired weight is not achieved, then allow them to substitute other items in an effort to get the weight required.

o   Allow your children to select the bills that should be used for payment of selected items. Do they select the most appropriate bills or the smallest number of bills? Do they tender two $500 bills when a $500 bill and a $100 bill would have been sufficient?

o   While unpacking the groceries, let your children guess the mass (in kg) of tinned goods or the capacity (in litres) of juices. Check the label to see how close they are.

o   Give your children some freedom in determining what quantity of a particular item would be sufficient for the household for a certain period. Ask questions such as: 'About how many kilograms of sugar do you think we would need for the month?' Allow your children to select the packs they think would be sufficient. Be prepared, however, to discuss and change their selection.

o   In some instances, where you know how many items are consumed each day or week, allow children to determine the total number that would be used in a month. For example, if, in your family, each child gets a box of juice to carry to school each day, have your children determine how many boxes of juice will be needed for the entire month.

•   There are also many opportunities to get children involved in activities within the home that will get them to think about or use mathematics. Some of these activities are discussed below:

o   While cooking, allow your children to help you measure and estimate the quantity of each ingredient to be used. Ensure that they use scales, measuring cups and measuring spoons to check the accuracy of what they are measuring as well as to see how close their estimates were. Remember to use metric units where you can, and make comparisons with empirical units (pounds, ounces) where possible.

o   Check the time when you put the food in the oven or on the stove. Let your children help you keep time. For example, let your children remind you in half-hour to check the cake in the oven. Ask questions such as: 'What time is it now?' 'At what time should I check the cake?' 'How long has it been since the pot has been on the stove?'

o   Allow your children to place grocery items (canned food, dry goods, sauces, etc.) on a kitchen scale. Set a predetermined mass/weight that no child should exceed. How

close can each child get to the limit without exceeding it? How close can each child get to the limit, whether by exceeding it or by remaining beneath it?

o Allow your children to help share dinner for the family, dividing food into what they think are equal portions.

o Whenever possible encourage your children to tell the time. Some children may only be able to tell time to the nearest five minutes using the analogue clock (clocks with hands). Try to use both digital and analogue clocks to state times differently, for example, 8:35 or 25 minutes to 9, etc.

o Help your children with running count-downs to exciting events such as birthdays or international sporting events. Depending on when the count-down begins you may first count down the weeks, then days, then hours, etc. until the event begins. A calendar could be used and the days marked.

o Involve your children in deciding when is the best time to depart for a journey so that the family arrives at their destination on time. They may further help to determine what time they need to wake up and may keep track of the time as they prepare to leave.

o Choose a room in your house. Challenge your children to spot right angles in the room. You may choose to limit the number to 20, for example, or allow the children to find as many as they can.

o Allow your children to guess the weights of different family members. Later you can help your children to weigh each member of the family (if the family member will allow it), helping them to read the scale if difficulties should arise.

o Wherever you have a collection of coins, whether in a change purse, the coin tray in your vehicle, or in a drawer at home, allow your children to empty and determine the value of the coins.

o For children who buy their own lunches at school, work out with them how much their lunches cost and how much money they need to get in order to pay fares and so on.

o Allow children to save towards a predetermined amount for special occasions. Help them to determine how much they will save each day/week/month to accumulate the desired amount.

o Use advertisements in magazines and newspapers, etc. to have children make a wish list of items they could buy with 'pretend money' or with a predetermined sum.

o   Photocopy money and allow your children to play shop. Help them to make change if they have any difficulties. Let each child get the chance to be both the shop keeper and the customer.

- There are also many activities that can be carried out while travelling around with your children. Some of these are:

  o   Allow children to estimate the length of time or the actual kilometres covered between two points. Use the odometer on the car to get precise measurements.

  o   As you drive past tall buildings and landmarks, have children estimate the heights of these objects. Have them estimate them in terms of other known objects, for example, 'That building is 3 times the height of my house' or 'That utility pole is 6 times my height'. For very advanced children, have them make their estimates in metres or other known units.

  o   See if you can spot other vehicles whose license plates are:

    - 1 more or 1 less than yours;

    - 10 more or 10 less than yours;

    - 100 more or 100 less than yours;

    - 1,000 more or 1,000 less than yours;

  o   Look at the license plates for other cars and see if the digits can be rearranged to form any patterns, for example, the digits that make up the license plate 5364 GH can be rearranged to give you 3 – 4 – 5 – 6. You may also be on the lookout with your child for the smallest or largest number formed on a license plate.

Mathematics Games – Grades 3 and 4

Times Table Cross-out

✳ One person has the '2 times' multiplication table and the other has the '5 times' multiplication table.

✳ Write six numbers in that table on your piece of paper, for example, the person with the '2 times' table may choose to write:

4, 8, 10, 16, 18, 20

✳ Roll one or two dice. If you choose to roll two dice, add the numbers together. For example, if you roll a 5 and a 4, add them to get 9.

✳ Multiply that number by your table number (2 for the '2 times' or 5 for the '5 times').

✳ If the answer is on the paper, cross it out.

✳ The first person to cross out all six of their numbers wins.

✔ *You may use other multiplication tables, rather than just 2 and 5.*
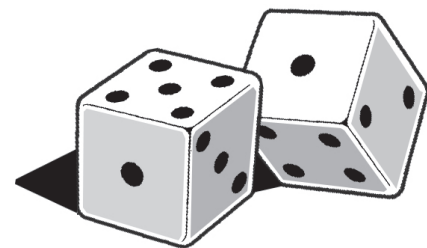
Round 'em up!

