

WHY WE SHOULD RECONSIDER (AND WHAT WE SHOULD BE DOING INSTEAD)

ROBERT KAPLINSKY

robert@robertkaplinsky.com

robertkaplinsky.com

[@robertkaplinsky](https://www.instagram.com/robertkaplinsky)

GOALS

WHO AM I?

WHAT'S WRONG WITH WORKSHEETS?

WHAT SHOULD WE BE DOING INSTEAD?

HOW DO WE DO IT IN OUR CLASSROOMS?

WHERE DO WE GET MORE PROBLEMS?

WHAT COMES NEXT?





GOALS

WHO AM I?

WHAT'S WRONG WITH WORKSHEETS?

WHAT SHOULD WE BE DOING INSTEAD?

HOW DO WE DO IT IN OUR CLASSROOMS?

WHERE DO WE GET MORE PROBLEMS?

WHAT COMES NEXT?



3 Digit Minus 3 Digit

Name: _____

Use subtraction to solve the following problems.

$$\begin{array}{r} 1) \quad 472 \\ - 446 \\ \hline \end{array}$$

$$\begin{array}{r} 2) \quad 787 \\ - 523 \\ \hline \end{array}$$

$$\begin{array}{r} 3) \quad 425 \\ - 274 \\ \hline \end{array}$$

$$\begin{array}{r} 4) \quad 732 \\ - 582 \\ \hline \end{array}$$

$$\begin{array}{r} 5) \quad 889 \\ - 172 \\ \hline \end{array}$$

$$\begin{array}{r} 6) \quad 387 \\ - 324 \\ \hline \end{array}$$

$$\begin{array}{r} 7) \quad 600 \\ - 258 \\ \hline \end{array}$$

$$\begin{array}{r} 8) \quad 961 \\ - 223 \\ \hline \end{array}$$

Answers

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

Name: _____

3-Digit Subtraction with regrouping

Rabbits on Vacation

Subtract to find the differences.
Then match the letters to the
blanks below to solve the riddle.

$$\begin{array}{r} \boxed{\text{E}} \quad 465 \\ - 239 \\ \hline \end{array}$$

$$\begin{array}{r} \boxed{\text{N}} \quad 239 \\ - 84 \\ \hline \end{array}$$

$$\begin{array}{r} \boxed{\text{I}} \quad 888 \\ - 295 \\ \hline \end{array}$$

$$\begin{array}{r} \boxed{\text{E}} \quad 619 \\ - 461 \\ \hline \end{array}$$

$$\begin{array}{r} \boxed{\text{A}} \quad 212 \\ - 190 \\ \hline \end{array}$$



WORKSHEET CONCERNS

- ~~OFTEN FEELS LIKE BUSY WORK~~
- ~~DON'T REALLY BUILD SENSE MAKING~~
- ~~RARELY LEAD TO GREAT CONVERSATIONS~~
- ~~DON'T GIVE US RICH INFORMATION~~

GOALS

WHO AM I?

WHAT'S WRONG WITH WORKSHEETS?

WHAT SHOULD WE BE DOING INSTEAD?

HOW DO WE DO IT IN OUR CLASSROOMS?

WHERE DO WE GET MORE PROBLEMS?

WHAT COMES NEXT?

PROBLEM ONE

Solve.

$$812 - 357 =$$

PROBLEM TWO

Using the digits 1 to 9 at most one time each, fill in the boxes to make two sets of three-digit numbers that form a true number sentence. You may reuse digits for each set.

$$\boxed{8} \boxed{8} \boxed{3} - 291 = \boxed{5} \boxed{6} \boxed{8}$$

PROBLEM THREE

Using the digits 1 to 9 at most one time each, fill in the boxes to make a difference that is as close to 329 as possible.

$$\begin{array}{|c|c|c|} \hline 9 & 8 & 7 \\ \hline \end{array} - \begin{array}{|c|c|c|} \hline 6 & ? & ? \\ \hline \end{array} =$$



Robert Kaplinsky

@robertkaplinsky

Hey 3rd grade teachers, I need your help. Please ask your students these 3 questions and then let me know what percentage of them got the problems correct using this form. Thanks for sending this to your 3rd grade teacher friends too!

