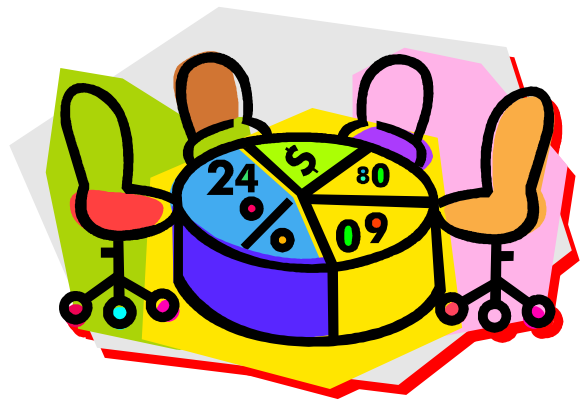

Formative Assessment Probes

Math Trailblazers

2010–2011



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Note: The directions for implementing the probes with the interventions are located in the companion document entitled, Formative Assessment Interventions – Math Trailblazers.

A Case for Formative Assessment

Delaware has adopted the definition of **Response to Intervention** as published by the National Association of State Directors of Special Education (2005):

“RTI is the practice of providing high-quality instruction and intervention matched to student need, monitoring progress frequently to make decisions about change in instruction or goals and applying child response data to important educational decisions. RTI should be applied to decisions in general, remedial and special education, creating a well-integrated system of instruction/intervention guided by child outcome data.”

Delaware’s three-tiered RTI model is an efficient and effective model that emphasizes high-quality differentiated instruction based on meeting the needs of each student using data collected during formative assessment, diagnostic assessment, and summative assessment.

Successful implementation of **Response to Intervention** requires Delaware educators to:

1. Believe that you can effectively teach all students.
2. Use a research-based, scientifically validated core curriculum with fidelity.
3. Use assessment data to inform your instructional decisions.
4. Use a problem-solving method to make decisions within a multi-tier model of service delivery.
5. Use research-based, scientifically validated interventions matched to student need.

In response to these five principles, the Delaware mathematics community designed the **Response to Intervention** project. Formative assessment is the cornerstone of the Delaware **RTI** model based on the strongest possible research-based evidence connecting the use of diagnostic assessment and descriptive feedback to improved student achievement (Black, P., & Wiliam, D., 1998; and Crooks, 1988). We adopted the Chief Council of State School Officers’ definition and five critical attributes of formative assessment listed below.

Formative assessment is a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students’ achievement of intended instructional outcomes.

Effective use of formative assessment requires attention to the following attributes:

- **Learning Progressions:** Learning progressions contain clearly articulated sub-goals of the ultimate learning goal.
- **Learning Goals:** Learning goals and criteria for success are clearly identified and communicated to students.
- **Descriptive Feedback:** Students receive evidence-based feedback linked to the intended instructional outcomes and criteria for success.
- **Self- and Peer-Assessment:** Substantial student self- and peer-assessment are important for providing students an opportunity to think meta-cognitively about their learning.

- *Collaboration:* Practitioners establish and support a classroom culture in which teachers and students are partners in learning.

(Developed and approved by the CCSSO Formative Assessment Advisory Group and Formative Assessment for Teachers and Students (FAST) SCASS, October 2006)

These formative assessment principles have been used to build curriculum-based templates that guide teachers through the process of identifying learning gaps and implementing interventions. The work is remedial in nature and designed to be integrated with acceleration strategies. We invite you to join this stage of development.

Formative Assessment: Delaware’s Vision of Response to Intervention

As much as possible, as we wrote this document, we tried to imagine what this kind of implementation of Response to Intervention would look like in classrooms. We tried to imagine formative assessment in all of its messiness, as well as its potential, in order to create a document that would provide practical support to teachers as well as vision.

Delaware’s RTI program is designed to occur within the classroom setting, using the curriculum materials that districts are already using. Teachers are supposed to analyze student work on pages that are part of the lessons themselves, and then use class time to intervene with students in need of Tier 1 intervention. While this may sound simple in conception, it is actually very complex and calls upon teachers to be experts in management, assessment, planning, and teaching.

Classroom Management and Classroom Culture

Tier 1 of RTI may require teachers to carefully observe students as they work, ask “in the moment” questions, and carry out interventions with individual, pairs, or small groups of students during class time. For this to be accomplished they need to establish a classroom culture which will allow this. Students need to learn to:

- Work productively by themselves and with others.
- Get, share, and return the materials they need.
- Ask and receive help from other students when the teacher is unavailable.
- Find something else productive to do when they are finished or stuck.

For help establishing such a culture, we recommend these resources:

- “Building the MTB Classroom,” Section 10 of the *Math Trailblazers Implementation Guide 3rd Edition*. This section focuses on establishing a flexible and challenging learning environment for all students. Strategies include addressing classroom culture, effectively grouping students, managing manipulatives, and pacing instruction.
- *The First Six Weeks of School* by Paula Denton and Roxann Kriete.
- Getting Metacognition Out of the Closet
(<http://investigations.terc.edu/library/implementing/qa-1ed/metacognition.cfm>)

Assessment

In order to gain as much information about students as possible, teachers need to assess their students in many ways. Teachers need to:

1. Observe students as they work and take notes in an organized way.
2. Carefully analyze student work on the formative assessment checkpoints after class.
3. Think about student understanding and misunderstanding not just in terms of “getting it” or “not getting it,” but in specific language that describes what the student does or does not understand. In analyzing student work as part of this project, we found that most student mistakes or difficulties fell into one of these categories:

- a. Lack of conceptual understanding;
- b. Inefficient strategy;
- c. Misusing or not using an important mathematical tool or representation;
- d. Difficulty with verbal or written communication;
- e. No connection to prior knowledge.

Recommended resources:

- “Assessment,” Section 8 of the *Math Trailblazers Implementation Guide 3rd Edition*. This section details the philosophy, goals, and components as well as a description of how to do observational assessment.
- The “ongoing assessment” section of each lesson in the curriculum.
- “Math Facts and Whole Number Operations,” Section 6 of the *Math Trailblazers Implementation Guide 3rd Edition*.
- How Do I Organize My Observations?
(http://investigations.terc.edu/library/implementing/qa-led/organize_observations.cfm)

Planning

In order to create lessons and interventions that help all students learn, teachers need to carefully plan their lessons. While management of materials and students is extremely important, **it is also extremely important that teachers plan the mathematical focus of their lessons**. For every activity, class discussion, or intervention, teachers need to figure out ahead of time what mathematical skills, concepts, or strategies they are trying to develop in their students. Much of this information can be gathered from

- Reading the “Background Information” section in each unit of the *Math Trailblazers Implementation Guide 3rd Edition*.
- Reading the lessons carefully.
- Doing the math ahead of time and anticipating student responses.
- Reading the “Lesson Overview” and the “At-A Glance” in each lesson of *Math Trailblazers Implementation Guide 3rd Edition*.

Class discussions are often not planned carefully ahead of time, and the students who are most affected by this lack of planning tend to be struggling students. Class discussions that are carefully focused, follow clear trains of thought, and draw clear connections among different strategies or ideas will extend the learning of all students in important ways.

Recommended resources for planning class discussions are:

- How Can I Help Special Needs Students Feel Included in Math Discussions?
(http://investigations.terc.edu/library/implementing/qa-led/special_needs_class_disc.cfm)
- “Inclusive Math Communities” (http://investigations.terc.edu/library/implementing/qa-led/inclusive_communities.cfm)

- “Meeting Individual Needs,” Section 11 of the *Math Trailblazers Teacher Implementation Guide 3rd Edition*. This section specifically focuses on the needs of the English Language Learner, special education students, and talented and gifted students.
- “Language,” Section 12 of the *Math Trailblazers Teacher Implementation Guide 3rd Edition*. This section focuses on the use of language and gives strategies for working with reading comprehension, writing, and discourse in a math classroom.

Likewise, when teachers are intervening with students, they need to carefully think about the primary goal(s) for their intervention. Not all interventions are designed for the same purpose. Some are designed to help the student who is lagging behind in conceptual understanding of a topic. Others are written to improve computation, communication, representation, and connections.

- **Conceptual Leap** – This type of intervention is designed to prompt students to develop or clarify a particular concept or generalization. For example, a second-grade teacher might design an intervention to prompt a student to develop a generalization about breaking 2-digit numbers into 10s and 1s. Or, a teacher may need to diagnose where the child is in a specific learning trajectory and use an intervention based on the child’s concept knowledge.
- **Computation Efficiency** – This type of intervention is designed to help students understand and use more efficient computation strategies. For example, a third-grade teacher might design an intervention to prompt students who are drawing pictures to solve multiplication problems, to begin using skip counting instead. A primary teacher might look at a student who is counting all and design an intervention for counting on.
- **Use of Tools or Models** – This type of intervention is designed to help students learn to use a particular tool or model to solve problems. Students in need of this intervention may not understand how a model relates to the mathematics. A fourth-grade teacher might design an intervention to help students understand and begin to use an array model to solve multiplication problems with 2-digit numbers. A primary teacher may design an intervention to help students make sense of a tens frame.
- **Communication** – This category includes both interventions designed to help students read and understand what a problem is asking and interventions designed to help students clearly communicate their thinking both verbally and in writing. It also includes carefully structuring a lesson so that vocabulary that is unknown (like campfire) does not get in the way of solving a problem. A fifth-grade teacher might design an intervention to help students read and make sense of multi-step word problems. Another fifth-grade teacher might design an intervention to help students record their work on multi-step word problems in a way that was clear and concise.
- **Prior Knowledge or Experiences** – This category of intervention is designed to prompt students to make connections among work they did earlier in the year or in a previous year and a current mathematical concept or task. For example, a fourth-grade teacher might design an intervention in which students divided a paper brownie into fractional parts and labeled the parts as they had in third grade. The purpose of this intervention would be to remind students of what they did know about fractions in order to prepare them for the fourth-grade fraction tasks.

Teaching

In thinking about the teaching of interventions, we asked ourselves two basic questions:

- When would interventions happen?
- What would interventions look like?

