What Do You Do With Those Cuisenaire Rods?

Sandra Ball
February 2013
Agenda

• What are Cuisenaire rods?
• Exploring the Cuisenaire Rods
• Building Understanding
• Literature Links
• One Size Does Not Fit All
Georges Cuisenaire

They were developed in 1931 by Belgian primary school teacher Georges Cuisenaire.

Noticing how easily children learned musical patterns, Cuisenaire designed his rods to represent specific mathematical intervals, like the keys on a piano.
What do you know about Cuisenaire rods?

How have you used them?
What Concepts can be developed?

• Number Sense
• Part-part whole
• Patterns
• Skip counting
• Multiplication - Division
• Measurement
• Multiples
• Factors
• Fractions
• Ratio
• Proportions
Why Use Them?

• Helps students see mathematical relationships

• Provided tactile and visual models

• Encourages thinking and reasoning

• Helps students to reflect on mathematical concepts
Open Exploration

- What do you notice?
- What relationships do you see?
Guided Exploration

1. Choose one of each rod.
   - Build a staircase.
   - Add to the pattern to change the staircase into a square with sides = to the length of an orange rod.

2. Choose two of the same rod.
   - Put them together to make lips.
   - Fill in the teeth with white rods.
   - Smile!
Build a Boat

• Choose at least 5 but no more than 10 rods.

• Build a boat.

• Make sure the boat lies flat.

• Estimate how many white rods you would need to cover your boat.

• How could you figure out how many white rods you would need to cover your boat?
Build a Animal

• Choose at least 5 but no more than 10 rods.

• Build an animal.

• Make sure the animal lies flat.

• Estimate how many white rods you would need to cover your animal.

• How could you figure out how many white rods you would need to cover your animal?
Mystery Trains

• The train is a long as a blue rod.
• Exactly 2 of the rods are the same colour.
• The train has 4 cars.
• Is there more than one solution?

• The train has 3 cars.
• The longest car is brown.
• Each car is 1 red rod longer than the last car.
• Is there more than one solution
Number Families

• How many ways can you make the yellow rod?

• How many ways can you make the orange rod?

• How would a mathematician show this?
Same Trains

- Choose a rod.

- How many ways can you use the rods to make trains the same length?

- Record the trains on your grid paper.

- Write equations to correspond with the trains.
Roll, Build, Record

• Roll 2 six sided dice.

• Choose the rod that is the same as one of the numbers rolled.

• Find more of the same rod to correspond to the second die.

• Place them on the grid. Record the spaces covered.

• Write a multiplication equation.
Cover the Giraffe

• Choose one of each rod.

• Cover the inside shape of the giraffe.

• Can you find another way?

• Explain the strategy you used.
Skip Counting

• Choose a red, yellow or orange rod.

• Build a train with a collection of no more than 10 rods.

• Line them with a ruler or metre stick.

• Record the numbers you would say to skip count.

0 2 4 6 8 10 12 14
Amanda Bean

• Choose one kind of rod.

• Find 4 more of the same rod.

• Write an addition equation to represent the creation.

• Write a multiplication equation.

• What do you notice?
Fractions

• Find pairs of rods that equal one single rod.

• What would you call one of the pairs?

• Find single rods that have the same length as three of the same rod.

• What would you call the smaller rods?
Doubles

• Which single rods can you make with doubles of another?

• How many ways can you find?

• How would a mathematician show this?
What’s Missing?

• Two rods make a blue.

• One of them is yellow.

• What’s missing?

• How would a mathematician show this?
Find It!

• Find a rod that is...
  • Longer than dark green, but shorter than orange.
  • What could it be?
  • How would a mathematician show this?
Which is longer?

• Choose two different rods.

• Which is longer….by how much?

• How would you prove this?
Fraction Riddles

• How might your solve these riddles

• The yellow rod is 1/2. What is the whole?

• The blue rode is one whole. What is 1/3?

• The green rod is 2/3. Which single rod is one whole?

• The orange rod is 5/4. What’s one whole?
More Riddles

• Which rod is 3 times longer than a red?

• Which rod is 3 times longer than a light green?

• Which rod is 3 times longer than white?

• What riddle can you create?
Literature Links

2 + 2 + 2 + 2 + 2 + 2 + 2 = 18

9 x 2 = 18

Amanda Bean's Amazing Dream

The House of 12 Bunnies
Three young frogs sing, Ribbit, ribbit,
from a puddle in the middle of a path.

Two tiny frogs joined in
from a windowpane, shrieking.
Preep, preep,
in voices as loud as a crowd.
ONE HUNDRED HUNGRY ANTS
ELINOR J. PINCZES
ILLUSTRATED BY BONNIE MACKAIN
Out of the magician's hat:
four banners,
five rabbits,
a pitcher of water,
and a
bouquet of flowers.
Under the beach umbrella, I counted (16, 24, 100) feet.

Which combination of animals could be sitting under the animals?
We can! We can!

2

Two fish, tails going swish, swim to the duck.
Splish, splish.
No luck.
The duck stays stuck deep in the muck down by the squishy, fishy marsh.

Help! Help! Who can help?
One Size Does NOT Fit All!
Who are our learners?
“Good teaching is, was and always will be about how the children learn. And that means honoring differences among children, looking for strengths in each child, and paving the road for each child to find ‘what the lesson has to say to him/her.’

Differentiated instruction is about children, not about teachers.”
Today I am starting a new beginning for myself. I have a new job this year! I am now the Inner-City Early Learning Teacher in the Surrey (School District #36). The anticipation of new challenges and passion for helping our struggling early learners has sparked new excitement in me. With the help of technology I am able to access resources, ideas, activities and information that others can easily access. I am trying to go “paperless” this year. Ideas, activities, handouts and information will be attached to this blog. Please let me know what you think about this idea and how it works for you. The first session entitled “Building a Numeracy Foundation” refers to a session I presented in Surrey, B.C. on August 20, 2010.
The Teacher’s Role

• listen to what the students say
• watch what they do
• ask questions
• respond carefully
• provide time talk
• allow students to struggle
Questions to extend thinking ...

- How do you know . . . ?
- Tell me what you are thinking . . .
- What do you see in your head . . . ?
- Show me what you know . . .
- Tell me what you know . . .
- How did you do that . . . ?
- What did you notice . . . ?
- What questions did you ask yourself . . . ?
- If you were going to tell someone else what you did . . ?
- What was your strategy . . . ?
- How did you start . . . ?
- Close your eyes. What do you see . . . ?
- What do you think the problem is . . . ?
- Why do you think _____ . . . ?
Jason’s Story . . .
Assessment

• What am I looking for?
• What am I listening for?
• How can I document the learning?
• How will this information inform my instruction?
Children will become confident “doers” of mathematics only if mathematics makes sense to them and if they believe in their ability to make sense of it.