

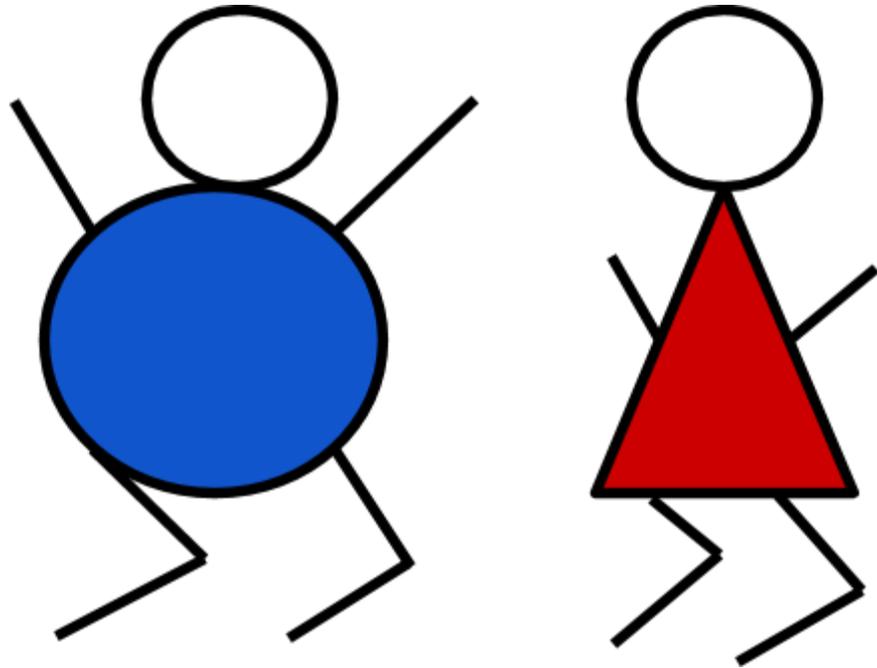
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Approximately 100 Ways

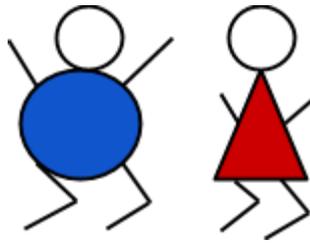
to get your students engaged in mathematics!!!

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RONCALLI

THE LIFE PREP SCHOOL



GENERAL

LET'S MAKE A DEAL DAY

At random, I will pick a day and do a supply check (usually 5 items for 5 points). Ask students to show you their compass, book, paper, pencil, ruler, grading pen, protractor, calculator, binder, notebook or whatever other items you require students to have every day for class.

BEACH BALL ANSWERS

Use a beach ball or balloon when going over homework. Someone serves, spell out "calculus" or "algebra" "math" with each hit. Last person must answer the next homework question.

FAMOUS MATHEMATICIANS

After I teach a subject that is named after or discovered by a notable mathematician, I tell students to stand in groups of 3 or 4. Their group must come up with another famous mathematician before they sit down.

CELEBRATE THE STRUGGLE/SUCCESS

After students have really worked diligently on a problem or problem set that was difficult, one way I make them celebrate is to pick the tallest kid in the class. He or she stands and holds his hand as high as possible and everyone has to jump and give him a high five. (or do low five).

CLOSURE

After a lecture, have everyone stand. Then the first person in each row turn to tell the person behind them one thing they learned today in class. Then next person turns and tell the person behind her, etc. Last person walk to front and tell the first person.

GO OVER HOMEWORK

Ask students which problems that caused them trouble from last night's homework. Then ask for different students to put these problems up on the board.

SWITCH SEATS

If student are really just too quiet, I move them for the day. For example everyone move 3 seats to the left and 1 back". Wait was that just a translation???

MEMORY MARCH

March around the room repeating facts that must be memorized. I always do an odd number of things so that they can give a little kick at the end. "3 point 1 4 1 5 9, 3 point 1 4 1 5 9, 3 point 1 4 1 5 9" or "2 point 7 1 8 2 8, 2 point 7 1 8 2 8, 2 point 7 1 8 2 8" or "x intercept let y be zero".

GOING OVER HOMEWORK

Assign each row 2-3 problems to put on the board. Whoever writes them on board is finished, the rest in that row have to explain their row's assigned problems.

CLAPPING

When someone has explained a problem to us, I usually ask my class to clap for that person. This got pretty mundane. So now we clap in patterns to keep everyone alert. For example I will say "3 claps" or "clap,clap,stomp" or "clap clap clap stomp snap" or "clap clap Whoop whoop". I know this is silly but it is fun! Then one time during Christmas we clap Christmas carols. Hilarious.

