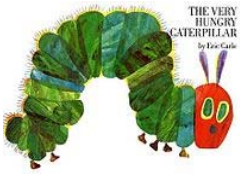
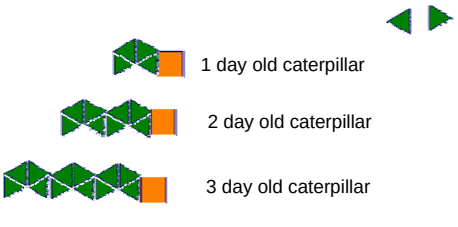
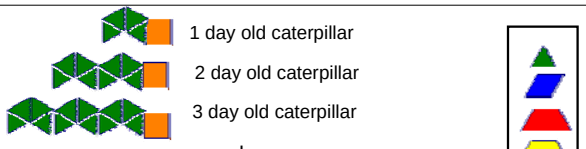




Build a 4 and 5 day old caterpillar



Fill in a table showing how many blocks you need to build each caterpillar

days old			total
1	4	1	5
2	8	1	9
3	12	1	13
4	16	1	17

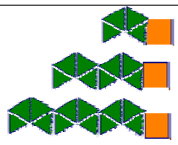
+4 +4 +4

grows +4 every time

stays the same

grade K strategy
is build and count

grade 1 strategy
is count and then add (count on)



days old			total
1			5
2			
3			
4			
5			
10	4×10	+1	41
100	4×100	+1	401

+4 +4 +4

add 4
9 times

grade 3 strategy
is find a pattern
and multiply

grade 2 strategy
is find a pattern
and add on

More third grade questions:

1. How many pattern blocks are in 1 car? easier
2. How many pattern blocks would you need to make 5 cars?
3. If you made a train and you used 8 green triangles, how many blue rhombi would you need?
4. If you made a train and you used 14 blue rhombi, how many green triangles would it have?
5. Could you make a train that used 5 blue rhombi? harder
(Explain your answer)

Common Core Math Practice Standards

MP1 Make sense of problems and persevere in solving them.
MP2 Reason abstractly and quantitatively.
MP3 Construct viable arguments and critique the reasoning of others.
MP4 Model with mathematics.
MP5 Use appropriate tools strategically.
MP6 Attend to precision.
MP7 Look for and make use of structure.
MP8 Look for and express regularity in repeated reasoning.

MP5 Use appropriate tools strategically.

Common Core Math Practice Standards

MP8 Look for and express regularity in repeated reasoning.

2+3=3+2
commutative law

days old	▲	■	total
1	4		5
2	4+4		9
3	3x4		13
4	4x4		17
5	5x4		21
10			
100			

+4 +4 +4 +4 +4x4

MP5 Use appropriate tools strategically.

Common Core Math Practice Standards

MP7 Look for and make use of structure.

3. If you made a train and you used 8 green triangles, how many blue rhombi would you need?

2 rhombi for each triangle
↓
double the number of triangles

MP5 Use appropriate tools strategically.

Common Core Math Practice Standards

MP6 Attend to precision.

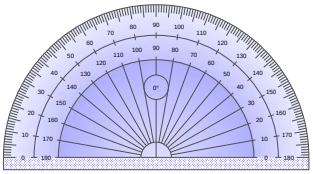
be careful with academic Language

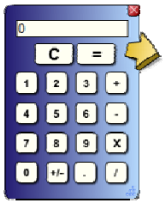
Label tables and graphs

days old	▲	■	total
1			
2			
3			
4			
5			
10			
100			

Common Core Math Practice Standards

MP5 Use appropriate tools strategically.





Common Core Math Practice Standards

MP4 Model with mathematics.

number of chirps in 14 seconds
+ 40°F

using number equations to describe things

"In early grades, this might be as simple as writing an addition equation to describe a situation."

days old	▲	■	total
1			
2			
3			
4			
5			
10			
100			

4x100+1 = 401

Common Core Math Practice Standards

MP3 Construct viable arguments and critique the reasoning of others.

share & learn from each other's strategies

10 sets of 4 triangles = 40 triangles.
Add 1 for the square makes 41

days old	▲	■	total
1			5
2			
3			
4			
5			
10	40	1	41
100			

start with 5 and add 4 9 times

Common Core Math Practice Standards

MP2 Reason abstractly and quantitatively.

