

**NCTM Annual Meeting
2104
New Orleans, LA**

***DO – SAY – WRITE: supporting student sense-making,
reasoning, and proof.***

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DO – SAY – WRITE: supporting student sense-making, reasoning, and proof.1. *Point of View?*

I have used 6 cubes to make a building and have blocked it from your view. As I describe the building can you make an exact copy just using my verbal description.
Listen as I describe and build. You may not ask me questions

Practices: Positional and academic language, communicate precisely

2. *Links in a Chain*

See separate handout

Practices: Multiple representations, Connections between representations, conceptualize with concrete objects

3. *Three in a row*

See separate handout

Practices: Look for and express regularity, discern a pattern

4. *Hawaiian Vintage Chocolate*

See separate handout

5. *Knots in a rope*

See separate handout

Practices: Analyze relationships, discern a pattern, explain correspondence between representations, conceptualize with concrete objects

6. *What's in the bag?*

See separate handout

Practices: Interpret results, make conjectures, justify conclusions

7. *Finish the Quadrilateral*

See separate handout

Practices: Make conjectures, justify conclusions

Links in a Chain



Children will make loops by gluing the ends of single strips of paper together. Connecting loops together makes a chain.

How many links will be in your chain if you have one minute to make them?

Describe your chain.

Look at other chains for your table.

Which chain has the most links? ?

Which has the least?

How many is two more than your chain?

How many would you have if you took two off your chain?

Write number sentences to represent these relationships

Making Predictions

How will your answers to the above questions change if we do it again?

If you have more people in your group?

If adults do it?

If we work for two minutes?

Use the chains to form a bar graph. Describe the graph.

Which bar is most, which is least? Are any the same?

Vary the arrangements of the bars so the graph is sometime vertical and sometimes

horizontal. Sometime left to right and sometime right to left.

Transfer the bar graphs to graph paper.

Rearrange the links to make a circle graph.

Counting in Three Columns

A	B	C
1	2	3
4	5	6
7	8	9

Complete the next three rows of the table.

Represent each number in the first four rows using the Cuisenaire rods. Use as many 3-rods as you can, then use 2-rods, then use the 1-rod. Organize the blocks in the same order of rows and columns as the table.

Do you see any pattern as you look down the columns?
Do you see any patterns as you look across rows?

Look at the blocks showing the number 4. I want to write a number sentence that represents the number 4. The blocks that make the number 4 are 3 and 1 so, $3 + 1 = 4$ or $4 = 3 + 1$
Choose some other number and look at the blocks that show that number. Write your own number sentence in two ways.

If you add any two numbers in column A together, in what column is the sum?
How do you know?

If you add any two numbers in column B together, in what column is the sum?
How do you know?

If you add any two numbers in column C together, in what column is the sum?
How do you know?

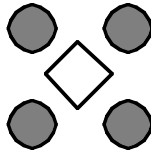
If you add one number from column A together and one number from column B, in what column is the sum? How do you know?

What can you say about subtracting numbers in different columns? In the same columns?

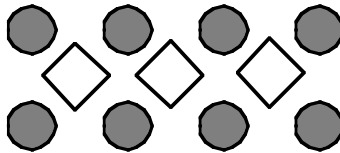
Hawaiian Vintage Chocolates

Big Island Vintage Hawaiian Chocolates are arranged in boxes so that a square caramel is placed in an array of four round chocolate creams as shown below. The dimensions above the box indicate how many rows and how many columns of chocolate creams come in a box. Develop a method to find the number of caramels in any box if you know its dimensions. Use words, diagrams and expressions to justify your method.

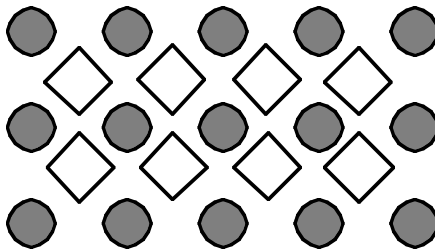
2 x 2



2 x 4



3 x 5



KNOTTED ROPE

You are a gym coach. Climbing a rope is good way to build upper body strength. You want to purchase a rope long enough to hang from a 30-foot high ceiling. Climbing a rope is not easy; having knots in the rope provides hand-holds for beginners. Also consider the fact that the rope will need to be tied to the rafters. Using one meter of rope as a sample, determine how much rope is needed.

Prepare a presentation that supports your proposal of how much rope you think should be bought.

- A. Begin with a piece of rope about a meter in length. Measure and record the length of the rope to the nearest cm.
- B. Tie one simple overhand knot in the rope. Measure and record the new length of the rope.
- C. Tie a second, third, fourth, and fifth knot in the rope, and measure and record the new length after each knot is tied. You may want to tie even more knots.
- D. Graph this data. Be sure to label the axes.
- E. What conclusions can you make from the graph?

What's in the bag?

There are four cubes in each bag. Some cubes may be the same color. **DO NOT LOOK IN THE BAG!** Your job is to predict which color you will pick after sampling the cubes in the bag.

This is how you should take a sample:

1. take one cube out at a time,
2. record its color by coloring a square on the record sheet,
3. replace it, and
4. shake the bag.

You should repeat this process 10 times. Color in a white square each time to show the colors that you picked on your 10 samples.

Now if you pick one more time, what color do you think you will get? Why?

What colors do you think are in your bag? Look at the ten squares you colored on the record sheet. Use this information to predict the colors of the four blocks in your bag. Color in the four squares to show your prediction

Make a Bag

Suppose you were to make a sampling bag using red and green cubes. What six cubes should you use to get the following:

In Bag 1 you will never draw a green cube

In Bag 2 you will always draw a green cube

In Bag 3 most of the time you will draw green, but sometimes you may get red

In Bag 4 most of the time you will draw red, but sometimes you may get green

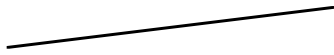
In Bag 5 getting a red or green is equally likely.

Finish the quadrilateral

Complete the drawing and then write a description as to how you are sure the sketch is correct.

You may use only an index card for a ruler and straight edge and well as a right angle drawer.

If this is the side of a square, sketch the entire square.



If this is the side of a rectangle, sketch the entire rectangle.



If this is the diagonal of a square, sketch the entire square.

