



Principal
Coffee – Friday,
April 10th

Jen Ortega, Math Coach
Susan Colgan, Literacy
Specialist
Beth Herlihy, Principal

Angela Duckworth





Computation in Grades 3-5

Building Understanding of
Addition, Subtraction,
Multiplication and Division

How you can help!!!

13 Rules That Expire

- In your packet, you will find the article, “13 Rules That Expire.” Please take a moment to look it over, and note anything that speaks to our topic of building computational fluency with conceptual understanding.

Subtraction in Grade 4

What do you notice about this application of the standard algorithm?

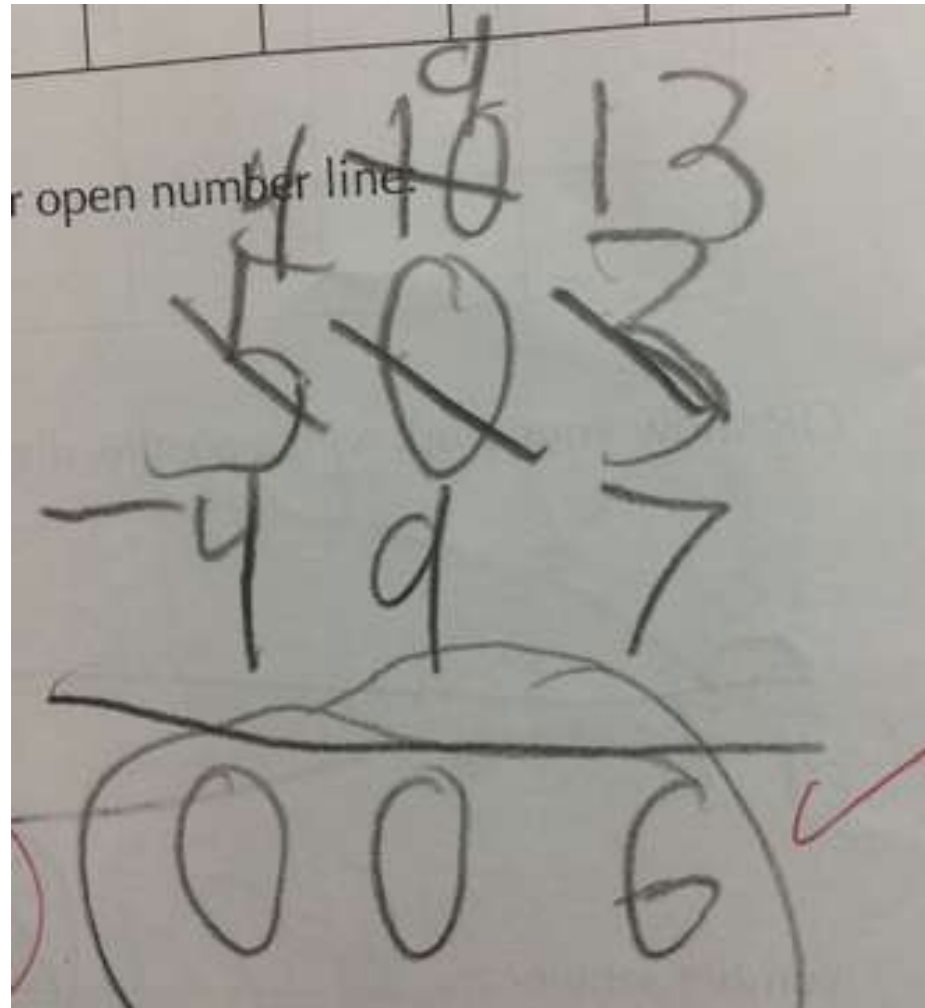
ow your work with a picture, diagram or

$$\begin{array}{r} \cancel{70} + 13 \\ \cancel{90} \\ - 734 \\ \hline 079 \end{array}$$
A photograph of a student's handwritten work on grid paper. The student has written a subtraction problem: 70 + 13 minus 734. The 70 and 90 are crossed out with a large 'X'. The result 079 is circled in red. The text 'ow your work with a picture, diagram or' is partially visible at the top of the page.

How about
here?

Handwritten subtraction problem on a piece of paper. The top part shows a subtraction problem: 3470313 minus 497 , with a horizontal line and the result 016 . The bottom part shows the equation $503 - 497 = 16$, with the number 16 circled in red.

Is this an efficient way to solve this problem?



Timeline for Fact Memorization with Whole Numbers



| K | First | Second | Third | Fourth | Fifth | Sixth |
|---------------------------|----------------------------|----------------------------|-------------------------------|--|-------|-------|
| Add and Subtract within 5 | Add and Subtract within 10 | Add and Subtract within 20 | Multiply Through 9×9 | Multiply and Divide Through 12×12 | none | none |

Timeline for Standard Algorithm with Whole Numbers



| K | First | Second | Third | Fourth | Fifth | Sixth |
|------|-------|--------|-------|--|------------------------------|------------------------|
| none | none | none | none | Multi - Digit Addition and Subtraction | Multi - Digit Multiplication | Mutli - Digit Division |