Teachers who have a 15-minute class time for doing Daily Practice Problems (DPPs) have utilized this time to bring a small group together. Other teachers have started a lesson with the whole class and find time to pull a small group together while the rest of the class is working in small groups. Some schools are finding daily “intervention” time and sharing that time between English language arts and mathematics. While some students are receiving Tier 2 intervention outside of class, others can receive Tier 1 intervention or extension activities.

What the teaching of interventions should look like was a broader question for us. Most of the interventions we wrote are written as small-group activities, facilitated by the teacher, and can be implemented as such. However, we are aware that teachers may not always be available to lead small-group lessons, and sometimes the number of students needing an intervention might be more than a “small group.” We also recognize that teachers may also not find it beneficial to gather the same students for small-group lessons too frequently. We do not want these students to become stigmatized in the eyes of their peers or themselves, and we do not want these students to become overly dependent upon adult help. We imagined that most interventions could be accomplished in one of four forms, with different forms being preferable under different circumstances. The four forms are:

- **Small-group lessons with the teacher** – This form is suggested most frequently in our intervention probes. In this form of intervention, the teacher meets target group of students for 10 to 25 minutes during the regular math class to provide interventions.
- **Strategic partnering of students** – In this form of intervention, a teacher carefully chooses particular students to collaborate as partners based on the belief that in working together one or both children will help the other child develop a particular skill or understanding. For example, a teacher might choose to have a student who had difficulty using a number line to solve subtraction problems work with a student who is able to use a number line to solve subtraction problems with the goal that the student who is having difficulty using the number line will learn from the other child. We recommend that teachers who use strategic partnering tell students in clear, but tactful language, what they hope the students will each contribute to and gain from the partnership. Strategic partnering could be especially helpful for students who lack vocabulary or background knowledge.
- **Whole-class interventions** – In this form of intervention, a teacher may modify a task for the whole class or plan a whole-class discussion in a particular way, based upon information learned from analyzing student work. For example, a teacher who realized that many students in her class have difficulty with the initial tasks in the fourth-grade fraction unit might revisit a third-grade fraction lesson with her whole class in order to activate the prior knowledge of all of the students in the class. Another teacher whose class was not clearly recording their work might take a lesson for addition strategies and focus on how each strategy could be recorded clearly.

- **Modification of tasks for particular students** – In this form of intervention, a teacher modifies a task or substitutes a different task for particular students based upon the learning goals for those students. For example, a third-grade teacher may have three students in her class who are just learning to add numbers by place. The teacher might give those three students the same word problems that she gives the other students in her class but changes the numbers in the word problems to make them 2-digit numbers instead of 3-digit numbers. That same teacher could also have the three students play a second-grade game during a Tier 1 math time as a way to improve their number sense and understanding of place value. This modification or substitution of a task is a good way to foster independence and perseverance among students who often ask for help. It can also be an effective homework strategy. By modifying a task or substituting a different task, a teacher can provide homework that can be done independently by the child and is focused on a targeted skill or concept.

We recommend the following resources for further ideas on implementing the types of interventions suggested above:

- “Meeting Individual Needs,” Section 11 of the *Math Trailblazers Teacher Implementation Guide 3rd Edition*. This section specifically focuses on the needs of the English language learner, special education students, and talented and gifted students.
- “Strategies for Special Needs Students” (http://investigations.terc.edu/library/implementing/qa-led/special_needs_strategies.cfm)
- “How do I enrich math class to challenge gifted students?” (http://investigations.terc.edu/library/implementing/qa-led/enrich_for_gift_students.cfm)
- “Teaching ALL Math Trailblazers Students” a differentiation opportunity in each unit.

Progress Monitoring

Selected Daily Practice Problems (DPPs) from the *Math Trailblazers* curriculum will serve as Progress Monitors for your Tier 1 students. Good teaching in the regular classroom along with a system to track students periodically will help all students meet the standards in mathematics. Look over the packet of DPPs for your grade level along with the spreadsheet that matches your grade level DPPs with the big ideas tested in the Universal Screening Tool.

Formative assessment is used to monitor student achievement.

- It is not graded but instead used to provide information about how each student in your classroom is doing based on the standards. Imagine giving each of these DPPs and walking around the room as students are working on them. The best part is that all students are doing the DPPs as a matter of fact each day, so asking students to do DPPs as you watch them work is not a new idea and children will not feel as though they are being graded.
- The teacher has a rare opportunity to watch students do math and ...
 - *ask them questions to clarify the problem,*
 - *stop them to redirect their thinking, and*
 - *probe the students who need additional help.*
- Then, by looking at the student work, the teacher can ...
 - *make a plan to have some students work in small groups based on your observations,*
 - *make a plan for whole-group instruction,*
 - *look to future lessons and use this information to teach what the students need.*
- The teacher directions are in a separate packet from the student DPPs but include a picture of the DPP formative assessment as well as three components.
 - *Suggestions for Implementation:* This section has been included and derived from the work that classroom teachers in the pilot study compiled. Since there are no teacher directions for administering DPPs in the curriculum, we asked teachers what worked best and included their findings here.
 - *Interventions:* Again, the teachers in the pilot tested some interventions and found some to be very workable. The teachers decided whether the intervention was to be large group, small group, individual, or sometimes whole class.
 - *Looking Ahead to Assess Again:* Since the DPPs do spiral, the authors looked ahead in the packet and made it very clear when this same topic was assessed in the Probes. There are many other opportunities to assess these skills during the curriculum as well, but this document takes you to the next DPP probe.
- The Universal Screening Tool includes a spreadsheet that groups questions into categories based on Numeric Reasoning. We have also grouped these DPPs into the same categories and have included a spreadsheet that shows how the student progresses. Instead of looking at one DPP at a time, the teachers decided to look at many chances to keep track of student progress by topic.

- In each grade level, there are certain manipulatives that are standard for your grade level. In almost every case, students should be given access to manipulatives when solving these problems. A rule of thumb for using manipulatives: Make available to each student what is usually given during the learning of the skill.

Please direct your questions to

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- Crystal Lancour, Department of Education, clancour@doe.k12.de.us
- Diana Roscoe, Department of Education, droscoe@doe.k12.de.us

1st Grade DPP Probes

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DPP W – What Number Once More?	Unit 3
---------------------------------------	---------------

1. What number follows fifteen?
2. What number comes just before fifteen?
3. What number follows nineteen?
4. What number comes just before nineteen?

DPP E – Even or Odd 1?	Unit 4
-------------------------------	---------------

Use your cubes to tell whether each number of objects is even or odd. Circle your choice and explain how you decided.

A. 7 cubes Even or Odd

B. 10 cubes Even or Odd

C. 21 cubes Even or Odd

DPP H – Adding Trains

Unit 4

Use two trains of cubes to solve the problems below. Write a number sentence to describe the combined train.

A. 5 add 2

B. 3 plus 4

C. 8 and 3 more

D. 4 and 4

E. 5 plus 7

DPP C – Parts and Wholes

Unit 5

1. Group fourteen beans into two parts and write a number sentence that describes your beans.

2. Group fourteen beans into three parts. Write a number sentence.

DPP D – Skip Counting 1

Unit 5

1. Write down the numbers you say when you skip count by twos. Start at 2 and stop at 20.

--

2. Write down the numbers you say when you skip count by fives. Start at 5 and stop at 30.

--

3. Write down the numbers you say when you skip count by tens. Start at 10 and stop at 50.

--

DPP H – Counting Feet by Twos

Unit 6

How many feet are there in all? Write number sentences to show your work.

1. Mom, Dad, and two children are sitting on the couch.

2. Four children are sitting on the couch with a teddy bear.

3. Three children, the dog, and the cat are on the couch.

DPP P – Grouping and Sharing	Unit 6
-------------------------------------	---------------

1. Group twenty beans or other counters into three parts and write a number sentence that describes your beans.

2. Share twenty cookies fairly with three people. How many leftovers do you have?

DPP L – Penny Problems	Unit 7
-------------------------------	---------------

A. $3\text{¢} + 2\text{¢} + 4\text{¢} = \underline{\hspace{2cm}}$

B. $8\text{¢} + 2\text{¢} + 3\text{¢} = \underline{\hspace{2cm}}$

C. $9\text{¢} + 2\text{¢} + 2\text{¢} = \underline{\hspace{2cm}}$

.....

DPP F – Name a Number	Unit 8
------------------------------	---------------

Write a number sentence to show your work.

1. Name the number that is three more than 11.
2. Name the number that is three less than 9.
3. Name the number that is four more than 6.
4. Name the number that is four less than 6.

DPP G – At the Circus

Unit 8

1. The peanut vendor started with 14 bags of peanuts. He sold 9 bags. How many did he have left? Write a number sentence to show your work.

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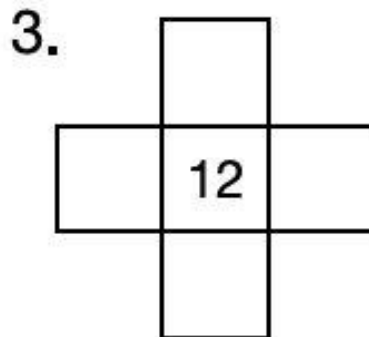
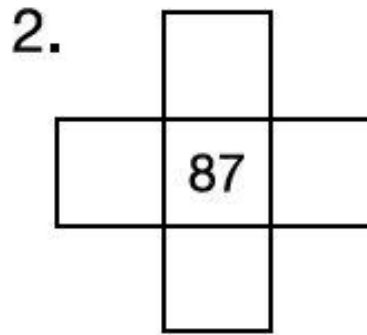
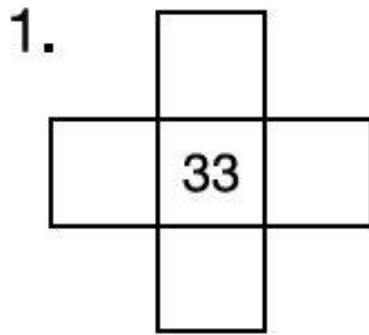
2. During the entire show, the acrobat will walk across the tightrope 13 times. In the first half of the show, she walked across the rope 7 times. How many more times will she walk across? Write a number sentence to show your work.

