Saturday Math: Elementary to Middle

A closer look at proportional reasoning through the grades.

Norms

- We take care of our own needs while recognizing our responsibility to the group.

- We listen with the intent to understand; we speak with the intent to contribute.

- We treat disagreement as a positive opportunity for learning.

- We are respectful and mindful of our own and others' strengths, challenges, and learning styles.

- We promote a collaborative, generative, and reflective environment.

Focus Questions of the Day

What is the mathematical story of proportional reasoning across elementary and middle school mathematics?

What is proportional reasoning?

ONLY IN MATH PROBLEMS CAN YOU BUY 60 CANTALOUPES AND NO ONE ASKS WHAT THE HECK IS WRONG WITH YOU.
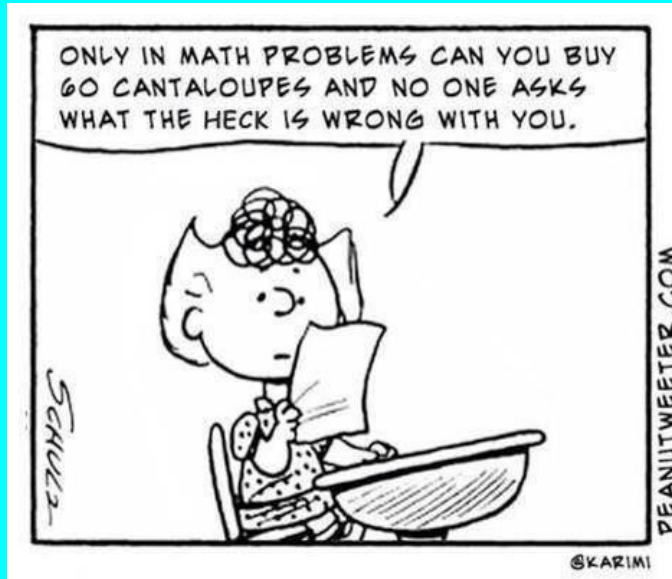
What is a Strand Trace?

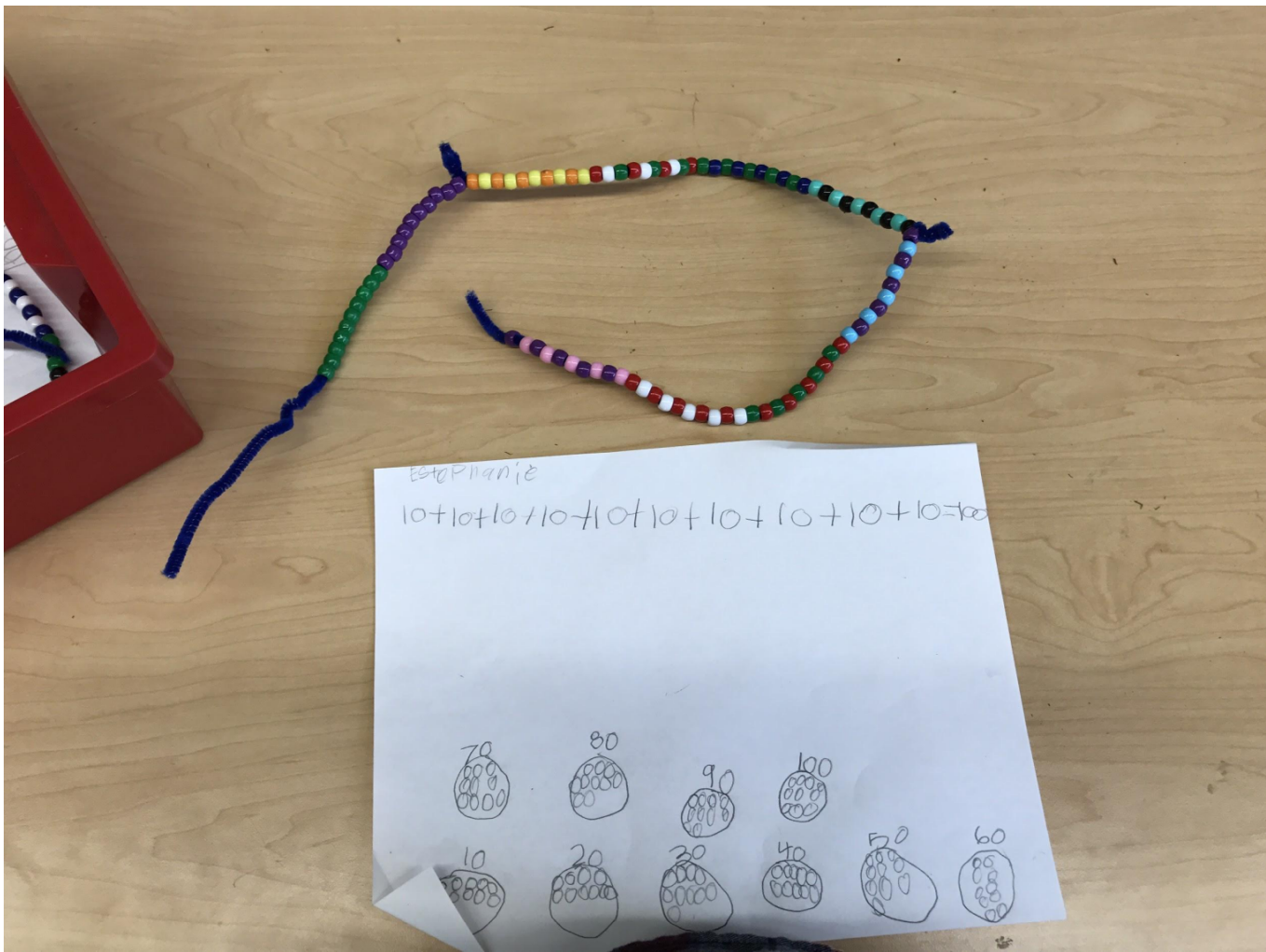We will **Explore the Mathematics** of some rich tasks from K-8.