Fact Fluency vs. Fact Memorization

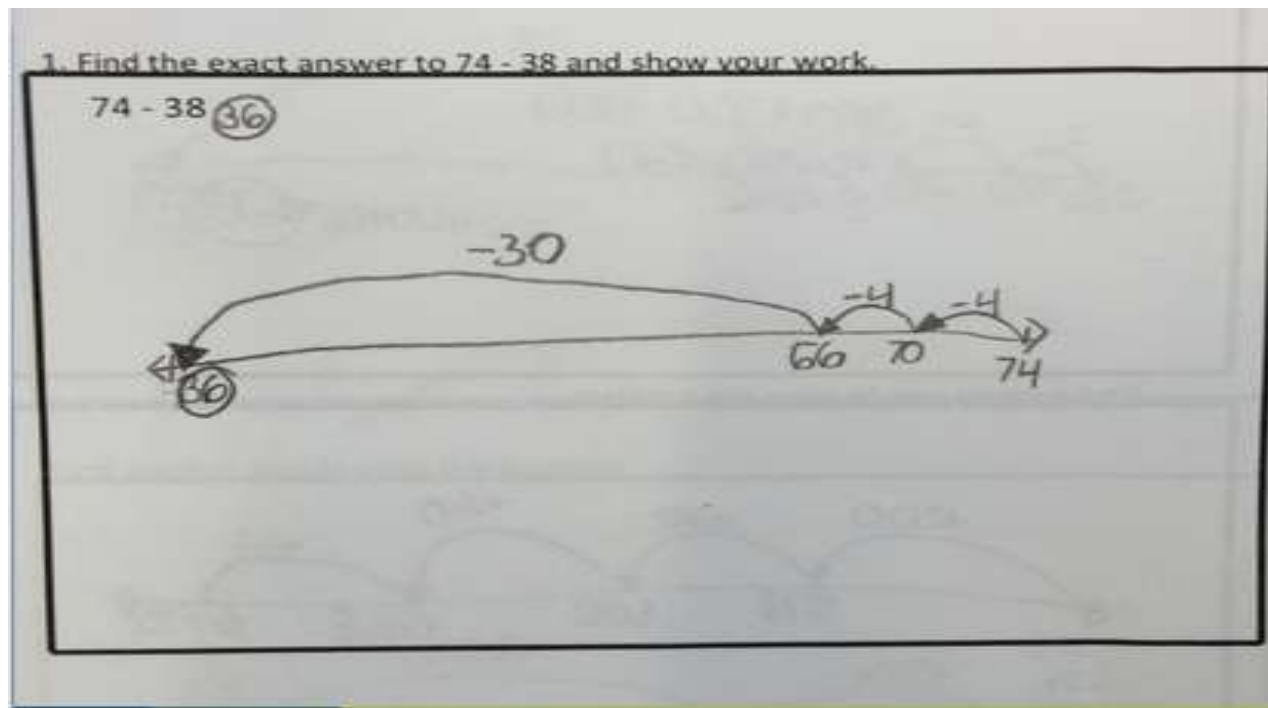
| Fluency | Memorization |
|--|--|
| Visible evidence of place value and number sense | Evidence of understanding not required |
| Answer and process focus | Answer focus |
| Solution found at a reasonable pace | Recall facts quickly |

Fluency with Operations in Grades 3-5

- Grade 3: Fluently add and subtract within 1000
- Grade 4: Multiply a whole number of up to four digits by a one-digit whole number, and multiply 2 two-digit whole numbers
- Grade 5: Find whole number quotients of whole numbers with up to four-digit dividends and two-digit divisors

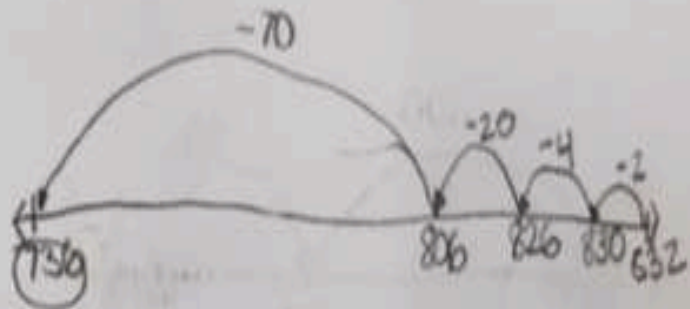
How do third graders add and subtract within 1000?

They can use an Open Number Line:

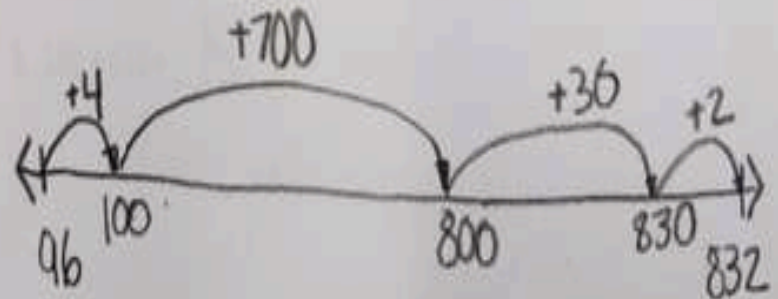


3. Find the answer to $832 - 96$ and show your work.

$$832 - 96$$



Find another way to solve this problem.

