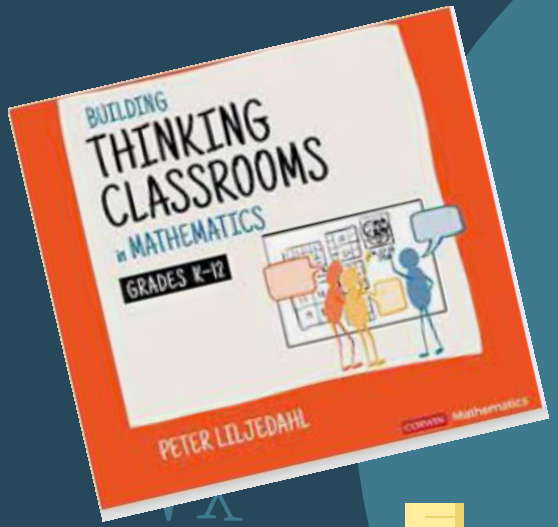
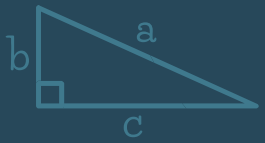


Building a Thinking Classroom in Mathematics

2+2=4

42:9

x



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Launch

2+

How many?

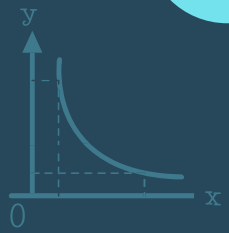
How do you know?

01 Building a Thinking Classroom in Mathematics

02 3 act task

03 Classroom Activity

04 Time to explore



2+2=4

42:9

x

01 Section

Building a Thinking Classroom in Mathematics

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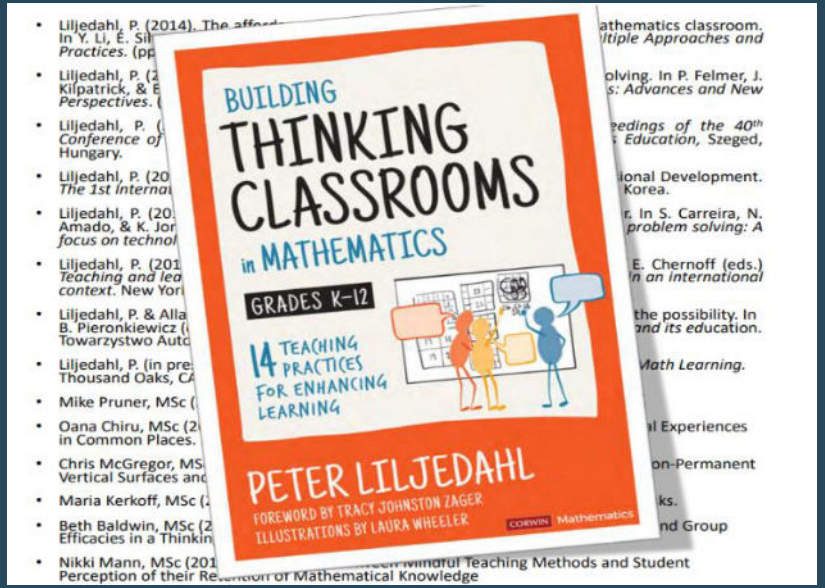
2+2=4

$\sqrt[n]{x}$

x/2y



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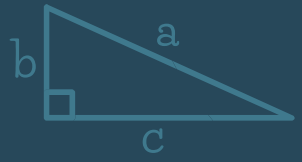


BUILDING THINKING CLASSROOMS

Research: @pgliljedahl

Sketchnote: @wheeler_laura

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
eg textbook problems

② Visibly Random Groups

- ☐ Randomly assigned eg playing cards
- ☐ Daily & in front of students
- ☐ 2 or 3 students / group

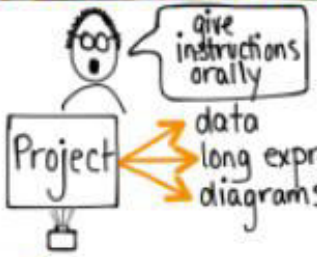
- ☐ Sit & stand together

③ Vertical Non-Permanent Surfaces

- ☐ Vertical
- ☐ Erasable

- ☐ 1 marker or chalk per group
  ↳ promotes discussion

④ Oral Instructions

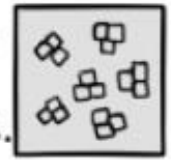


→ groups will discuss (instead of decoding text)

⑤ Defront the room

Desks → orient in various directions
pull away from wall (room to stand @ VNPS)

Teacher addresses the class from a variety of locations.

