1. Access the Resources
   bit.ly/360math

2. Fill out this short survey
   bit.ly/freeCASE

3. Find a spot on the Wall and write:
   - Your Name Up Top
   - List some struggles us math teachers have in the math classroom
"If a child can't learn the way we teach, maybe we should teach the way they learn."

- Ignacio Estrada
360° Math is not a system or a magic wand!
“Absorb what is useful. Discard what is not, Add what is uniquely your own.”
**Building Thinking Classrooms**

1. **Begin w/ a Problem**
   - Give a problem-solving task
   - To start:
     - Problems should be
       - engaging
       - non-curricular
       - collaborative
     - Promote talking
   - Later:
     - Problems can be curricular
     - of textbook problems

2. **Visibly Random Groups**
   - Randomly assigned
   - Playing cards
   - 2 or 3 students / group
   - Sit & stand together

3. **Vertical Non-Permanent Surfaces**
   - Vertical
   - Erasable
   - 1 marker & chalk per group
   - Promotes discussion

4. **Oral Instructions**
   - Give instructions orally
   - Short expressions
   - Diagrams

5. **Defront the Room**
   - Desks
   - Orient in various directions
   - Pull away from wall
   - (room to stand @ VIPS)
   - Teacher addresses the class from a variety of locations

6. **Answering Questions**
   - Acknowledge but don’t answer:
     - Proximity questions (we teacher is close)
     - Stop thinking questions
   - Answer:
     - Keep thinking questions
     - Give HINTS not answers

7. **Build Autonomy**
   - model how groups can visit other groups when they are stuck or done
   - Hints & extensions come from peers (not just the teacher)

8. **Hints & Extensions**
   - Manage flow
   - More groups / solutions
   - Debrief directly teaching the “lesson”

9. **Level to the Bottom**
   - Once all groups pass a minimum threshold
   - Work through a new problem with whole group

10. **Student Notes**
    - Student created:
      - Select
      - Synthesize
      - Reorganize
    - Provide time for this after leveling

11. **Assessment**
    - Process → Product
    - Group work + Individual work
    - Student learning
      - Where are they?
      - Where are they going?
COMPANION GUIDE - CLICK HERE!

CUE Rock Star Companion:
360° Degree Math: a Classroom REvolution

Ed Campos Jr
Today’s Plan

360° MATH
Dan Meyer:

Math class needs a makeover

TEDxNYED · 11:39 · Filmed Mar 2010

32 subtitle languages
View interactive transcript
"THE PD AND THE BOOK AREN'T THE PROBLEM, THE ROOM IS THE PROBLEM!" - JON CORIPPO
"In some classes, it looks like a TeachersPayTeachers website threw up all over the walls."

-Anonymous
A reader asked me what classroom technology she should purchase with $1,000. My response:

I’d install whiteboards on every vertical surface in the room. I’d make sure I had a good document camera. And I’d probably purchase video capture equipment, a hard drive, and a microphone so I could record my lessons. That’ll probably get you close to $1,000.
ARE YOU READY?
1. Describe how the pattern is growing (where do you see the growth?)
2. Draw the 1st, 2nd, 3rd, and 4th shape
3. How many orange squares will be in the 43rd step? (be prepared to share your reasoning for this answer)
4. How many squares would there be in the n\textsuperscript{th} step?
5. Draw the figure in step 0
6. What other ways can you represent this pattern?
Click on a pattern to see a larger image and the answer to step 43. **What is the equation?**
Be a MATH DOER with DUDAMATH

DUDAMATH is an integrated environment for interactive exploration of mathematical concepts and problem solving.

Get Started
1. Describe how the pattern is growing (where do you see the growth? 
2. Draw the 1st, 2nd, 3rd, and 4th shape
3. How many orange squares will be in the 43rd step? 
   (be prepared to share your reasoning for this answer)
4. How many squares would there be in the n\textsuperscript{th} step?
5. Draw the figure in step 0
Create 5 fractions using the whole numbers 0 through 9, exactly one time each as numerators and denominators, and place them all on a number line.
Using ONLY the numbers 1-4, No more than one time each, Make the largest possible product

Then draw an array that represents this product
What is problem asking?