goo.gl/forms/xZ5Ebknt... #MTBoS

#iteachmath

PROBLEM ONE
Solve.
 $812 - 3$

RobertKaplinsky.com

PROBLEM TWO
Use the digits 1 to 9, at most once, to fill in the boxes to make two numbers that form a true number sentence. You can reuse numbers for the same place value.
 $\square\square\square - 291$

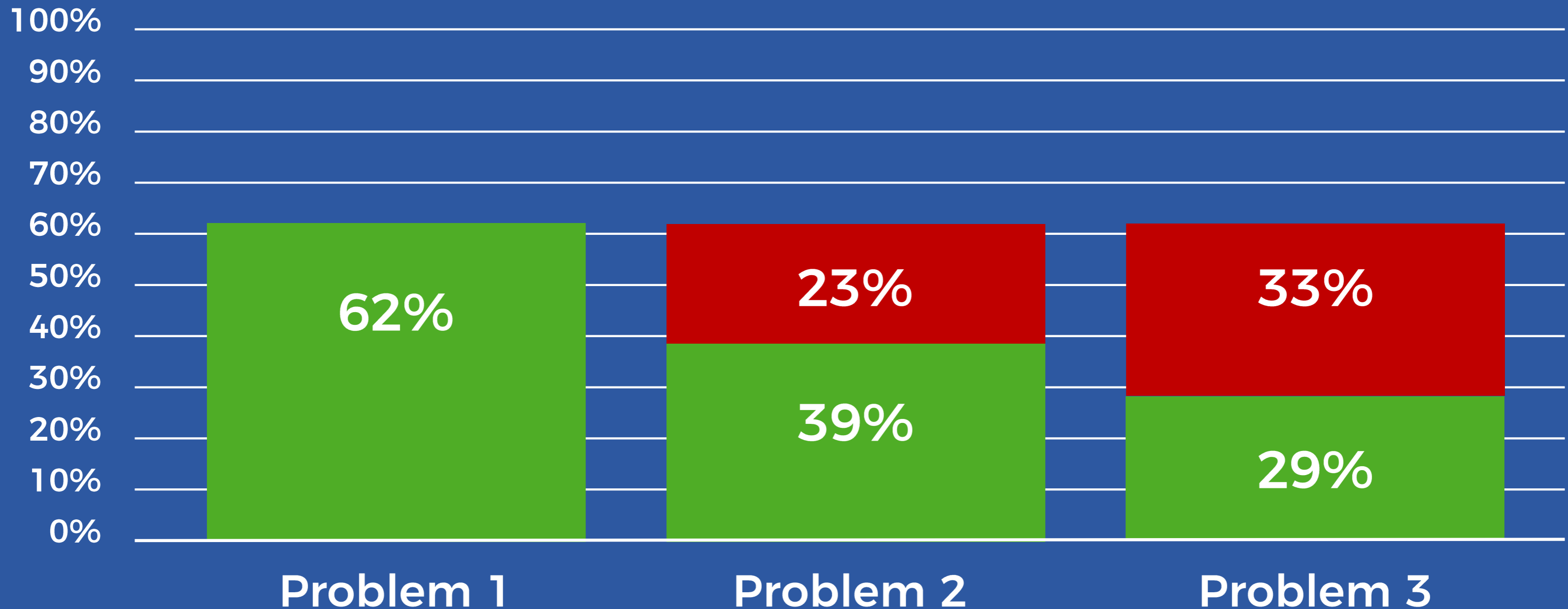
RobertKaplinsky.com

PROBLEM THREE
Use the digits 1 to 9, at most once, to fill in the boxes to make a difference close to 329 as possible.
 $\square\square\square - \square$