FLY-SWATTER

Give 2 students a problem to solve. Have several answers written randomly all over the blackboard. Solve the problem and then find the answer and swat it. May be used with solving 1, 2, or multi-step algebra problems, geometry definitions, special triangles, exact trigonometric values, etc.

AROUND THE WORLD

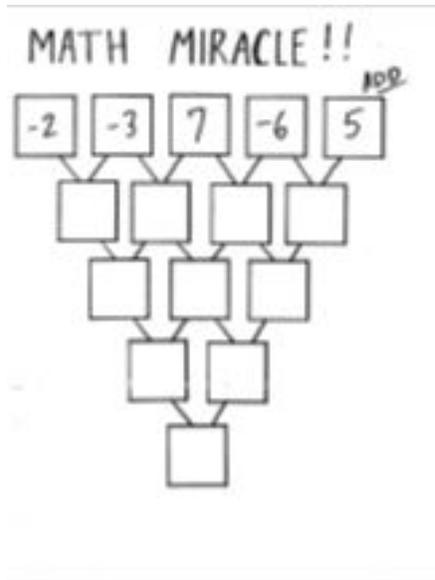
The first 2 students in row one stand next to each other and I shout out something like "5 times 4" and whoever shouts "20" first gets to move on to the next person in that row. Keep it moving fast. I offer bonus if they can beat 5 kids. When someone loses have them sit in the seat where defeated. I do this with precalc students to wake them up and then add powers, roots, , etc.

HOMEWORK ROUND-UP

Count off students in 1, 2, 3, 4, 5's for groups. Have students move to stations, where answers to homework problems 1 – 5 are at first station, 6 – 10 at next station, etc. Make sure students bring a grading/correcting pen and prepare to chat about errors.

MATH MIRACLE

Hand this sheet upside down to students in first row.



When teacher says “go!” they fill out one row and pass back to the next person fills in a row, etc. Last person in row fills out the rest to get the answer, runs the paper up to teacher. (Everyone is adding 2 numbers above) Go fast but be correct! Do this with multiplication as well.

BASKETBALL REVIEW

Grab a nerf ball or use paper wads from recycle and the trash can against a wall. Tape a 2 pt or 3 pt line. Split students up into teams or just use boys vs. girls. One student from each team comes to board to answer a review question. If correct get to shoot ball into a trash can from 2 or 3 point line. (or if first to get correct answer, she gets to shoot twice)

BOARD RACE REVIEW

Randomly number students in the room so that you have 2- 1's, 2- 2's, 2- 3's, etc. Put a math problem on the middle of the whiteboard. Call out 5's and then the 2 people who are 5's race to board to work the problem. I sometimes grade this as a 5 point assignment – if they are correct they get 5, if they are first they get 6 points and if they get it incorrect but remembered they were number 5 they get 3 points!

RELAY RACE REVIEW

Use teams of 4 for this one. Put 4 problems on a card, numbered 1 - 4 (need 5-9 cards the same depending on number of students in the class. I just use a 8 ½ x 11 so that I can copy on machine.) “Go!” means first person grabs the card and works out #1 problem. I usually have them go to the board. When finished they pass the card to next member of group, and so on. Award points for 1 correct, 2 correct, etc. and move to the next card.

CHAIRMAN OF THE BOARD

This is a review of skills board race game where students are placed at the board in prearranged sets of two. Stronger students start at the back of the board. Each pair race each other. The winner moves up and the loser moves back. At the end of the time, the winner in spot 1 at the front is the Chairman of the Board.

I DO, WE DO, YOU DO

I model a skill or set of problems. Then we play “dumb teacher” and the students tell me all the steps. Then all the students go to the board and demonstrate the skill.

LEGO DANCE

We do a 15 second Lego dance before a quiz to knock out the jitters.

JERICHO

If we have been sitting or taking notes too long, we will walk around the room reciting a math memory statement to re-energize.

BASIC BOARD RACES

The class is split into teams and each takes turns going to the board. Points are awarded and the winning team gets candy.

WHO'S NEXT?

Pick a student to share the first answer from the homework by tossing a ball or stuffed animal (or my choice, a small Hoberman sphere) to him, then the student tosses the ball to the next student who will share.

REVOLVING SEATING CHARTS

Research shows simply receiving information from a different angle allows students to process it more readily; create new seating charts on a weekly basis.

BOARD RACE SYSTEM STYLE

The class is split into teams of 4 and they line up facing the board. A card with 4 problems is placed at the board and one at a time they run to the board, work the problem, and hustle back. The next person in line either corrects the previous problem or works the next problem. All must be correct and finished to win.

