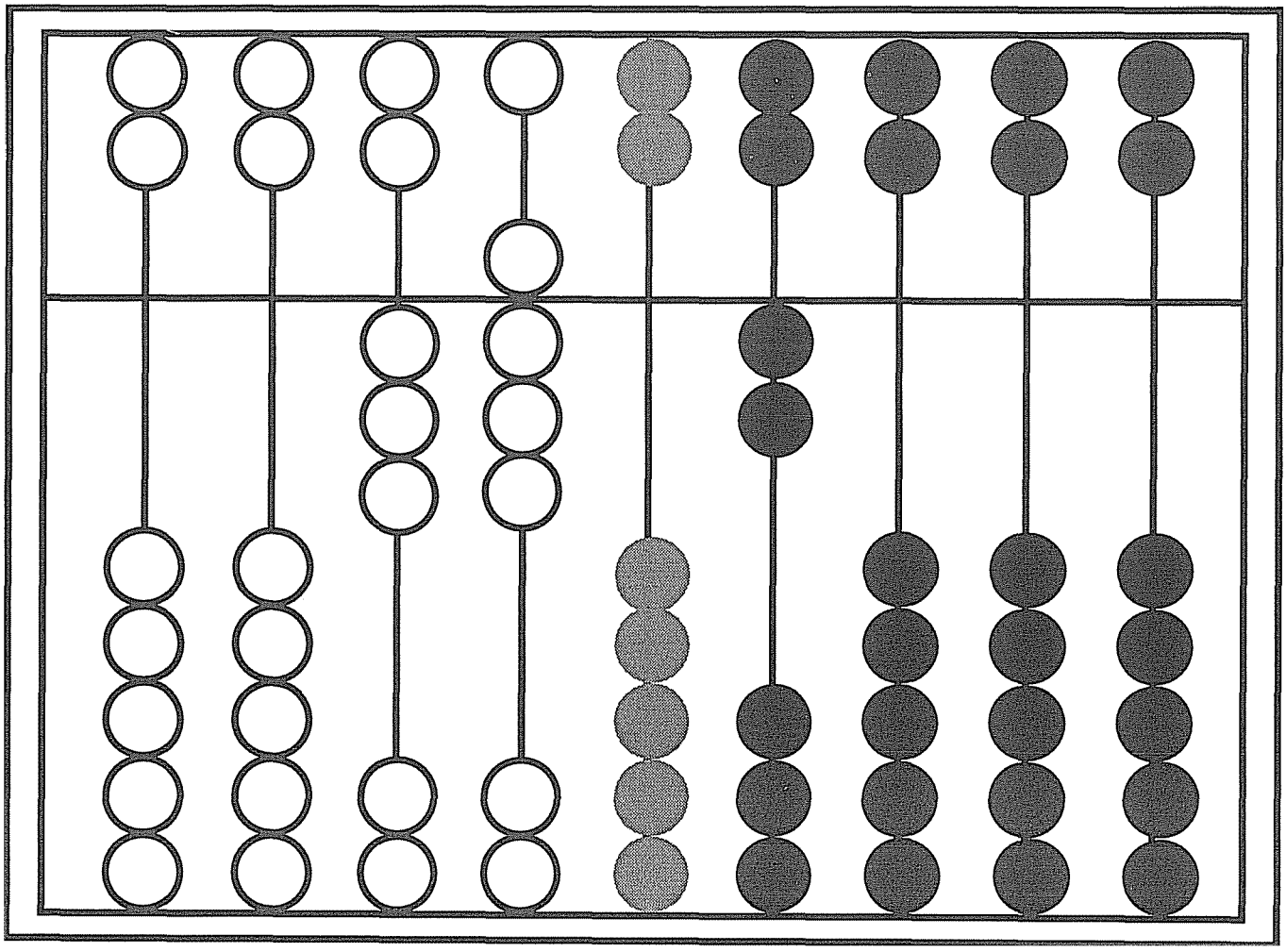
# Abacus

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# ▲ FROM THE EDITOR'S DESK

## Focus on Kindergarten

## Introduction

Children's early learning experiences have a profound effect on their development. OAME's committee JK - 5 prepared very interesting mathematics material for Early Childhood and Kindergarten. This is the time when children's receptivity to new influences and capacity to learn is at its peak. The JK - 5 committee, chaired by **Laurie Moher**, is **Ralph Connelly**, **Stewart Craven**, **Ann Pederson**, and **Lyn Vause**. Thank you to all on this committee for the thought and effort to provide our readers with a focus issue for **Early Childhood and Kindergarten** mathematics.

We need to review the Kindergarten Curriculum Expectations from the Ministry of Education and Training document, 1998. For more information from this publication please see the website: http://www.edu.gov.on.ca. The writers, led by Lyn Vause, tie these expectations to their particular activities. These learning opportunities will enable and encourage children to listen, look, explore, question, predict and promote the growth of their inquiry and critical thinking skills. Emphasis is on the use of traditional types of early childhood materials such as blocks, sand table, etc. The activities are written to encourage play-based problem solving where the teacher is the guide and students work in groups or pairs.

Some of the activities require materials that may or may not be in the classroom. Encourage children to bring personal toys or have a container of miscellaneous toys available for the children to choose one or more items needed for the activity.

**Kindergarten Curriculum Expectations and Activity**
(Reprinted from the MET document: The Kindergarten program 1998 for reference. ISBN 0-7778-7384-2)

**MATHEMATICS: OVERALL EXPECTATIONS**

**By the end of Kindergarten, children will:**

1. Demonstrate understanding of sets and whole numbers.
2. Measure and compare the length, weight, mass, capacity, and temperature of objects, and demonstrate awareness of the passage of time.