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DPP D – How Many in the Bag?	Unit 9
-------------------------------------	---------------

I have 18 beans in the bag. Now I am taking out 9 beans. How many beans are left in the bag? Write a number sentence that describes my bag now.

DPP U – Target Numbers	Unit 9
-------------------------------	---------------



DPP A – Ten Frames	Unit 10
---------------------------	----------------

1. Show 32 on the ten frames.

2. What are some number sentences you can write to represent 32?

3. Show 28 on the ten frames.

4. What are some numbers sentences you can write to represent 28?

DPP O – Back at the Circus	Unit 11
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Twenty-five acrobats were in the ring. Five more joined them. How many acrobats are in the ring now? Write a number sentence to show your work.

.....

DPP T – What’s the Weather Like?	Unit 11
---	----------------

1. In Chicago last week, 5 days were sunny and 2 days were cloudy. How many more days were sunny? Write a number sentence to show your work.

2. In Seattle last week, 6 days were cloudy and 1 day was sunny. How many more days were cloudy than sunny? Write a number sentence to show your work.

DPP A – Even or Odd?

Unit 12

1. Is 6 even or odd? How do you know?

--

2. Is 13 even or odd? How do you know?

--

3. Is 17 even or odd? How do you know?

--

4. Is 26 even or odd? How do you know?

--

DPP G – Sharing Pencils	Unit 12
--------------------------------	----------------

Mando’s mom gave him and his sister a box of 12 pencils for school. If they share the pencils fairly, how many will each child get? Show your work.

.....

DPP C – Pennies and Dimes	Unit 14
----------------------------------	----------------

1. How much are 7 pennies worth? _____
2. How much are 7 dimes worth? _____
3. How much are 12 pennies worth? _____
4. How much are 12 dimes worth? _____

DPP H – Addition Facts 1	Unit 14
---------------------------------	----------------

A. _____ + 7 = 8

B. 2 + _____ = 9

C. 2 + 8 = _____

D. 3 + _____ = 9

E. _____ + 7 = 10

F. 3 + 8 = _____

G. _____ = 4 + 7

H. 12 = _____ + 8

I. 10 = 4 + _____

J. 8 + 1 = _____

.....

DPP G – Naming Numbers	Unit 15
-------------------------------	----------------

Write a number sentence to show your work.

A. What number is two more than 29?

B. What number is two more than 59?

C. What number is three less than 31?

D. What number is three less than 71?

DPP B – Working With Ones Then Tens	Unit 17
--	----------------

A. $3 + 4 =$ _____

B. $30 + 40 =$ _____

C. $7 - 3 =$ _____

D. $70 - 30 =$ _____

.....

DPP J – Money Math Facts 2	Unit 17
-----------------------------------	----------------

A. $10\text{¢} + 8\text{¢} =$ _____

B. $10\text{¢} + 7\text{¢} =$ _____

C. $10\text{¢} + 6\text{¢} =$ _____

D. $10\text{¢} + 5\text{¢} =$ _____

.....

DPP H – Adding Ones, Tens, and Hundreds	Unit 18
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A. $4 + 2 + 1 =$ _____

B. $40 + 20 + 10 =$ _____

C. $400 + 200 + 100 =$ _____

D. $3 + 2 + 3 =$ _____

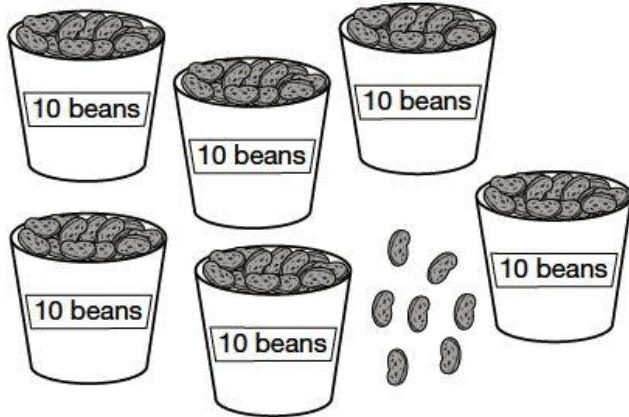
E. $30 + 20 + 30 =$ _____

F. $300 + 200 + 300 =$ _____

DPP K – Buckets of Beans

Unit 18

What is the total number of beans shown?



DPP E – Adding Bears

Unit 19

1. Eight baby bears are playing tag. Five more bears join their game. How many bears are playing tag? Explain your strategy.

2. Ten baby bears are eating honey. Three of the bears are all sticky. How many bears are not sticky? Explain your strategy.

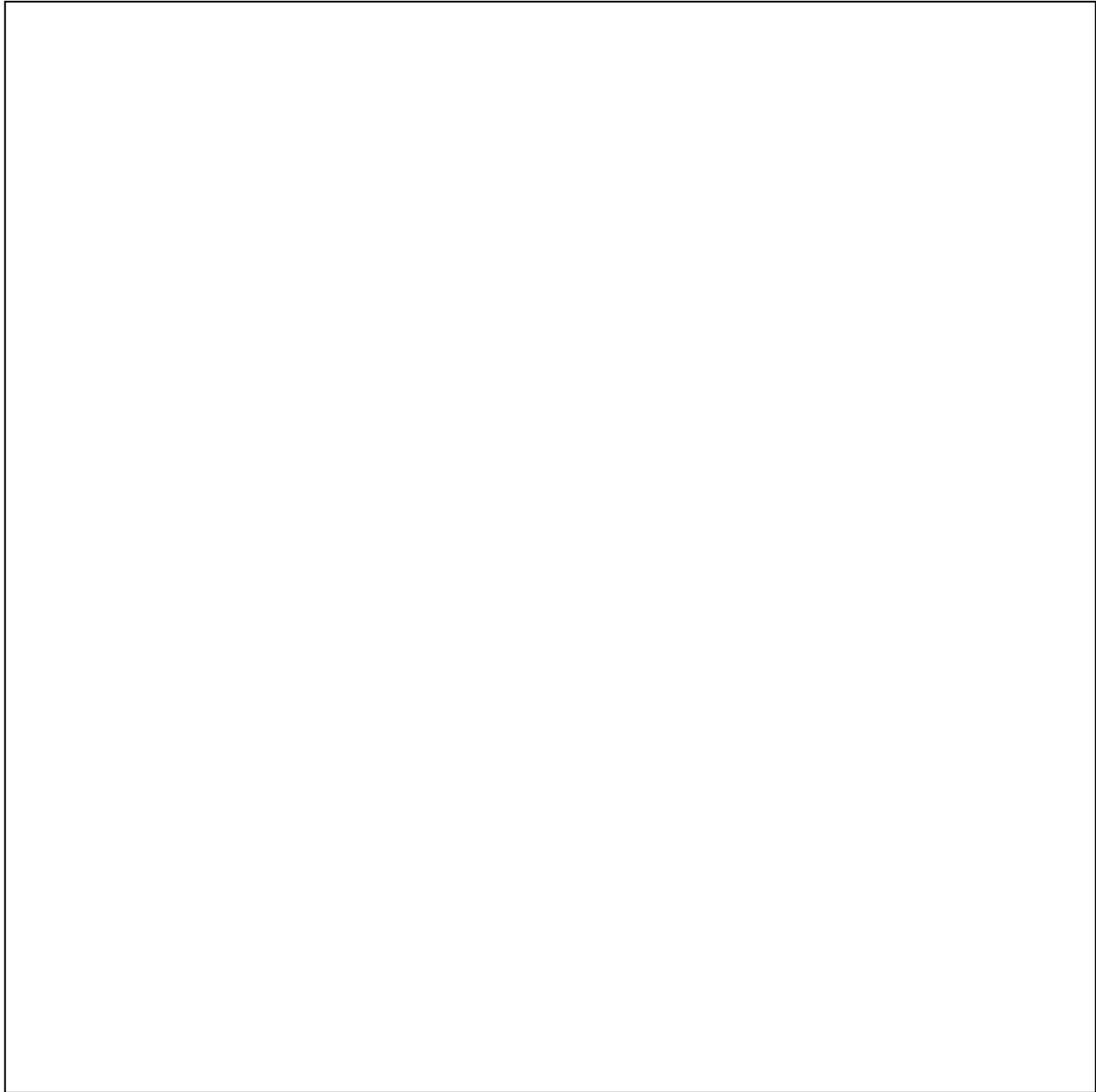
2nd Grade DPP Probes

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DPP N – School of Fish

Unit 1

Nancy’s class counted the number of fish they had at home as pets. One student had two fish. Another had nine fish. A third had six fish. How many fish did they have in all? Draw a picture or write a number sentence to show how you found your answer.



DPP D – At the Park

Unit 2

1. Twelve children went to the park right after school. Six more arrived a little later. How many children are at the park? Show how you found your answer.

2. Eight children are playing tag. Three children are on the swings. The rest are on the monkey bars. If fifteen children are at the park, how many are on the monkey bars? Show how you found your answer.

3. Explain your strategy for either Question 1 or Question 2.

DPP S – The School Store

Unit 2

1. An eraser costs 6¢. How much does it cost to buy two erasers? Show how you found your answer.

2. A sticker costs 6¢. A pencil costs 8¢. Mario has 17¢. Does he have enough to buy a pencil and two stickers? Show how you found your answer.

DPP E – Buttons	Unit 3
------------------------	---------------

Mary has twenty-seven buttons and Carol has thirty-three buttons.

A. Who has more buttons?

B. How many more buttons does she have? Show how you found your answer.

DPP F – Collecting Buttons	Unit 3
-----------------------------------	---------------

Marcus and Stephanie collected buttons from their families. Marcus collected 82 buttons. Stephanie collected 53 buttons. How many buttons did they collect in all? List two different strategies you can use to solve this problem. Then, find the solution.