Examine the **connections** between the explicit and underlying mathematical concepts from each task.

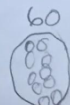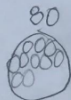# Kindergarten/First Grade Structuring: Place Value

To celebrate the hundredth day of school, we are going to make bead necklaces with ***exactly 100 beads***.

Make a plan and then follow your plan.

Estephanie

10+10+10+10+10+10+10+10+10+10=100

70
80
90
100
10
20
30
40
50
60

Angelo

Yo voy a contar eh lo eh lo

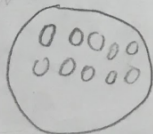10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10

10
20
30
40
50
60
70
80
90
100

Ashley

5 10 15 20 25
00000 00000 00000 00000 00000

30 35 40 45 50 55 60 65
00000 00000 00000 00000 00000 00000 00000 00000

70 75 80 85 90 95 100
00000 00000 00000 00000 00000 00000 00000

5+5+5+5+5+5+5+5+5+5+5+5+5+5+5+5+5+5+5+5=100

Mi para que ms.pena pueda hacer cadenas con cien bolitos yo contare en cinco y cinco.

5 10
00000 00000

30 35 40
00000
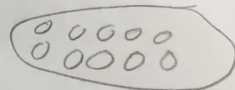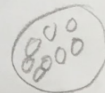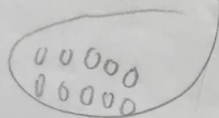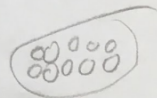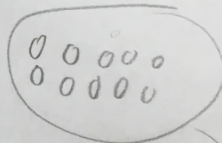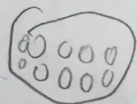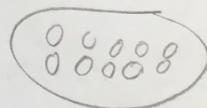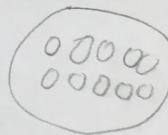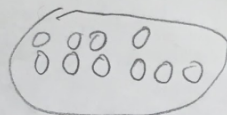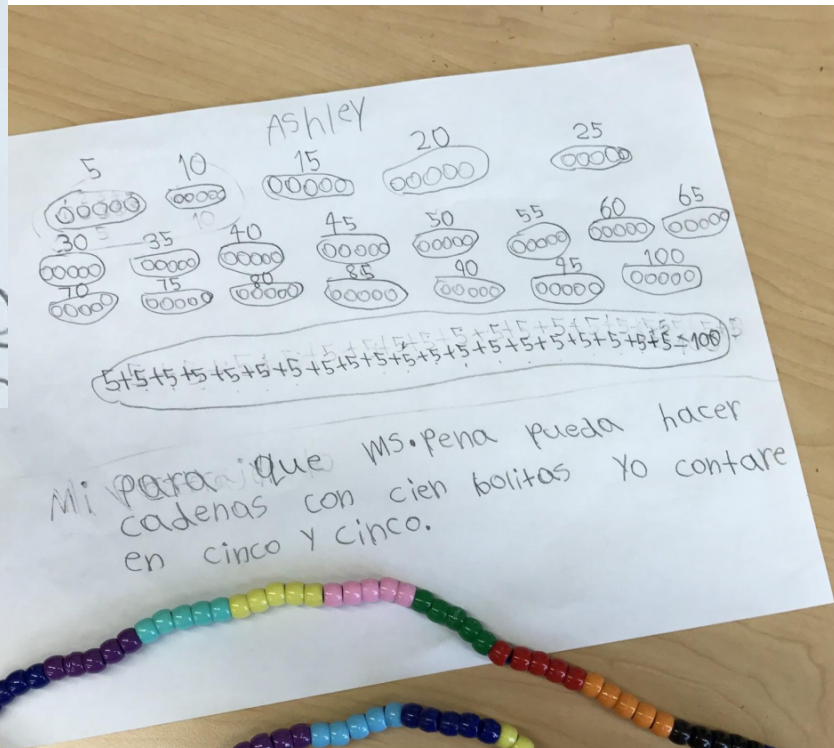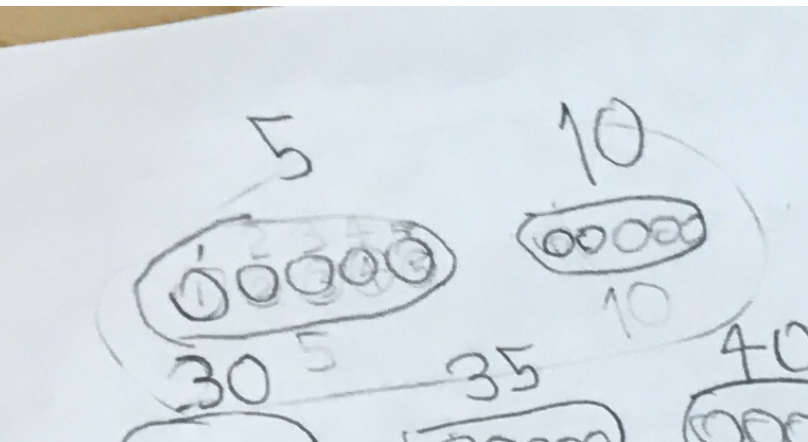
1st Grade Structuring: Properties of Number