RobertKaplinsky.com

10:45 AM - 22 May 2018

PROBLEM RESULTS

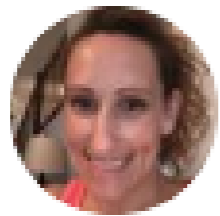


Depth of Knowledge Matrix - Elementary Math

Topic	Adding 1-Digit Numbers (< 5)	Equality	Interpreting Data	Money
CCSS Stand.	<ul style="list-style-type: none"> K.OA.5 	<ul style="list-style-type: none"> 1.OA.7 	<ul style="list-style-type: none"> 1.MD.4 	<ul style="list-style-type: none"> 2.MD.8
DOK 1 Example	Solve. $3 + 1 =$	Determine whether the number sentence is true or false. $4 + 1 = 5 - 2$	How many people were surveyed? <p>A bar graph with the y-axis labeled from 1 to 3 and the x-axis labeled 'Favorite Color' with categories Blue, Red, and Yellow. The bars show 3 for Blue, 1 for Red, and 2 for Yellow.</p>	If you have 1 quarter, 4 dimes, 2 nickels, and 3 pennies, how many cents do you have?
DOK 2 Example	Using the digits 1 to 5 at most one time each, fill in the boxes to create two true number sentences. $\square + \square = \square$	Using the digits 1 to 9 at most one time each, fill in the boxes to create two true number sentences. $\square + \square = \square - \square$	Make a graph that shows a possible result of 7 students' favorite color. <p>A blank bar graph with the y-axis labeled from 1 to 3 and the x-axis labeled 'Favorite Color' with categories Blue, Red, and Yellow.</p>	Make 72¢ in two different ways with either quarters, dimes, nickels, or pennies.
DOK 3 Example	Using the digits 1 to 5 at most one time each, fill in the boxes to create a true number sentence with the greatest possible sum. $\square + \square = \square$	Using the digits 1 to 9 at most one time each, fill in the boxes to create a true number sentence with the greatest possible value. $\square + \square = \square - \square$	Make a graph that shows a possible result of 7 students' favorite color with red being the most popular color. <p>A blank bar graph with the y-axis labeled from 1 to 3 and the x-axis labeled 'Favorite Color' with categories Blue, Red, and Yellow.</p>	Make 72¢ using exactly 9 coins that are either quarters, dimes, nickels, or pennies.

Depth of Knowledge Matrix - Elementary Math

Topic	Subtracting 3-Digit Numbers	Operations with Time	Comparing Fractions	Multiplying Decimals
CCSS Stand.	<ul style="list-style-type: none"> 3.NBT.2 	<ul style="list-style-type: none"> 3.MD.1 	<ul style="list-style-type: none"> 4.NF.2 	<ul style="list-style-type: none"> 5.NBT.7
DOK 1 Example	Solve. $821 - 357 =$	What time will it be 14 minutes after 1:27 pm?	Place a < or > between the two fractions to make a true number sentence. $\frac{4}{7} \quad \frac{3}{5}$	Solve. $3.4 \times 2.5 =$
DOK 2 Example	Using the digits 1 to 9 at most one time each, fill in the boxes to make two different pairs of three-digit numbers that form a true number sentence. $\square\square\square - 291 = \square\square\square$	Using the digits 1 to 9 at most one time each, fill in the boxes to make a time that is 4:37 pm. $\square\square$ minutes after $\square:\square\square$ pm	Using the digits 1 to 9 at most one time each, fill in the boxes to create two different fractions: one that is less than one half and one that is more than one half. $\frac{\square}{\square} < \frac{1}{2}$ and $\frac{\square}{\square} > \frac{1}{2}$	Using the digits 1 to 9 at most one time each, fill in the boxes to make a true number sentence. $\square.\square \times 3.2 = \square.\square$
DOK 3 Example	Using the digits 1 to 9 at most one time each, fill in the boxes to make a difference that is as close to 329 as possible. $\square\square\square - \square\square\square =$	Using the digits 1 to 9 at most one time each, fill in the boxes to make the latest possible time. $\square\square$ minutes after $\square:\square\square$ pm	Using the digits 1 to 9 at most one time each, fill in the boxes to create a fraction that is as close to 5/11 as possible. $\frac{\square}{\square}$	Using the digits 1 to 9 at most one time each, fill in the boxes so that the product is as close to 50 as possible. $\square.\square \times \square.\square =$



Chrissy Day

@ChrissyDay1974



I LOVE Open Middle [@robertkaplinsky](#) second graders were working on ____ - ____ Make the smallest difference possible using the digits 1-9 once only. The conversation and perseverance was something I had never seen from these kids!