WHITEBOARD TEAMS

The class is split into teams. Each team gets a white board and marker. The teacher picks a spokesperson for each team. Once the problem is announced, the team works together but the answer must be submitted by the spokesperson. I usually pick the most quiet kids to be the spokesperson.

ROSARY PRAYER

During Lent, the class will pray the Sorrowful Mysteries of the Most Holy Rosary. Students are selected on a rotating basis to come forward to lead the prayers.

MENTAL MOVING AGENDA

Besides just establishing a classroom of physical movement, in low level classes, I try to plan my daily agenda with mental movement so that the brain must stay focused and shift from activity to activity. For these struggling students, it helps keep them on task and makes the time pass quickly.

SCAVENGER HUNT

Problems are numbered according to their answers and placed throughout the room on the walls. The students are then individually assigned a specific problem. The answer leads them to the next problem somewhere in the room.

THUMBS UP/THUMBS DOWN

Quick formative check to see if students agree or disagree with an answer or to gauge comprehension of a concept.

LET THE STRESS OUT

On high energy or stressful days, have the students stand up and, on the count of three, let out their stress – yell, wave their arms, get silly – with the understanding they watch the teacher for a cut off.

MUSICAL CHAIRS

You know the drill!

BRAIN BREAKS

Have a student pick an action from a jar of popsicle sticks (jumping jacks, run in place, air guitar, drum solo, etc.) and lead the class in moving.

PAIR AND SHARE WITH CARDS

Have students pick a card from a partial deck (must know the number of students ahead of time) then find their matches.

REGGIE REVIEW

This is a basketball review game where players are in a board race. The winner gets a point and a shot at a three-point basket from behind the podium.

BASEBALL

The class is divided into teams and a baseball field is formed using the four corners of the room. When a team is in the field, the player of record is the pitcher and if they win the board race, then an out is recorded. If the offensive team wins, then a number cube is rolled to determine the outcome:

- 1 - single and any runners advance one base
- 2 - double and any runners advance two bases
- 3 - triple and any runners advance three bases
- 4 - walk
- 5 - single and all runners advance two bases
- 6 - home run

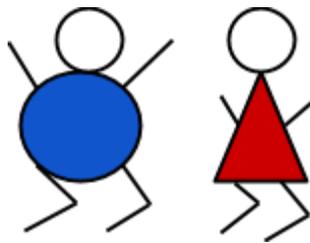
FOOTBALL

The class is divided into teams and a football field is drawn in the board. With each win on the board, the winner rolls a number cube.

- 1 - 10 yard gain
- 2 - 20 yard gain
- 3 - 30 yard gain
- 4 - 40 yard gain
- 5 - field goal
- 6 - touchdown

WORKSHEET ROTATE

Students are scattered about the room and a rotation established. A review worksheet is handed out. All students work number 1 and then rotate. They check the previous problem and then work the next. Then rotate.



PRECALCULUS/TRIGONOMETRY

X-INTERCEPTS

Students use left arm as x-axis and right hand make a parabola. Then they show me how to situate the parabola and the x-axis with no x-intercepts, 1 x-intercept and 2 x-intercepts

CONIC SECTION ACTS

Students are placed into groups of 3 – 4. Each group must “act out” their graph of conic sections. For parabolas, someone might be the directrix, parabola, or focus (with a head or fist). Two people can hold hands to make an ellipse and one person put fists for the focal points. etc.

CONIC SECTION EQUATIONS

Put different conic equations on the board. Have students use their arms, legs, or friends to make the shapes of either a parabola, circle, ellipse or hyperbola.

GRAPHING POLAR POINTS

This is like a cheerleader move. When practicing plotting points, have students stand. For

$\left[3, \frac{\pi}{4}\right]$, they must take three small steps right and then rotate their arm (right or left)

counterclockwise from standard position. For $\left[-2, -\frac{3\pi}{2}\right]$ students must take 2 steps left and rotate their arm clockwise. Etc.

BEARING PRACTICE

Everyone stands and faces north (I usually say “face downtown” for us south-siders). Ask everyone to turn (and I usually write this on the board) $W 45^\circ N$ and then $E 30^\circ S$, etc.

TRIG GRAPHS WITH MATH BUDDIES

Have students stand with their math buddies. In order to review the graphs of the 6 different trig functions, ask students to work as a team and use their arms to display the graphs of $y = \sin x$, $\cos x$, $\sec x$, $\csc x$. For $y = \tan x$ and $y = \cot x$ one person is the axes.

TRIG VALUES

Everyone stand. Using a pointer, I point to individuals for the sin, cos, tan of exact values that should be memorized. Must be quick response or remain standing.