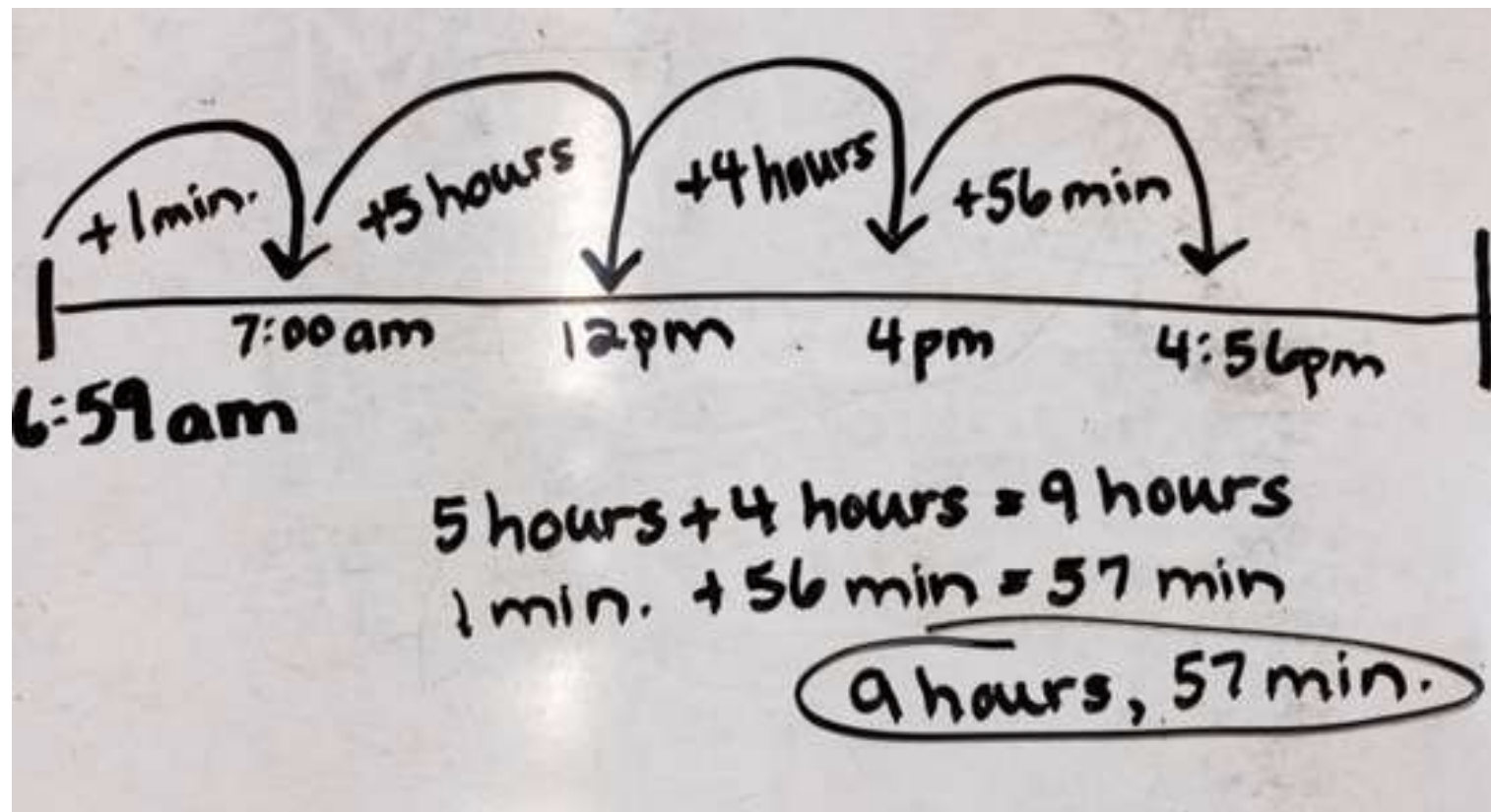


$$700 + 30 + 4 + 2 = \textcircled{736}$$

Calculating Elapsed Time

- In 3rd grade, students are expected to calculate elapsed time. A common problem they might encounter:
- On Friday, January 30th, the sun rose in Newton Center at 6:59 AM. It set at 4:56 PM. How much daylight did Newton Center get on January 30th?