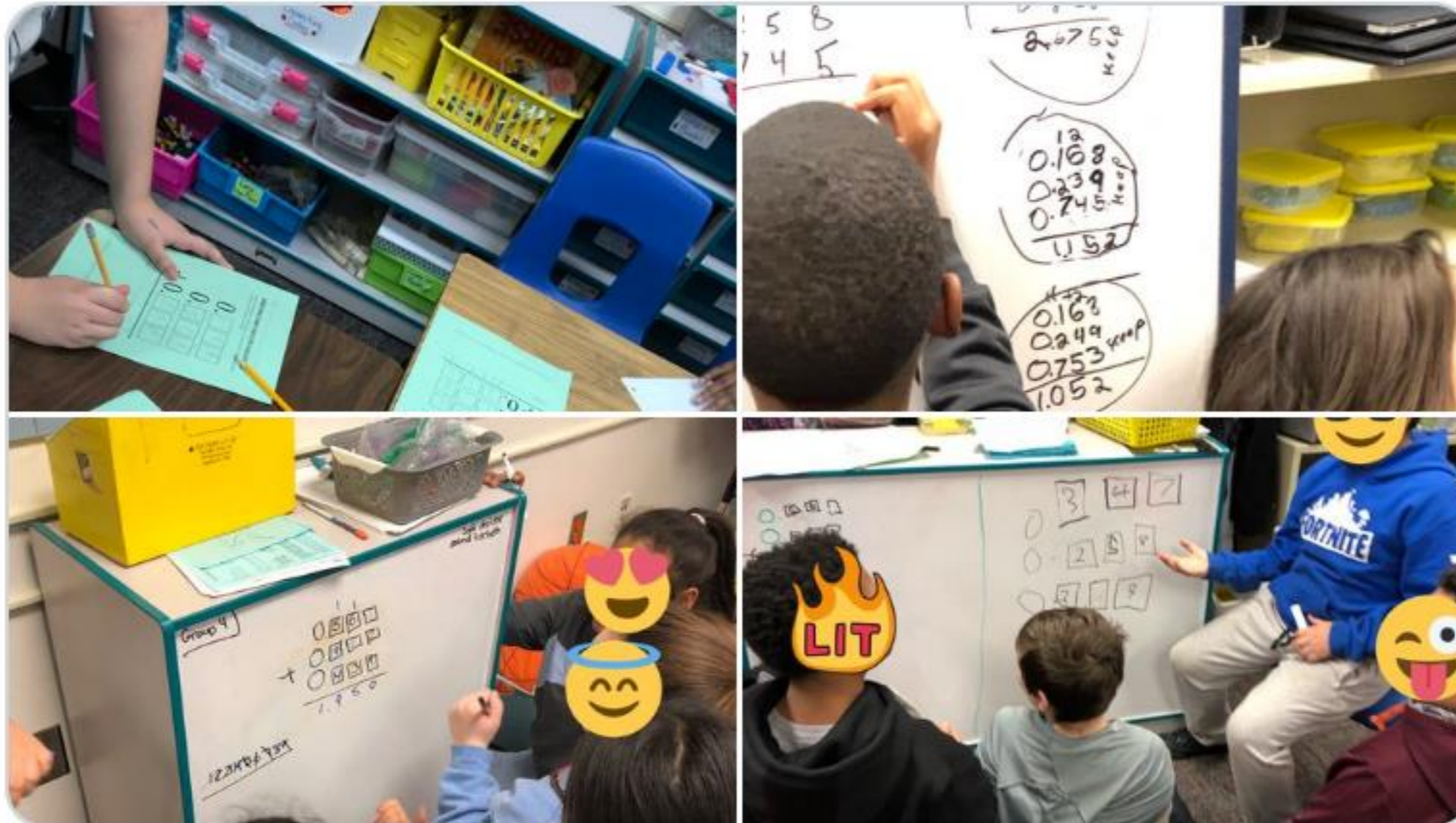
5:20 PM · Mar 9, 2019 · [Twitter for iPhone](#)

6 Retweets **62** Likes



DeLaina Ellis @dellis5th · Jan 11

It was an @openmiddle **showdown** in 5th grade! They could NOT stop! One student even asked me for his paper during recess so he could try to get even closer! #wearegrandview #iteachmath #mtbos #productivestruggle





MrsDill

@MrsDill2



Replying to [@robertkaplinsky](#) [@openmiddle](#) and [@And02B](#)

My students live for these! Nearly every day I'm asked, "You got anymore of those open problem things for us to solve?"