✳ Roll three dice; if you have only one die, roll it three times.

✳ Make any three-digit number from the numbers rolled.

✳ Round off your three-digit number to the nearest 10 and write down this new number.

✳ Take turns, repeating the process each time and keeping a total of the numbers after they have been rounded off.

✳ The first person to get to 3,000 or any pre-determined number wins.

Cross Divide

✳ Each player chooses five of the following numbers and writes them on a piece of paper.

5, 6, 8, 9, 12, 15, 20, 30, 40, 50

✳ Take turns rolling a die. If the number you roll divides exactly into one of your numbers without a remainder, cross it out. For example, if you roll a 3 you can cross out 12 if you had chosen it.

✳ If you roll a 1, you miss that turn. If you roll a 6, cross out and roll again.

✳ The first to cross out all five of their numbers wins.

Even Odds

For this game you will need to create a board like the one to the right. (See appendix for a larger version.)

✳ Start at 1.

✳ Roll a die. If the number is even, move that many places forward. If it is odd, do not move.

✳ If you land on a multiple of 3, move 3 places forward. If you land on a multiple of 5, move 5 places forward.

✳ The first person to reach 100 wins.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

10 Pairs to 100

This is a game for two players.

✺ Each player draws 10 circles and writes a different two-digit number in each circle. You are not allowed to write a multiple of 10 (that is, 10, 20, 30, etc.)

✺ Player A gives Player B one of his/her numbers. Player B is to determine what number is to be added to the number he/she has been given to make 100, for example, within one minute.

✺ If Player B cannot do that, then the number comes back to Player A, who then has the chance to give the answer.

✺ Whichever player gets the correct answer has the opportunity to write his/her initial above the number. If neither person is correct, then an X is drawn through the number.

✺ Player B then offers Player A one of his/her numbers with the same challenge and conditions.

✺ When all the numbers have been used, the player who has initialed most numbers wins.

Subtraction by Chance

✺ This is a game for 2 to 5 players. One person who is not playing is needed to select cards from a deck and call them out.

✺ For the game, you will need one of each of the following cards from the deck:

  o   Number cards 2 - 9

  o   Ace to represent 1

  o   Queen to represent 0

✺ Remove all other face cards.

✺ For this game, each player will need to draw the following template of a subtraction problem in which a two-digit number is being subtracted from a three-digit number.

✱ The aim of the game is to arrange 5 digits in the template so as to get the smallest difference possible.

✱ The caller selects a card from the deck and calls it out. Each person decides in which box to place the digit. Each player must write a digit after it has been called and cannot wait to hear the other digits. Once written, the digit cannot be placed somewhere else.

✱ The caller selects and calls 4 more digits — a total of 5. After each digit is called, the players place it in a box in the template.

✱ After the boxes have been filled up, each person performs their subtraction problem and the winner is the person who has the smallest difference.

> ✔ *Alternatively, the rule could be changed so that the answer closest to the largest difference wins.*

> ✔ *Instead of subtracting, a template could be created for multiplication, addition or even division.*

What's My Number?

✱ Player A thinks of a number between 0 and 20 (Ask him/her to write it down if you want to ensure honesty).

✱ Player B is allowed to ask any 5 questions in order to determine the number of which Player A is thinking.

✱ Examples of questions include (questions may vary depending on the age or readiness of the players):

  o Is it less than 10?

  o Is it an odd number?

  o Does it have a 5 in it?

  o Is it a multiple of 5?

  o Does it have 1 or 2 digits?

  o Is there a 0 in it?

  o Is there a 1 in it?

✳ Player A may answer only 'yes' or 'no' to each question. Agree that some questions will not be asked, such as 'Between which 2 numbers does the number fall?'

✳ If Player B cannot determine the correct number, then Player A wins that round and the roles are reversed.

✳ Play 3 to 5 rounds to get an overall winner.

> ✔ *For an easier game, use numbers up to 10. For a harder game, use only 3 questions, or use bigger numbers.*

Secret Sums

✳ Player A says a number, for example, 43.

✳ Player B secretly does something to it (for example adds 30), and says the answer, (for example 73).

✳ Player A then says another number, (for example, 61).

✳ Player B does the same to that number and says the answer.

✳ Player A has to guess what Player B is doing to the number each time!

✳ Then roles are reversed for another round of the game.

Thirty Up!

✳ This is a game for two persons. For this game you will need a 3 by 3 playing board as shown below and nine cards numbered 2, 4, 6, 8, 10, 12, 14, 16, and 18.

✳ The aim of the game is to make a line of three cards (vertical, horizontal or diagonal) which totals 30.

✳ Shuffle all the cards and place the deck face down on the table.

✳ Taking turns, each player takes the top card and places that card anywhere on the grid.

✳ The first person to complete a line which totals 30 is the winner!

Egg Threes

✻ This is a game for two players. For this game you will need a calculator, counters and an Egg Threes Board (See appendix).

✻ The aim of the game is to cover all the eggs in your egg tray.

✻ Convert your calculator to a 'multiplication by three machine' by pressing:

| **3** | **×** | **×** | **=** | **0** |

✻ Taking turns, each player types a number in the calculator and presses the 'equal/=' sign. If the result shown is in his/her Egg Threes Board then he/she covers that number with a counter.

