Baseline Assessment STORY PROBLEM TYPES

GOALS: To find out:

- which problem types are most easily solved by students at your level and which types of problems are more problematic
- how accurate students are in solving problems of various types and if the problem type or the method of solving most impact accuracy
- what resources students use to solve the problems
- differences among students within a classroom or across grade levels

Attached are 3 Forms (Form A, Form B or Form C) of the baseline assessment. You can select the level that best matches the students in your class/course. You may even want to give different forms to different students in your class/course. Form A is for beginning learners and all problems are about apples.

Form B is for intermediate learners and all problems are about a school store. Form C is for advanced learners who can cope with different contexts.

There are 6 problems to give to all students in your classroom/course. You can give all 6 problems on one day or spread across different days.

You may read/reread any problems to students and can have manipulatives or number lines <u>accessible</u> to students. Try to keep track of students who use fingers, manipulatives or number lines, if possible. Try to get students to put as much work as possible in the "work space".

You can discuss the format. Following the problem, the "answer" - the unknown - goes in the box and the kind of thing goes on the label line. You can even go over that apples would be the right word to write on the label line in problem $\underline{\#1}$. Tell students to show their work in the "work space" and they can keep working below the problem.

Option: Before you start, you can talk about the context used in the problems. You can ask students what they know about that context or what they have done with things like those in the context given in the problems. e.g what do they do with apples, have they been in a school with a school store and what happened there.

Fill out the recording sheet. Bring your students' work and your recording sheets to the PLC meeting. Also, save the problems and recording sheets for our next professional development day.

Name_____

Form A

Solve each problem and <u>show</u> how you got your answer.

 Chris picked 9 apples. His mom picked 7 apples. How many apples do they have together?

	Work Space
label	

NameForm ASolve each problem and show how you got your answer.

2. Chris had 15 apples. Chris ate 6 apples. How many apples does Chris have now?
Work Space

label

Name

Solve each problem and <u>show</u> how you got your answer.

3. Yesterday Allison had 18 apples.
Today Allison bought some more apples.
Now Allison has 26 apples.
How many apples did Allison buy today?

	Work Space
Label	

Name	Form A
Solve each problem and <u>show</u> how you got your answer.	

4. Chris had 19 apples. He gave away some apples. Now Chris has 12 apples. How many apples did Chris give away?

	Work Space
Label	

Name

Solve each problem and <u>show</u> how you got your answer.

5. Yesterday Chris bought some apples.
Today Chris bought 7 more apples.
Now Chris has 13 apples.
How many apples did Chris start with yesterday?

	Work Space
Label	·····

NameForm ASolve each problem and show how you got your answer.

6. Mary has 16 apples. Joann has 7 apples more than Mary. How many apples does Joann have?

	Work Space
Label	

Label

BASELINE ASSESSMENT RECORDING SHEET for Word Problems - FORM A

For each way to solve a problem, record the number of students who got the problem correct and the number of students who got the problem incorrect. If students use multiple ways to solve, record the initial solution method (the entry point to solving the problem).

		Studer	nts solved thi	is problem w	/ith	
1 . PPW-whole	Realistic Pictures		Representative Drawings (e.g. circles, tallies)		Bar Model or Inverted V model	
<i>unknown</i> Chris and mom	# sts correct	# sts incorrect	# sts correct	# sts incorrect	# sts correct	# sts incorrect
picking apples 16 apples						
	Equation only		No work shown, observed use of manipulatives, fingers, number line, etc.		No work shown, assume mental math	
	# sts correct	# sts incorrect	# sts correct	# sts incorrect	# sts correct	# sts incorrect

	Students solved this problem with					
2. PPW-part	Realistic Pictures		Representative Drawings (e.g. circles, tallies)		Bar Model or Inverted V model	
unknown Chris ate some	# sts correct	# sts incorrect	# sts correct	# sts incorrect	# sts correct	# sts incorrect
apples 9 apples						
	Equation only		No work shown, observed use of manipulatives, fingers, number line, etc.		No work shown, assume mental math	
	# sts correct	# sts incorrect	# sts correct	# sts incorrect	# sts correct	# sts incorrect