6:44 PM · Apr 17, 2019 · [Twitter for iPhone](#)

5 Likes

OPEN MIDDLE PROBLEM BENEFITS

- KIDS LOVE DOING THEM
- BUILD CONCEPTUAL UNDERSTANDING
- OFTEN LEAD TO GREAT CONVERSATIONS
- REVEAL HIDDEN MISCONCEPTIONS

GOALS

WHO AM I?

WHAT'S WRONG WITH WORKSHEETS?

WHAT SHOULD WE BE DOING INSTEAD?

HOW DO WE DO IT IN OUR CLASSROOMS?

WHERE DO WE GET MORE PROBLEMS?

WHAT COMES NEXT?

HOW DO WE DO IT?

- Open Middle Worksheet

Name: _____ Period: _____ Date: _____

First attempt:

Points: ____/2 attempt ____/2 explanation

What did you learn from this attempt? How will your strategy change on your next attempt?

Second attempt:

Points: ____/2 attempt ____/2 explanation

First attempt:

Points: ____/2 attempt ____/2 explanation

What did you learn from this attempt? How will your strategy change on your next attempt?

HOW DO WE DO IT?

- Open Middle Worksheet
- Classwork
- Homework
- Assessments

GOALS

WHO AM I?

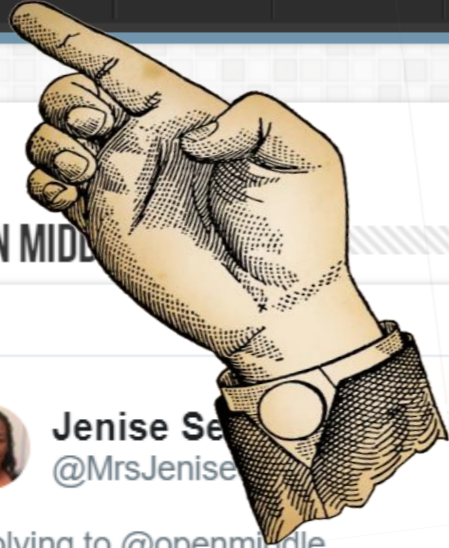
WHAT'S WRONG WITH WORKSHEETS?

WHAT SHOULD WE BE DOING INSTEAD?

HOW DO WE DO IT IN OUR CLASSROOMS?

WHERE DO WE GET MORE PROBLEMS?

WHAT COMES NEXT?



WHY OPEN MIDDLE



Jenise Sexton
@MrsJenise



Replying to @openmiddle

just when I think my Ss are "good" w/reasoning, the problems show me some holes to fill. I like that. Continuous growth.

♡ 6 4:48 PM - Jan 11, 2017



[See Jenise Sexton's other Tweets](#)



Marguerite Spriggs
@mspriggs30



My first time trying an @openmiddle problem with my students today. Wasn't sure how it would go or if they'd solve it. After a few minutes going at it (and coming up with more than one solution) they asked "can we do another one?" "That was fun - we should do it more!"

Radical Challenge

RADICAL EQUATIONS

Directions: Using the digits 0-9 at most one time each, make both of these equations true.



OPEN MIDDLE WORKSHEET

[English \(student version\)](#)

[English \(document camera version\)](#)

[French \(student version\)](#)

[French \(document camera version\)](#)

[Spanish \(student version\)](#)

[Spanish \(document camera version\)](#)

BROWSE BY COMMON CORE STATE STANDARDS

[Kindergarten \(13\)](#)

[Counting & Cardinality \(3\)](#)

[Geometry \(3\)](#)

[Number & Operations in Base Ten \(1\)](#)

[Operations & Algebraic Thinking \(6\)](#)

[Grade 1 \(18\)](#)

[Geometry \(3\)](#)

[Measurement & Data \(4\)](#)

[Number & Operations in Base Ten \(4\)](#)

[Home](#) > [Grade 1](#) > [Adding Two-Digit Numbers \(Elementary\)](#)

ADDING TWO-DIGIT NUMBERS (ELEMENTARY)

Directions: Using the digits 1 to 9 at most one time each, fill in the boxes to make the smallest (or largest) sum.



Hint

In the two-digit number, what does the digit on the left represent? What does the digit on the right represent?

Answer

97 + 86 is one answer for the largest sum. 13 + 24 is the smallest sum.