Solve it visually

(Insert Q or word here)

Transition

Numberless Problems

Solve problem another way

Write a sentence explaining answer
Numberless Problems

Molly is a zookeeper. She has some hungry monkeys.

Molly is a zookeeper. She has some hungry monkeys and some bananas.

Molly is a zookeeper. She has some hungry monkeys and 24 bananas.

Molly is a zookeeper. She has some hungry monkeys and 24 bananas, and each monkey needs 4 bananas.

What questions might we answer?

How did your thinking about the problem evolve after each prompt?
With your partners, discuss the following two questions

- How does the Numberless Problem open the problem up for deeper thinking?

- In what ways did the Numberless Problem allow for each of the elements of literacy to come to light?

Solution: $? \times 4 = 24$

Students might draw on the remembered product $6 \times 4 = 24$ to say that the related quotient is 6. Alternatively, they might draw on other known products—for example, if $5 \times 4 = 20$ is known, then since $20 + 4 = 24$, one more group of 4 will give the desired factor $(5 + 1 = 6)$. Or, knowing that $3 \times 4 = 12$ and $12 + 12 = 24$, students might reason that the desired factor is $3 + 3 = 6$. Any of these methods (or others) might be supported by a representational drawing that shows the equal groups in the situation.

With your partners, discuss the following question

- How does the Numberless Problem provide opportunities for multiple solution techniques to be accessed?
Create A Numberless Problem

Examples: Multi-Step Percent Problems

1. A sweater is marked down 30%. The original price was $37.50. What is the price of the sweater after it is marked down?

A template for your own Numberless Problem is here goo.gl/0oBIa2

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A store has a sweater. The sweater is marked down. The mark down is 30% off.

A store has a sweater. The sweater is marked down. The mark down is 30% off and the sweater costs $37.50 without the mark down.

A template for your own Numberless Problem is here goo.gl/0oBl2

If you’re following along with slide deck, click the question mark for more help.
1. Take a Picture of your Pattern work

2. Erase Your Pattern Work

3. Write Down Your Thoughts about this experience
   - Student Lens
   - Teacher Lens
The 8 Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Express regularity in repeated reasoning.
| **Pros** |
|------------------|------------------|
| Healthier        | Expo Markers and |
| Everyone On Task | Cheating?         |
| Faster           | Don't be a 1 trick|
| More discussion  | pony             |
| Organic collaboration | Chaotic     |
| Perseverance     | Loud             |
| More questions asked |             |
| Take more risks  |                 |
| Share out more   |                 |
| Brings out artistic side |          |

| **Cons** |
|------------------|------------------|
|                 |                 |
|                 |                 |

A teaching method based on the idea how the human brain works and how we learn most effectively. It includes a rich sensory learning, a positive expectation of success and the use of a varied range of methods like dramatised texts, music, active participation in songs and games, etc.
Help students **work together** to make sense of mathematics

1. What **strategy** did you use?
2. Do you **agree**?
3. Do you **disagree**?
4. Would you **ask the rest of the class** that question?
5. Could you **share your method** with the class?
6. What part of what he said do you **understand**?
7. Would someone like to **share ___**?
8. Can someone **retell or restate** [student]'s explanation?
9. Did you **work together**? In what way?
10. Would anyone like to **add to what was said**?
11. Have you **discussed** this with your group? With others?
12. Did anyone get a **different answer**?
13. **Where** would you go for help?
14. Did **everybody get a fair chance** to talk, use the manipulatives, or be the recorder?
STRATEGIES FOR MANAGEMENT
CLASSROOM REDESIGN: #STRAIGHTOUTTACAMPOS

