



Empower Students with Routines Along the Route of Learning



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Welcome & Introductions

◇ Introduce yourself:

- Name
- Role
- Grade level

◇ What are you hoping to learn today?



Getting Connected

GoSoapBox Event Code:
543-469-165

◇ app.gosoapbox.com

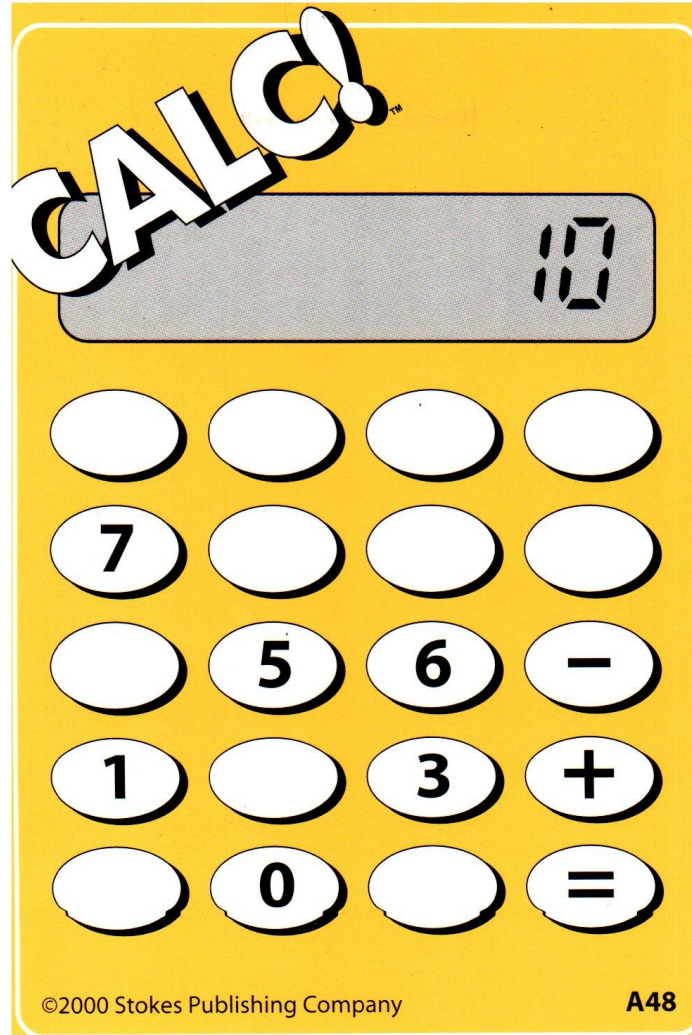




CALC

Rules

- ◆ Multiply
- ◆ Calculate a 2
- ◆ Multiply
- ◆ Finish




(only once)
to create
number
given





Why Routines?

- 
- ◆ Develop fluency & deepen understanding
 - ◆ Create interest in the future study of math
 - ◆ Communicate using mathematical models
 - ◆ Develop logical thinking
 - ◆ Apply math to real situations





Routines that Support . . .

1 Number Line Concepts & Number Sense

2 Developing Understanding Over Time

3 Patterns, Patterns, Everywhere!

4 Questioning & Justifying
through Writing





How I Use Routines

- ◇ Daily
- ◇ 7 - 10 minutes
- ◇ Cycle of common routines
- ◇ Individual work time
- ◇ Class discussion





1

Number Line Concepts & Number Sense


Exploring number concepts through number lines



Number Line Concepts & Number Sense

- ◇ Understand relationships between numbers
- ◇ Develop fluency (efficiency, accuracy, & flexibility)
 - Efficiency - can use strategy easily
 - Accuracy - knows number facts and relationships
 - Flexibility - knows multiple strategies






Number Line

- ◇ Explore numbers in multiple forms: fractions, decimals, exponents, etc.
- ◇ Place the numbers on a number line correctly
- ◇ Variations:
 - Create their own number(s) & add to a class number line
 - Give students an incorrect number line & have them correct the mistakes

Number of the Day

- ◇ Choose a number of the day
- ◇ Students use that number to do specific tasks such as:
 - Create an $+$, $-$, \times , \div problem with the # as the result
 - Put # on a number line
 - Create a visual representation
 - Find the square root
 - Graph a point with #
 - Create a pattern with # as its growth
 -



Let's Try It!

Number of the Day is...

1

***Can use Desmos, Padlet, or GoSoapBox





Let's Try It!