Example of Third Grade Elapsed Time Problem Solving



Grade 3

Array Multiplication

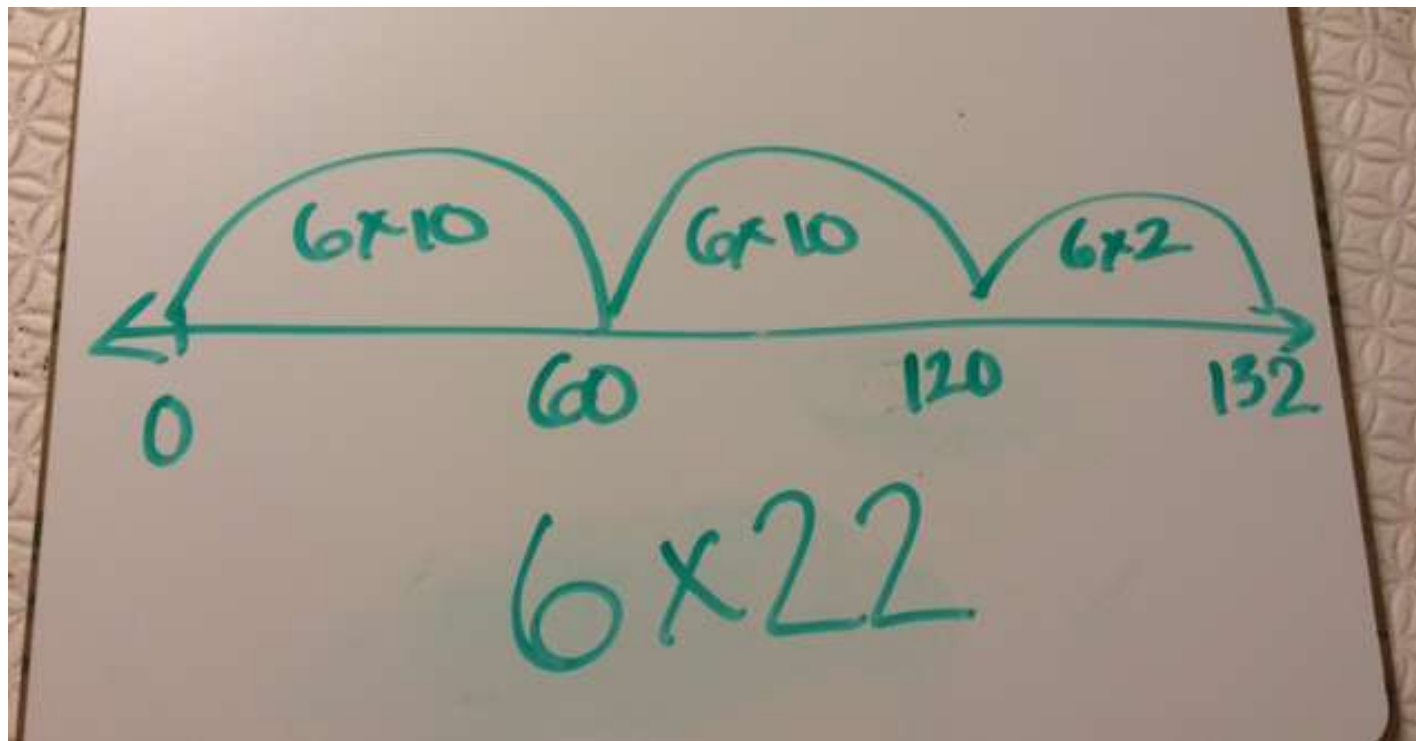


$$3 \times 6 = 18$$

Why are we making multiplication so complicated?

- Dr. Raj Shah explains:
https://www.youtube.com/watch?v=X_CK1e0Lmxw

Grade 4 Number Line Multiplication



Grade 4

Open Array Multiplication

6 bottles per pack

| | | |
|------------|------------|----|
| 10p | 10p | 2p |
| 60 bottles | 60 bottles | 12 |

$(6 \times 10) + (6 \times 10) + (6 \times 2)$
 $60 + 60 + 12 =$

Division in Grade 5 – Why don't we teach the traditional algorithm?

- The traditional algorithm is rigid, and students are blindly following a process.
- We teach for conceptual understanding, where students are finding quotients by making sense of the problem

Advantages of Partial Quotients

- Not just ONE correct pathway to the answer
- Can use COMFORTABLE numbers
- Students make sense of the problem – “how many groups of 9 are in 2079?”

Partial Quotients

$$\begin{array}{r} 6 \overline{) 258} \\ - 120 \\ \hline 138 \\ - 120 \\ \hline 18 \\ - 18 \\ \hline 0 \end{array} \quad \begin{array}{l} 20 \\ 20 \\ 3 \\ \hline 43 \end{array}$$

$$\begin{array}{r} 21 \overline{) 2772} \\ - 2100 \\ \hline 672 \\ - 630 \\ \hline 42 \\ - 42 \\ \hline 0 \end{array} \quad \begin{array}{l} 100 \\ 30 \\ 2 \\ \hline 132 \end{array}$$

Multiple pathways to find a quotient

The image shows three handwritten long division problems for $153 \div 3$, each illustrating a different method to find the quotient.

Method 1 (Left): Standard long division. The quotient is 51. The steps are: 3 goes into 15 five times (50), leaving a remainder of 3. 3 goes into 3 one time (3), leaving a remainder of 0.

$$\begin{array}{r} 51 \\ 3 \overline{) 153} \\ \underline{- 60} \\ 93 \\ \underline{- 93} \\ 0 \end{array}$$

Method 2 (Middle): Repeated subtraction. The quotient is 51. The steps are: subtract 30 from 153 ten times to get 123, then subtract 30 from 123 ten times to get 93, then subtract 30 from 93 ten times to get 63, then subtract 30 from 63 ten times to get 33, then subtract 30 from 33 ten times to get 3, and finally subtract 3 from 3 one time to get 0.

$$\begin{array}{r} 3 \overline{) 153} \\ \underline{- 30} \\ 123 \\ \underline{- 30} \\ 93 \\ \underline{- 30} \\ 63 \\ \underline{- 30} \\ 33 \\ \underline{- 30} \\ 3 \\ \underline{- 3} \\ 0 \end{array}$$

Method 3 (Right): Decomposition. The quotient is 51. The steps are: subtract 150 from 153 to get 3, then divide 3 by 3 to get 1. The total quotient is 50 + 1 = 51.

$$\begin{array}{r} 3 \overline{) 153} \\ \underline{- 150} \\ 3 \\ \underline{- 3} \\ 0 \end{array}$$

No Secrets Here!!!

- We will teach your child the standard algorithms, but we want students to know the “why” not just the “how”
- Students will have multiple strategies for finding solutions, and will assess the situation to find the most efficient

The slide features a light green border with a subtle geometric pattern. At the top center, there is a dark grey rectangular box. The main content area is white and contains the text "Thank You!" in a green, sans-serif font.