November 13, 2015 · by Ed Campos Jr · Bookmark the permalink.
MIDDLE SCHOOL 360 IN ACTION!
edcamposjr

18 likes

edcamposjr Typical day in room 303 at @vcisonline #360DegreeMath #mathchat #MTBoS

zenreignssupreme Dood, we've got the same room number

edcamposjr @zenreignssupreme no way, brotha from anotha mothah
Mr. Garcia's class up and moving after lunch with #360math!
#CUSDrockstar
appeducationfox, alisha_montoya, stevens009, megustuestilo, ls_karl, remindhq, sweetymrs.d and dani_g199 like this

edcamosjr #360Math #ClassroomCribs #MathClassNeedsAMakeover

ls_karl Love it!

reubenhoffman So cool. I did some whiteboard walls and tables. More to come.

edcamosjr @reubenhoffman what paint did you use? I wanna paint these
Check out the full blog post at

bit.ly/360mathpost
edcamposjr The Expo Tower is re-stocked & ready for the semester battle against Fixed Mindsets in Mathematics #Locked&Loaded #FullClip #ExpoTower #WonderWalls & #DynamicDesks

achamalbide U need a hashtag intervention!!
Classroom Cribs(Room 303)

Click here to enter a description for this album

84 photos • 3 videos

By: Joe Eagle
WHAT DO THE STUDENTS THINK?

**STUDENTS**

Do you have math anxiety? (45 responses)

- Yes: 66.7%
- No: 33.3%

**ADULTS**

Do you have math anxiety?

- Yes: 30.4%
- No: 69.6%
If you like using the whiteboards, please describe what you like about it or why you like using them. If you do not like using them, please describe why you don’t like them.

(50 responses)

I like them because we can learn math on them and have fun maybe art too.

I like it because it brings a new element to learning math. Not only can I check to see if I’m correct, I can also get help from my peers and from the teacher much more quickly.

I like them because if I made a mistake it is easier to erase. Also, I like them because if I need help I can ask someone and they can show me an example.

I like using the whiteboards because when I am mad at something the teacher said, oh were gonna do 360 math and I get happy.

I like them because you can be creative with them and do art with them.

I love using the Whiteboards because it is more easy than paper and I can get help easier.

I like them because it helps us and it’s more cool to use them also I like when we see everyone’s drawings.

I like using them is because it feels less stressful and it makes you succeed.

I like using the whiteboards because I like it when Ms. Camisa puts a question and we all answer it.

I do like using like using the whiteboard because it helps me and there funner than a paper.

I like using the whiteboards because you can get more help from someone standing next to you than at your desk. Also, using a whiteboard is easier to erase than a piece of paper.

I like using the whiteboards because I feel more comfortable when I’m standing. I feel more comfortable when I’m next to my friends and I don’t feel awkward/weird.

I love using the whiteboards because I get to collaborate with other students in my class. I also love when we do the gallery walks on our whiteboards because I can see the different strategies my classmates use and different ways I could have solved the problem my teacher gives me.

I like using the whiteboard because it makes me stretch and makes my mind feel good.

I like using the whiteboards in class because its better to be around people who we know can really help us and know that after we do a gallery walk is even better cause we get to see what we did wrong in our work.

I like using the whiteboard because I can put my ideas on the whiteboard and the gallery walk is fun because I can see how others do their work.

I like the whiteboards around the room because it gives us more of a connection point for us to see all for our peers work and easily be observed around the room. I also like the whiteboards because sometimes I get bored at just sitting at our seats and it’s nice to get up and stand so we could stretch while doing our work.

so you can erase faster on the whiteboard than a paper

I like using the whiteboards because it gives us a time to stand up. Its also creative! I have never seen anything like it, and it’s innovative.

I like using them because it gives us a chance to stretch it also lets you get a chance to talk to your peers.

