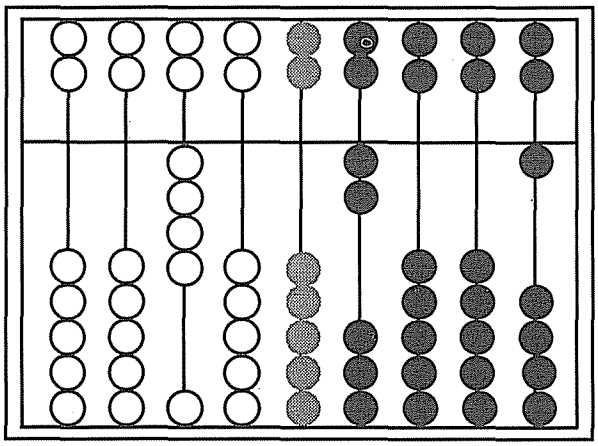
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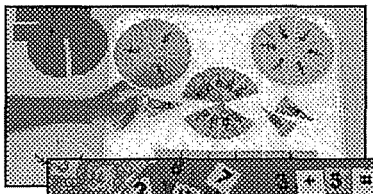
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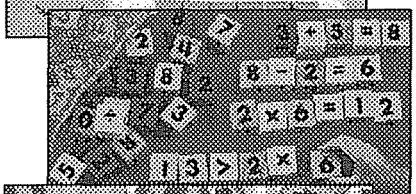
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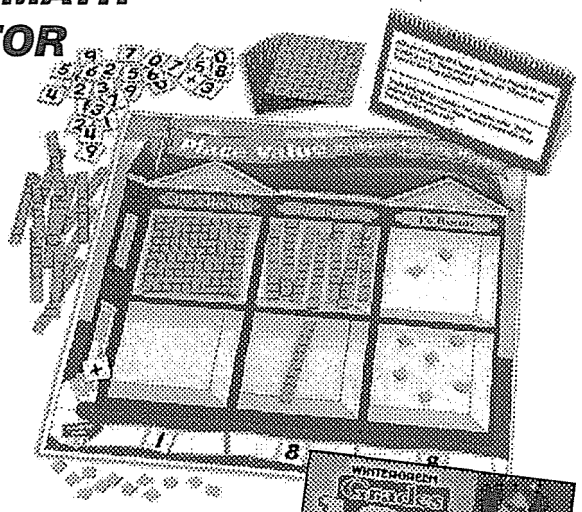
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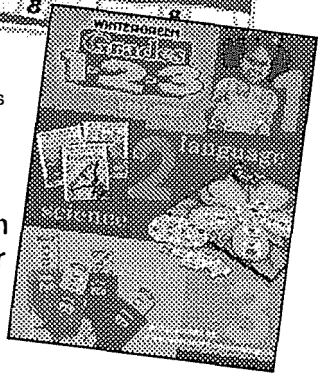
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▲ From the Editor's Desk

Caroline Rosenbloom, a mathematics instructional leader with the Toronto District School Board, has contributed two special activities for this issue. **Dice Difference** and **Calling Out Outcomes** addresses the strand *Data Management and Probability* for grades 5 to 8. Here are the specific expectations for these activities:

Grade 5: predict probability in simple experiments and use fractions to describe probability

Grade 6: connect the possible events and the probability of a particular event

Grade 7: identify the favourable outcomes among the total number of possible outcomes and state the associated probability.

Grade 8: compare predicted and experimental results in probability experiments.

[quoted from The Ontario Curriculum Grades 1-8 Mathematics, Ministry of Education, 1997]

Thank you Caroline for a thoughtful presentation of activities.

This issue marks the beginning of volume 40 for the *Abacus* and the beginning of my fifth year as your editor. Since I have been a member of OAME (joined in 1983), I have a copy of each *Abacus* produced through all the years of my membership. I decided to review the issues and pick out nuggets that will interest classroom teachers today. Children and mathematics haven't changed too much over the years. Hope you enjoy the tidbits by previous editors and writers.

Frances Schatz

▲ Teacher Notes - Dice Difference

Warm Up Activity: What are all the possible outcomes when you roll a pair of dice?