3. Identify the characteristics of two-dimensional shapes and three-dimensional objects; recognize and use patterns.
4. Collect, display, and interpret data in daily activities.
5. Show willingness to persevere in solving problems.
6. Seek further information, assistance, or materials when necessary.

**EXPECTATIONS IN SPECIFIC AREAS**

**Number Sense and Numeration**

- Sort and classify objects into sets according to specific characteristics, and describe those characteristics (e.g., colour, size, and shape).
- Match objects by one-to-one correspondence (e.g., one cup to one saucer).
- Estimate and count to identify sets with more, fewer, or the same number of objects;
- Count orally to 30, and use cardinal and ordinal numbers during play and daily classroom routines (e.g., identify first, second, and third places in a race);
- Recognize and write numerals from 1 to 10;
- Demonstrate awareness of addition and subtraction in everyday activities (e.g., in sharing crayons).

***See The Stuck Duck Drama, Number Tell and Show, and Mixed Fingers.***

**Measurement**

- Use simple measurement terms correctly (e.g., tall/short, big/small, empty/full, heavy/light, tomorrow/yesterday);
- Order two or more objects according to size or mass (e.g., the Three Bears).
- use non-standard measuring devices appropriately (e.g., string, scoops, sugar cubes, sand timer);
- use some standard measuring devices appropriately (e.g., tape measure, balance scale, thermometer, clock)

***See Teeter-Totter Blocks, Sand Table, Art Time, and Art Attack.***

**Spatial Sense and Geometry**

- Use language accurately to describe basic spatial relationships (e.g., above/below, near/far, and in/out).
- Identify and sort two-dimensional shapes (e.g., circle, square, rectangle, triangle).

***See Computer Station and Art Attack.***

**Patterning**

- Identify and reproduce simple patterns (e.g., red blocks alternating with blue blocks; clap-clap-stamp);
- Create and extend simple patterns using a variety of materials or actions (e.g., popsicle sticks, pebbles, stickers, and counters).