Source: [Robert Kaplinsky](#)



OPEN MIDDLE WORKSHEET

[English \(student version\)](#)

[English \(document camera version\)](#)

[French \(student version\)](#)

[French \(document camera version\)](#)

[Spanish \(student version\)](#)

[Spanish \(document camera version\)](#)

BROWSE BY COMMON CORE STATE STANDARDS

[Kindergarten \(13\)](#)

[Counting & Cardinality \(3\)](#)

[Geometry \(3\)](#)

[Number & Operations in Base Ten \(1\)](#)

[Operations & Algebraic Thinking \(6\)](#)

[Grade 1 \(18\)](#)

[Geometry \(3\)](#)

[Measurement & Data \(4\)](#)

[Number & Operations in Base Ten \(4\)](#)

Ashley Powell

Blanca Pacheco

Bryan Anderson

Cecilia Calvo

Christa Amezcua

Dan Shuster

Daniel Luevanos

Daniel Rocha

Debbie Vitale

Devin Rossiter

Diane Rodriguez

Dominique Bodin

Emma McCrea

Inés Ham

John Ulbright

Jules Bonin-Ducharme

Katie Bond

Keely Hulme

Kjersti Oliver

Kristine Cunningham

Laura Wagenman

Marc Garneau

Mathías López

Molly Rawding

Nanette Johnson

Owen Kaplinsky

Robert Kaplinsky

Scott Hampton

Zach Berkowitz

GOALS

WHO AM I?

WHAT'S WRONG WITH WORKSHEETS?

WHAT SHOULD WE BE DOING INSTEAD?

HOW DO WE DO IT IN OUR CLASSROOMS?

WHERE DO WE GET MORE PROBLEMS?

WHAT COMES NEXT?

WHAT COMES NEXT?

Action	Do Now	Start Planning	Don't Do
Try Open Middle problems out with your students	✓		
Find more problems I can use on the Open Middle website.	✓		
Incorporate Open Middle problems on assessments.		✓	
Replace all traditional problems with Open Middle problems.			✓
Share these resources with colleagues to make them aware.	✓		