Number Lines

- ◇ Choose 2 different numbers
(in different forms - ex: fraction, decimal, mixed number)
- ◇ Write each number on a
Post-It-Note
- ◇ Add your Post-Its to the class
number line



Student Work

Number of the Day Interesting Tidbit: I was (2) years old when I wrote me.

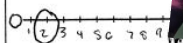
Write me as a fraction.

$$\frac{2}{1}$$

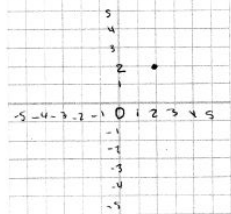
Create a pattern with me as its growth (and label me).

$$\begin{array}{ccccccc} 0 & 2 & 4 & 6 & 8 & & \\ \hline +2 & +2 & +2 & +2 & & & \end{array}$$

Write me on a number line number less than me and 1 me.



Graph me as part of a point. (2, 2)



Find my square root (and show what it means).

$$\sqrt{2} \approx 1.41$$

Create a subtraction problem with me as the result.

$$28 - 26 = 2$$

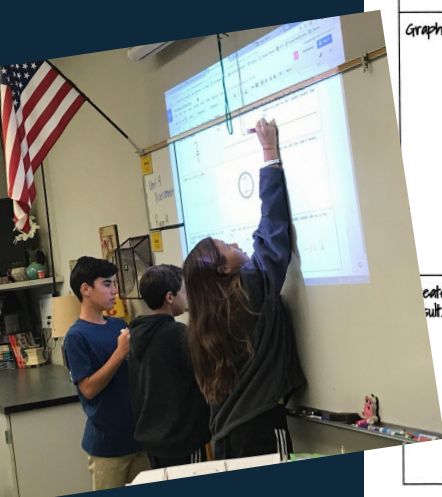
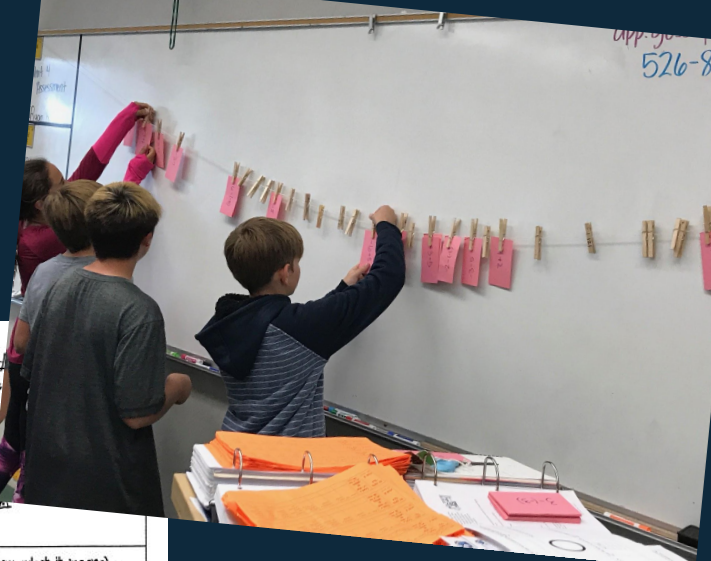
Create a table with me as the growth (and label me).

in(x)	out(y)
0	2
1	4
2	6

growth
+2

Create a multiplication problem with me as the result.

$$1.41 \cdot 1.41 \approx 2$$





2

Developing Understanding Over Time

Desmos Exit Tickets and SBAC Target Cards



Developing Understanding Over Time

- ◇ Desmos Exit Tickets
- ◇ SBAC Target Cards



Target C - #4 This graph shows a proportional relationship between the amount of money in Jack's savings account and the number of weeks Jack has been saving money.

Jack's Savings Account

Number of Weeks	Amount in Savings (\$)
0	0
1	5
2	10
3	15
4	20
5	25

Which statement identifies the correct slope, and the correct interpretation of the slope for this situation?