✻ The first person to cover all the numbers in his/her Egg Threes Board is the winner!

Three in a Row

For this game a calculator may be required.

✻ Draw a number line like the one below.

BK
✗
| 0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |

✻ Take turns to choose a fraction and use the calculator to convert your fraction to a decimal. For example, if you choose, $^2/_5$ then 2 ÷ 5 = 0.4.

✻ Mark your initials above the decimal on the line.

✻ The first person who gets three marks in a row without another player's initial in between is the winner.

License Plate Bingo

✳ This game can be played by as many persons as are in the car. Each person chooses a different target number between 1 and 10.

✳ The aim of the activity is to spot numbers on license plates on cars that add up to the target number. Each time you get your target number as a sum, you score a point.

✳ Alternatively, you may decide to widen the numbers from which you can make your target number to anything you pass on your way to work: buildings, advertisements, addresses, etc.

✳ For a greater challenge, make your target number a two-digit number (such as 65). Form up to two two-digit numbers out of the 4 digits on a license plate and see if you can get your target total.

Cross-out 8

✳ This is a game for two players.

✳ Draw eight lines in a row across the paper.

✳ Each player takes turns crossing out either one or two of the lines. There is no designated order for crossing out lines; when it is your turn you may cross out any line. So the first player does not have to cross out the first line.

✳ If you choose to cross out two lines when it is your turn, these lines should be beside each other.

✳ The player who crosses out the last line left on the paper is the winner.

Roll Over

✳ This is a game for two players. For this game you will need a pair of dice, 10 counters for each player and a Roll Over Board (See appendix).

✳ The aim of the game is for a player to get all of his/her counters 'home'.

✳ Each player chooses a colour and places his/her counters on the corresponding circles. A player may place as many counters as he/she likes on any circle.

✷ Taking turns, each player rolls the dice and finds the sum of the two numbers on the dice. If the player has counters on the circle with that number, he/she may move one counter from that circle 'home'. Otherwise the player cannot move.

✷ If the two sixes are rolled, the player may move any counter home.

✷ On any turn a player may move one counter to another circle, but he/she must do this at the beginning of his/her turn and is not allowed to roll once this is done.

✷ The first player to get all 10 counters 'home' is the winner!

Children 11 – 12 Years Old (Grades 5 and 6)

Within this age group, students are expected to be at the perceptual stage of numeracy. At this stage of numeracy, there is greater ability to determine how mathematics learned can be used in real contexts and to use abstract reasoning. The following mathematics tasks are usually associated with this stage of numeracy.

Math Skills – Grade 5

By the end of grade 5, your child should be able to:

- Read and interpret numbers with up to 3 decimal-places (for example, 9.658);

- Add or subtract decimal numbers with up to 3 decimal places;

- Make connections between the place value system and the system of measuring and valuing money;

- Round off decimals to the nearest whole number (for example, 4.91 is approximately 5);

- Multiply together 2 decimal numbers (such as 2.35 × 4.1) or a decimal number with a whole number (such as 2.1 × 3);

- Use ALL units of the metric system proficiently;

- State how much time has elapsed between two time intervals (for example, from 12:17 p.m. to 3:21 p.m.);

- Read and write whole numbers up to 8 digits (for example, read 16,236,670 as sixteen million, two hundred and thirty six thousand, six hundred and seventy);

- Read and write symbols in the Roman Numeral System to represent numbers up to 1,000;

- Say whether a number is divisible by any number from 2 - 9;

- Arrange decimal numbers in order of size from smallest to largest or from largest to smallest;

- Divide one number by another, writing the answer as a decimal;

- Estimate multiplication problems involving decimals;

- Round off dollar values to the nearest $1, $10, $100 or $1,000;

- Differentiate between the use of millimetres, centimetres, decimetre, metre and kilometre in measurement situations;

- State the relationship between the metric units of measurement;

- Use language such as 'increase' or 'decrease' to describe measurement of temperature;

- Determine the century in which an event took place given the year of the event.

Math Skills – Grade 6

By the end of grade 6, your child should be able to:

- Read and write numerals in the Roman Numeral System using any numbers;

- Perform ANY computation with whole or fractional numbers;

- Use ratios to simplify and solve problems in mathematics;

- Know that 100% represents a whole and use percentages to solve problems;

- Calculate simple interest on a sum of money;

- Identify the value of scale drawings as used on maps on architectural plans;

- Appreciate that speed is a rate determined by distance and time;

- Use the 24-hour clock in problem situations.

Math in Daily Life – Grades 5 and 6

Students at this age are usually very focussed on right answers and are very competitive. They are also at an age where they are more independent and are likely to be involved in higher level spending, negotiating and other money management activities. They are also now playing games with well developed rules and are beginning to appreciate the value of strategising and thinking critically. These factors and others make them ideal for parent-led activities that spur their interest in mathematics. Some of these activities are discussed below.

- Spending and managing money provides children with the ideal opportunity to use mathematics meaningfully. Various money activities that you can engage your children are as follows:

    o Discuss value for money with your children. For example:

        - What is the better buy at a fast food chicken outlet, a 3-piece combo which costs $455.00 or a 2-piece combo which costs $399.00?

        - Is the large can of mixed vegetables a better buy than the small can?