We have 24 kids in our class. When we play math games, will everyone have a partner?

2   4   6   8   10   12   14 18   9

1   2   3   4   5   6   7 8   No parner
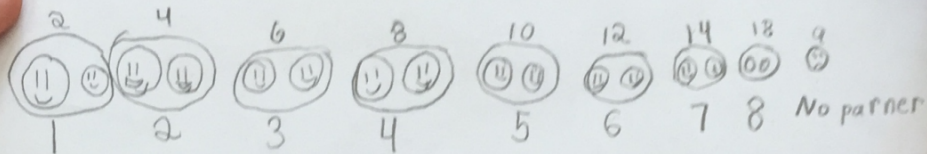
8 partenrshipS

1 partern ship is
a lone on ly 1 prsin
is init.

ech partnership has
tou in side it.
they are like dobls like

1 partner sip is ecwald
to 1t1=2.

3rd Grade: Turkey Problem
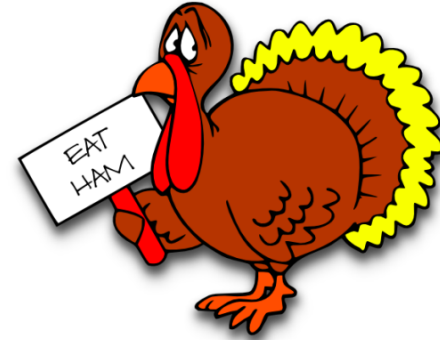
What a Big Dinner!

$1.25

What do you notice about $1.25?

* 5 quarters is equal to $1.25.
* 12 dimes and one nickel equals $1.25.
* If you multiply $1.25 by 4, you get $5.

$$4 \times \$1 = \$4 \quad \text{and} \quad 4 \times \$0.25 = \$1$$
$$\$4 + \$1 = \$5$$

* $1.25 is 125 cents.

100 + 25

* The decimal point separates the dollar from the cents.

$1 and 25¢

Stanley's prediction:

Every time you multiply $1.25 by a multiple of 4, the product will always be a multiple of 5.

Part I

Turkey problem

1 lb = 1.25   24 pounds

$$\begin{array}{r} 34 \\ \times\,0 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 24 \\ \times\,1 \\ \hline 24 \end{array}$$
$$\begin{array}{r} 25 \\ \times\,24 \\ \hline 100 \\ 00 \\ 80 \\ +\,20 \\ \hline 600 \end{array}$$

$1.25 \times 4 = 5$
$1.25 \times 4 = 5$
$1.25 \times 4 = 5$
$1.25 \times 4 = 5$
$1.25 \times 4 = 5$
$1.25 \times 4 = 5$
$\overline{\$30}$

$\dfrac{24}{1} \times \dfrac{5}{4} = \dfrac{120}{4}$

The Turkey problem
Part I   Part II

Part I
1.25 per lb
24 lb How much
does it cost.