A. The slope of the line is $\frac{5}{1}$, so Jack's savings rate is \$5 dollars every week.

B. The slope of the line is $\frac{5}{1}$, so Jack's savings rate is \$5 dollars every 5 weeks.

C. The slope of the line is $\frac{1}{5}$, so Jack's savings rate is \$5 dollars every 5 weeks.

D. The slope of the line is $\frac{1}{5}$, so Jack's savings rate is \$1 dollars every 5 weeks.


1 Concepts and Procedures

8.EE.B
also target C



Desmos Exit Tickets



- ◇ Given to students at the end of a lesson or 2
 - ◇ Short assessment (1-4 problems)
 - ◇ Reviewed the next class if needed
- 

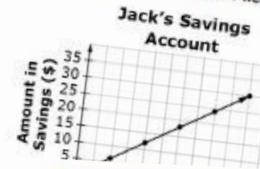
SBAC Target Cards

- ◆ Students grouped by area of greatest need
- ◆ Groups work together on 1 card at a time

Target C - #4 This graph shows a proportional relationship between the amount of money in Jack's savings account and the number of weeks Jack has been saving money.



Target C - #6 This graph shows the amount of money s , in dollars, in Jack's account after w weeks.



Target C - #5 The table shows the proportional relationship between the cost in dollars (c) of meat and the weight in pounds (p) at Lane Grocery Store.

p	c
3	15
5	25
7	35
9	45
10	50

Select the equation that shows a cost of meat per pound which is twice the cost of meat per pound at Lane Grocery Store.

- A. $c = 5p$
- B. $c = 6p$
- C. $c = 10p$
- D. $c = 30p$



Let's Try It!


Hey, students!

Go to student.desmos.com
and type in:

JYVUJ

You can also share this link with your students:

<https://student.desmos.com/?prepopulateCo>



Student Work

Redwood Trees Exit Ticket 3YMJD

Anonymize Pacing Pause

30 STUDENTS

	1 Question 1 Read the situation $f(x)$	2 Question 2 Using the same $f(x)$
Maria Agnesi	<input type="checkbox"/>	<input type="checkbox"/>
Johannes Kepler	<input type="checkbox"/>	<input type="checkbox"/>
Aristotle	<input type="checkbox"/>	<input type="checkbox"/>
Henri Poincaré	<input type="checkbox"/>	<input type="checkbox"/>
Hee Oh	<input type="checkbox"/>	<input type="checkbox"/>
Pierre-Simon La...	<input type="checkbox"/>	<input type="checkbox"/>
Elana Piscopia	<input type="checkbox"/>	<input type="checkbox"/>

Question 1

Read the situation below and state the growth of the tree that occurs every year.

Mark's tree is 16 feet tall five years after he planted it.

Expression	Students
3.2	Hee Oh, Elana Piscopia, Gotthold Eisenstein, Mary Ross, Frances Kirwan, Mary Cartwright, John Urschel, Augustin Cauchy, Ingrid Daubechies
$x = 3.2$	Johannes Kepler, Sun-Yung Alice Chang
3.2 feet	Shing-Tung Yau, Niels Abel
3 ft	Peter Dirichlet, Hermann Minkowski
3.2 each year	Maria Agnesi
<i>You do not have enough info</i>	Aristotle
3 Feet	Henri Poincaré



3

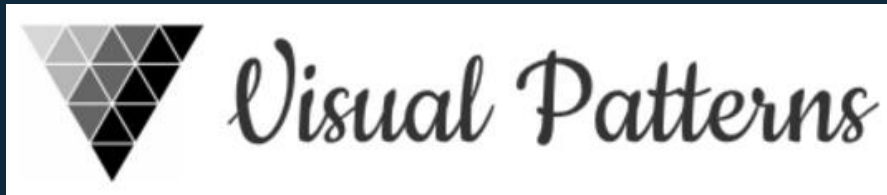
Patterns, Patterns, Everywhere!

Supporting students in looking for, exploring, and describing patterns



Patterns, Patterns, Everywhere!