***See Number Grid Game.***

**Data Management and Probability**

- Place some specific types of objects (e.g., shoes, favourite foods) on concrete graphs and pictographs.
- Compare information on objects, using two categories (e.g., rough, smooth).

***See Sand Table and Ramp Rally.***

*Abacus* editor would like to see stories or samples of student work from these various activities.

Thank you to the OAME JK - 5 committee for some great classroom activities.

Frances Schatz

## Stuck Duck Drama

***Reading Resource:***
Root, Phyllis. *One Duck Stuck*. Candlewick Press, Cambridge, Massachusetts, (Scholastic) ISBN 0-7636-0334-1 1998.

In this counting book, increasingly larger groups of animals try to help a duck that is stuck in the sleepy, slimy marsh.

Read the story to the students and then do it as a dramatic representation. Students act out the parts which involve more and more animals getting stuck in the mud. One student is the duck. Two fish come forward to help. No luck. If the book is not available, have the students answer "Help! Help! Who can help?" with their own choice of creatures; e.g., three pigs come forward, no luck. Continue until ten creatures help the stuck duck.

*See the activity page*. Children will need to collect pictures or draw each set of animals for 1 to 10. At each chart stage, have the students hold up fingers or objects to illustrate the number.

## Number Tell and Show

Literature Link: *"12 Ways to Get to 11"*, Eve Merriam, Simon & Schuster, ISBN 0-671-75544-7

This book's story line is about the different combinations of things that add up to 11.

Example: "Where's eleven?
Pick up nine pinecones
From the forest floor
And two acorns."

Using different materials, demonstrate ways to get to:

**One** - example:
1 acorn or 1 pine cone or 1 apple

**Two** - example:
1 acorn and 1 pine cone

**Three** - example:
1 acorn and 2 pine cones or 2 acorns and 1 pine cone.

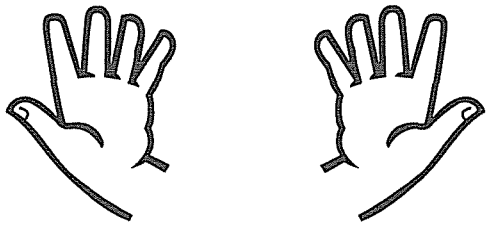
Students work through the problem in pairs or individually and then bring their findings to the whole group. Have students show their samples and talk about how many different ways they found to get one, two, three, etc.

Make a tab book. See example for *"4 Ways to Make 5"* on the activity page. Staple the four sheets together to make a book. The students draw pictures on each page to demonstrate their combinations of numbers.

## Mixed Fingers

*See the activity page.*

Each child holds up one hand. *"How many fingers?"* e.g., 5.



Demonstrate how to separate the fingers into two sets. (It is easier if the children are allowed to hold the fingers apart using their other hand). *Example:* 4 fingers and 1 finger.

Students are asked to close their eyes. When the teacher tells them to open their eyes they are to have their fingers divided into two sets. The children are to look around the class at all the variations. Share the variations. Record the results on the activity graph.

*Follow-up:* Students draw around their hands. They use two different colours to separate their fingers. Observe the variations of colour that are shown.

## Teeter-Totter Blocks

Make a teeter-totter with large wooden blocks and a plank. Balance different-sized blocks on either side of the teeter-totter. Balance containers on either side of the teeter-totter. Fill the containers with different materials. *Example:* put styrofoam packing in the one container on one side and play cubes in the container on the other side. *See activity page diagram.*

*Ask:*

1. What are the different things that will balance one block or cube? (Encourage the use of different items.)
2. Which block or item is lighter? How do you know?
3. Which block or item is heavier? How do you know?
4. Which is heavier, a container of paper or the same container filled with water?

Let students experiment with the blocks. Take photographs of some of the examples and keep in the centre for other children's reference.

## Sand Table

Use a beach pail or bucket. Have students explore with different containers (small, medium and large paper drinking cups) to determine how many of these containers will fill a bucket. Use the activity page diagram to record the results.