	Students solved this problem with						
3.	Realistic Pic	tures	Representat	tive	Bar Model o	Bar Model or Inverted V	
PPW-nart			Drawings (e	.g. circles,	model		
, pare			tallies)				
unknown	# sts	# sts	# sts	# sts	# sts	# sts	
Allison buying	correct	incorrect	correct	incorrect	correct	incorrect	
apples							
8 apples							
	Equation on	ly	No work shown,		No work shown,		
			observed use of		assume mental math		
			manipulativ	es, fingers,			
			number line	, etc.			
	# sts	# sts	# sts	# sts	# sts	# sts	
	correct	incorrect	correct	incorrect	correct	incorrect	

Students solved this problem with						
Realistic Pict	ures	Representat	ive g. circlos	Bar Model or Inverted V		
		tallies)	.g. chicles,	model		
# sts	# sts	# sts	# sts	# sts	# sts	
correct	incorrect	correct	incorrect	correct	incorrect	
Equation on	Equation only No wor		No work shown,		No work shown,	
		observed us	e of	assume mental math		
		manipulativ	es, fingers,			
		number line	, etc.			
# sts	# sts	# sts	# sts	# sts	# sts	
correct	incorrect	correct	incorrect	correct	incorrect	
	Realistic Pict	Studer Realistic Pictures	Students solved th Realistic Pictures Representat Drawings (e. tallies) Drawings (e. tallies) # sts # sts # sts # sts correct incorrect Equation only No work showed us manipulative number line # sts # sts incorrect correct	Students solved this problem w Realistic Pictures Representative Drawings (e.g. circles, tallies) # sts # sts # sts # sts incorrect correct incorrect correct Equation only No work shown, observed use of manipulatives, fingers, number line, etc. # sts # sts # sts # sts incorrect correct	Students solved this problem with Realistic Pictures Representative Drawings (e.g. circles, tallies) Bar Model o model # sts # sts # sts model # sts # sts # sts # sts incorrect correct incorrect correct Equation only No work shown, observed use of manipulatives, fingers, number line, etc. No work shift sts # sts # sts # sts # sts incorrect correct incorrect correct	

	Studer	nts solved th	is problem w	/ith	
Realistic Pictures		Representat	ive	Bar Model or Inverted V	
		Drawings (e	.g. circles,	model	
		tallies)			
# sts	# sts	# sts	# sts	# sts	# sts
correct	incorrect	correct	incorrect	correct	incorrect
Equation on	ly	No work shown,		No work shown,	
		observed use of		assume mental math	
		manipulativ	es, fingers,		
		number line	, etc.		
# sts	# sts	# sts	# sts	# sts	# sts
correct	incorrect	correct	incorrect	correct	incorrect
	Realistic Pict # sts correct Equation on # sts correct	Realistic Pictures # sts # sts correct incorrect Equation only # sts incorrect # sts incorrect # sts incorrect Image: state	Students solved th Representation Representation # sts # sts tallies) # sts # sts correct correct incorrect incorrect correct correct Equation only No work show observed us ranipulation number line # sts # sts # sts correct incorrect correct # sts # sts # sts correct incorrect correct	Students solved this problem w Representative Drawings (e.g. circles, tallies) # sts # sts # sts correct incorrect correct incorrect Equation only No work shwn, observed use of manipulatives, fingers, number line, etc. observed use of manipulatives, fingers, fing	Students solved this problem withRealistic PicturesRepresentativeBar Model or modelDrawings (e.g. circles, tallies)modelmodel# sts# sts# sts# stscorrectincorrectcorrectincorrectincorrectcorrectincorrectcorrectEquation onlyNo work shown, observed use of manipulative, fingers, number line, etc.No work shown, assume mer assume mer manipulative, fingers, incorrect# sts# sts# sts# stscorrectincorrectcorrectincorrect

	Students solved this problem with						
6.	Realistic Pic	tures	Representat	ive	Bar Model o	Bar Model or Inverted V	
Comparison –			Drawings (e.g. circles, tallies)		model		
Greater Quantity	# sts	# sts	# sts	# sts	# sts	# sts	
Unknown	correct	incorrect	correct	incorrect	correct	incorrect	
Mary and Joann's							
apples							
23 apples for							
loann	Equation only		No work shown,		No work shown,		
Joann			observed us	e of	assume mental math		
			manipulativ	es, fingers,			
		1	number line, etc.			1	
	# sts	# sts	# sts	# sts	# sts	# sts	
	correct	incorrect	correct	incorrect	correct	incorrect	

NameForm BSolve each problem and show how you got your answer.