        - Is the cheaper gas station so far away that any possible savings would not be worthwhile?

    o Have your children help to make up the budget before you go shopping – agree on a spending limit and as items are added to the trolley, keep a running total by estimating. How close to the limit can they get without exceeding the limit or without having to put back an item?

    o Look for newspaper stories that include large numbers, for example, numbers with 6 or more digits. Have your children say the words for these numbers, for example, $34,123,567.34 is 'thirty four million, one hundred and twenty three thousand, five hundred and sixty seven dollars and thirty four cents'.

    o Allow your children to help you keep track of the spending in the household. Discuss utility bills and other expenses with them. Over time, with your children, track the amount spent on electricity, water, food, etc.

    o Use utility bills to generate mathematics problems for your children. For example, in looking at the electricity bill, you could ask them to calculate the average amount of electricity used by each person in the family.

- Within the home, there are many activities in which you can involve children. Some of these are as follows:

  o Discuss recipes with your children. Show them a basic recipe and discuss how much of each ingredient will be needed if the recipe is to be changed.

  o Show your children a basic recipe for 2 or 3 cups of drink. Have them adjust the recipe to produce 5 or 6 cups of drink. Measure the finished drink into a measuring cup to see how close they were.

  o Have your children count the number of tiles needed to cover the floor of a room; encourage them to find efficient ways of counting these tiles. Challenge children to estimate the number of tiles needed to cover the floor of the entire house.

  o Discuss with your children the sizes of the different rooms in the house. Use the number of tiles on the floor in each room as a way of determining the size of each room. Can they determine if one room is twice or three times as large as another?

  o Additionally, look at the pieces of furniture in a room and determine how many of each piece could hold inside the room. Again, use the number of tiles covered by a piece of furniture as a rough guide for your children.

  o Allow children to take turns performing tasks or playing games (such as deciding what to watch or playing a computer game). Make each turn 10, 12, 15, or some other number of minutes long. Allow children to figure out when the next turn will begin.

  o On long journeys, calculate the speed at which you drive; ask questions such as: 'If it takes us 2 hours to cover 200 km, how far did we travel in each hour?' Have children compare the actual distance travelled in an hour with the calculated time. Discuss the question: 'Did we travel the same distance in each hour?'

  o Discuss the 24-hour clock with your children; For a week or a month, decide that all time in the house will be stated using the 24-hour clock format. Paste numbers on your clocks to help your children convert 12-hour time format into the 24-hour format. Additionally, cell phones can often give both time formats and can be used with children for them to appreciate the relationship between the 12-hour time format and the 24-hour time format.

Mathematics Games – Grades 5 and 6

3 Hex

✳ This is a game for two people. Each player has three counters. The aim of the game is to get the three counters in consecutive places.

✳ The first player places a counter on one of the circles. The second player then places one of his/her counters on a circle. This continues until all the counters have been placed.

✳ If neither player has got 3 counters in consecutive places then the first player slides a counter along a line to a circle that is not already covered.

✳ The other player then slides a counter to an adjacent circle. Counters can only move along one line into an empty space. They cannot jump over counters.

✳ If a player cannot move a counter she/he misses a turn.
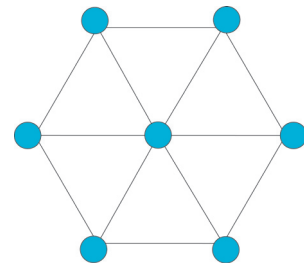
Hex

✳ For this game you will need a Hex board (See appendix) and at least 12 counters for each player.

✳ This is a game for two players. Each player selects a colour (red or blue).

✳ Taking turns, each player places one counter on the board. The object of the game is to connect the sides of the same colour by a continuous line of counters.

✱ The continuous line does not have to be straight; it may zig-zag across the board, as long as you can move from one counter to another of the same colour.

✱ The first person to connect his/her sides is the winner!

Nim

✱ For this game you will need 16 matchsticks or some other suitable objects.

✱ This is a game for two players. Arrange the matchsticks/objects as shown in the diagram.

✱ Taking turns, each player takes up 1 or 2 sticks. Two sticks can only be taken if they are beside each other.

✱ The player that picks up the last stick/object loses.
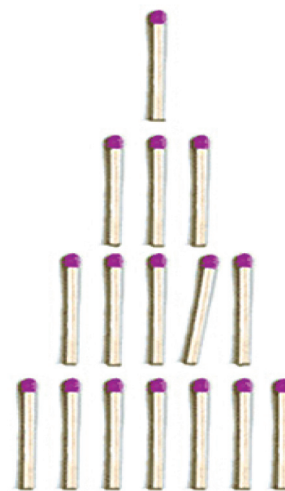
Hundred Cover

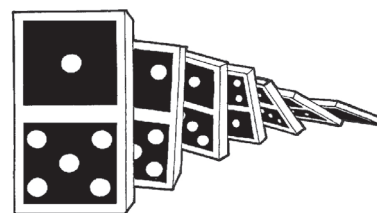For this game you will need a hundred-chart, a deck of cards and coloured pencils.

✱ Give each player a different coloured pencil.

✱ Taking turns each player pulls two cards from the deck. The player then uses the numbers displayed and any mathematical operation to create a mathematical expression. Aces are counted as 1 and Wild cards (Jacks, Queens and Kings) can be assigned any value.

✱ The player then shades the number corresponding to the solution on the hundred-chart.