United States

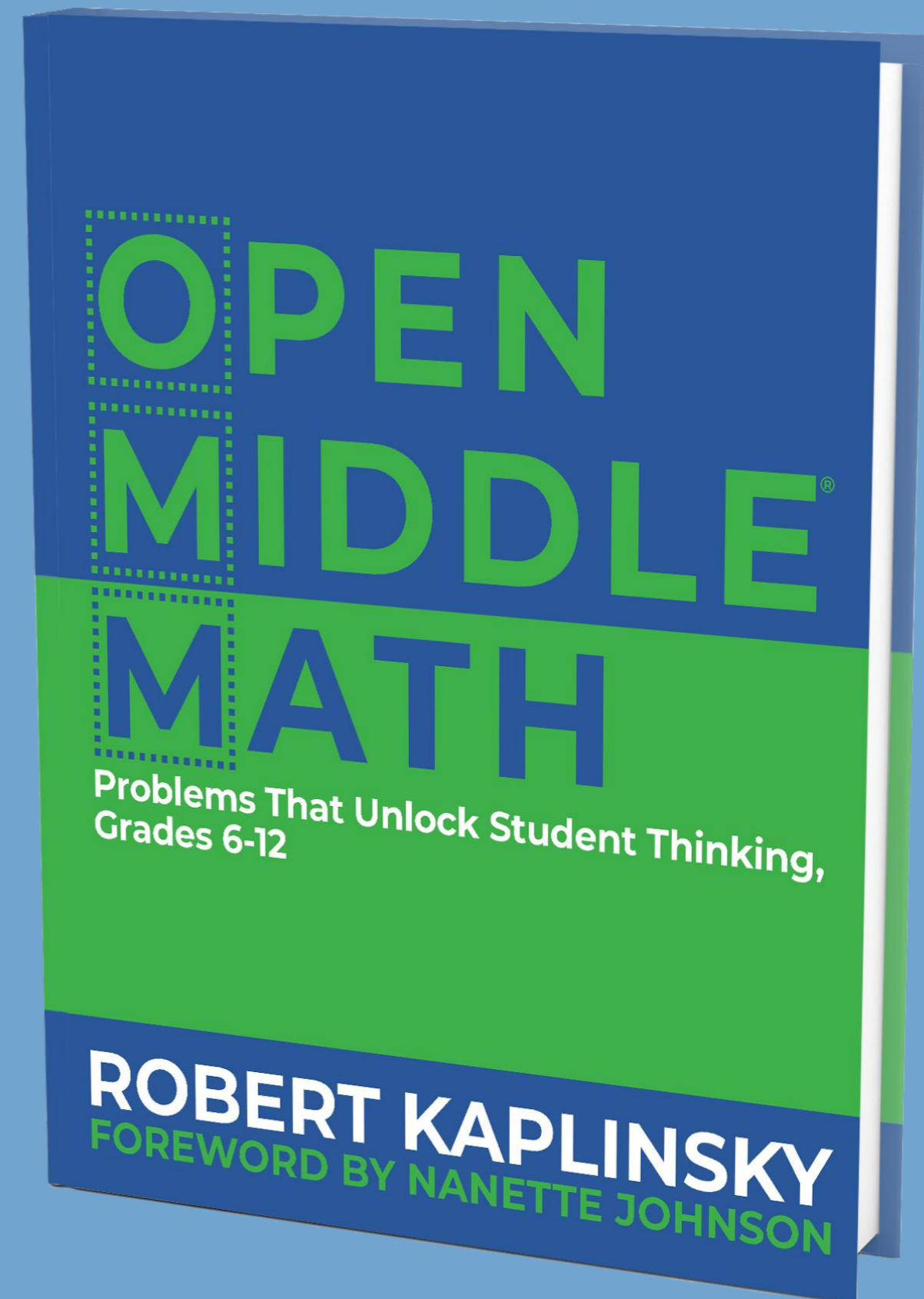
bit.ly/OpenMiddleBook

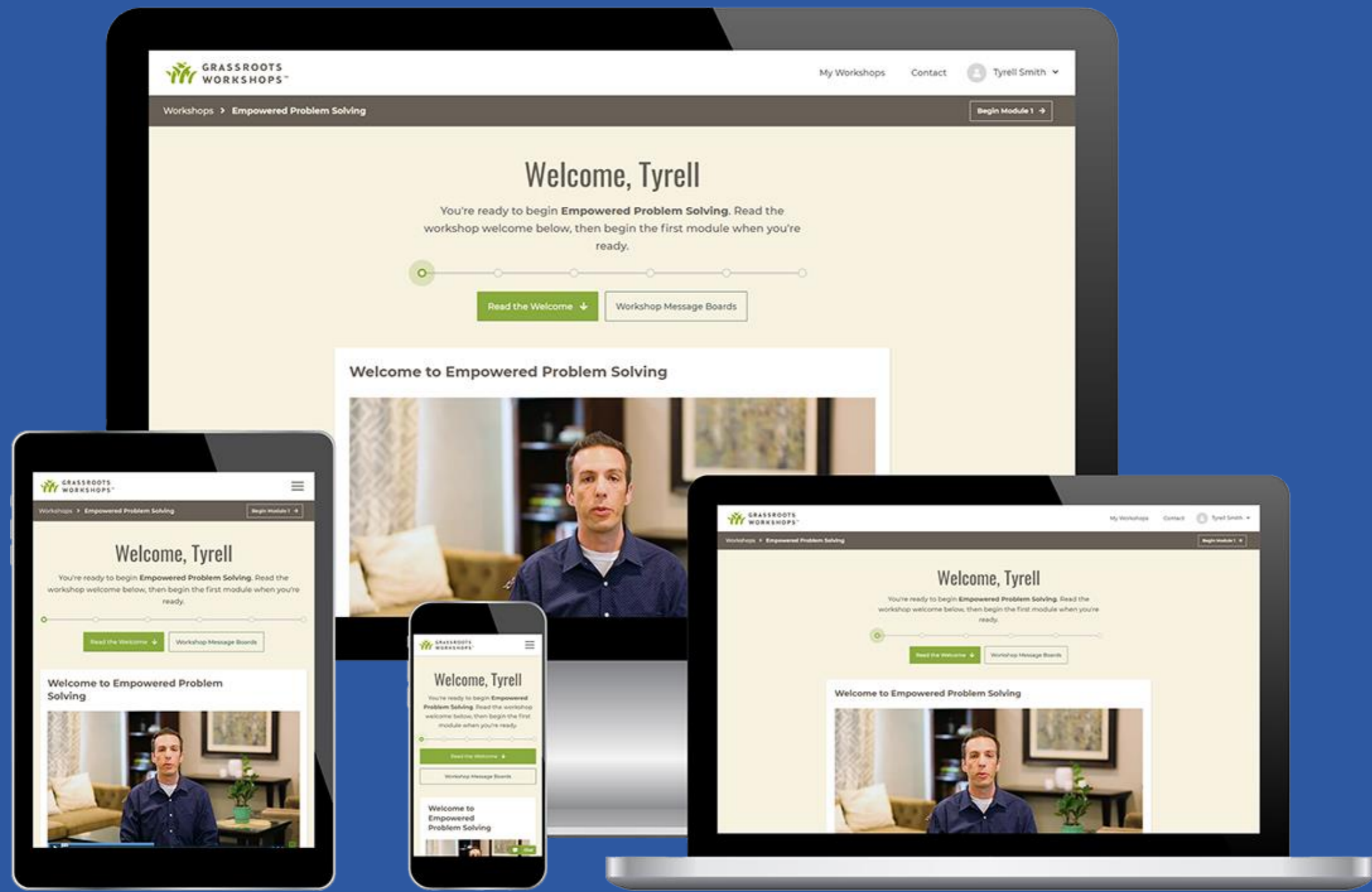
Coupon code: OPEN10

Canada

bit.ly/OpenMiddleBookCA

RobertKaplinsky.com







Option	Cost	University PD credits	Choose instructor?	Stay in classroom?	Access to content?

PROBLEM-BASED LESSON

PLANNING CHECKLIST

Essentials

These are the bare minimum steps that need to be done to teach the lesson.
Have you...

Planning

- picked a mathematical goal for the lesson? (Reference: "By selecting particular students..." on pg.133 of Orchestrating Discourse PDF)
- solved the problem in at least two ways?
- considered potential student misunderstandings and what you will do?

Technology

- made sure all needed videos are downloaded (locally) or that they are ready to stream off the internet?
- downloaded the lesson such as Powerpoint, files or images onto your computer?
- checked that your technology such as a computer and digital projector is working properly?

Student Resources

- printed copies of the Problem Solving Framework or other tools?
- made any necessary manipulatives accessible?

PROBLEM-BASED LESSON

TROUBLESHOOTING GUIDE

Before Students Start Working On Their Own

What do you do when students ask for information you don't have, hadn't considered, or forgot to get?

- Validate student(s): Unexpected is not bad.
- Explain that it's a reasonable request, and that you don't have the information.
- Ask students to think of another strategy that may work.
- If this happens often, maybe you aren't spending enough time anticipating problem solving methods.

What do you do when students ask for information that is probably not important or they don't actually need?