1. Emily is in charge of the school store that will open in a few weeks. She bought 25 sets of markers last week. Then she bought some more sets of markers this week. There are now 53 sets of markers in the store. How many markers did she buy this week?

	Work Space
Label	

Name _____

Form **B**

Solve each problem and <u>show</u> how you got your answer.

2. The school store had 75 red pens when it opened. It sold several red pens. Now there are 48 red pens left in the store. How many red pens were sold?

	Work Space
Label	F

Name Solve each problem and <u>show</u> how you got your answer.

Emily bought 25 boxes of pencils for the school store. 3. There were 8 pencils in each box. Emily took the pencils out of each box and put all the pencils in a big jar on the counter. How many pencils does the store have for sale in the big jar?

	Work Space
Label	

_____ Form B Name Solve each problem and <u>show</u> how you got your answer.

Emily needs to buy 120 pens for the school store. If 4. each package has 6 pens, how many packages should she buy?

Work Space

Label

Form B

Intermediate District 287 BASELINE ASSESSMENT

Name _____ Solve each problem and <u>show</u> how you got your answer.

The school store has 52 yellow highlighters and 27 pink 5. highlighters. How many more yellow highlighters does it have than pink highlighters?

	Work Space
Label	I

Name Solve each problem and <u>show</u> how you got your answer.

The school store has some large glue sticks. It has 23 6. small size glue sticks which are 1/3 as many as the number of large glue sticks. How many large glue sticks are there?

Work Space

Label

Form B

BASELINE ASSESSMENT RECORDING SHEET for Word Problems - FORM B

For each way to solve a problem, record the number of students who got the problem correct and the number of students who got the problem incorrect. If students use multiple ways to solve, record the initial solution method (the entry point to solving the problem).

	Students solved this problem with					
1.	Realistic Pictures		Representative		Bar Model or Inverted V	
PPW-part			Drawings (e.g. circles,		model	
unknown	# sts	# sts	# sts	# sts	# sts	# sts
Emily & sets of	correct	incorrect	correct	incorrect	correct	incorrect
markers						
28 sets of markers						
	Equation only		No work shown,		No work shown,	
			observed us	e of	assume mer	ital math
			manipulative	es, fingers,		
			number line	, etc.		
	# sts	# sts	# sts	# sts	# sts	# sts
	correct	incorrect	correct	incorrect	correct	incorrect

	Students solved this problem with					
2. PPW-part	Realistic Pictures		Representative Drawings (e.g. circles, tallies)		Bar Model or Inverted V model	
unknown	# sts	# sts	# sts	# sts	# sts	# sts
Red pens sold	correct	incorrect	correct	incorrect	correct	incorrect
27 red pens						
	Equation on	ly	No work shown,		No work shown,	
			observed use of		assume mer	ntal math
			manipulatives, fingers,			
	# sts	# sts	# sts	# sts	# sts	# sts
	correct	incorrect	correct	incorrect	correct	incorrect

	Students solved this problem with					
3.	Realistic Pict	tures	Representative		Bar Model or Inverted V	
Equal Groups –			Drawings (e.g. circles, tallies)		model	
Product Unknown	# sts	# sts	# sts	# sts	# sts	# sts
Emily buying boxes	correct	incorrect	correct	incorrect	correct	incorrect
of pencils						
200 pencils						
	Equation on	ly	No work sho	own,	No work sho	own,
	Equation on	ly	No work sho observed us	own, e of	No work sho assume mer	own, ntal math
	Equation on	ly	No work sho observed us manipulative	own, e of es, fingers,	No work sho assume mer	own, ntal math
	Equation on	ly H ata	No work sho observed us manipulative number line	own, e of es, fingers, , etc.	No work sho assume mer	own, htal math
	Equation on # sts correct	ly # sts incorrect	No work sho observed us manipulative number line # sts correct	own, e of es, fingers, , etc. # sts	No work sho assume mer # sts	wn, htal math # sts
	Equation on # sts correct	ly # sts incorrect	No work sho observed us manipulative number line # sts correct	own, e of es, fingers, , etc. # sts incorrect	No work sho assume mer # sts correct	wn, ntal math # sts incorrect
	Equation on # sts correct	ly # sts incorrect	No work sho observed us manipulative number line # sts correct	own, e of es, fingers, , etc. # sts incorrect	No work sho assume mer # sts correct	own, htal math # sts incorrect
	Equation on # sts correct	ly # sts incorrect	No work sho observed us manipulative number line # sts correct	own, e of es, fingers, , etc. # sts incorrect	No work sho assume mer # sts correct	wn, ntal math # sts incorrect