Thank You!



Waggle

Principal's Coffee
Friday, April 10, 2015

Productive Struggle

Involves:

- grappling with perplexing problems
- making sense of challenging ideas

Leads to:

- understanding.
- attainable learning goals
- Worthwhile effort results.
- empowerment

Key Elements of Productive Struggle

- Motivation and persistence
- Scaffolded support
- Feedback

Desirable Difficulties

- Challenges that strengthen long term memory

Introducing Waggle!





- Smart Practice
 - Hints
 - Rewarded for effort
 - Mixed practice

So what is “Mixed Practice”?

- 1 Multiple Choice
- 2 Hot Spot
- 3 Multiple Select
- 4 Hot Spot Click to Fill
- 5 Embed Text and Image
- 6 Drag and Drop
- 7 Embed Text in Text
- 8 Highlight Text
- 9 Graph Point Segment Line
- 10 Sorting
- 11 Open Response

Kid Side...

- The Lift Meter
- Skills
- Standards
- Goals





Welcome Page

| | | | |
|---|--|---|---|
| 3 DAYS LEFT | LITERARY ELEMENTS | 0/5 |  <p>150 100 50 10</p> |
| 7 DAYS LEFT |  WRITE ABOUT INFORMATIONAL TEXT | 0/2 | |
| 8 DAYS LEFT | INFORMATIONAL TEXT ELEMENTS | 0/3 | |
|  LATE | WRITE ABOUT INFORMATIONAL TEXT |  | |

Show Cleared

Welcome Page

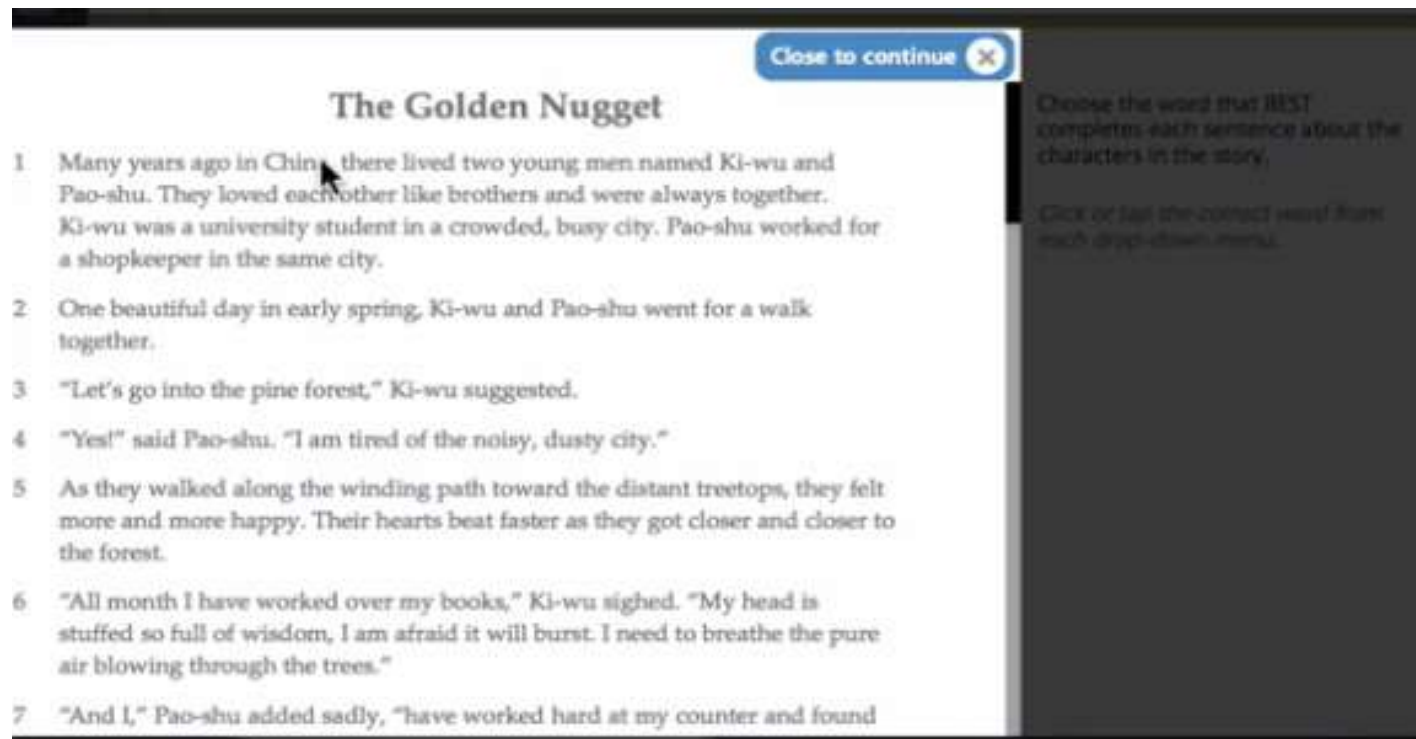
| | | | |
|--|--|--|--|
| 3 DAYS LEFT | LITERARY ELEMENTS | 0/5 |  |
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| 8 DAYS LEFT | INFORMATIONAL TEXT ELEMENTS | 0/3 | |
|  LATE | WRITE ABOUT INFORMATIONAL TEXT |  | |