- ◇ Visual Patterns
- ◇ Dot Cards

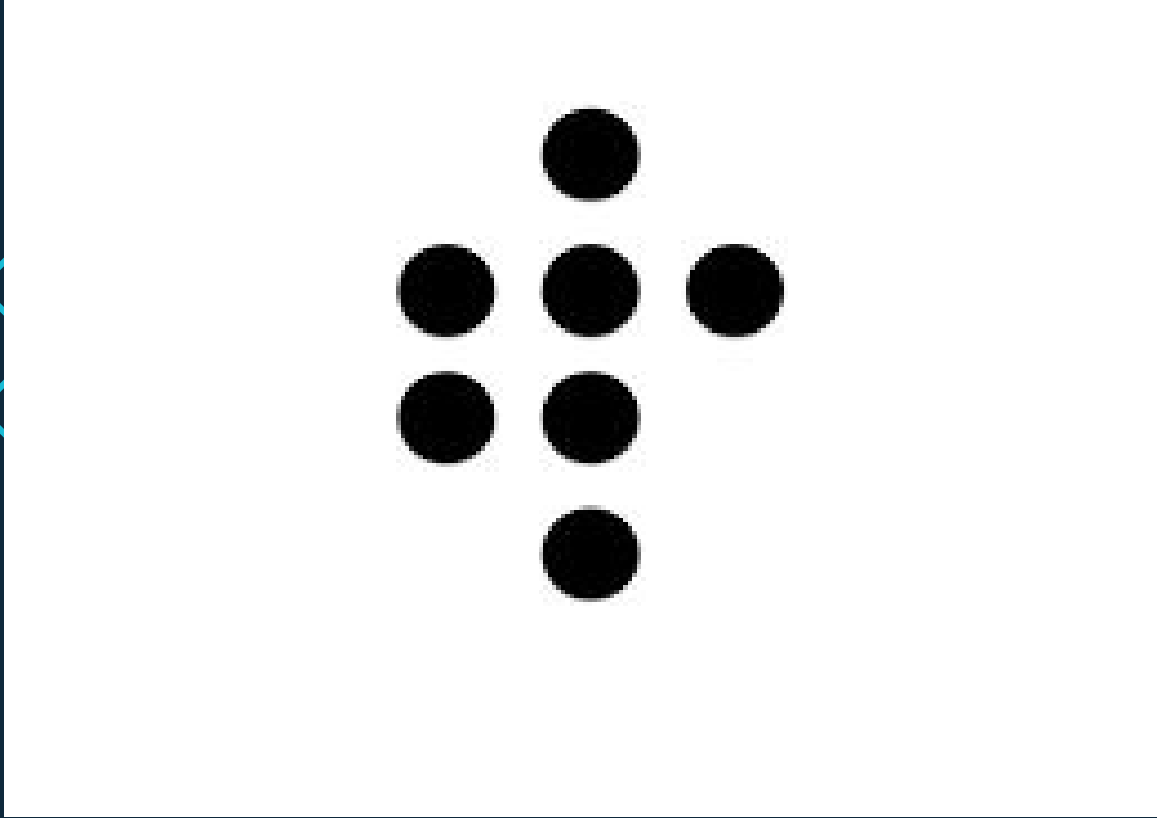




Let's Try Visual Patterns!

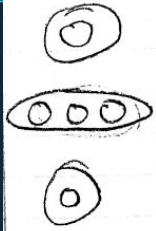
- ◇ How many candy corns are in step 1?
- ◇ How is the pattern growing?
- ◇ How many candy corns does the 6th, 7th, 15th figure have?
- ◇ Can you generalize the pattern to figure out the number in any figure of the pattern?







Student

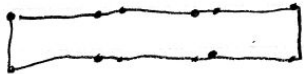


Total: 5. Saw 2 dots

88 Total: 7

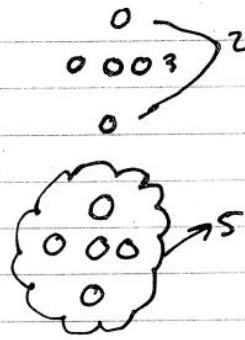


Saw a 2 boxes and

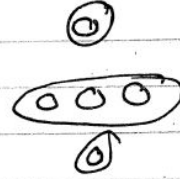


Total: 12

I saw a big box.

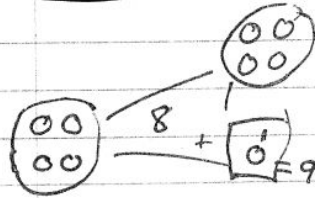


I see 3 then 2

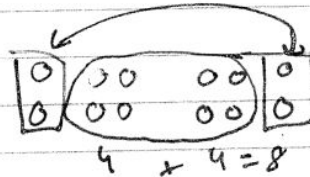


st

d a box.



I see 4, 4, and 1



$2 \times 2 = 4 + 8 = 12$

$4 + 4 = 8$

I see 4, 4, 4



4

Questioning & Justifying through Writing

Developing students art of questioning and justifying skills



Questioning & Justifying through Writing



GoSoapBox





Let's Try It!

◇ Padlet - What is your favorite routine?

<http://bit.ly/padletroutine>





Let's Try It!