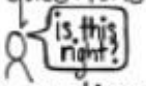


⑥ Answering Questions

Acknowledge, but don't answer:

✗ Proximity questions (b/c teacher is close by)

✗ Stop thinking questions



Answer:

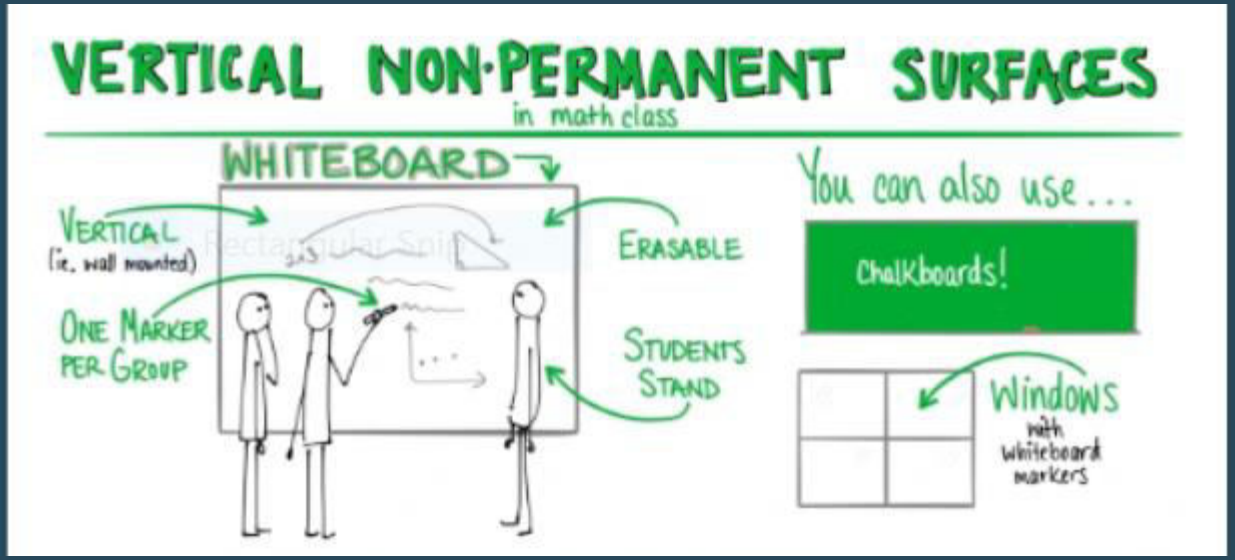
✓ Keep thinking questions
↳ give HINTS not answers

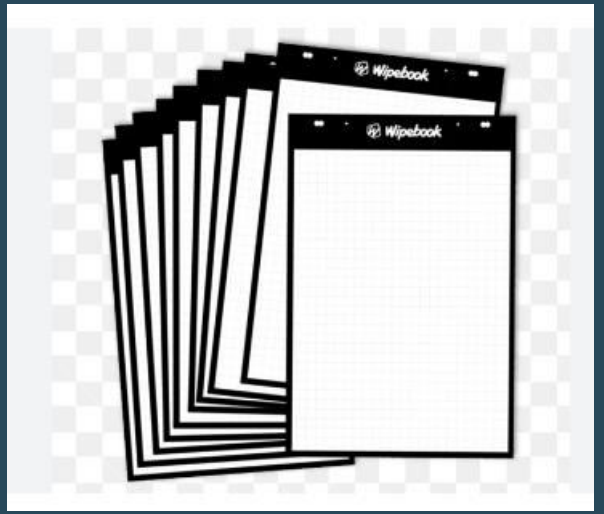
⑦ Build Autonomy

- ☐ Model how groups can visit other groups when they are stuck or done.
- ☐ Hints & extensions come from peers (not just the teacher).

