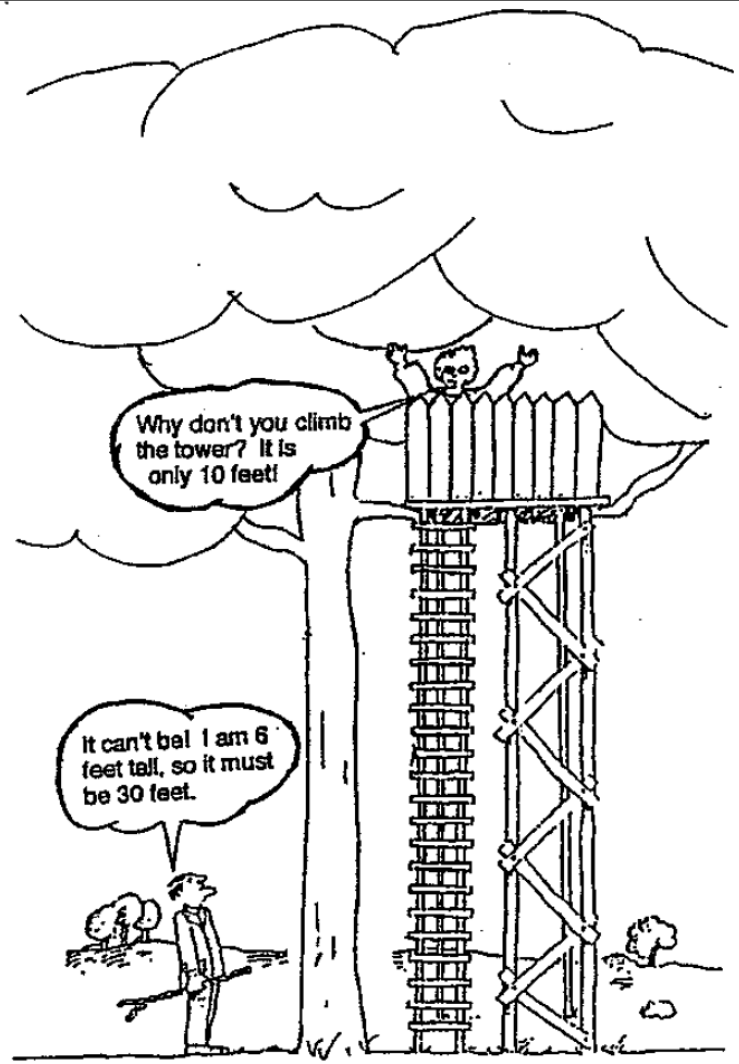
FRACTIONS AND PROPORTIONAL REASONING

Tr. Chhaya Bhabhor
Tr. R. U. Joshi
Tr. P. K. Mishra

Students' Strategies



These people disagree on the height of the tree house. How high do you think it is? Explain your reasoning.

Students' Strategies

Student A: 15 feet
If the tower in front of me an up it would look 15 feet tall

Student B: 9 feet
Mrs. Pashki said the gold part of our pencil is a inch, so I kept adding the inch and I got 9.

Student C: 18 feet
I figured out it takes about 3 people the size of that man to be tall as tower. I found out that by counting the ladder steps – that every 8 of those could be 6 feet. I then just counted every eight.

Student E: 24 feet
I took my thumb and pointer finger, that measured the man 3 times.

What is Proportional Reasoning?

Proportional reasoning refers to the ability to scale up and down in appropriate situation and to supply justifications for assertions made about relationships in situations involving simple direct proportions and inverse proportions.

Constant of Proportionality

Two quantities are proportional when they vary in such a way that they maintain a constant ratio $\frac{y}{x} = k$

# of stacked wooden cubes	1	2	3	4	5	6
height of the stack in inches	3	6	9	12	15	18

Invariance

It takes 6 men 4 days to complete a job. How long will it take two men to do the same job?

Think: 6 men take 4 days

1 man doing the work of 6 men all by himself takes 24 days

8 men, dividing up the work that one man did, take 3 days

Invariance

# men (x)	# days (y)	# man days as in work done
6	4	24
8	3	24

When two quantities are related in such a way that as one of them increases and the other decreases, there is invariance of the product of two quantities.

$$xy = k$$

What is Multiplicative Thinking?

