



**At Agincourt Road
Public School,
It's as Easy as
1.....2.....3.....!**

*A Short Math Manipulatives Guide
for Parents and Guardians*



from your School Council, Teachers, and School Staff

Parents want to know...

What are math manipulatives?

Math manipulatives are real objects that teachers use in the classroom to help students learn about math. They can be unifix cubes, geometric solids, counting objects, the learning carpet, base ten blocks, pattern blocks, tangrams, and many, many other things. Pictures of some of these math manipulatives appear on the pages of this guide. You can also visit your child's classroom to see what he or she is using at Agincourt Road Public School.

What are the benefits of using math manipulatives?

Teachers use many different techniques to teach new concepts and ideas. Math manipulatives are one way to get students talking about math, solving math problems, and understanding abstract concepts by using their sense of sight and sense of touch. In the classroom, math manipulatives help students learn math concepts such as patterns, addition, subtraction, multiplication, division, geometry, fractions, data management, measurements, probability, and algebra.

How do teachers use math manipulatives in the classroom?

Teachers use math manipulatives every day and they are usually available at all times for their students to use. Just like you would show your child how to use a fork or a spoon, a teacher will demonstrate at the beginning of a lesson how their students can use a particular manipulative as a tool to solve math problems. After the demonstration, students have a chance to use and talk about the manipulative with friends.

Parents want to know...

How do students use math manipulatives in the classroom?

Teachers encourage students to work both independently and in groups to discuss, explore, and solve math problems. Depending on the lesson, students may be asked to use a specific manipulative or choose the manipulative they prefer from those available in their classroom to help them solve a math problem. Teachers help students use many different strategies to solve math problems by demonstrating, by practicing, and by discussing what works best and why.

How can I help my child at home?

You can show your child how you use math in your daily life, around the house and in the neighbourhood, for sports and for shopping. Encourage your child to talk about numbers and work together to solve everyday math problems at home. You can also help your child to create a math toolbox for your family so that your child can practice with math manipulatives outside of school. In this guide, you will find ideas from your child's teachers about how to make and use your own math manipulatives at home. Most importantly, be positive about math!

Where can I find more information?

The best resource is to talk to your child's teacher to find out what your child is learning in the classroom. This guide also provides helpful information about how teachers at Agincourt Road Public School are using math manipulatives as part of the Ontario Math Curriculum. You can also find information about the Ontario Curriculum and other helpful guides for parents/guardians on the Ministry of Education website at www.edu.gov.on.ca.

Unifix Cubes - Blocs emboîtables



What are they?

→ These math manipulatives are small interlocking cubes that come in many different colours and sizes (1 cm³, 2 cm³, 2.5 cm³).

How do students use them?

→ Unifix cubes can be connected together for counting, making repeating colour patterns, building bar graphs, measuring, and acting out basic operations. Measuring with unifix cubes helps students to add units.

What can you use at home as part of your family's math toolbox?

→ At home, you could use Lego, MegaBlocks, or any kind of building blocks.

Ask me...

- ✓ To measure my toys with blocks or cubes. How many blocks longer or shorter is each toy?
- ✓ To sort my Lego by colour and guess which piles would make the longest line or the shortest? Ask me to try it, so I can see if my guess was right.
- ✓ To create a bar graph with MegaBlocks to track everyone's favourite supper (data management). Which choice has the most votes?
- ✓ Why is it so important to use the same sized Lego when measuring objects?



A Note from your Teacher

Unifix cubes are my favourite manipulative because they can be used in so many ways. We use them for counting, measuring, sorting, and making long, long, long lines. Older students use them to add, subtract, multiply, and divide.

~Ms. Julie Breeze, JK



Geometric Solids – Solides Géométriques



What are they?

→ These math manipulatives are solid wooden blocks in the shapes of cubes, pyramids, prisms, cones, spheres, cylinders, and more.

How do students use them?

→ Geometric solids are used to build towers, to draw three-dimensional shapes, to talk about symmetry, and to identify the number of faces (flat sides), vertices (corners), and edges.

What can you use at home as part of your family's math toolbox?

→ At home, you could use household boxed items, cans, and jars

→ You could ask your child's teacher for "black line master templates" to build geometric solids at home.

→ Or, using straws and marshmallows, you could build your own three-dimensional shapes.

AGINCOURT RD PS TEACHERS CHOICE AWARD

The solids help students to understand the basics of geometry. Students learn how to create and how to classify new shapes.