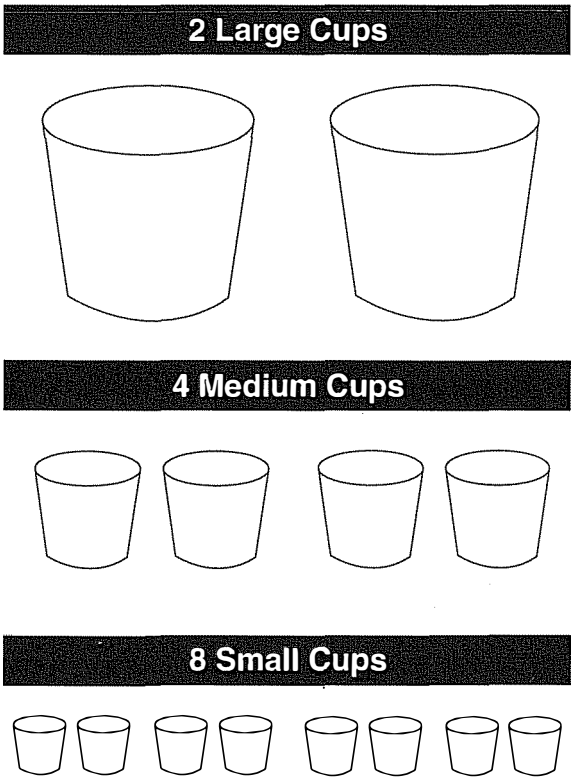
*Teacher says:*

- Put your containers in order from smallest to largest.
- Count how many small containers it takes to fill the beach pail.
- Count how many large containers it takes to fill the beach pail.

- Which container fills the beach pail the fastest? Why?
- Which container fills the beach pail the slowest? Why?
- Which container is largest? Smallest?

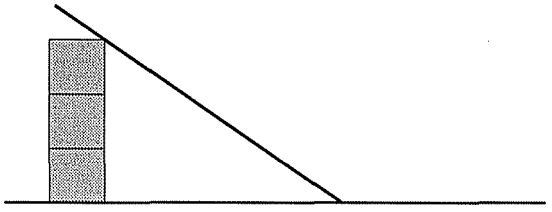
## Sand Table Graph

Filling the Pail




### Ramp Rally

*Materials:* boards for ramps, small stuffed toys or plastic models or miniature toy cars.



Make a small ramp. Experiment with this yourself to ensure you have the right slope. Velcro different materials (e.g., tinfoil, sand paper, woolen or cotton material) to the small toys. Each child is to try different materials on their toys (you have already put a strip of velcro around the toy and the joiner velcro on the various pieces of material).

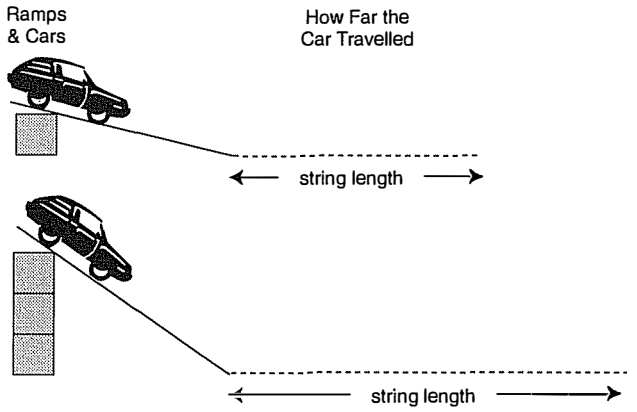
At the top of the ramp, let go of the toy so it slides down the ramp first without any attachments, then with material attached.

*Teacher says:*

Which one went further? Why?

Arrange the attach materials in order of "made the toy go the fastest" to "made the toy go the slowest".

Make ramps with blocks and boards at various heights. Repeat the above to compare how far a miniature car will go from a one block ramp to a three block ramp. Measure the distance for each case with strings. Compare the lengths of the strings.