✱ If the player is unable to form an expression with an answer that has not been coloured he/she loses his turn.

✱ When all numbers have been coloured, the player with the most coloured squares is the winner.
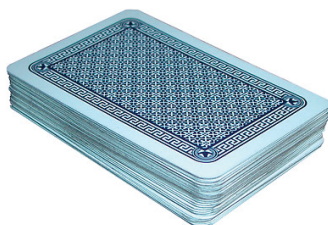
Operations Domino

For this game you will need a pack of dominoes.

✳ Players will decide among themselves who will play first. The first player poses with any card.

✳ The second player may play on either end, however the number on that end should be the result obtained from any mathematical operation carried out on the two numbers on the domino. For example, if the first player poses with 5-6, the second player can play 4-1 on the 5, as 4+1=5.

✳ If the player cannot find a domino to which to play, he/she loses his/her turn and the play passes to the next person.

✳ The first person to play all of his/her dominoes is the winner.

Equals

For this game you will need a deck of cards with the face cards removed (Aces are used as 1).

✳ This game can be played by 2-6 players.

✳ The aim of the game is to obtain 'equals' by adding/subtracting/multiplying/dividing the numbers on the red cards and on black cards so that the answer for the red cards is the same as that for the black cards. (Hearts and diamonds are red, and clubs and spades are black).

✳ To start the game, each player gets 4 cards. Players look to see if they can obtain 'equals' from the cards they have been dealt. If no one can, then player 1 pulls a card from the deck.

✳ Player 1 may take that card in exchange for one in his/her hand or place it face up on the table.

✳ The next player can either exchange that card for one in his/her hand or pull one from the deck. Each player must have exactly 4 cards in his/her hand at all times.

✳ Play continues in this way until someone obtains 'equal'.

✳ Persons who are dealt 4 cards of the same colour will have to try to obtain the other colour as it is introduced into the game.

Cover Up

This is a game for 2 or 3 players.

Remove the face cards from a deck of cards (Aces are used as 1).

✳ Each player is dealt 7 cards and turns 3 cards face up on the table. Player 1 adds/subtracts/ multiplies/divides the numbers on as many of the cards as possible to get an answer that matches one of the upturned cards. He/she then places all of those cards on top of the upturned card.

✳ The card on top of that pile now becomes one of the upturned cards. If at any point a player cannot match any of the upturned numbers, he/she must pull cards from the deck until a match is possible.

✳ Play continues in the same way until someone has played his/her last card. This player is the winner.

Closer Takes All

This is a game for 2 persons.

Remove the face cards from a deck of cards. (Aces are used as 1).

✳ Each player is dealt 3 cards and turns 1 card face up.

✳ Each player adds/subtracts/multiplies/divides the numbers in his/her hand to try to get the number on the upturned card or a number close to it.

✳ The person who gets the closest to that number takes all cards, including the upturned card. If both players get the same number, then the players add their cards to their piles and the upturned card remains.

✳ Each player is dealt another 3 cards and a new card is upturned. Once more the players try to get as close to the number on the upturned card or as close as possible.

✳ Play continues in this way until all cards have been played. The player with the largest pile is the winner.

Treasure Hunt

This is a game for 2 players. Each player will need 2 of the grids shown below. (See appendix for a larger version.)

	A	B	C	D	E	F	G	H	I	J
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

✳ Each player starts by 'hiding' the following treasures by shading them as shown below on one of their grids. Each player ensures that the other player cannot see his/her grid.

A car

An aeroplane

A truck

A chair
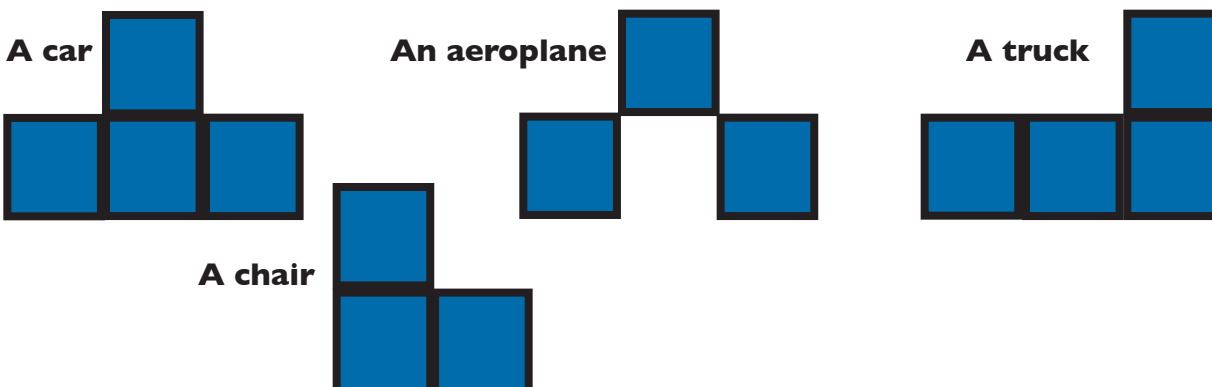
✷ Each player tries to find the other person's treasure in the following way. Taking turns, players call out a location on the grid by giving its letter and number. For example, in the grid below, the star occupies cell F6.

	A	B	C	D	E	F	G	H	I	J
1										
2										
3										
4										
5										
6						★				
7										
8										
9										
10										

✷ If a player correctly guesses a cell where a treasure is hidden, he/she is told, 'hit'; otherwise he/she is told, 'miss'. Each player will keep a record of his/her hits and misses on the blank grid sheet.