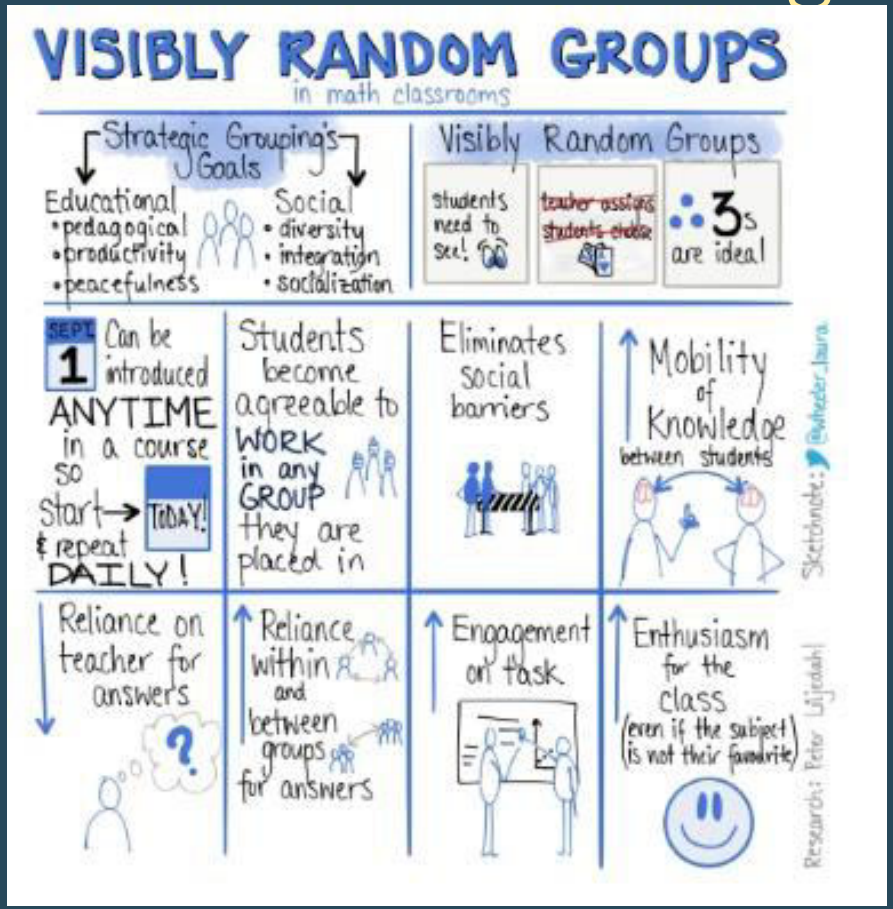
→ Helps manage flow

Where should students write?





How should I determine the groups?



- use thinking tasks
- use vertical non-permanent surfaces
- frequently form visibly random groups
- give task early, standing, and verbally
- defront the classroom
- answer only keep thinking questions
- be intentional less helpful
- use hints and extensions to manage

02 Section

3 act task

Engaging way to push for collaborative problem-solving that disrupts the traditional “I do, we do, you do” instructional model

Act 1
You do

Notice & wonder
Predict the question
Estimate

Act 2
Y’all do

Predict the info needed
Collaborative groups

Act 3
We do

Select and sequence with class discussion
The big reveal

Act 1: Engage and Perplex

- Provides a visual- either a photo or video- to hook the viewer into the task
- Sparks curiosity
- Provokes questions
- Students “Notice” and “Wonder”
- Students define the question (Possibly with teacher guidance)

2+2=4

+

x

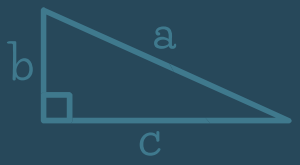
$\sqrt[n]{x}$

Whoppers

What do you notice?
What do you wonder?

Main Question: How many whoppers are in the jar?