Activity Description: This is a game for two players.

1) Player A takes the set of answers {0,1,2} and player B the set of answers {3,4,5}.

2) Toss 2 dice. If the difference is 0,1 or 2, Player A wins. IF the difference is 3,4 or 5, Player B wins.

3) Play 20 rounds.

Questions:

a) Is the game fair or unfair? Justify your answer.

b) What is the probability that in any one round, A wins?

c) If you think the game is unfair, change the rules to make it fair. You must still keep the rule that you subtract the smaller from the larger. You may change the numbers which Player A wins though.

d) Change the game to "Dice Sum". How do you change the rules to make it a fair game?

Notes: Examine all the possible outcomes (36 possible pairs of numbers counting 1,3 different from 3,1).

Answer chart

probability (difference = 0) is 6/36

probability (difference = 1) is 10/36

probability (difference = 2) is 8/36

probability (difference = 3) is 6/36

probability (difference = 4) is 4/36

probability (difference = 5)is 2/36.

So the probability that A wins is 2/3 and the probability that B wins is 1/3.

Remedial: Check these students' answers to the warm up activity to ensure they are on the right path. Have them look at patterns before making their predictions.

ESL: Students can create a chart to record their results. This will elicit a visual pattern for them to see.

Enrichment: Students can create their own games using a product of the numbers. They can create a fair game and an unfair game.

▲ Teacher Notes - Calling Outcomes

This activity has been adapted from Quest 2000. Students are collecting data and looking at trends to make decisions on what sum they are most likely to get when they roll a pair of dice.

Activity description:

1) In this activity, students will use probability to think of possible outcomes.
2) Hand out a gameboard to each pair. Player A predicts the sum of the dice and records the prediction on the chart. Roll the dice and graph the sum on the game board. If their call is correct, A scores a point. Then player B takes a turn.
3) The game is over when one of the players reaches 5 points.
4) After the game, ask students if they noticed any patterns.
5) Students should complete the worksheet to find the total possible sums.

Questions: Why do the numbers on the tally chart go from 2-12? Where is the number one?

Remedial: Look at the student's predictions if the players seem to need help in developing a strategy, encourage them to look at patterns on their graph.

ESL: Students can draw their expectations for their journal entry. The game is hand-on and can easily be followed. If they are having difficulties understanding the game, ask them to watch other students and to also record their guesses on paper.

Enrichment: Adapt the game so that each player can call out a sum or the word "double". Double refers to the same number appearing on both dice. The scoring is as follows: correct sum 1 pt;Double call 2 points; incorrect call of double minus 2 points; first one to reach 5 wins.

Change the rules using the products.

▲ Nuggets - Metric Scavenger Hunt

*(**Abacus**, **September 1984, Editors Lorna Morrow and Trevor Brown**)*

Divide into groups and each group needs a bag.

Find as many items as you can, but only within the classroom.

If an object is too large for the bag, you may draw a picture of it.

The group with the most items is the winner.

List of items:

2 items heavier than 1 kg

2 items shorter than 10 cm

1 item longer than 1 m

3 items lighter than 10 g

1 item that holds more than 1 L

1 item that holds less than 1 L

1 item that is warmer than 20°C.

▲ Dice Difference

Toss 2 dice. If the difference is 0,1 or 2 then Player A wins. If the difference is 3,4 or 5 then Player B wins. Play 20 rounds. Record the dice difference of your rolls.

	Player A {0, 1, 2}	Player B {3, 4, 5}	Who wins: A or B ?
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

▲ Dice Difference

of times a 0 occurs = _____ (This is the relative frequency)

# of rolls _____

# of times a 5 occurs = _____ (relative frequency)

# of rolls _____

Is this game fair or unfair?

What is the probability that in any one round A, wins?