[Show Closed](#)

| | | |
|------------------------|--------------------------|-------------------------|
| 0 GOALS REACHED | 0 FLOCKS RELEASED | 30 FEET TRAVELED |
|------------------------|--------------------------|-------------------------|

how many... you've earned... for this class

Distraction-free page



Close to continue ✕

The Golden Nugget

- 1 Many years ago in China, there lived two young men named Ki-wu and Pao-shu. They loved each other like brothers and were always together. Ki-wu was a university student in a crowded, busy city. Pao-shu worked for a shopkeeper in the same city.
- 2 One beautiful day in early spring, Ki-wu and Pao-shu went for a walk together.
- 3 "Let's go into the pine forest," Ki-wu suggested.
- 4 "Yes!" said Pao-shu. "I am tired of the noisy, dusty city."
- 5 As they walked along the winding path toward the distant treetops, they felt more and more happy. Their hearts beat faster as they got closer and closer to the forest.
- 6 "All month I have worked over my books," Ki-wu sighed. "My head is stuffed so full of wisdom, I am afraid it will burst. I need to breathe the pure air blowing through the trees."
- 7 "And I," Pao-shu added sadly, "have worked hard at my counter and found

Choose the word that **BEST** completes each sentence about the characters in the story.

Click or tap the correct word from each drop-down menu.

Another sample question

By each wanting the other to have the gold nugget, Ki-wu and Pao-shu show they are .

By taking up all the space at the spring and running to get the gold, the man shows he is .


By telling the man about the gold, Ki-wu and Pao-shu show they are .

By yelling at Ki-wu and Pao-shu because he thinks they tricked him, the man shows he is .

Choose the word that BEST completes each sentence about the characters in the story.

Click or tap the correct word from each drop-down menu.

[Reset](#)

[View Selection](#) Hints: [1](#) [2](#) [3](#) [4](#) [5](#)  [Check My Answer](#)

Look back in the text!

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[View Selection](#) Hints: [1](#) [2](#) [3](#) [4](#) [5](#) [Reset](#) [Check My Answer](#)

Look back in the text!

Hints are available throughout the process.

Teacher monitoring

Knewton: 5th Grade - Math

SKILLS TO WATCH

"No news is good news! All skills are on track to be completed by their due dates."

STUDENTS TO WATCH

2 Struggling

Nepom, Jessica

Georgiev, Mark

"No Excuses Students! Why not"

Nepom, Jessica is **BEHIND** the goal pace for **6** Goals and has **HIGH** active time.

SUMMARY SKILLS GOALS

Summary

Learn how to get the most from this report [Export/Print](#)

Skills Proficiency

Class Avg
Proficient and Above: 0%

Assignments

Class Avg
Assignments completed: 0

1 COMPLETED

| Proficiency Level | Percentage |
|-------------------|------------|
| Minimal | 0% |
| Partial | 20% |
| Basic | 6% |
| Proficient | 1% |
| Advanced | 0% |
| Not Started | 74% |

| Assignment Status | Percentage |
|-------------------|------------|
| Behind | 26% |
| On Track | 70% |
| Ahead | 0% |
| Completed | 4% |

Teacher monitoring

Knewton: 5th Grade -..
Math
Last updated: 10/29/2014
SKILLS TO WATCH
"No scores in green zones!
All skills are on track to be completed by their due date."

STUDENTS TO WATCH

| Count | Status |
|----------------|------------|
| 2 | Struggling |
| Nepom, Jessica | |
| Georgiev, Mark | |

Nepom, Jessica is BEHIND the goal pace for **6** Goals and has **HIGH** active time.

SUMMARY | SKILLS | GOALS

Summary
Learn how to get the most from this report [i](#) [Export/Print](#)