Repeat the experiment with different weights on a car and chart the various lengths of string in the same way as the above diagram.

### Art Time

*Materials:* 1 box of yarn (Metre box) with each piece 1 metre in length and 1 box (Centimetre box) of yarn with each piece 1 cm in length, plus glue and art paper.

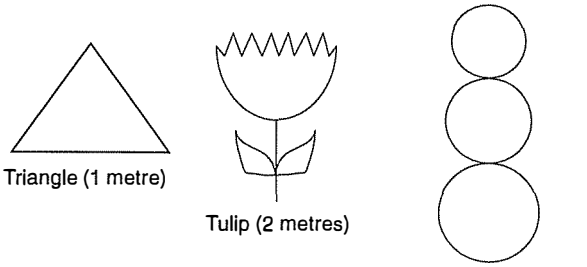
*Activity:* Make a picture out of different pieces of the 1 cm yarn. Tell the children to count how many 1 cm pieces are used to make the Centimetre Picture.

Make a picture out of the metre piece by twisting and turning the yarn. The Metre Picture is made up of only 1 metre piece of yarn.

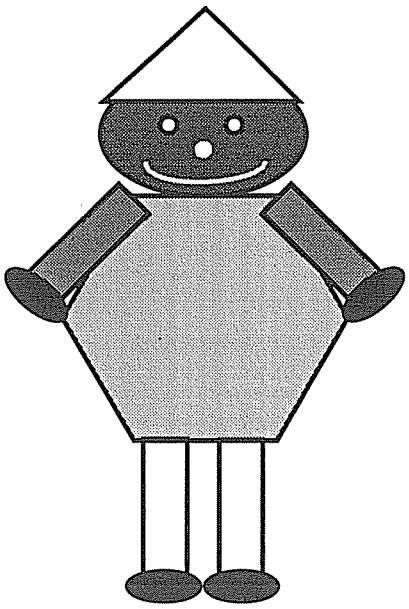
### Art Attack

*Materials:* several pieces of string or rope in 1 metre, 2 metre and 3 metre lengths (each attached at the ends to make a closed figure).

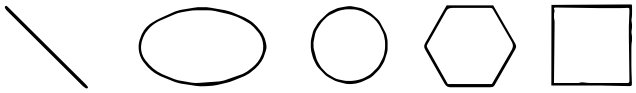
*Activity:* Students work in pairs to make an "Art Attack" picture or geometric shape with one or more of the ropes. The rest of the class will guess which length of rope is used.



## Computer Station



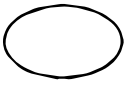
Students use the "Draw" programme on *Clarisworks* or *Appleworks* to draw a Math Person. The person can only be made of geometric shapes such as the following:



Use lots of talk to ensure the students use the right geometric names and have them share their pictures with the entire class. Show the students how to fill in the shapes.



Have the students discuss how they drew their Math Person.

| | Jean | John | Jess | Jill | Joe | Jim |
|---|---|---|---|---|---|---|
|  | 2 | 1 | 1 | 1 | 2 | 1 |
|  | 1 | 2 | 2 | 1 | 1 | 1 |
|  | 0 | 0 | 1 | 1 | 1 | 1 |
|  | 1 | 2 | 1 | 1 | 1 | 1 |