~Ms. Micheline McCarthy, SK

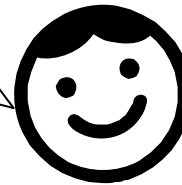
~Ms. Kate Tindale, Grade 1

~Mr Donald Guité, Grade 4

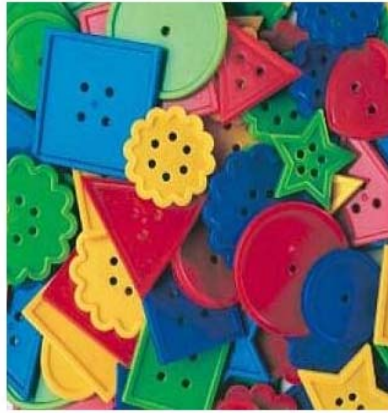
~Mr. Gord White, Grade 4

Ask me...

- ✓ To show you a polygon at home and to tell you how many sides, angles, and vertices I see.
- ✓ Why do objects have specific shapes?
- ✓ Why do cans have a cylinder shape?
- ✓ Why aren't cereal boxes round?
- ✓ To show you how I can use a string to measure the circumference of a can.



Counting/Sorting Objects – Objets à compter/à classifier



What are they?

→ These math manipulatives can be just about anything as long as you have more than one. In the classroom, teachers use buttons, coins, and other small objects.

How do students use them?

→ Counting/sorting objects can be used to make patterns, to sort into groups according to colour, size, shape (attributes), to estimate, to count, and to measure capacity.

What can you use at home as part of your family's math toolbox?

→ You could use collections of small objects found in the home, like toy cars, dry noodles, or hockey cards. Note: To keep children interested, parents could introduce new sets of objects each week or month.



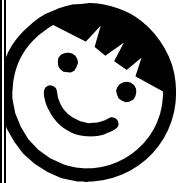
A Note from your Teacher

My students enjoy using small math manipulatives like buttons, toys, and tiles for sorting, patterning, counting, adding, subtracting, and more. They also use them on the school's learning carpet (see page 7 of this guide) to teach different math concepts.

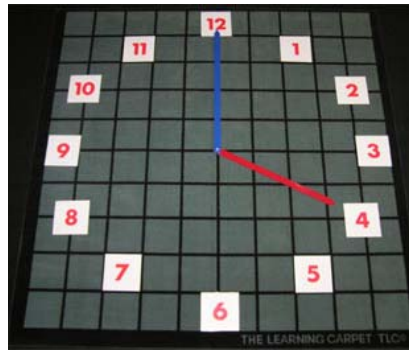
~Ms. Anne Cleary, SK

Ask me...

- ✓ To make a pattern using toy cars or stickers.
- ✓ How many carrots are in this bag?
- ✓ How many hockey cards are in this pile?
- ✓ What is the best way to count my collections?
- ✓ Why do I sometimes get different totals?



The Learning Carpet – Tapis de cent



What can you use at home as part of your family's math toolbox?

→ At home, you could use interlocking foam squares, pieces of multicoloured paper taped together, graph paper, or you could draw your own learning carpet with chalk on your sidewalk.

Ask me...

- ✓ To count from one to one hundred on the learning carpet.
- ✓ To sort my toys into categories and to make a graph.
- ✓ To turn it into a map by adding drawings or toys like a Polly Pocket house.
- ✓ To give directions on how to get from one square to another.
- ✓ To make a big square using a different number of smaller squares.

What is it?

→ This math manipulative is a large carpet made up of squares. It is 10 squares long and 10 squares wide making it 100 squares in total.

How do students use them?

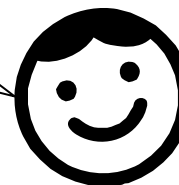
→ The learning carpet can be used for counting, making patterns, measuring, understanding perimeter, area, for graphing, demonstrating symmetry, and learning directions. It can also be used for telling time as shown on the left.



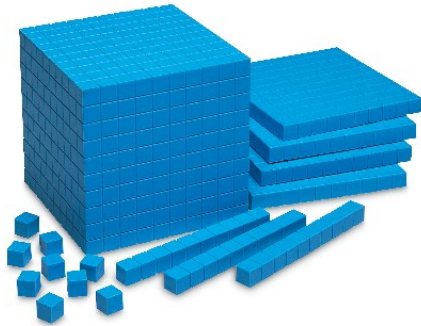
A Note from your Teacher

The kids are always excited about working on the learning carpet. Everything I demonstrate on the carpet is large size and demands their attention. They can move things around on it and really understand the concepts. One of my favourite activities has been a giant "save the animals" game. We played with two carpets and students had to guess the coordinates of the opposing team's animals.

~Ms. Kelly Smyth, Grade 2



Base Ten Blocks – Blocs de base dix



What are they?

→ These math manipulatives are sets of blocks or groups of 10 units.

How do students use them?

→ Students use these math manipulatives for number sense and place value concepts, for computation and problem-solving. Base ten blocks make “carry the one” and “take one from the tens” make sense.