DPP O – Skip Counting	Unit 4
------------------------------	---------------

1. If you skip count by fives, will you hit 103? Explain how you know.

2. If you skip count by twos, will you hit 106? Explain how you know.

3. If you skip count by tens, will you hit 125? Explain how you know.

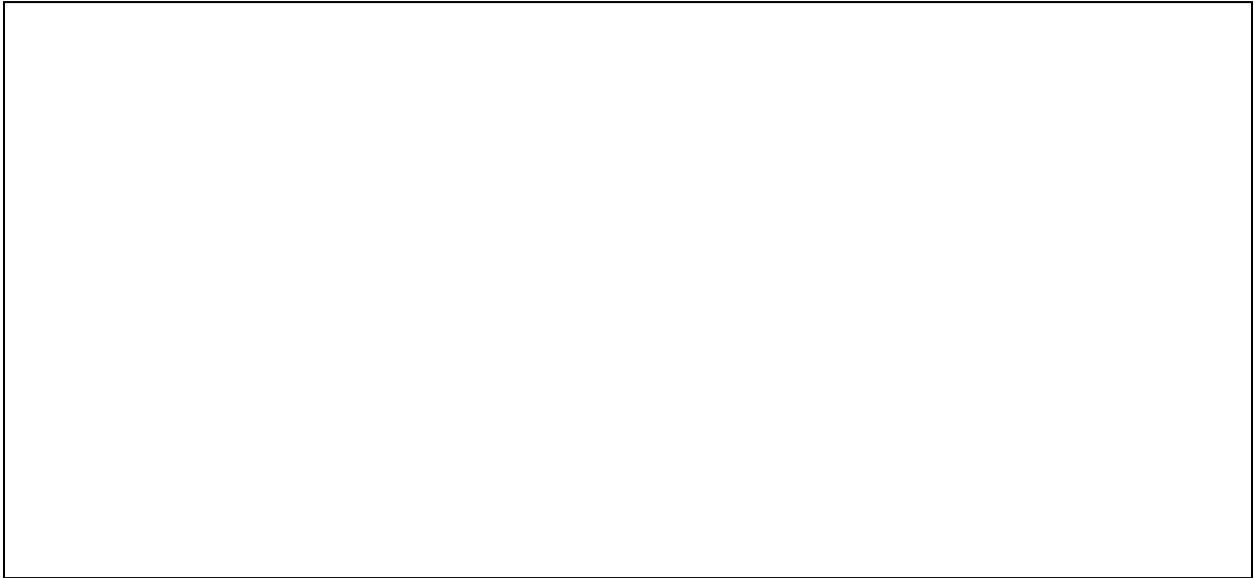
DPP G – Animals	Unit 5
------------------------	---------------

Charlie saw eighteen geese in the pond at the park. He also saw five ducks and twelve crows at the park. How many birds did Charlie see in all? Show how you found your answer.

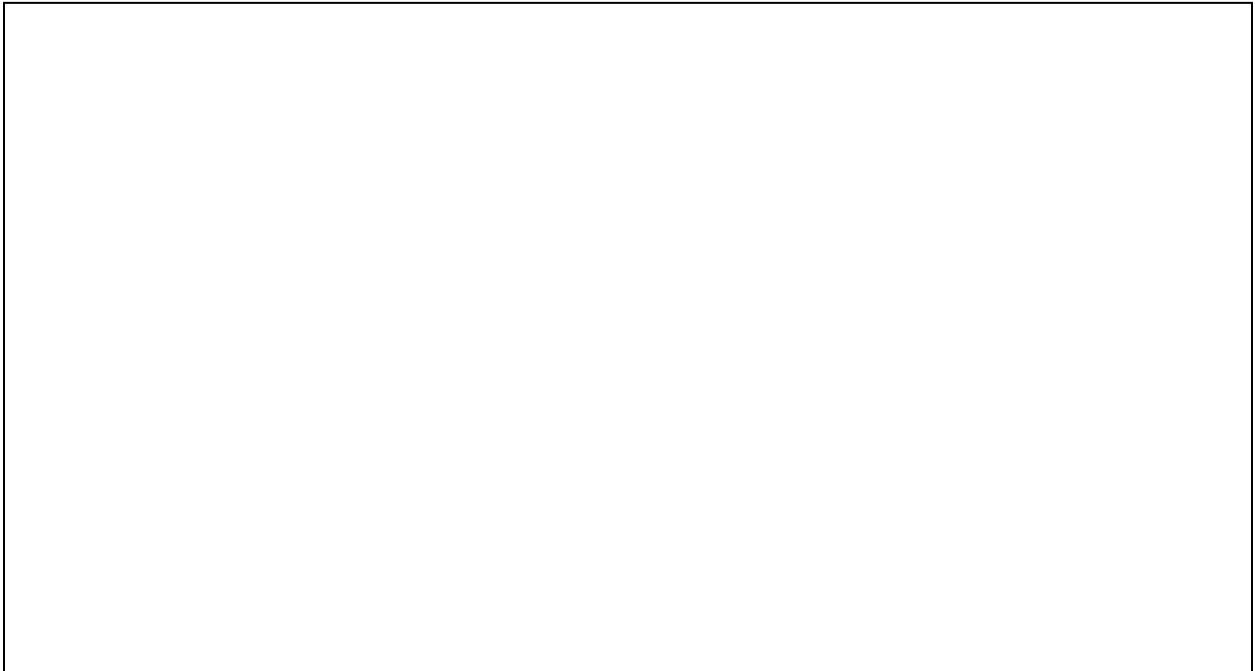
DPP G – Practice with Money

Unit 6

A. Vimal has 7 nickels and his brother gave him 1 more. How many nickels does he have now? Show how you found your answer.



B. How much are his nickels worth? Show how you found your answer.



DPP N – Buckets of Cubes

Unit 6

Lyle and Alyssa counted buckets of cubes for their teacher.

1. Lyle had 7 bundles of one hundred cubes, 4 stacks of ten cubes, and 8 leftover cubes in his bucket. How many cubes are in his bucket? Show how you found your answer.

2. Alyssa had 7 bundles of one hundred and 9 cubes left over in her bucket. How many cubes are in Alyssa’s bucket? Show how you found your answer.

3. Whose bucket has more cubes? Tell how you know.

DPP Q – Five Pieces	Unit 6
----------------------------	---------------

1. Becky scattered the following pieces on her desk:

- a bit
- a skinny
- a bit
- a flat
- a skinny

What number is represented with these 5 pieces?

2. Ron found a skinny and eight bits under his desk. He also found three flats and three skinnies in his desk. Then, he found three bits in his pencil box. What number can Ron represent with all these pieces?

DPP H – Base Ten Pieces

Unit 7

A. Tonya showed her mom’s age with base-ten pieces. She displayed three skinnies and five bits. How old is her mom? Tell how you know.

B. To show the number 133, Reanin used these pieces:

- 1 hundreds piece
- 3 tens pieces
- 3 ones pieces

How else can you show the number 133? Show your work.

C. Is there another way? Show that way, too!

DPP L – What’s My Number?

Unit 7

Larry placed 2 flats, 4 skinnies, and 9 bits on the table. He said, “That’s how many pennies are in my jar.” How many pennies does Larry have in his jar? Show how you found your answer.

.....

DPP D – Skip Counting by Fives and Tens
--

Unit 8

Alex had 50 marbles. Renee had 10 marbles. Dana had 10, Leroy had 5, and Kenya had 3 marbles. How many marbles do they have in all? Show how you found your answer.

DPP G – Practice with Money	Unit 8
------------------------------------	---------------

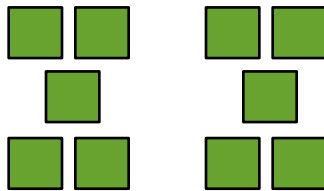
1. Jack found 9 nickels in his coat pocket and 3 nickels on his desk. How many nickels did Jack find in all? Show how you found your answer.

2. How much are Jack's nickels worth? Show how you found your answer.

DPP I – Sharing Stickers	Unit 9
---------------------------------	---------------

1. Bob had fifteen stickers. He used five on his math folder and gave six to his friend, Beth. How many stickers does Bob have left? Show how you found your answer.

2. Fran bought two packages of stickers. Each package cost 30¢ and had five stickers in it.



<p>How many stickers did she buy? Show how you found your answer.</p> <div style="border: 1px solid black; height: 300px; width: 100%;"></div>	<p>How much did Fran spend? Show how you found your answer.</p> <div style="border: 1px solid black; height: 300px; width: 100%;"></div>
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DPP O – Which Two?	Unit 9
---------------------------	---------------

28	43	9	54	12
	35	59	64	

1. Which two numbers above will add up to **about** 70?

1 st Way	2 nd Way

2. Which two numbers will add up to **about** 90?

1 st Way	2 nd Way

3. Which two numbers will give a sum **greater than** 100?

1 st Way	2 nd Way

DPP H – Addition	Unit 10
-------------------------	----------------

Show two ways you can solve.

$$38 + 24$$

1 st Way	2 nd Way

DPP A – Addition Practice**Unit 1**

Solve each problem in two ways without using a calculator. Explain your strategies.

$43 + 39 =$ 1 st Way	$43 + 39 =$ 2 nd Way
$52 + 48 =$ 1 st Way	$52 + 48 =$ 2 nd Way

DPP E – More Base-Ten Pieces	Unit 11
-------------------------------------	----------------

Melissa represented the number 58 with five skinnies and eight bits. Show Melissa’s way, then show a different way to represent the number 58.

Melissa’s Way	Your New Way

DPP R – Story Problems	Unit 11
-------------------------------	----------------

Make up a story for each of these number sentences.