- How you handle this depends on whether you think the request is a joke or legitimate and whether you have time to explore it.
- If you have time and believe it's a legitimate request, you can explore why the student(s) want the info as one of you may have a misunderstanding or misconception.
- If you don't have time and believe it's a legitimate request, let them know that you don't have time but you'd love to

talk later about why they wanted the info.

- If you believe it's a joke, then simply state you don't have that information. If this happens, it may be worth revisiting your classroom norms.

What do you do when students don't know what to write for what they know and don't know?

- Consider beginning with at least 30 seconds of quiet individual time to give students space to think about the problem.
- Have students use a think/write/pair/share strategy so they can discuss what was written as a pair or small group and then as a whole class. This gives students more experience seeing how others process thinking about problems.
- Allow students to share information and tell them they should write down other comments they agree with.

What do you do when you ask for an estimate and students don't know what to do?

- Making an estimate is a crucial step to evaluate what information is needed, so try not to skip it.

GOALS

WHO AM I?

WHAT'S WRONG WITH WORKSHEETS?

WHAT SHOULD WE BE DOING INSTEAD?

HOW DO WE DO IT IN OUR CLASSROOMS?

WHERE DO WE GET MORE PROBLEMS?

WHAT COMES NEXT?

Empowered Problem Solving

- robertkaplinsky.com/eps

Webinar Handout

- robertkaplinsky.com/wsresources