## Number Grid Game

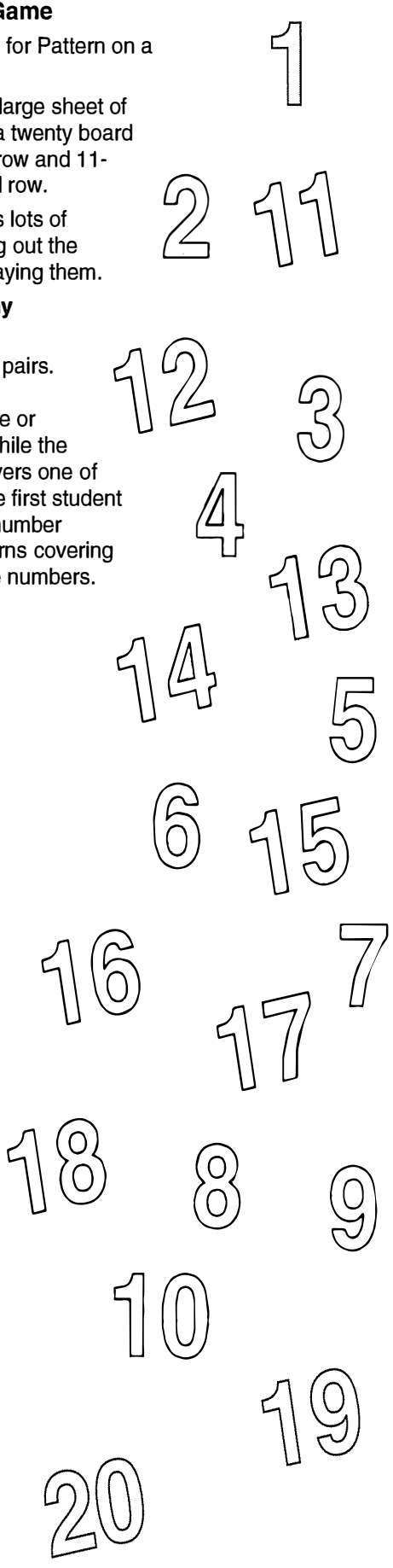
See activity page for Pattern on a 2x10 Grid.

On the floor or a large sheet of plastic, tape out a twenty board with 1-10 in one row and 11-20 on the second row.

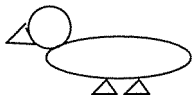
Give the students lots of practice marching out the numbers while saying them.

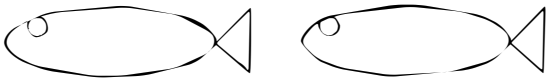
***Game:* Guess my Number**

Students work in pairs. One student is instructed to close or cover the eyes while the other student covers one of the numbers. The first student must guess the number covered. Take turns covering and guessing the numbers.



## The Stuck Duck Drama

1 

2 

3

4

5

6

7

8

9

10

Make up a Chart Paper Graph Together as a Tally Chart or Use Pictures

## Number Tell & Show

*4 Ways to Make 5*

| | 1 + 4 | 2 + 3 | 3 + 1 + 1 |
|---|---|---|---|

*3 Ways to Make 5*

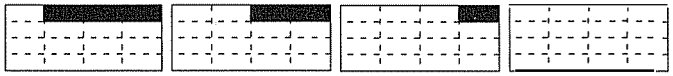
*To make the tab book, use 5 retangular sheets of the same size. Take one of the sheets and fold it into 16 equal sections and then unfold it to use as your template.*

*For example:*

| | | | |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

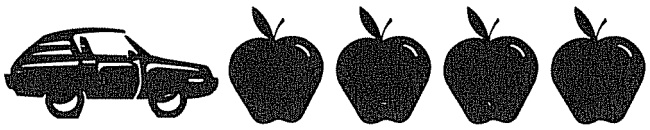
*Cut off the section from each of 3 sheets of paper, as demonstrated below (in black) and leave 1 as is:Cut off the section from each of 3 sheets of paper, as demonstrated below (in black) and leave 1 as is:*

*Example:*



**1 + 4**

**1 Car and 4 Apples**



# Teeter-Totter Blocks

Balance blocks and toys
on a teeter-totter




## Patterns on a 2 x 10 grid

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |

On the floor or a large sheet of plastic, tape out a twenty board in the same manner as a hundred board. the 1-10 should be put in one row. The 11 - 20 on the next.

# Sand Table Graph

## Filling the Pail

**2 Large Cups**

**4 Medium Cups**

**8 Small Cups**