	Students solved this problem with					
4.	Realistic Pict	tures	Representative		Bar Model or Inverted V	
Equal Shares –			Drawings (e.g. circles, tallies)		model	
Factor Unknown (# OF groups)	# sts correct	# sts incorrect	# sts correct	# sts incorrect	# sts correct	# sts incorrect
Emily buying pens 20 packages						
	Equation only					
	Equation on	ly	No work sho observed us	own, ie of	No work sho assume mer	own, ntal math
	Equation on	lγ	No work sho observed us manipulative number line	own, e of es, fingers, e, etc.	No work sho assume mer	own, htal math
	Equation on # sts correct	ly # sts incorrect	No work sho observed us manipulative number line # sts correct	own, e of es, fingers, e, etc. # sts incorrect	No work sho assume mer # sts correct	bwn, htal math # sts incorrect
	Equation on # sts correct	ly # sts incorrect	No work sho observed us manipulative number line # sts correct	own, e of es, fingers, e, etc. # sts incorrect	No work sho assume mer # sts correct	wn, ntal math # sts incorrect

	Students solved this problem with					
5.	Realistic Pict	tures	Representative		Bar Model or Inverted V	
Comparison –			Drawings (e.g. circles, tallies)		model	
Difference	# sts correct	# sts incorrect	# sts correct	# sts incorrect	# sts correct	# sts incorrect
Yellow & Pink Highlighters 25 yellow						
highlighters	Equation only		No work shown, observed use of manipulatives, fingers, number line, etc.		No work shown, assume mental math	
	# sts correct	# sts incorrect	# sts correct	# sts incorrect	# sts correct	# sts incorrect

	Students solved this problem with					
6 . Multiplicative	Realistic Pictures		Representative Drawings (e.g. circles,		Bar Model or Inverted V model	
Comparison – Greater Ouantity	# sts correct	# sts incorrect	# sts correct	# sts incorrect	# sts correct	# sts incorrect
Unknown Large and small						
	Equation only		No work sho	own,	No work sho	own,
69 large glue sticks		,	observed us manipulative number line	e of es, fingers, , etc.	assume mer	ntal math
69 large glue sticks	# sts correct	# sts incorrect	observed us manipulative number line # sts correct	e of es, fingers, , etc. # sts incorrect	assume mer # sts correct	ntal math # sts incorrect

Name _____

Solve each problem and <u>show</u> how you got your answer.

1. Amy has 16 boxes. She wants to put 3 cookies in each box. How many cookies does Amy need to make to fill all the boxes?

	Work Space
Label	, i

2. Amy has 24 boxes. She and her friends made 96 cookies. How many cookoies will go in each box if the boxes are filled all the same?

	Work Space
Label	····-L ····

Name _____

Solve each problem and <u>show</u> how you got your answer.

3. Amy made 48 cupcakes for her cousins. She will give 3 cupcakes to each cousin. How many cousins does Amy have?

	Work Space
Label	•

4. The gym needs to be set up for a concert. There are 96 chairs for the band players. If the chairs are put in 4 identical rows, how many chairs can go in each row?

	Work Space
Label	

Name _____

Solve each problem and show how you got your answer.

5. Zach and Callen collect baseball cards. Zach has $6\frac{1}{2}$ boxes of cards. Callen has 3 times as many boxes as Zach. How many boxes of cards does Callen have?

	Work Space
label	, i

6. Clara, Eddy, and Bill collect cans to recycle. Eddy has 12 cans. Clara has 3 times as many cans as Eddy. Bill has 2 times as many cans as Clara. How many cans does Bill have?

	Work Space
label	

BASELINE ASSESSMENT RECORDING SHEET for Word Problems – FORM C

For each way to solve a problem, record the number of students who got the problem correct and the number of students who got the problem incorrect. If students use multiple ways to solve, record the initial solution method (the entry point to solving the problem).