✷ If a player has uncovered a treasure by successfully guessing all the cells that hide the treaure, he/she should be told, for example, 'car found'.

✷ A player can ask his/her opponent for details about any cell that has been hit by asking: 'Is it a _____?'. A player is allowed no more than 3 questions in any round.

✷ The winner is the player who first finds all of his/her opponent's treasure.

Squares

This is a game for 2 players. The game requires a game board as shown below. (See appendix for a larger version.)
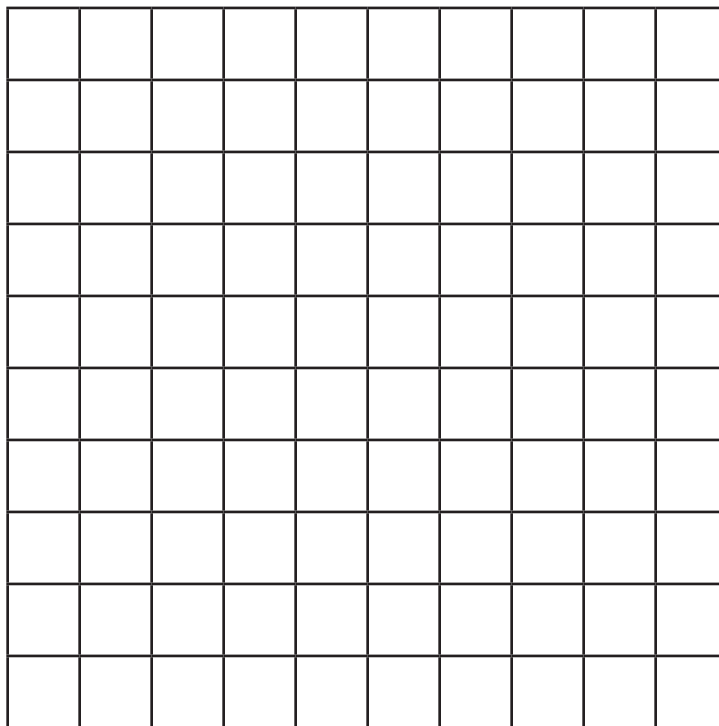
✳ Player 1 starts by colouring a block of 2 squares that are beside each other in one corner of the game board.

✳ Player 2 then uses a different colour to colour a block of 2 squares that are beside each other in the opposite corner of the game board.

✳ Play now passes back to player 1 who now has to colour another block of 2 squares that touches the first block at one corner.

✳ Play continues in this way until a player is unable to play. The last person who is able to colour 2 squares is the winner.

Taking Counters

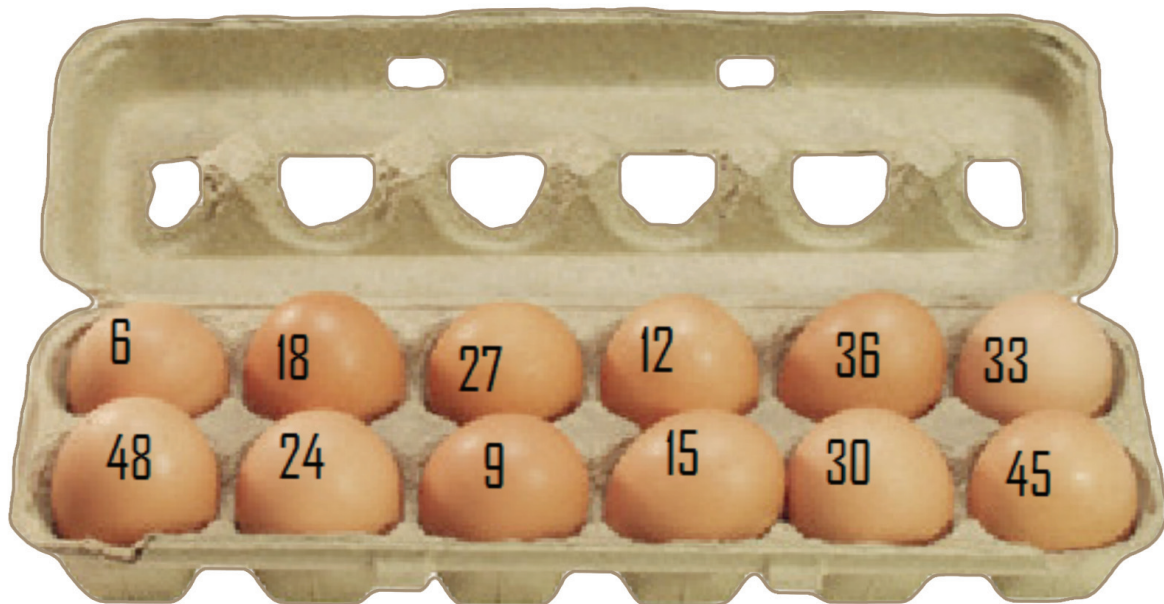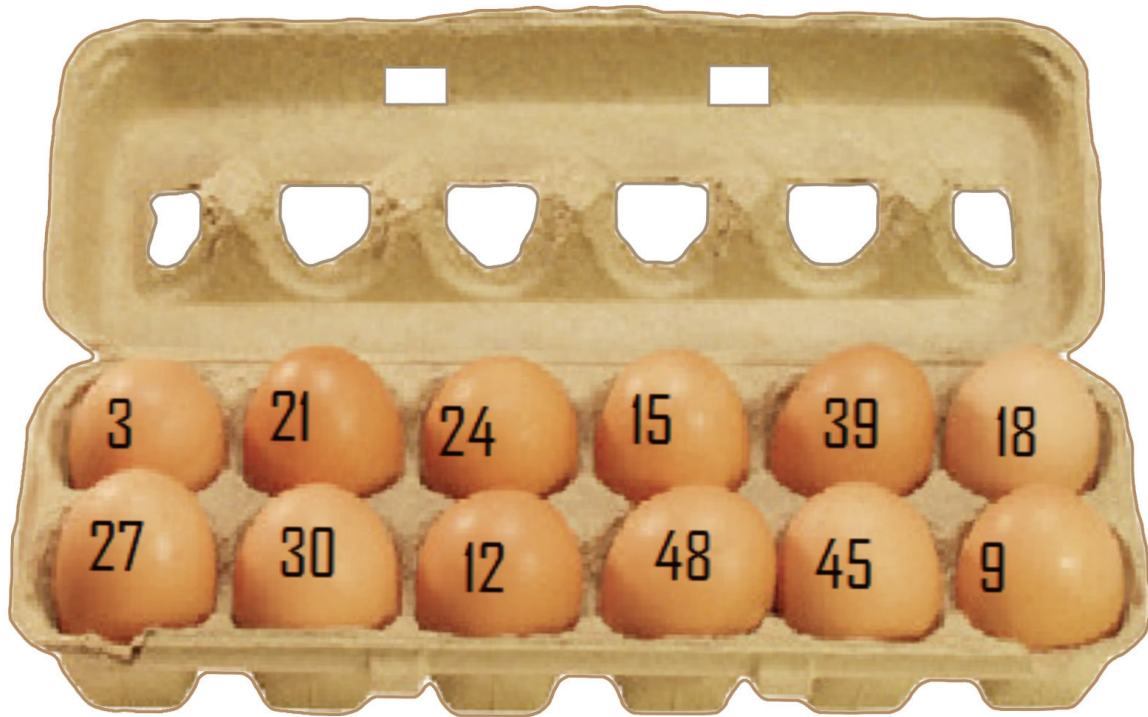This is a game for 2 players. Start with a pile of 12 counters on the table.