Part II
15 mins per lb
How long will
it take to cook

$1.25
$1.25 $5.00
$1.25
$1.25
$1.25
$1.25
$1.25 $5.00 $5.00
$1.25
$1.25
$1.25 $500 $5.00
$1.25 $5.00
$1.25   +$5.00
               $30.00

$5.00

$5.00

$6.00

$5.00

15 ... 60
15
15
15
360 min

The turker problem

Part I $1.25 per lb
           24 lb

How much does it cost?

$1.25 \times 4 = \$5.00$
$1.25 \times 4 = \$5.00$
$1.25 \times 4 = \$5.00$
$1.25 \times 4 = \$5.00$
$1.25 \times 4 = \$5.00$
$1.25 \times 4 = \$5.00$
$\overline{+\ \$30.00}$

the five fours are the 20.

The Turkey Problem

Part I   <u>Work</u>

How much money does it cost? _30_

cook?

```
 1    2    3   4
25 + 25 + 25 + 25 = 100¢

 5    6    7   8     +
25 + 25 + 25 + 25 = 100¢

 9    10   11
25 + 25 + 25 + 25 = 100¢ = 300 + 300 =
```

12 + 12 = 24

24 × 1 = 24

24 + 6 = [30$] answer

15 mins for a point

Name: Muriel
Date: 1/3/17

Part I

$600 = 6.00 $

```
  6.00
+ 24.00
```

[Answer: 30.00]

[dubble the 15]

```
3 × 5 = 15
3 × 5 = 15
      + 15
```

[$30]

Part 1: $1.25 per LB

Fahim

24 LB

```
  25        √24
 x24        x 1
            ↓
            24
          +  0
          $524
```

```
 25÷
x24
```

Key:
24 - 4 = 20
20 - 4 = 16 $6.00
16 - 4 = 12   ___
12 - 4 = 8
8 - 4 = 4
4 - 4 = 0

4 quarters = $1.00

```
  24
 +  6
 $30
```

12 LB = $15

```
  15        12
 +15       +12
 $3 0=answer  24 LB = total
```

The Turkey Problem

quarters
quarters

24 LB

$1.25 $1 ¢25
The decimal
point separates
the dollar from
the cent

```
  25
 x24
 600
```

600 ÷ 25 = 24   600 cents
                  is $6.00

	20	5
20	400	100
4	80	20

600

Proved Work

	20	5
20	400	100
5	100	25

```
  625
-  25
  600
```

100
+100
+100
+100
+100
+100
 600

$1.25 is ¢125

```
  15
 +15
  30
```

```
 $24.00
+$ 6.00
 $30.00
```

1

1

1

1

| 1 | | 1 | | 1 |

| 1 | | 1 | | 1 |

(Turkey Problem)

Part 1 $1.25 per lb
24 lb

How much, does it cost?
Double 15.00 it. +15.00
30.00

1.25 × 3 4

36
1.25 20
1.25 20
1.25 10
1.25 10
1.25 10
1.25 10
1.25 60
+1.25 23
1500
1 30.00

Answer: 30.00

Part 1 **The turkey problem**

1.25 per pound

I bought 24 pounds

$30.00

Squarter = ___

$ 4
1 25
1 25
1 25
1 25
1 25
1 25
1 25
+ 1 25
16.00

10.60
10.00
+
30.00

3 lbs × 8 lbs = 24 lbs

The Turket Problem 24

Stanley

24
× 1
24 $

24
× 25
80
+5

600¢ = 6.00

1
24.00
+ 6.00
Answer: 30.00 $

24
÷ 12
5
× 5
60

7th Grade: Gym Memberships

Do the Math!

Resources: Lab-sheet, Graph Paper, Colored Pencils, Straight Edge

Think About: What is the math? How have we seen it come up during the day in other grades?

7th Grade: Gym Membership

In January, Georgia signed up for a membership at Anytime Fitness. The plan she chose cost $95 in start-up fees and then $20 per month starting in February. Edwin also signed up at Anytime Fitness in January. His plan cost $35 per month starting in February, and his start-up fees were waived.

Who got the better deal? How do you know?

- Resources Available:
  Graph Paper, Colored Pencils, Sticks, Blank Tables

Connections ?

Reflection & Closing

Reflection form

One Word that describes your learning experience of the
morning.