A. $45 - 7 = \underline{\hspace{2cm}}$

B. $71 + \underline{\hspace{2cm}} = 89$

DPP L – Subtraction with Tens and Hundreds	Unit 12
---	----------------

A. $8 - 2 =$ _____

D. _____ $= 8 - 6$

B. $80 - 20 =$ _____

E. _____ $= 80 - 60$

C. $800 - 200 =$ _____

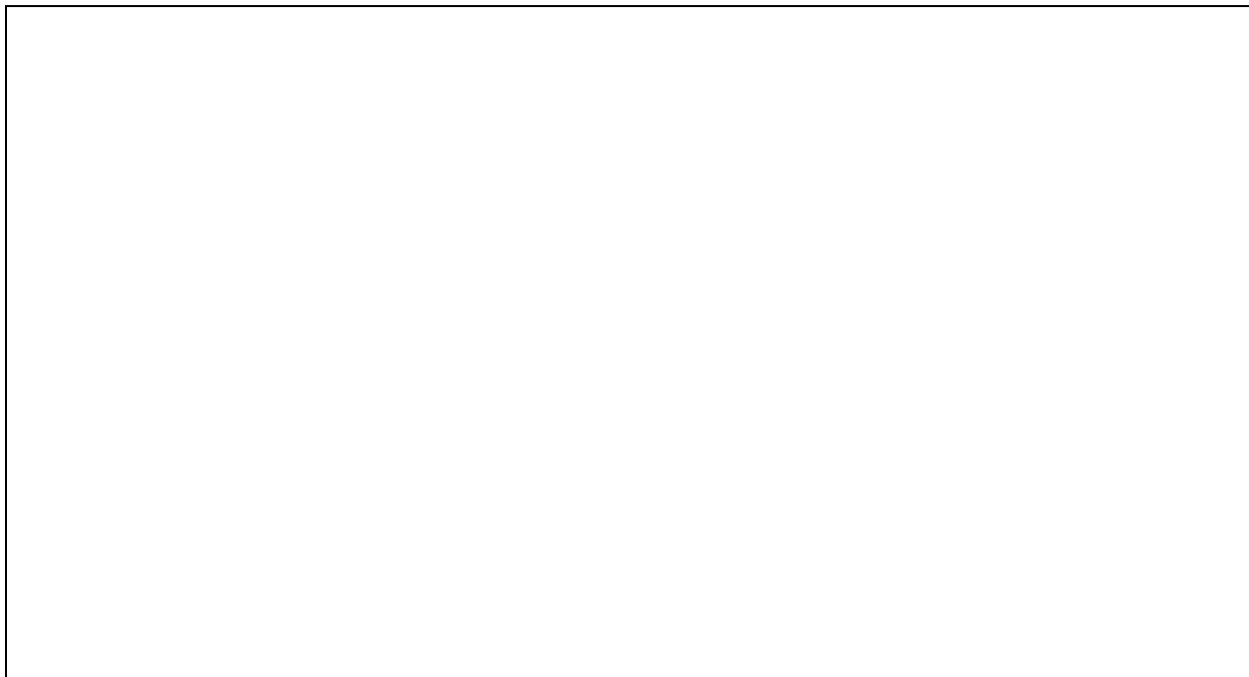
F. _____ $= 800 - 600$

DPP B – Peanut Treats	Unit 13
------------------------------	----------------

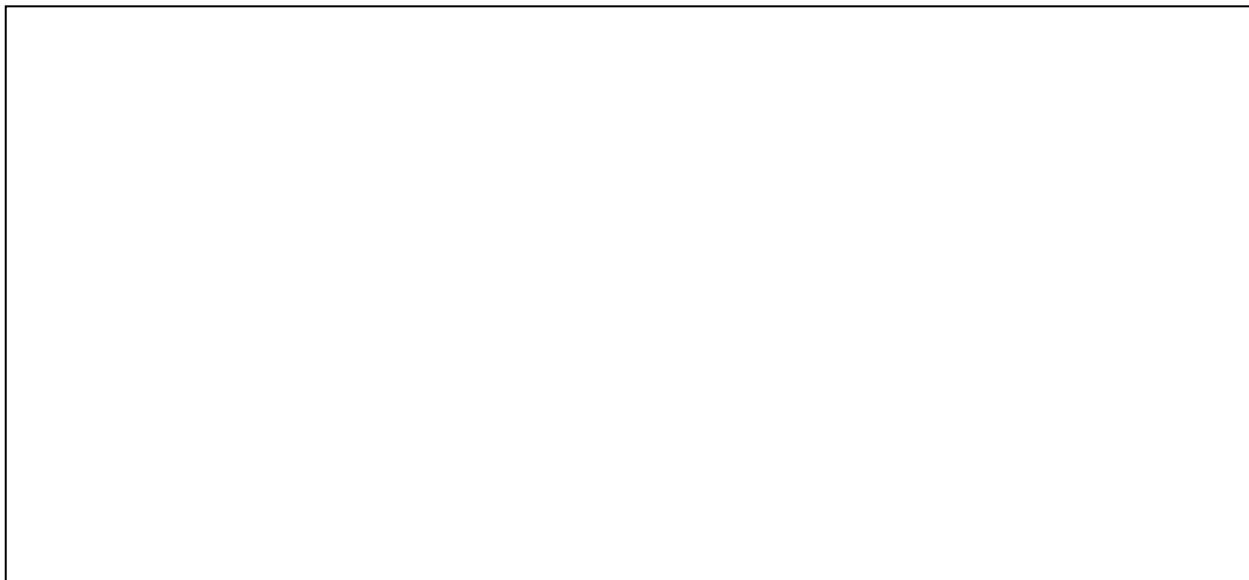
Bob, the monkey trainer, is giving six monkeys a treat. In each of the six cups, Bob wants to place four peanuts. How many peanuts does Bob need? Show how you found your answer.

DPP F – Subtraction Story	Unit 13
----------------------------------	----------------

Write a story and draw a picture to show $12 - 5$. Write the number sentence.



Name three other number sentences that are in the same fact family.



DPP I – Sharing Peanuts	Unit 13
--------------------------------	----------------

Elaine has 28 peanuts. She wants to give them to four of her friends. How many peanuts will each friend get if she shares them equally? Show how you found your answer.

DPP D – Pennies

Unit 16

Brian decided to count all of his pennies. He found 76 pennies in a drawer, 93 pennies in his piggy bank, and 17 pennies in his pocket.

A. Where did Brian find the most pennies?

B. How many pennies did he find altogether? Show how you found your answer.

C. How many more pennies does he need to reach 200 pennies? Show how you found your answer.

DPP J – Numbers	Unit 16
------------------------	----------------

123

321

253

235

132

1. Which number is the largest? How do you know?

2. Which number is the smallest? How do you know?

DPP G – Word Problem

Unit 17

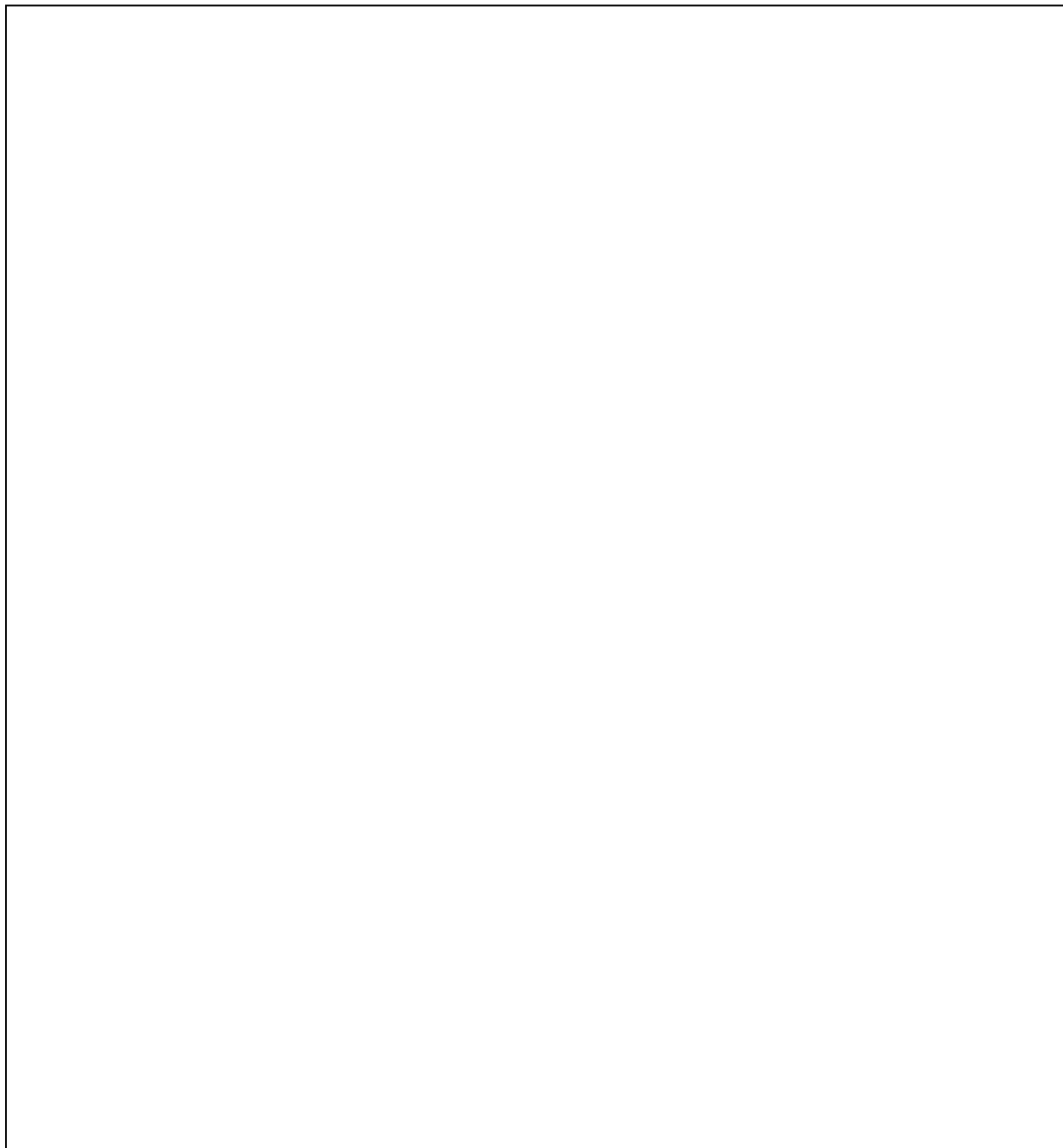
1. Jenny collected 9 stickers. Tim gave her 7 more for her collection. How many stickers are in Jenny’s collection now? Show how you found your answer.

2. Jenny made a birthday card for her mother using 6 stickers from her collection. How many stickers are in Jenny’s collection now? Show how you found your answer.