✴ Each player alternatively takes any number of counters from the pile. However this game has two important rules:

✴ The first player cannot take all the counters from the pile.

✴ A player should not take more than twice the last number of counters taken.

✴ The winner is the player who takes the last counter.

Appendix

Coin Toss and Even Odds

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Egg Threes Board

PUTTING MATHEMATICS INTO FAMILY LIFE

Roll Over

3 Hex

Hex

Blue

Red

Red

Blue
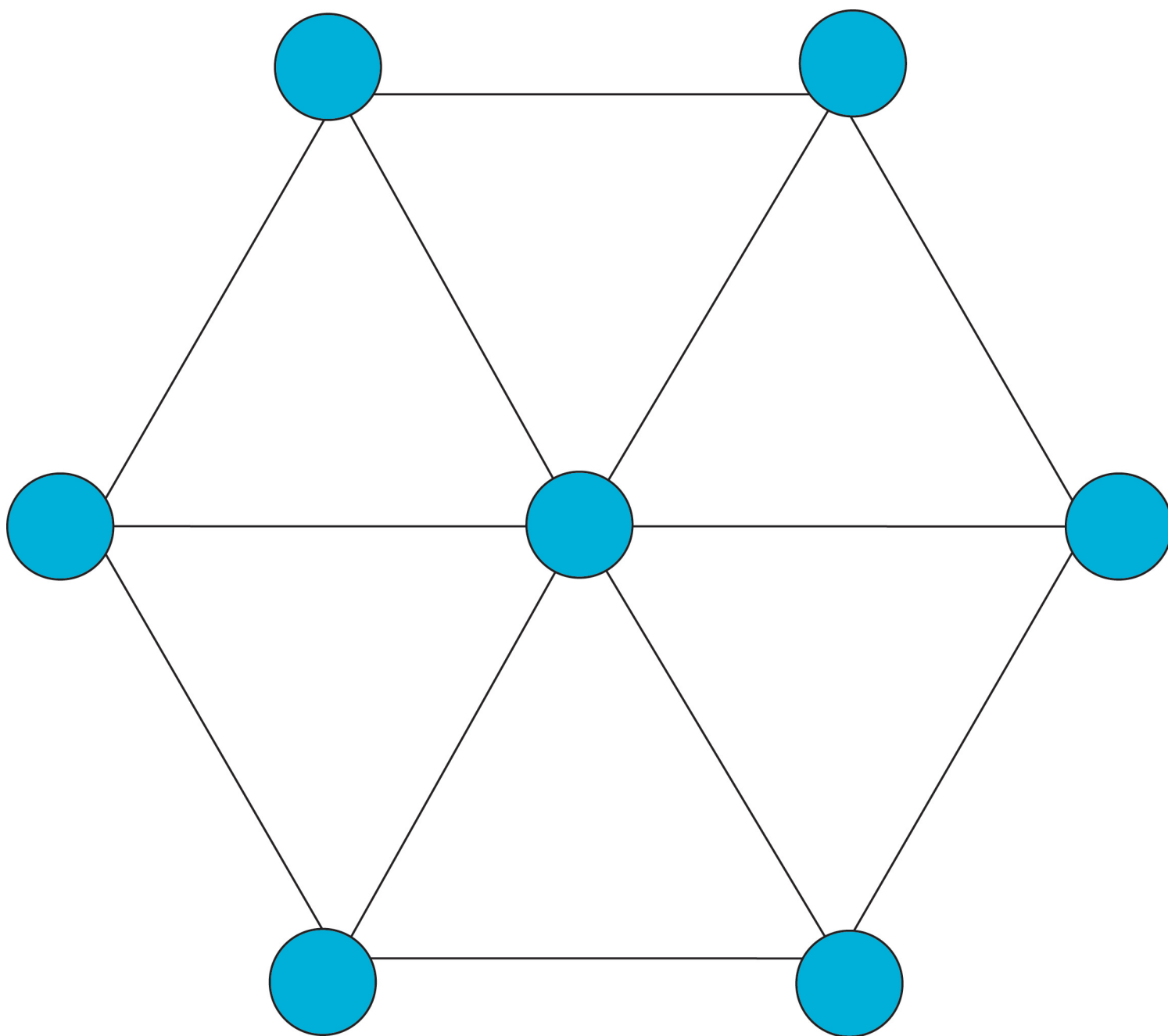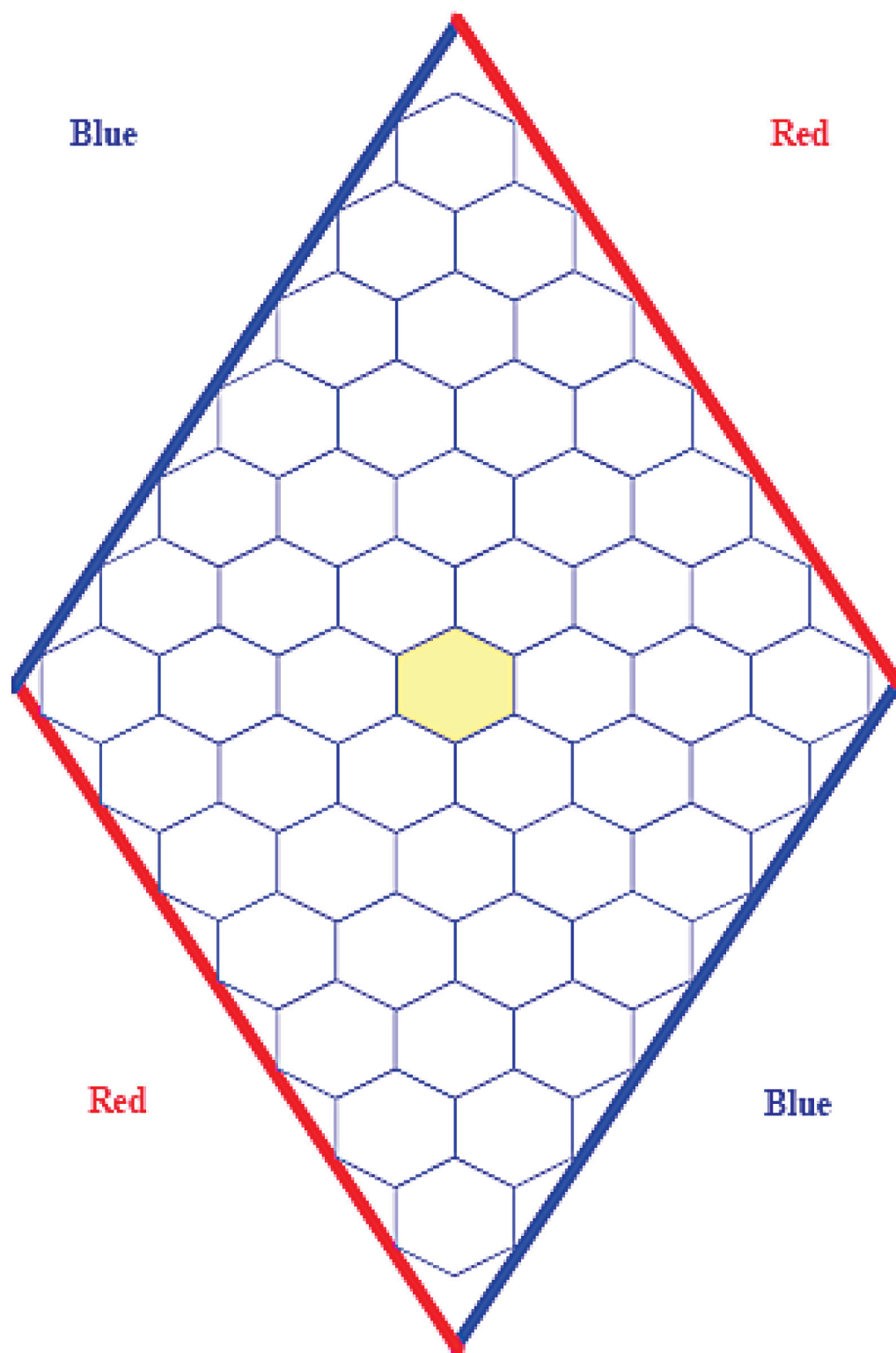
Treasure Hunt and Squares