 GoSoapBox

 Mrs. Nagatani

Questioning Routine

[Go Back To Moderation Panel](#)

Event Code

166-936-073

Enter this code at

app.gosoapbox.com



Student Work

Nancy Nagatani +31 - 3m

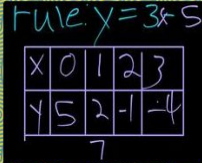
Graphs, Tables, Rules, & Patterns

Write a rule for a table, pattern, or graph you find in your book or on the internet. Add the image and your rule to your post. Then describe what the rule means.

Maisen

$$Y=4x+3$$

x	y
0	3
2	11
4	19
6	27
8	35



Audrey

$$Y=6x+5$$

The 6 represents the growth in the table and the 5 represents the starting point.

x	y
0	5
1	11
2	17
3	23
4	29

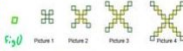
Lucas

$$\text{Rule: } y=3x+7$$



$y=3x+7$
This means that the growth is 3 and the starting point is 0,7

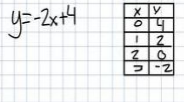
Andrew



$y=4x+4$
This rule means that the growth is 4 and the starting point is 4

Megan

You start out with 4 and the subtract 2



Taylor West

You start off with 14 and subtract 5 every time.



Mia Gillum

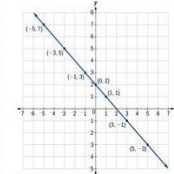
Start with five and add 3 every time.

$y=3x+5$

0	5	→ +3
1	8	
2	11	→ +3
3	14	
4	17	→ +3
5	20	

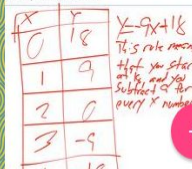
Taylor Weissler

$y=-x+2$
This equation means that your starting point is 2 and you subtract x every time.



Caleb C.

Padlet thing
Oct 9, 2017 at 8:23 AM



Ean

Start at 5 and increase by

Figure Number	Number of Tiles
0	5
1	9
2	13
3	17

$y=4x+5$
Growth SP
-4

Andrew

$$Y=2x-1$$

x	y
0	-1
1	0
2	3
3	8
4	15
5	24

Talan

$$Y=5x+3$$

On this table the starting point is 3 and it's adding 8 every time.

$$y=8x+3$$

x	y
0	3
2	11
4	19
6	27
8	35

+8
+8
+8

Talan

x	y
0	3
1	8

Nancy Nagatani +40 - 1m

What is a real situation when you end up with zero?

Example: I ran 5 yards in my football game, but the referee gave us a 5 yard penalty.

Nathan
I have 10 pens then gave them away.

I had 1.766666666666 cookies then some one ate it all up

I had a red balloon then a clown stole it

Tyrone had 100 boxes of chicken, he fell and dropped them all. How much does poor Tyrone have now

Chaz and Shane had movie tickets and then used them so they had 0

Cruz
I've made 10 figurines out of 5 red clay and 5 blue clay, and ran out of other color clay.

I had \$10 to spend on whatever snacks I want. My total came to \$10 now I have no money.

Matthew
Skype



Reflection & Wrap Up

Discuss, Share, and Next Steps



Routines that Support . . .

1 Number Line Concepts & Number Sense

2 Developing Understanding Over Time

3 Patterns, Patterns, Everywhere!

4 Questioning & Justifying
through Writing





Developing Mathematical Language

- ◇ Students share their ideas and their thinking using the language they have
- ◇ Focus on the math, not just the vocabulary
- ◇ Connect with everyday language
- ◇ Model proper use of vocabulary and clarify misuse





Looking for Multiple Solutions

- ◇ Interact with numbers daily
- ◇ Focus on exploration and number sense, not on memorization and algorithms
- ◇ Look for connections with multiple representations






Reinforcing Growth Mindset Messages

- ◇ Mistakes and challenges grow your brain
- ◇ Speed is not an indicator of knowledge
- ◇ Visualize and make connections
- ◇ Everyone can learn math at high levels
- ◇ Questions & discussions deepen your mathematical understanding





Routines as a Formative Assessment Tool

- ◇ Gauge student understanding and use this understanding to guide routine planning
- ◇ Uncover misunderstandings and provide opportunities to build understanding
- ◇ Introduce concepts in a fun and engaging way, connect these experiences to lessons





Discuss

What ideas do you have for using routines to increase student access to and engagement with mathematics?





Next Steps

- ◇ Identify 1-2 next steps.
- ◇ Write them down.
- ◇ Share them with a partner.





Thank you!

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