INVERSES

Make students show the graphs with their arms, then show with their arms what the graph of the inverse looks like.

GROUP GRAPHING - GROWTH/DECAY

Have math buddies find a set of other buddies for a 4-some. Have 1 person be the x-y axis, one be the asymptote, one be the equation graphed and last person put a fist at intercepts.

PARENT FUNCTION DANCE

Play the music only to Sugar Hill Gang's "Jump on It" (or something else). But, say " x^2 , square root, absolute value." I tell them $y =$ is understood. Add trig functions later!!
FUNNY!!

NON-RIGID TRANSFORMATION OF PARENT FUNCTIONS

Have every student make the shape of a parabola with their arms. Then tell them "I am now going to horizontally shrink you." Make sure their arms move to a skinnier parabola. Follow this with horizontal stretch, vertical stretch and shrink.

PARALLEL, PERPENDICULAR, or NEITHER

Write equations of pairs of lines on the board or in notes. Ask the students to first think if the lines are parallel, perpendicular, or neither. Then respond at the same time with 2 arms straight up (parallel) or form a "T" for perpendicular, or wave off for a neither. Follow with asking students why before moving on to the next problem.

INTRO TO $Y = \sin/\cos X$

As soon as students graph these for the first time I ask them to take their arm and model the "wave" like riding a roller coaster, or what a tail of a squirrel looks like when jumping or what the girls did in the movie "Clueless" for 'rollin with the homies'.

ODD, EVEN OR NEITHER

Draw pictures of graphs on notes or on board. With their arms, students make an O for Odd, with arms and a leg make an E for Even, and wave off if neither. Students answer the question all at the same time. After each make sure to call on someone to say why with the correct definition.

ARM ANGLES

Have students stand with a math buddy. Have one person put his math buddy's arms in standard position for angles on a unit circle. Then make him move his buddy's arms to an angle. Then try negative angles. Then have math buddies switch positions. Do this for Radians and Revolutions as well.

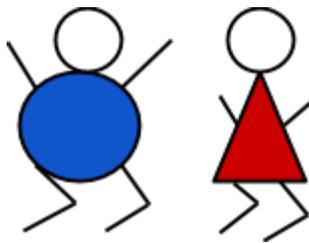
ROTATING ANGLES

Have all students turn their desks 90° clockwise. Then turn 30° counterclockwise, etc.

BEAUTIFUL DANCE MOVES

Need I say more??





PROBABILITY AND STATISTICS

ROCK PAPER, SCISSORS

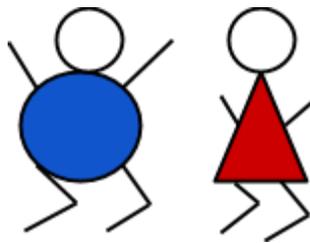
Have a tournament with the old R,P,S game. Play best of 5 for fun and drama. Discuss strategies about guessing other's throws, thinking quickly, why so-and-so was the winner, etc.

EMPIRICAL RULE – 68, 95, 99.7

These percentages must be memorized: Everyone stands. I point to a person they say 68, next says 95 and next says 99.7. They get to sit if correct. Do this fast so they pay attention to others and keep saying them to themselves.

HEADS OR TAILS

Have all students stand up. Either put their hands on their head or their tail. Flip a coin. Losers take a seat. Winners keep standing. Keep flipping until a winner is determined (candy? bonus? free hw?). Students will monitor themselves. May follow up with how many rounds it took with n people for a winner, etc.



GEOMETRY

RUN TO....

Everyone stands. Students will move somewhere in the room. I say, “Everyone - go run to a right triangle” or “find parallel lines”. No overlaps!!

QUADRILATERAL CHARACTERISTICS

Students are in groups of 4 or 5. Each member stands and must announce a different characteristic of rectangle, like opposite sides parallel, opposite sides congruent, 4 right angles, etc. Do this for special triangles as well.

CLASS ANGLES

The entire class works together to form linear pairs, vertical angles, complementary angles, etc.

GROUP TRIANGLES

Put students in groups of 3 or four. As a team, make them form (with their arms) obtuse, right, isosceles, scalene, etc. triangles.

HOW HIGH IS THAT TREE?

This is a geometry outdoor activity where the students are placed in groups and are given a tree, light pole, or flagpole to evaluate. They must evaluate the height of the object 5 different ways and write an analysis of their findings.

OUTDOOR TRANSVERSALS

This is a geometry activity where we go out to the parking lot and use a chalk line string to create transversals and angles. Students are then asked to stand in different sets of angles.