	Students solved this problem with					
1 . Equal Groups –	Realistic Pictures		Representative Drawings (e.g. circles, tallies)		Bar Model or Inverted V model	
Product unknown Amy making	# sts correct	# sts incorrect	# sts correct	# sts incorrect	# sts correct	# sts incorrect
cookies 48 cookies						
	Equation on	ly	No work sho observed us	own, e of	No work sho assume mer	own, Ital math
	Equation on	lγ	No work sho observed us manipulative number line	own, e of es, fingers, , etc.	No work sho assume mer	own, Ital math
	Equation on # sts correct	ly # sts incorrect	No work sho observed us manipulative number line # sts correct	own, e of es, fingers, , etc. # sts incorrect	No work sho assume mer # sts correct	wn, htal math # sts incorrect
	Equation on # sts correct	ly # sts incorrect	No work sho observed us manipulative number line # sts correct	own, e of es, fingers, , etc. # sts incorrect	No work sho assume mer # sts correct	wn, ntal math # sts incorrect

	Students solved this problem with					
2. Equal Groups –	Realistic Pictures		Representative Drawings (e.g. circles, tallies)		Bar Model or Inverted V model	
Pactor Unknown (Partitive Division	# sts correct	# sts incorrect	# sts correct	# sts incorrect	# sts correct	# sts incorrect
- <i>know # OF parts</i> Amy putting cookies in boxes 4 cookies						
	Equation only		No work shown, observed use of manipulatives, fingers, number line, etc.		No work shown, assume mental math	
	# sts correct	# sts incorrect	# sts correct	# sts incorrect	# sts correct	# sts incorrect

	Students solved this problem with					
3.	Realistic Pictures		Representative		Bar Model or Inverted V	
Equal Groups –			Drawings (e.g. circles, tallies)		model	
Factor Unknown	# sts	# sts	# sts	# sts	# sts	# sts
(Measurement	correct	incorrect	correct	incorrect	correct	incorrect
Division – know #						
IN A part or the						
number to						
"measure" out	Equation only		No work shown,		No work shown,	
Δην σίνιησ			observed us	e of	assume mer	ital math
			manipulatives, fingers,			
cupcakes to			number line	, etc.		[<i>u</i> .
cousins	# StS	# StS	# StS	# StS	# StS	# StS
16 cousins	correct	incorrect	correct	incorrect	correct	incorrect

	Students solved this problem with					
4.	Realistic Pictures		Representative		Bar Model or Inverted V	
Array or Equal			Drawings (e.	.g. circles,	model or Ar	ray
Shares – Array	# sts	# ctc	tallies) # sts	# sts	# sts	# ctc
dimension or	correct	incorrect	correct	incorrect	correct	incorrect
Factor Unknown						
(partitive divison –						
know number of						
narts (rows))	Equation only		No work shown,		No work shown,	
Band chairs			observed use of		assume mental math	
			manipulatives, fingers,			
24 chairs in a row	# ctc	# ctc	number line	, etc.	# ctc	# ctc
	# sts	incorrect	correct	incorrect	correct	incorrect

	Students solved this problem with					
5.	Realistic Pictures		Representative Drawings (e.g. circles, tallies)		Bar Model or Inverted V	
Multiplicative					model	
Comparison –	# sts	# sts	# sts	# sts	# sts	# sts
Greater Quantity	correct	incorrect	correct	incorrect	correct	incorrect
Unknown						
Boxes of baseball						
cards						
19 ½ boxes	Equation only		No work shown,		No work shown,	
			observed use of		assume mental math	
			manipulatives, fingers,			
	ll ata	ll ata	number line	, etc.	ll at a	ll at a
	# StS	# STS	# StS	# StS	# StS	# StS
	Correct	incorrect	correct	incorrect	correct	incorrect
		1	1	1	1	

	Students solved this problem with					
6.	Realistic Pic	tures	Representative		Bar Model or Inverted V	
Multiplicative			Drawings (e	.g. circles,	model	
Comparison -			tallies)			
Companson –	# sts	# sts	# sts	# sts	# sts	# sts
Greater Quantity	correct	incorrect	correct	incorrect	correct	incorrect
Unknown						
Recycling cans						
72 cans						
	Equation only		No work shown,		No work sho	own,
			observed use of		assume mer	ntal math
			manipulatives, fingers,			
		1	number line, etc.			
	# sts	# sts	# sts	# sts	# sts	# sts
	correct	incorrect	correct	incorrect	correct	incorrect