DPP A – At the Carnival

Unit 18

There are eight cars on the Twirling Tornado ride. Each car holds six people. How many people can ride the Twirling Tornado at once? Write a number sentence and draw a picture that describes your answer.



DPP K – Sorting Lids

Unit 18

1. Michelle counted the class collection of plastic and metal lids. Altogether there were 53 lids, 27 lids were metal. How many were plastic? Show how you found your answer.

2. Hani sorted the same 53 lids by color. There were 18 blue, 22 red, and the rest were black. How many were black? Show how you found your answer.

DPP N – Word Problems at the Beach

Unit 19

Write a number sentence for each problem.

1. Heather collected 13 shells in her bucket at the beach. During her walk 4 shells broke. How many whole shells does Heather have? Show how you found your answer.

2. Linda collected 13 shells and her brother Jimmy collected 5. How many more shells did Linda collect than Jimmy? Show how you found your answer.

3. Howard collected 7 shells. He wanted to collect more shells than Linda. How many more shells does he need to collect? Show how you found your answer.

DPP B – Addition and Subtraction Facts Problems	Unit 20
--	----------------

Write a word problem for each number sentence. Show how you would solve each problem.

A. $6 + 9 =$

B. $15 - 7 =$

3rd Grade DPP Probes

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DPP A – Quick Addition	Unit 2
-------------------------------	---------------

A. $4 + 9 =$

B. $40 + 90 =$

C. $20 + 90 =$

D. $20 + 30 =$

E. $30 + 50 =$

F. $40 + 60 =$

G. $10 + 90 =$

H. $60 + 80 =$

I. $80 + 70 =$

Explain your strategy for Question I below.

DPP K – Pumpkins in Wagons	Unit 3
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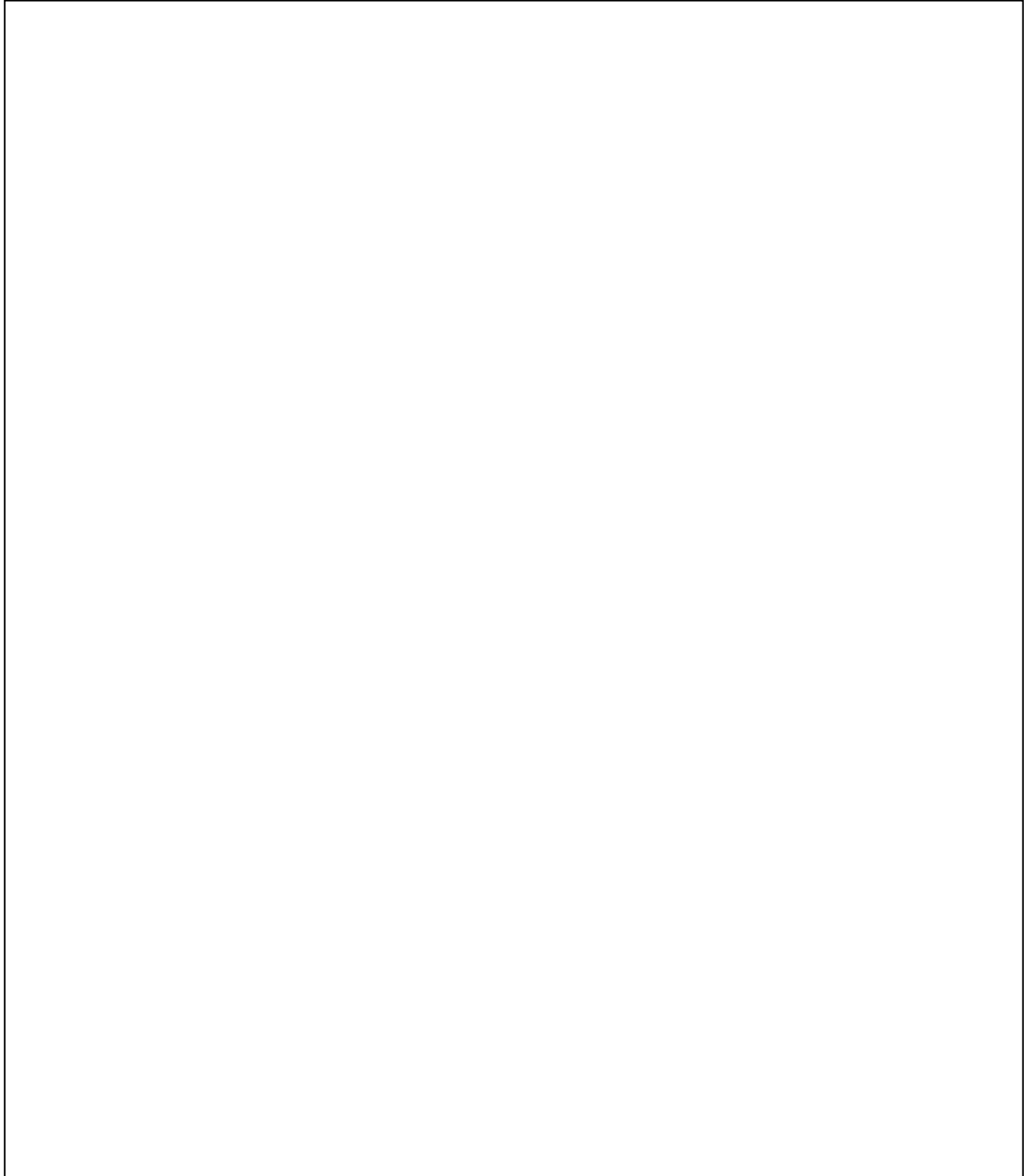
This story problem was written by a third-grade student:

There are ten wagons and three pumpkins in each wagon. How many pumpkins are there? Solve the problem and show your work.

DPP B – Story Solving

Unit 4

Write a story and draw a picture about 3×8 . Write a number sentence about your picture.



DPP P – Addition Practice	Unit 4
----------------------------------	---------------

Solve each problem in two ways. Use base-ten shorthand or a shortcut method.

1st Way $65 + 35 =$	1st Way $37 + 58 =$	1st Way $49 + 22 =$
2nd Way $65 + 35 =$	2nd Way $37 + 58 =$	2nd Way $49 + 22 =$

DPP S – More Subtraction	Unit 4
---------------------------------	---------------

Do these problems in your head.

A. $60 - 40 =$

B. $60 - 20 =$

C. $500 - 200 =$

D. $80 - 60 =$

E. $80 - 50 =$

F. $80 - 30 =$

G. $12 - 3 =$

H. $120 - 30 =$

I. $110 - 20 =$

.....

DPP F – More Comics	Unit 5
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On an average day in the United States, 1096 copies of a certain comic book series are sold. Show this number with base-ten shorthand.

DPP N – Addition Practice	Unit 5
----------------------------------	---------------

1st Way $60 + 42 =$	1st Way $26 + 48 =$	1st Way $58 + 33 =$
2nd Way $60 + 42 =$	2nd Way $26 + 48 =$	2nd Way $58 + 33 =$

DPP C – Subtraction: Using Doubles	Unit 6
---	---------------

Do these problems in your head.

A. $50 - 25 =$

B. $51 - 25 =$

C. $100 - 50 =$

D. $100 - 48 =$

E. $180 - 90 =$

F. $160 - 80 =$

G. Explain your strategy for Question D:

DPP J – Bicycle Riding**Unit 6**

James likes to ride his bicycle. He rides two miles every day after school. He rides five miles on each of the weekend days.

- How far does he ride in one week? Show your work.

DPP N – Adding Nine**Unit 6**

Solve the following problems using a mental math strategy.

A. $14 + 9 =$

B. $104 + 9 =$

C. $41 + 9 =$

D. $23 + 9 =$

E. $32 + 9 =$

F. $42 + 9 =$

G. $77 + 9 =$

H. $68 + 9 =$

I. $95 + 9 =$

Explain the strategy you used to solve the problems.

DPP P – Change for \$1	Unit 6
-------------------------------	---------------

How many ways can you make change for \$1 using only nickels and dimes? Show your work.

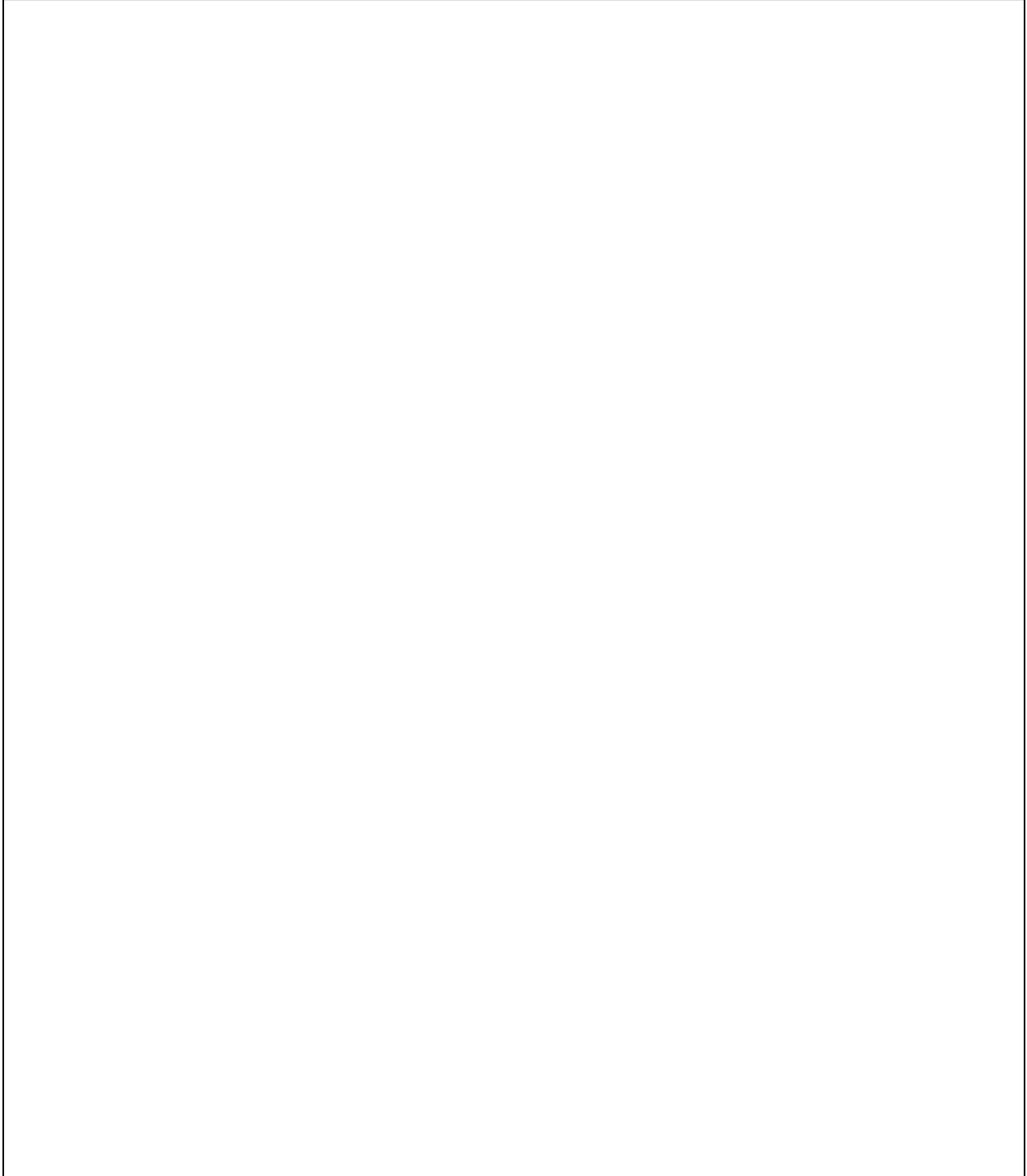
DPP T – Time	Unit 6
---------------------	---------------