Skills Proficiency

| Proficiency Level | Percentage |
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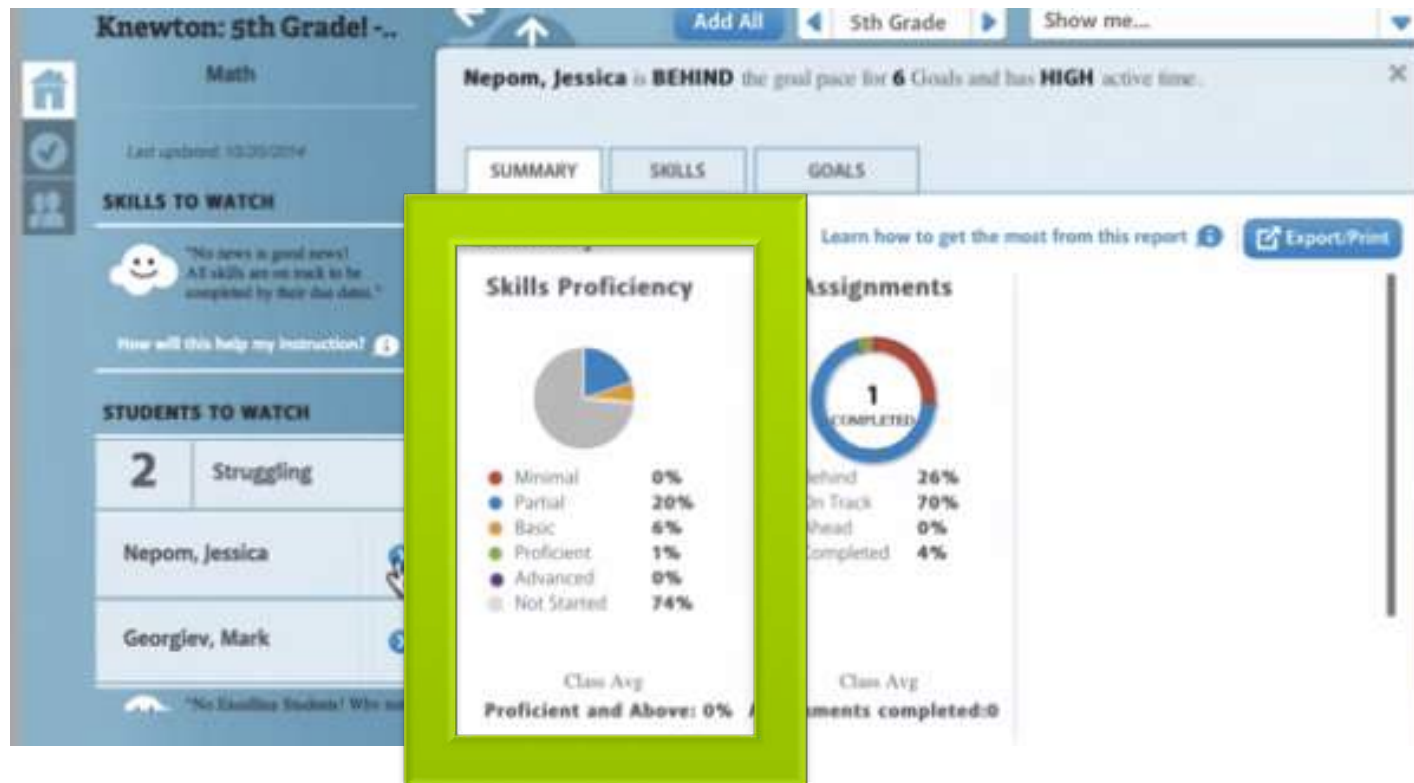
Class Avg
Proficient and Above: 0%

Assignments

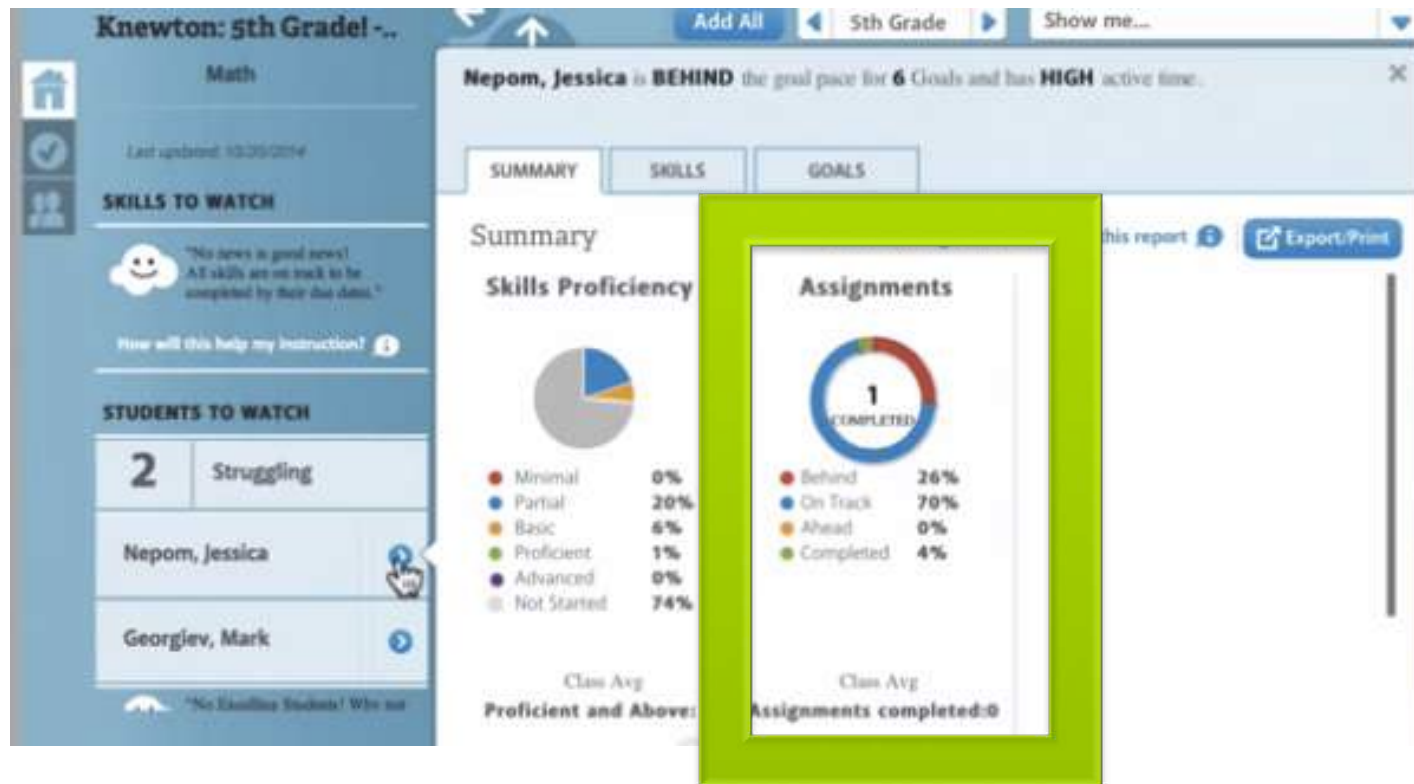
| Assignment Status | Percentage |
|-------------------|------------|
| Behind | 26% |
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Class Avg
Assignments completed: 0