Design a situation that involves multiplicative thinking.

- A problem in which students will have to compare two numbers multiplicatively and not additively.

Multiplicative Relationship

Additive Vs Multiplicative thinking

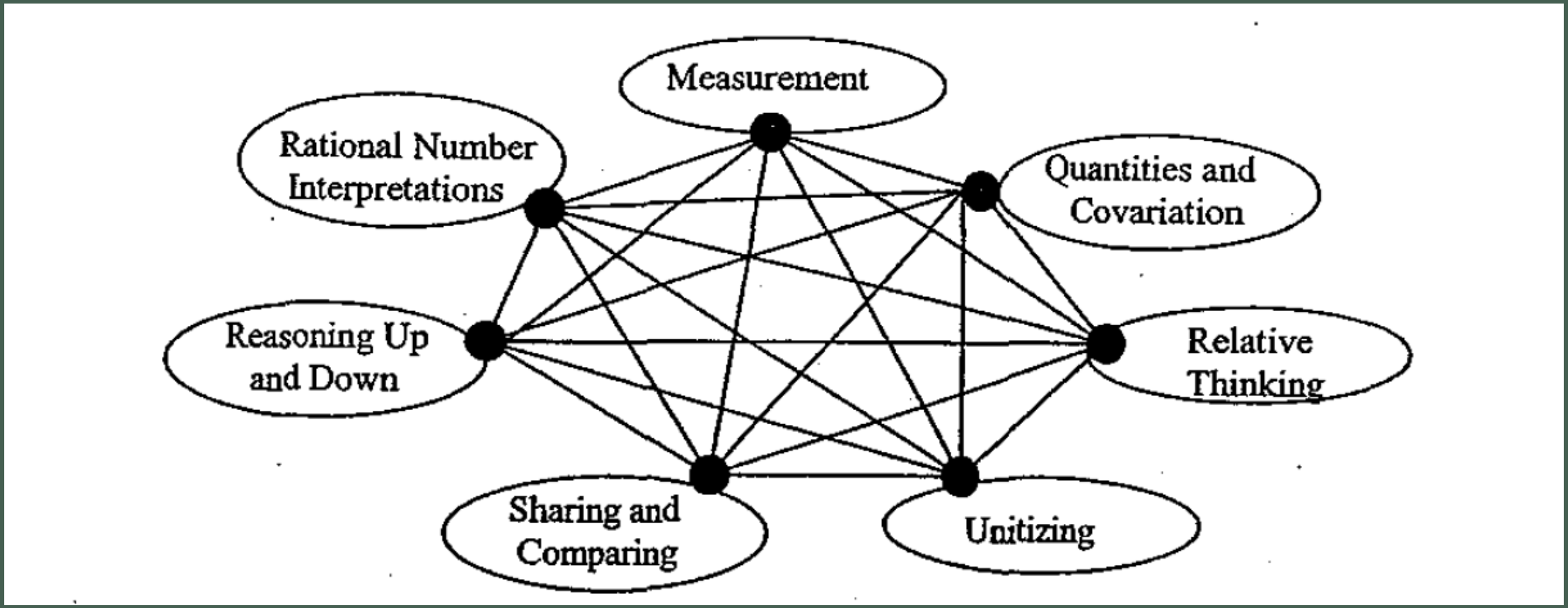
Additive thinking

Situations that involve adding, joining, subtracting, separating, removing – actions with which children are familiar because of their experiences with counting and whole number operations.

Multiplicative thinking

Situations that involve such processes as shrinking, enlarging, scaling, duplicating, exponentiating and fair sharing.

Concepts with Multiplicative Thinking



Let's Solve the Problem I

Six students were given 20 minutes to clean up the classroom after an eraser fight. They were angry and named 3 other accomplices. The principal added their friends to the clean-up crew and changed the time limit. How much time did she give them to complete the job?

Let’s Solve the Problem II

Posh Academy boasts a ratio of 150 students to 18 teachers. How can the number of faculty be adjusted so that the academy's student-to-teacher ratio is 15 to I?

Let's Solve the Problem I

What is the ratio of men to women in a town where $\frac{2}{3}$ of the men are married to $\frac{3}{4}$ of the women?

THANK YOU!