How many minutes are in $1\frac{1}{2}$ hours? Show your work.

DPP B – Story Solving

Unit 7

$8 \times 4 = ?$ Write a story and draw a picture about 8×4 . Write a number sentence on your picture.



DPP M – Shortcut Addition and Subtraction	Unit 7
--	---------------

Do the following problems using a shortcut method. You may use base-ten shorthand if you wish.

1.
$$\begin{array}{r} 241 \\ + 83 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 517 \\ - 45 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 579 \\ + 407 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 405 \\ - 375 \\ \hline \end{array}$$

5. Explain a way to do Question 4 using mental math.

DPP V – Twins and Triplets

Unit 7

On an average day in America, 217 sets of twins and 5 sets of triplets are born. How many babies is this? Show your work.

DPP J – Base-Ten Pieces**Unit 8**

What number is represented with each group of base-ten pieces?

First, draw each group of base-ten pieces.

Then, draw it using base-ten shorthand using the Fewest Pieces Rule.

Finally, write the number.

	Base-Ten Pieces	Base-Ten Pieces Using Fewest Pieces Rule	Number
4 flats 7 skinnies 12 bits			
9 flats 11 skinnies 4 bits			
12 skinnies 11 bits			

DPP K – Toy Car**Unit 9**

A toy car balances nine 6-gram masses and three 5-gram masses. What is the mass of the car? Show your work.

DPP A – Mental Arithmetic: Adding 99**Unit 11**

Use mental math to solve these problems.

A. $131 + 99 =$

B. $555 + 99 =$

C. $97 + 99 =$

D. $103 + 99 =$

E. $355 + 99 =$

F. $769 + 99 =$

G. $327 + 99 =$

H. $82 + 99 =$

I. $777 + 99 =$

Explain your strategy for solving these problems.

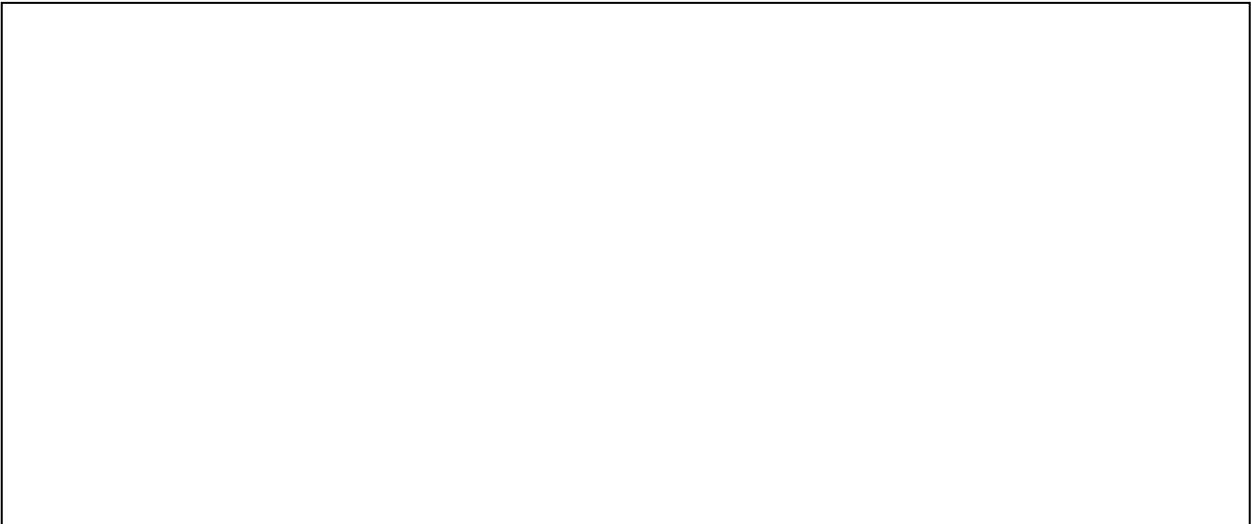
DPP I – Lizardland Picnic	Unit 11
----------------------------------	----------------

At Lizardland, eight people can sit at a table in Picnic Park. If your class had a picnic there (including your teacher), how many tables would you need? Draw a picture to show your answer and write a number sentence.



DPP K – Cookies	Unit 11
------------------------	----------------

At Max and Cora’s cookie stand, one cookie costs 35 cents. How many different ways can they get paid exact change for one cookie using only nickels, dimes, and quarters? Show your work.



DPP P – How Much and How Many?

Unit 11

- A. Moe spent 9 nickels and 7 dimes to buy ice cream. How much money did he spend? Show you found your answer.

- B. Joe has 5 shirts. Each shirt has 3 pockets. How many pockets are on Joe's shirts? Write a number sentence.

- C. Flo has 7 braids in her hair. Each braid has 5 beads. How many beads are in Flo's hair? Write a number sentence.

DPP H – Larry the Lizard Show	Unit 12
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Larry went to see a Lizard show twice in one day. The theater can seat 300 people. 178 people attended the 10 a.m. show. 284 people attended the noon show.

A. How many more people attended the noon show than the 10 a.m. show? Show your work.

B. How many people attended the two shows? Show your work.

C. How many empty seats were there during the two shows? Show your work.

DPP J – More or Less Than 1½**Unit 13**

I am $\frac{1}{2}$ more than $1\frac{1}{2}$. What number am I?

Explain how you know.

DPP D – Multiples of 10 and 100**Unit 14**

Use the patterns you found in your multiplication table for multiplying by 10 and 100 to do the following problems.

A. $2 \times 9 =$

B. $2 \times 90 =$

C. $2 \times 900 =$

D. $9 \times 7 =$

E. $9 \times 70 =$

F. $9 \times 700 =$

G. $4 \times 9 =$

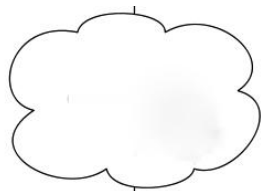
H. $4 \times 90 =$

I. $4 \times 900 =$

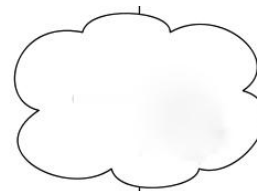
DPP N – Adding and Subtracting**Unit 14**

Solve the following problems. First, estimate and put your estimate in the cloud next to the problem. Then, solve each problem using base-ten pieces or base-ten shorthand if it helps.

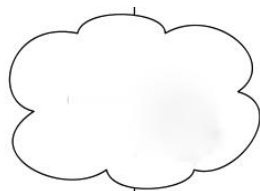
A.
$$\begin{array}{r} 137 \\ + 446 \\ \hline \end{array}$$



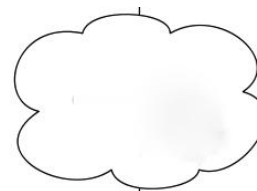
B.
$$\begin{array}{r} 439 \\ - 176 \\ \hline \end{array}$$



C.
$$\begin{array}{r} 2348 \\ + 4769 \\ \hline \end{array}$$



D.
$$\begin{array}{r} 504 \\ - 426 \\ \hline \end{array}$$



Explain your estimation strategy for Question C.

Explain how to do Question D using mental math.

DPP D – Walk-a-Thon**Unit 16**

The following are the results of a walk-a-thon.

Second Grade

Room 100 \$214

Room 101 \$161

Third Grade

Room 200 \$147

Room 201 \$262

--

1. How much did the Second Grade raise? Show your work.

2. How much did the Third Grade raise? Show your work.

--

3. Which grade came close to the goal of \$450? Show your work.

--

4. How much more did Room 201 raise than Room 200? Show your work.

--

DPP J – Mother’s Helpers**Unit 16**

1. After school, Jan helps her neighbor with her new baby and earns 2 dollars each day. How much does Jan earn if she helps for 4 days? 9 days? 7 days? 3 days? Show your work and write number sentences.

4 days?	9 days?
7 days?	3 days?

2. Tony helps by going to the store for the neighbor and earns 50 cents each time. How much will Tony earn if he goes to the store 4 times? 5 times? 8 times? 9 times? Show your work and write number sentences.

4 times?	5 times?
8 times?	9 times?