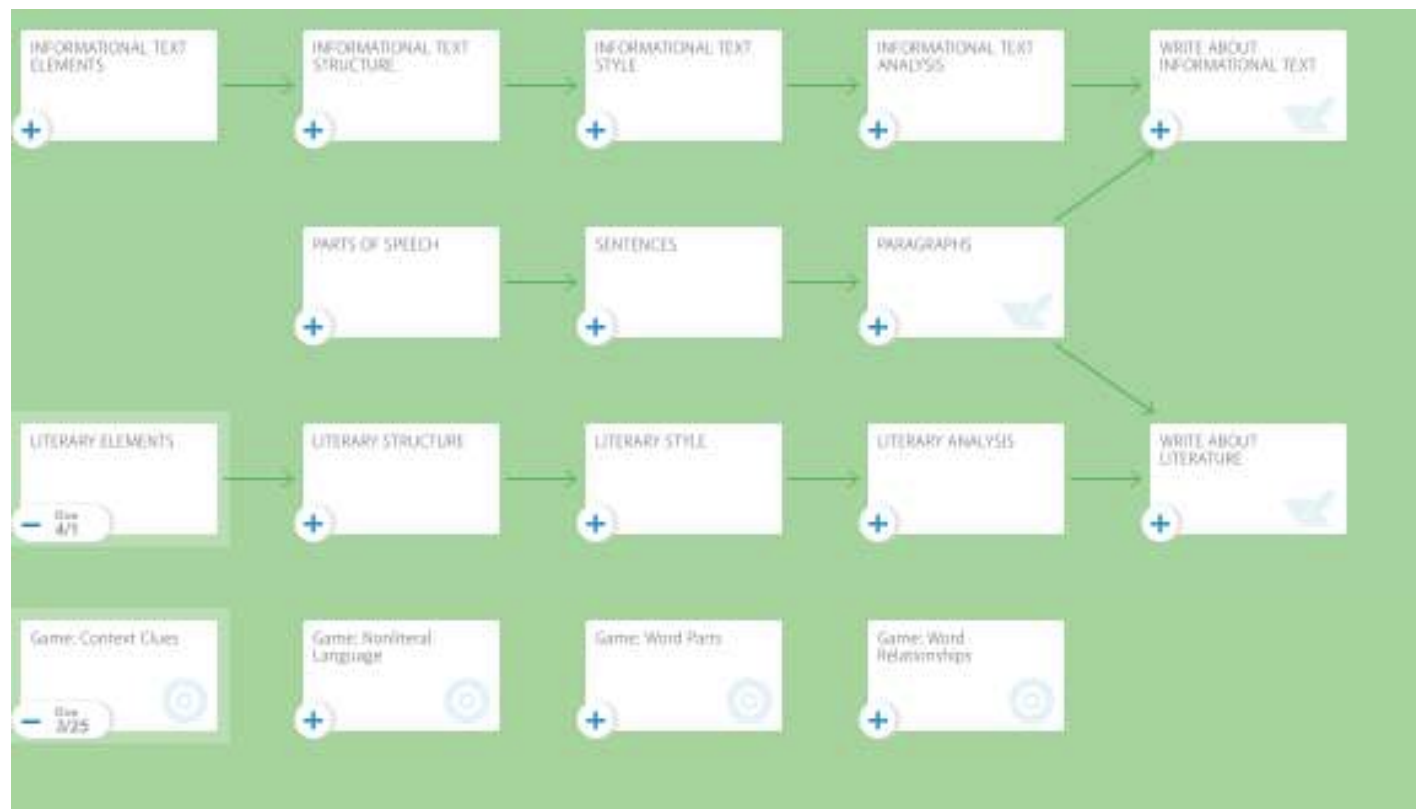
Teacher monitoring



Teacher monitoring



Common Core State Standards



Each standard is broken down into skills

SKILL

Use relative adverbs

L.4.1.a

Use adjectives

L.4.1.d

Use modal auxiliaries

L.4.1.c

Use relative pronouns

L.4.1.a

Use future progressive tense verbs

L.4.1.b

Use prepositional phrases

So what is Countryside saying? The bad...

- “Directions are hard to understand.”
- “I have trouble logging in at home.”
- “The computer is freezing.”
- Waggle logs me out.”

So what is Countryside saying? The good...

- “Set up is fun but we can still learn.”
- “Learning literacy moves the cloud and boosts your confidence.”
- “Enjoy that you can learn and it’s enjoyable!”
- “We like the flocks!”
- “Can’t wait to play the games at home.”
- “It helps us learn.”

PARCC

- PARCC is designed to assess student learning of the Common Core State Standards at each grade level K-8
- It will most likely replace MCAS for ELA and Math in 2016 for grade 3-8
- 11 of the elementary schools are taking the assessments online

Structure of PARCC

| | When? | English Language Arts | Mathematics |
|------------------------------|-------------------------------|---------------------------------------|---|
| Performance-Based Assessment | Mid-March through Early April | Writing effectively Analyzing text | Solving multi-step problems Using abstract reasoning |
| End-of-Year Assessment | Early- to Mid-May | Reading Comprehension | Understanding major grade-level math concepts |

What does PARCC look like?

- There are online practice tests