I like them because their cool. It makes math more fun for us. Also you get partnered up while using them. Thank You donner! :)}
I sent my students a Google form survey about #360Math, they had incredible things to say! @edcampOSjr @LindseyBlass1 @jpspeng @DonorsChoose

- Do you like using the whiteboards around the room? (50 responses)
  - Yes: 94%
  - Not really: 5%
  - Don't like: 1%

- Does using the whiteboards make it easier for you to get help from peers when you're struggling? (50 responses)
  - Yes: 94%
  - Not really: 5%
  - No: 1%

- Do you like seeing how other people solved a problem during gallery walks around the room? (50 responses)
  - Yes: 94%
  - Not really: 5%
  - Don't like: 1%

- Do you prefer using the whiteboards while standing, or working at your desk while sitting? (50 responses)
  - Standing: 43 (86%)
  - Sitting: 9 (18%)
IPAD AND AIRPLAY/AIRSERVER TO KEEP YOU MOBILE!
INTERACTIVE WHITEBOARD APPS

- Doceri
- educreations
- StagePro
- Explain Everything
GO MOBILE!
$V = \pi r^2 h = (36\pi)(10) = 360\pi$

$r = 6 \quad h = 10$

$A = \pi r^2$
$A = \pi (6^2)$
$A = 36\pi$
AirServer

7-day trial
Free

Fully featured version. Internet access required for operation.

Educational License
$7.99 - $11.99

For students, teachers and educational institutes. Authentic educational email address required.

DOWNLOAD FOR FREE

BUY NOW
Tech Integration
COLLABORATIVE GOOGLE DRIVE FOLDER
Stop, Collaborate, and Listen
Music Cues

Class is Better with Music
Check For Understanding
LET'S GET READY TO RUMBLE
Install Google Drive app for iOS or Android and then use your browser to access this shared folder:

Then click ‘Open in Drive’ to access this folder in the Google Drive app.
Oh God, That's alot of stuff
The Math Scramble

- Lots of content to review
- 4 person teams
- 1 person presenting at all times
- CHOOSE a problem you can do & explain
- Coach & assist team members
  - Critique reasoning
- 1 mulligan (teacher will do problem)
Peer Review Google Form
Implementation

Low Budget
Implementation

GoWrite!
GoWrite! 5442 Dry Erase Poster Board, 12 Point, 0.69" Height, 22.5" Width, 28.5" Length, Premium White (Pack of 25)

Price: $72.96 ($2.92 / Board) Prime

Only 5 left in stock (more on the way).
Want it tomorrow, April 18. Order within 9 hrs 58 mins and choose One-Day Shipping at checkout. Details
Ships from and sold by Amazon.com.

3M
2 X 3M Whiteboard Eraser for Whiteboa

Price: $12.47 Prime | FREE Same-Day
Delivered today for FREE with qualifying orders over $35.

Note: Available at a lower price from other sellers, potentially w

Only 13 left in stock - order soon.
Get it TODAY, May 8. Order within 1 hr 2 mins and choose Same Day Shipping at checkout. Details
Sold by BestSource Office Supplies and Fulfilled by Amazon.

Size: 2 x 2 Pack

New (2) from $12.24 & FREE shipping.

Report incorrect product information.
Implementation
Implementation

High End Budget
Multi-Device Display Setup for your #Classroom Cribs

Click on Images for Links to products

There’s lots of room for activities making student’s thinking visible with this setup!

Just a iPad document stand

Logitech Harmony Remote

1 touch Input Programming!

Dual Display Laptop
Dual 1 iPad/Apple TV R
Chromecast L & Chromecast R
Chromecast L & Laptop Right
Apple TV L & Laptop Right
Apple TV L & Chromecast R
Apple TV L & Chromecast R
Google Cast for Education
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<td>Writey Board (4 x 8 adhesives)</td>
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<tr>
<td>iPad Stand</td>
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WOULD YOU RATHER?
What is problem asking?

Solve it visually

Start here

Transition

Numberless Problems
Numberless Problems

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