Decontextualize

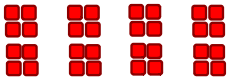
I can find how many crayons by multiplying 4x8

context/descriptions → numbers

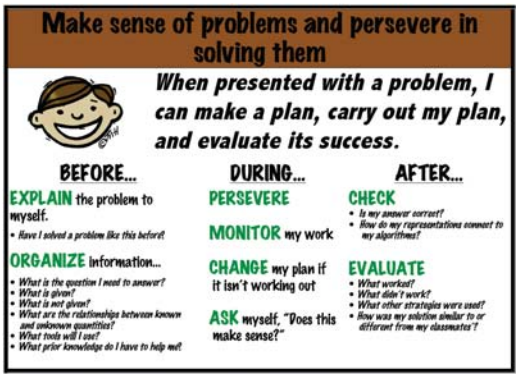
Contextualize

I know that 32 tells me how many crayons in all.
I can interpret 4x8 as 4 sets of 8

numbers → context



MP1



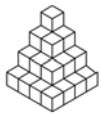
1. There are 4 separate large boxes, and inside each large box there are 3 separate small boxes, and inside each of these small boxes, there are 2 separate smaller boxes. How many boxes, counting all sizes, are there altogether?

2. When asked how many gold coins he had, the collector said:
If I arrange them in stacks of five, none are left over
If I arrange them in stacks of six, none are left over.
If I arrange them in stacks of seven, one is left over.
What is the least number of coins he could have?

Math Olympiad problems (grades 4-8)

3. Alice and Betty run a 50-meter race, and Alice wins by 10 meters. They then run a 60-meter race, and each girl runs at the same speed she ran in the first race. By how many meters will Alice win?

4. The tower at the right has no gaps. Suppose it is painted red on all exterior sides, including the bottom, and then cut into cubes along the indicated lines. How many cubes will each have red paint on just 3 faces?



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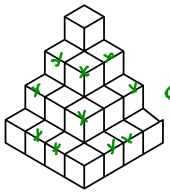


and I'm back!

With just cups, you can practice numbers and fine motor skills at the same time!

http://lookatmyhappyrainbow.com/cups/

cubes

cups

5 in the cup

2 outside the cup

How many cubes in all?

With cups and cubes you can ask addition and subtraction questions:

I had 6 cubes
I hid some under the cup
How many are under the cup?

cubes

How much to show?

Show 2 repetitions to make it clear what the pattern is

cubes

Naming repeating patterns

AB

ABC

ABBA

A B C D

cubes cups

Questions to ask

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

What is under the next cup?

What is under cup number 8?
What is under cup number 11?
What is under cup number 20?

Kindergarteners can solve problems by touching cups and counting out patterns

Second and third graders can use a number line to make deductions (eg. odd numbers are blue)

cubes cups

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

What numbers go with the red tiles? multiples of 3

What numbers go with the blue tiles? 1, 4, 7, ... skip count by 3

What number comes next?

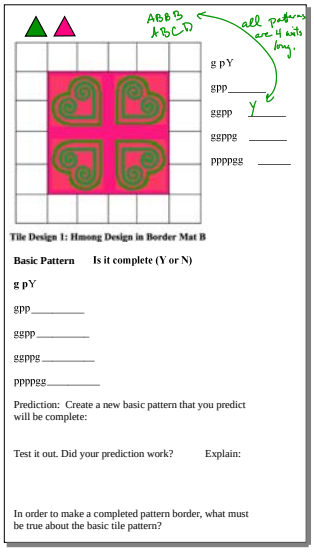
3, 6, 9, 12, 15, ___

4, 7, 10, 13, 16, ___

11, 21, 31, 41, 51, ___

4, 10, 16, 22, 28, ___

Typical related skip-count problems (gr. 3)



Tile Design 1: Hmong Design in Border Mat B

Basic Pattern **Is it complete (Y or N)**

g p Y

gpp_____

ggpp_____

ggppg_____

pppgg_____

Prediction: Create a new basic pattern that you predict will be complete:

Test it out. Did your prediction work? Explain:

In order to make a completed pattern border, what must be true about the basic tile pattern?