What can you use at home as part of your family’s math toolbox?

→ At home, you can use pennies, dimes, and loonies or you can make your own – see the tip below and let your child show you how to do it.

Ask me...

- ✓ What are base ten blocks and how do I use them at school?
- ✓ When do we use the number 10 as a base and why?
- ✓ What would numbers look like if we used a base 5 model?
- ✓ To play the 10 game: Here’s how: Choose 10 objects. Player one hides some of them. Player two figures out how many are hidden.



A Note from your Teacher

My favourite math manipulatives are base ten blocks. You can make your own math kit using dried beans for the ones. For groups of 10, make beansticks (popsicle sticks with 10 beans drawn or glued on it).

~Ms. Leslie Blackwell, Grade 2

Pattern Blocks – Blocs-formes



Notes from your Teachers

My students enjoy using the pattern blocks to make symmetrical shapes, to show patterns, and to measure the area of a shape. They also enjoy making unique designs that they can copy onto sheets or cards.

~Mme Elizabeth Silieff, Grade 2

Pattern blocks are my favourite math manipulatives to teach concepts in geometry (polygons, angles, congruence, symmetry, transformations) as well as fractions (proper and improper fractions, mixed numbers, equivalent fractions, addition).

~M. Martin Paris, Grade 5



What are they?

→ These math manipulatives are made of wood or plastic. They are flat tiles in the shape of squares, triangles, hexagons, rhombuses, and trapezoids.

How do students use them?

Pattern blocks are used to create patterns, to talk about angles, symmetry, area, perimeter, fractions, measurement, and graphing.

What can you use at home as part of your family's math toolbox?

→ You could ask your child's teacher for "black line master templates" to use at home or you could use rubber stamps. Small ceramic tiles would be interesting to try.

Ask me...

- ✓ What is symmetry and how do I know that an object is symmetrical?
- ✓ To create new shapes by combining polygons - what is the name of the new shape?
- ✓ What tiles at the hardware store remind me of pattern blocks?
- ✓ To estimate how many tiles would cover the table.

Tangrams - Tangrams



A Note from your Teacher

*Tangrams are my favourite!
They can be used like parts
of a puzzle, or to make
pictures and tell stories.
Tangrams help the children
to think abstractly.*

~ Ms. Leslie Shields Grade 2

Ask me...

- ✓ What are tangrams?
- ✓ How many different shaped squares can I make using tangrams?
- ✓ To make a picture of a dog or a house or my classroom at school.
- ✓ To show you how I can use tangrams to demonstrate fractions.

What are they?

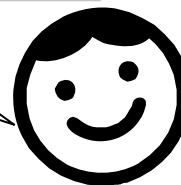
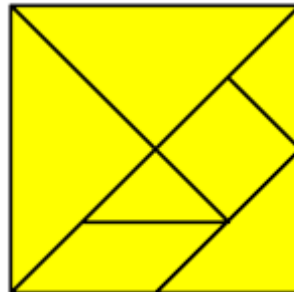
→ These math manipulatives come in a set of 2 small triangles, 2 large triangles, 1 medium triangle, 1 small square, and 1 parallelogram. Placed in the right order, they make 1 large square. These flat plastic or wood pieces come in many different colours and different shapes.

How do students use them?

→ Students use tangrams to create new shapes. Tangrams are particularly helpful to teach students about transformational geometry (flips, slides, and turns).

What can you use at home as part of your family's math toolbox?

→ You could make your own tangrams by cutting out shapes from construction paper or using recycled cardboard and colouring your tangrams with markers or crayons. Use the pattern below as a guide.





My Favourite Math Manipulative

By _____

Student's Name

My favourite math manipulative is...

Mon manipulative de mathématiques préféré est...

This is what it looks like...

Voici un dessin...

In class, I like to use them to...

En classe, j'aime...

This is what is in my math toolbox at home...

Chez moi, dans ma boîte à outils, il y a...



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Math Manipulatives Are Part of Your Everyday Life

Every day, we all use math to buy groceries, to keep score in a basketball game, to make a recipe for supper, or to figure out how long it will take to get to an appointment. We also use real objects as tools to help us complete these daily jobs. Some of the objects we might use to help us with the above tasks are money, a scoreboard, measuring cups, and a bus schedule or a road map. These real objects you are using are math manipulatives – just like the ones your children are using in school.

As one of its priorities for student success for 2007-2008, Agincourt Road Public School Council purchased math manipulatives to be made available to classroom teachers.

Thank you to the members of the School Council, parents, guardians, teachers, and school staff who helped to raise funds to purchase these math manipulatives and who helped to prepare this guide for our school.

This guide was written for Agincourt Road Public School by volunteers Kelly Smyth (teacher) and Norah Vollmer (parent). June 2008