What information do you need to answer the main question?



Act 2

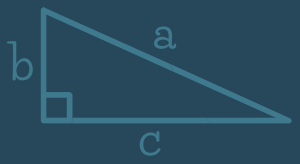
Main question: How many whoppers are in the jar?

Act 2: Seek information and Solutions

How many whoppers are in the jar?

What is an unreasonable estimate for this problem?

What estimate is too high?
What estimate is too low?



Students “do some work”

- Students will work independently, in pairs, and/or in small groups
- The teacher observes students as they work and offers support as needed
- The teacher also is considering how they will facilitate the debrief (this requires consideration of solutions, strategies, and questions they will ask)

Act 2

Main question: How many whoppers are in the jar?

Act 3: The reveal!

- The teacher facilitates a discussion based around the solutions and strategies - students should do most of the talking
- Once students have come to a version of consensus (depending on the specific 3 Act Task) the teacher will reveal “the answer”

Whoppers reveal

3 Act Tasks

-take some time to explore these tasks
-which unit would these fit with?
-examples

2+2=4

42:9

x

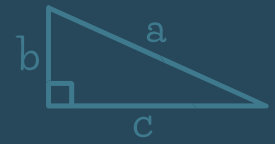
+

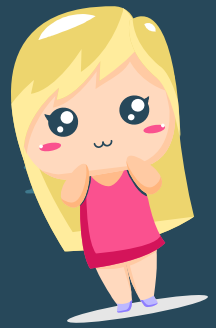
+

%

03 Section

Classroom activity





Guidelines for classroom activity

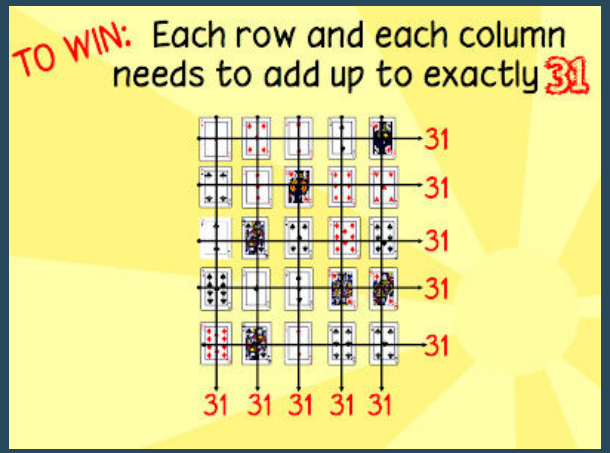
x/2y

-explain task
-random groups (count off, deck of cards)
-3 in a group
-if using posters have them numbered ahead of time

31-derful

31-derful is a fun and easy way to implement group problem solving.

Each row and each column needs to add up to exactly 31. Face cards are worth ten and aces are worth 11.



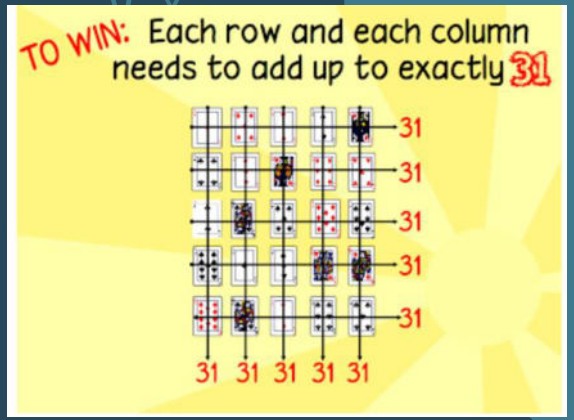
31-derful

The goal of the puzzle is to create rows and columns of cards that the sum totals exactly 31

-5x5 array

-Face cards are 10

-Ace cards are 11

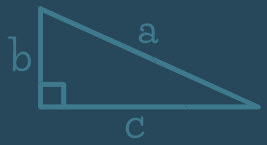


2+2=4

42:9

x

Let's try it!



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Alternative resources

https://mathequalslove.net/

Activities

https://www.peterliljedahl.com/teachers/numeracy-tasks

Open middle