Total Possible Differences

	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

Probability (difference of 0) = _____

Probability (difference of 1) = _____

Probability (difference of 2) = _____

Probability (0, 1, 2) =___

Probability (difference of 3) = _____

Probability (difference of 4) = _____

Probability (difference of 5) = _____

Probability (3, 4, 5) =___

▲ Calling Outcomes

Find the total possible sums:

	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

What is the minimum sum? _____

What is the maximum sum? _____

List the probability of all the sums occurring?
Here are a few to start:
Probability (7 occurs) = 6/36 = 1/6
Probability (9 occurs) = 4/36 = 1/9

▲ Nuggets - A Problem That Won't Quit

(or a rich learning experience — editor)

(Abacus, *September 1987, author Bruce Black, Frontenac Secondary School, editor Ron Ripley)*

George, who was 1/3 his father's age 4 years ago and whose present age now makes a sum of 64 with his dad's, is mixing a 40% salt solution with a 25% salt solution to get 600 kg of 28% solution. He plans to see this mixture by driving from Montreal to Cornwall at 80 km/h and then from Cornwall to Belleville at 110 km/h. The total distance is 395 km, and the time is 4 hours. He will sell the mixture for $1.50/kg, and the money will be composed of a total of 54 ten dollar and twenty dollar bills. George then will invest part of his money at 12% and part at 16% in order to earn $122 interest for one year.

How old is George?

How much 25% salt solution will he need?

How far is it from Cornwall to Belleville?

How many $20 bills will he have?

What amount will he invest at 16%?

Why would a teacher ever dream up a crazy problem like this?

(Challenge to grade 6-8 students: write your solution for this problem and send to the current *Abacus* editor, Frances Schatz. Prize available for the best submission.)

▲ Nuggets - Monsters

(Abacus, November 1983, Editors Trevor Brown and Lorna Morrow)

Problem posing presents difficulties for children and we need to give children the opportunity to design their own problems. Here is an example.

Teacher: Make up a story for the addition fact 2 + 3 = 5.

Child: Two monsters were chasing three other monsters. I'm glad all five were running away from me.

▲ Nuggets - Duelling Cylinders

(Abacus, June 1995, Editor Jennifer Weiner)

Measurement: Capacity

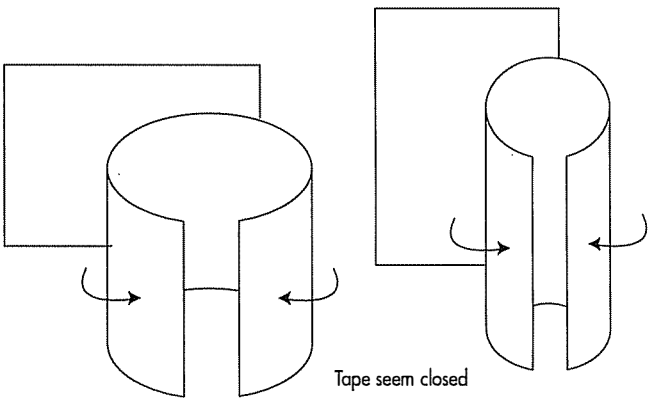
Grade Level: 3-6

Materials:

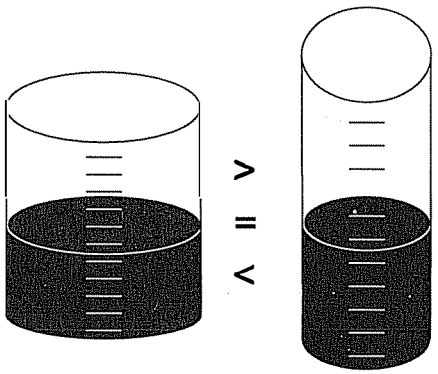
- pourable materials
  e.g., vermiculite chips, aquarium gravel , rice cereal
- graduated containers
- paper
- tape
- bristol board square

Instructions:

Using tape and a sheet of paper for each, create two cylinders, one whose height is the width of the paper and the other whose height is the length of the paper. Fill the two cylinders with a pourable material.



Compare the capacities.



Home Connection

"Duelling Cylinders

1. Pick a container. Compare it to a litre box. Guess how many millilitres it holds.
   _____ mL
2. Now measure how much it holds.
   _____ mL
3. Collect some containers from the recycle box. Order them from the one you think will hold the most to the one you think will hold the least. Use a pourable material to check your estimate.

