

Base Five Blocks

How to make and use Base Five Blocks for Elementary
Teacher Preparation
Craig McCarron

Based on activities adapted from
*Mathematics for Elementary Teachers: A
Conceptual Approach, 9th Edition* by Bennett,
Burton, & Nelson

Experiment

On each of the following slides,
count the number of objects on
the slide and call out the number
as quickly as possible.

7 7
7 7

3 3

9 9
9 9

What's the point?

Automaticity

A level of expertise in performing a task that

- causes the task to be performed with little or no conscious thought.

What's the point?

Automaticity

A level of expertise in performing a task that

- makes it difficult to “turn off” (Have you ever started to drive your “old route” someplace?)

What's the point?

Automaticity

A level of expertise in performing a task that

- makes it difficult to describe what you are doing.

Base Ten Blocks

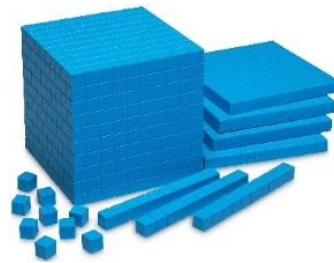


image source: basetenblocks.com

Base Ten Blocks

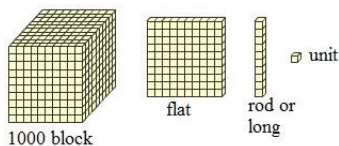


image source: mathatube.com

Base Ten Blocks

Thousands	Hundreds	Tens	Ones
1000	600	70	2

image source: inspiration.com

Base Ten Blocks

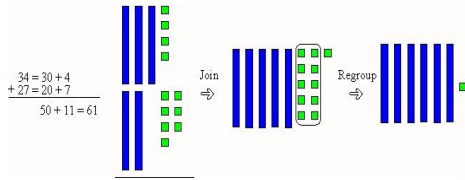


image source: mason.gmu.edu/~mmankus/

Base Ten Blocks

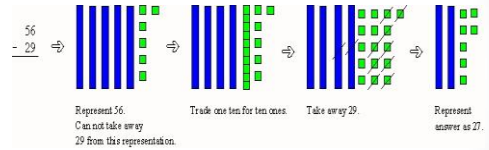


image source: mason.gmu.edu/~mmankus/

Remember?

Automaticity

A level of expertise in performing a task that

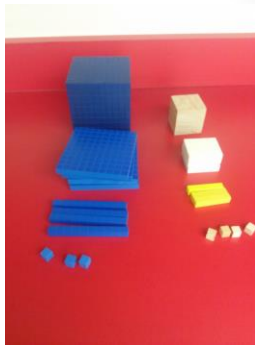
- makes it difficult to describe what you are doing.

Problem:

How do we get future elementary teachers to think about base ten addition and subtraction algorithms?

Solution:

Learn addition and subtraction base five.



Base Five Block Kits

This kit is intended for groups of four students

- 5 to 10 blocks (each block represents 5^3)
- 20 flats (each flat represents 5^2)
- 20 longs (each long represents 5^1)
- 20 units (each unit represents 5^0)
- 2 dice
- 1 sheet of sandpaper

Base Five Scavenger Hunt

Step 1: raid the Cuisenaire Rod kits

- yellow rods are “longs” ($1\text{ cm} \times 1\text{ cm} \times 5\text{ cm}$)
- white rods are “units” ($1\text{ cm} \times 1\text{ cm} \times 1\text{ cm}$)



image source: supernaru0heroine0ordinaire.files.wordpress.com

Base Five Scavenger Hunt

Step 2: raid the geometric solids (or order more)

- 2 inch cubes are “blocks” ($5\text{ cm} \times 5\text{ cm} \times 5\text{ cm}$)



image source: cdn.shopify.com

Base Five Scavenger Hunt

Step 3: send a work order to the campus carpenter

- cut scrap plywood ($3/8$ inch thick or $1/2$ inch thick) into 2 inch squares
- plywood squares are “flats” ($5\text{ cm} \times 5\text{ cm} \approx 1\text{ cm}$)



image source: overthebigmoon.com

Adapt Base Ten Activities



Situation

- Playing the game of “trade up” base ten
- Student has 37
- Student rolls 8
- Student puts 2 units back in the middle and takes one long from the middle
- What does this tell you?

When to take the Blocks Away

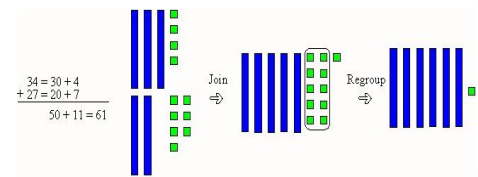


image source: mason.gmu.edu/~mmankus/