REFLECTIONS

Have students pair up and choose one to lead; the other will follow. The follower will “reflect” the leader’s movements. After a few minutes, switch.

SHOW ME

Students demonstrate parallel and perpendicular lines, acute, obtuse, right, and straight angles, etc., using their hands and arms.

TRANSLATION

Students demonstrate the translation of a figure by moving the appropriate number of steps in the appropriate direction.

ROTATION

Students demonstrate basic rotations (90° clockwise, 270° counterclockwise) by starting at the origin (facing straight ahead) and hopping (turning) to the correct new position.

ACROSS THE RIVER

This is an outdoor geometry activity where we find the distance across the river using congruent triangles.

POSTER MAKING

We make posters of major lists and classifications such as the 7 different kinds of triangles, the Complex Number System, etc.

GEOMETRY PROOF PUZZLE STATIONS

Students are placed in groups and rotate through different geometry proof puzzle stations.

ORANGE SLICE

The students are placed in groups and they slice oranges, hot dogs, and other objects at different angles to help visualize cross sections.

ORIGAMI CUBES

The students are placed in groups and given instructions for an origami cube fold. They must help each other with the instructions and folds.

CALL AND RESPONSE

AKA as “stomp and clap”. Vary the cadence and speed; allow students to lead.

DANCE AND GLIDE

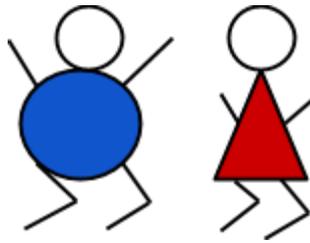
Similar to “stomp and clap”. Again, let students lead.

FLASH ME AN ANSWER

Students show with their fingers the answer to a problem, the number of segments in a diagram, the number of solutions to an equation, etc.

PICTIONARY

Divide students into groups and have them play the classic game with math terms, geometric figures, etc.



ALGEBRA

HUMAN EQUATIONS

Students are given cards that are a number, a variable, or an operation symbol and they must construct a true equation using each other.

STADIUM OBJECTS

We take the class outside and time dropped objects to validate the quadratic form for moving objects.

PLACE VALUE LIVING NUMBERS

My low level algebra students were struggling with the concept of place value so I made them take the place of place value. They were divided up into groups and each given a different digit. I then read a number or stated a place value and the had to go stand and form the situation. (become the number)

QUADRATIC REVIEW VIDEO

Make a video summary of all the rules and aspects of quadratics and their graphs.
“Quadratics are awesome, quadratics are cool, quadratics are awesome, we learn them in school.”

OUTDOOR ELLIPSE

This is an Algebra 2 activity where we go outside and sketch an ellipse using chalk and string and take measurements and check for accuracy.

THE SLOPE SONG

Difference of Y
Over
Difference of X
Equals
Slope, Slope, Slope

ALGEBRA PROOF PUZZLE STATIONS

Students are placed in groups and rotate through different algebra proof puzzle stations.

CHANGE SEATS USING SLOPE

Announce a seating change in the middle of class by telling students to move using a particular slope of a line (e.g. “switch seats using a slope of $2/3$ ”).

POLYNOMIAL DANCE/END BEHAVIOR

Students model their understanding of end behavior of polynomial functions by demonstrating with their arms the graphs for positive even, positive odd, negative even, and negative odd functions. Square root and cube root functions can be added.

COORDINATE MATH

Mark a coordinate plane on the floor with masking tape, then have the students act as points. Plot points, lines, curves, etc.

FIELD TRIP

Arrange to switch rooms with a colleague at a pre-determined time in class. Students pick up their belongings and move to a new space.

PASS THE GRAPH

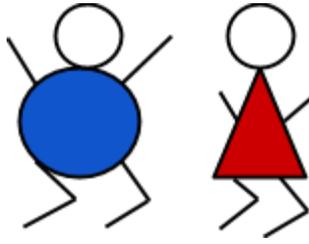
Put students into groups of 3 or 4 and move them with their group. On heavy paper (I use old manila folders) I draw graphs of trig equations translated and ask the group to write the equation (on a template I have made). Number the graphs 1 – 10 etc. Give students 1-2 minutes – using a timer is fun – then pass the graph. This will work for equations for lines, conics, parent functions, etc.

ORDER OF OPERATIONS

Teach/practice with students to make (with arms) a plus sign, minus sign, times sign, divide sign, parenthesis for grouping, and fist for powers or exponents. Put an expression on the board and ask everyone to show me what comes first, next, etc.

AXES

Show me with your arms a horizontal line, vertical line, x-axis, y-axis. Then add positive/negative slope.



CONTACT INFORMATION

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