


Direct Modeling, cont.

The action or situation of the strategy has to match the action of the problem. All quantities in the problem must be represented. Direct modeling is a sensible approach but becomes inefficient as numbers get larger.

counting strategies. Students first use counting strategies that match the action in the problem. They often use their fingers to keep track of counting. Repeated addition is an advance on direct counting because it takes advantages of the equal-sized groups present in the problem situation.

9. Cats usually have 4 legs. How many legs are on 7 cats? 28



I drew a pict and counted the legs by twos

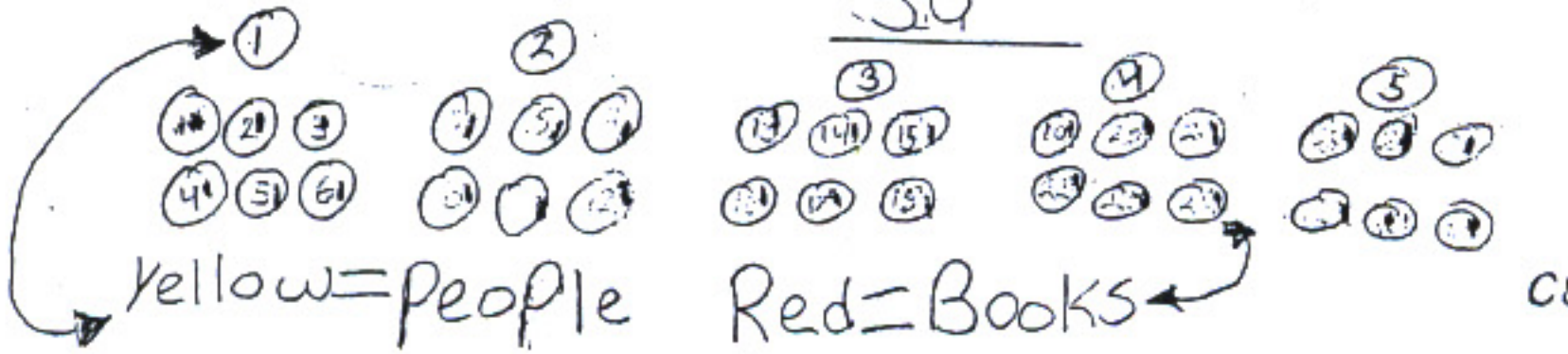
direct modeling

Bob has 8 rows of stickers on a page. many stickers does Bob have? 32

There are 4 stickers in each row. How

△	□	○	◇
□	○	○	○
○	○	○	○
△	△	△	○
△	△	△	△
□	□	△	△
◇	◇	◇	□

1 Five girls went to the library. They each checked out 6 books. How many books did they check out altogether? 30



Yellow = people Red = Books

The repeated addition model can be broken into two parts those strategies that use sequences of multiples and those that use known addition or subtraction facts.

1. Mrs. Hill bought 9 bags of cookies at the bake sale. Each bag had 3 cookies in it. How many cookies did she buy? 27

I counted by threes
3, 6, 9, 12, 15, 18, 21, 24, (27)

1 Five girls went to the library. They each checked out 6 books. How many books did they check out altogether? 30

$$\begin{array}{r} 161 \\ + 62 \\ \hline 12 \\ + 63 \\ \hline 15 \end{array}$$

18
+ 64
124
+ 15
30

adding or subtracting

Maria had 4 grocery bags. She packed 15 cans in each bag. How many cans did Maria pack? 60

$$\begin{array}{r} 15 \\ + 15 \\ + 15 \\ + 15 \\ \hline 60 \end{array}$$

$15 \times 4 = 60$

derived facts

2. Calvin's mother was making pancakes for 4 people. She stacked 6 pancakes on each plate. How many pancakes did she make? 24

$$\begin{array}{r} + 6 \\ + 6 \\ + 6 \\ + 6 \\ \hline 24 \end{array}$$

1 Five girls went to the library. They each checked out 6 books. How many books did they check out altogether? 30

I used multiplication to figure out the answer

$$5 \times 3 + 15 = 30 \quad 5 \times 6 = 30$$

4. Talia has 8 rows of stickers on a page. There are 4 stickers in each row. How many stickers does she have? 32

Talia

$$8 \times 4 = 2 \times 16 = 32$$

Very often the representation students

choose to represent their thinking on paper did not match the actions or strategies students actually used.

"How did you get 27?" His response was, "I know 3×10 is 30" and I counted backwards by 3." I asked Why by 3? "There were 9 bags of cookies so I had to take away a three."

1. Mrs. Hill bought 9 bags of cookies at the bake sale. Each bag had 3 cookies in it. How many cookies did she buy? 27



$$\begin{array}{r} 20 \\ + 7 \\ \hline 27 \end{array}$$

~~$20 \div 3 = 6$~~
 $27 \div 3 = 9$