DPP J – Multiples of 10 and 100	Unit 17
--	----------------

1. Solve the following problems.

A. $3 \times 4 =$

B. $3 \times 40 =$

C. $3 \times 400 =$

D. $400 \times 9 =$

E. $300 \times 6 =$

F. $5 \times 60 =$

G. $5 \times 59 =$

H. $4 \times 40 =$

I. $4 \times 39 =$

2. Choose one of the problems. Draw a picture and write a story about the problem.

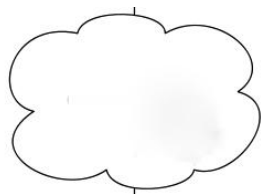


DPP C – Addition and Subtraction Practice**Unit 18**

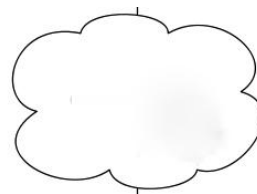
- A. Predict which of the following problems will have the smallest answer (sum or difference).

Complete the following problems. First, estimate and put your estimate in the cloud next to the problem. Then, solve each problem using pencil and paper or mental math to find the answers.

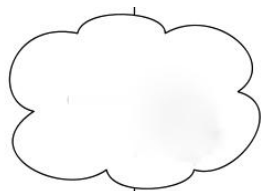
B.
$$\begin{array}{r} 750 \\ - 262 \\ \hline \end{array}$$



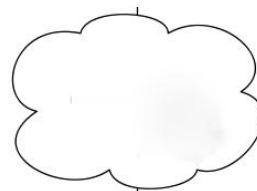
C.
$$\begin{array}{r} 689 \\ + 851 \\ \hline \end{array}$$



D.
$$\begin{array}{r} 148 \\ + 198 \\ \hline \end{array}$$



E.
$$\begin{array}{r} 9145 \\ - 8997 \\ \hline \end{array}$$



DPP I – Lizardland	Unit 19
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Lizardland hot dogs cost \$1.50

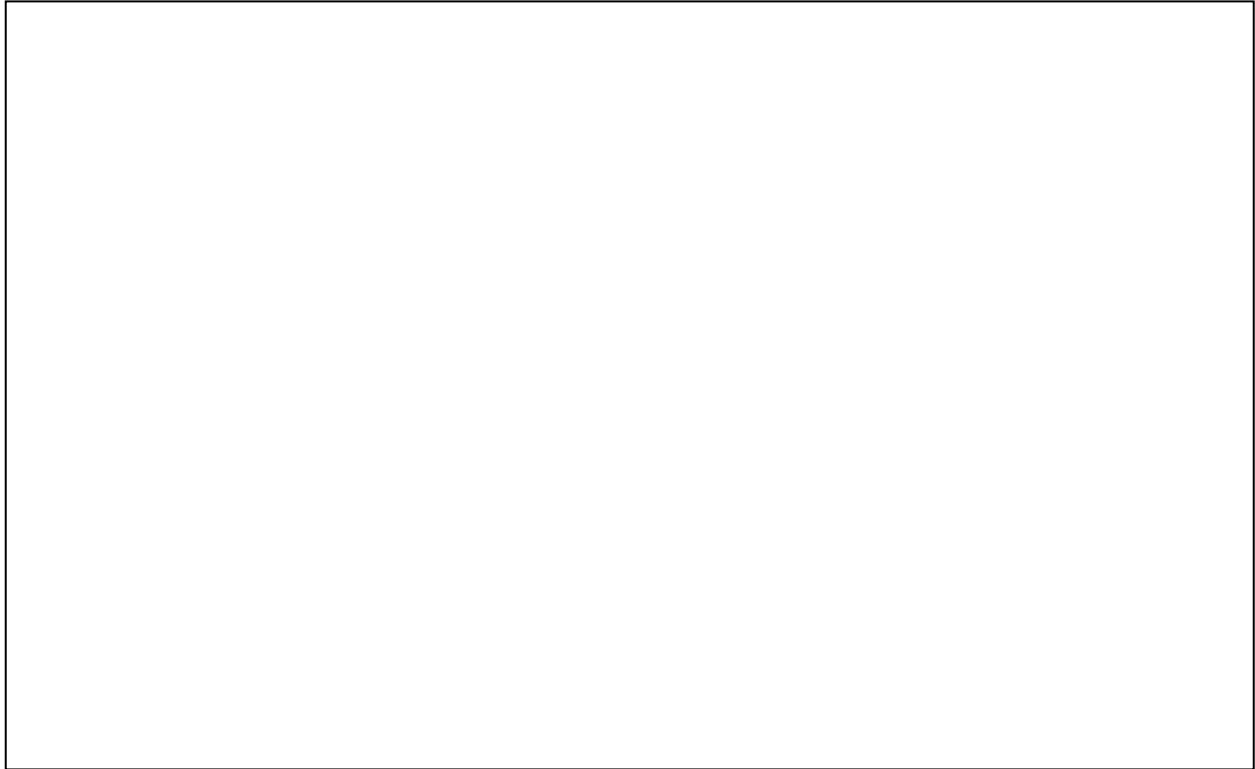
1. Sam wants 2 hot dogs. What will this cost? Show your work.

2. Sam agrees to buy Adam 2 hot dogs. How much will 4 hot dogs cost? Show your work.

3. Time spent \$12 trying to win the Lizard stuffed animal. How many hot dogs could he have bought with the \$12? Show your work.

DPP L – Multiplication Story 38 x 4	Unit 19
--	----------------

Solve 38×4 . Write a story and draw a picture to match your solution.



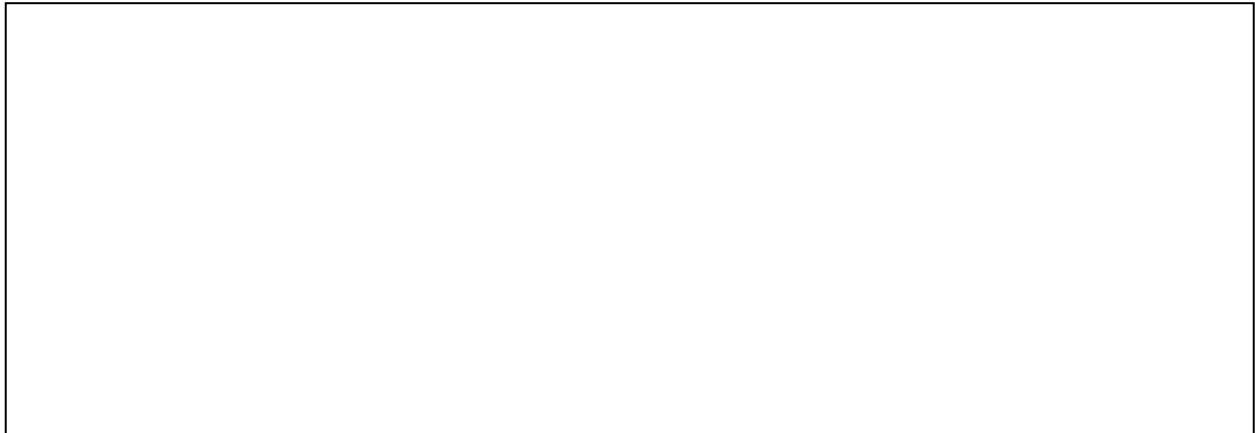
DPP O – Some More Sums	Unit 19
-------------------------------	----------------

Add 27 to each of the numbers below.

65

189

2977



DPP L – Which Two Add Up?**Unit 20**

39

276

149

57

- A. Which two of these numbers should you add if you want an answer over 400? Show your work.

--

- B. Which two of these numbers should you add if you want an answer less than 100? Show your work.

--

- C. Which two of these numbers should you add if you want an answer close to 200? Show your work.

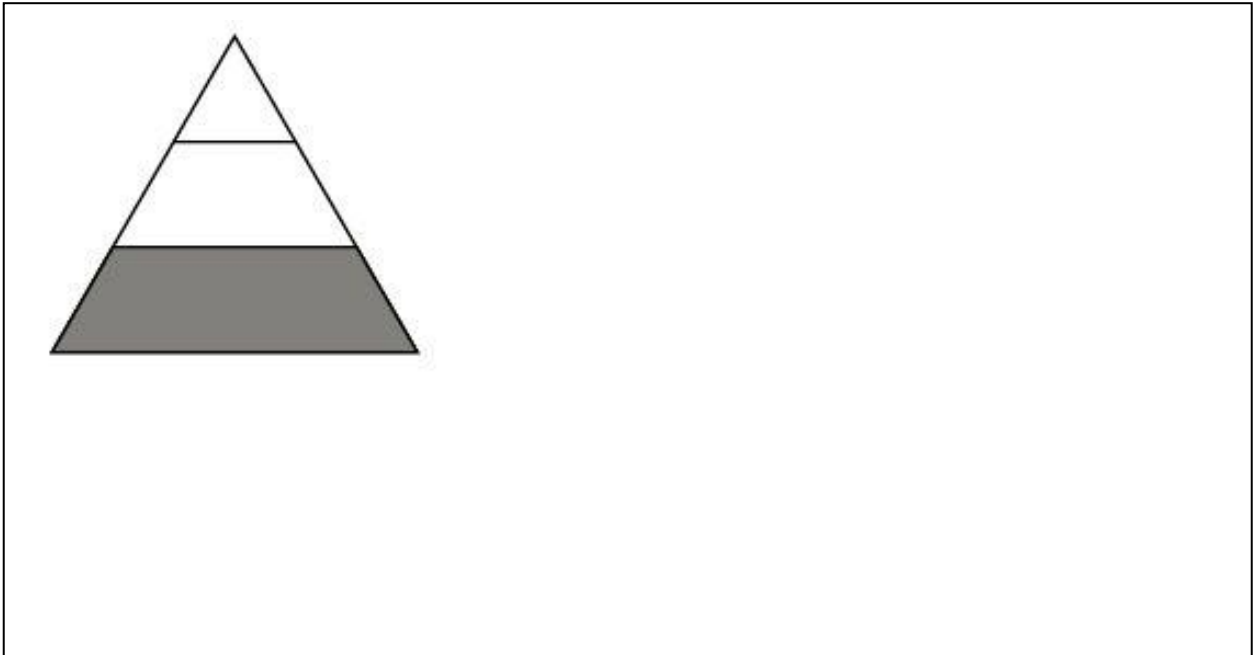
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- D. Which number when doubled will be close to 300? Show your work.

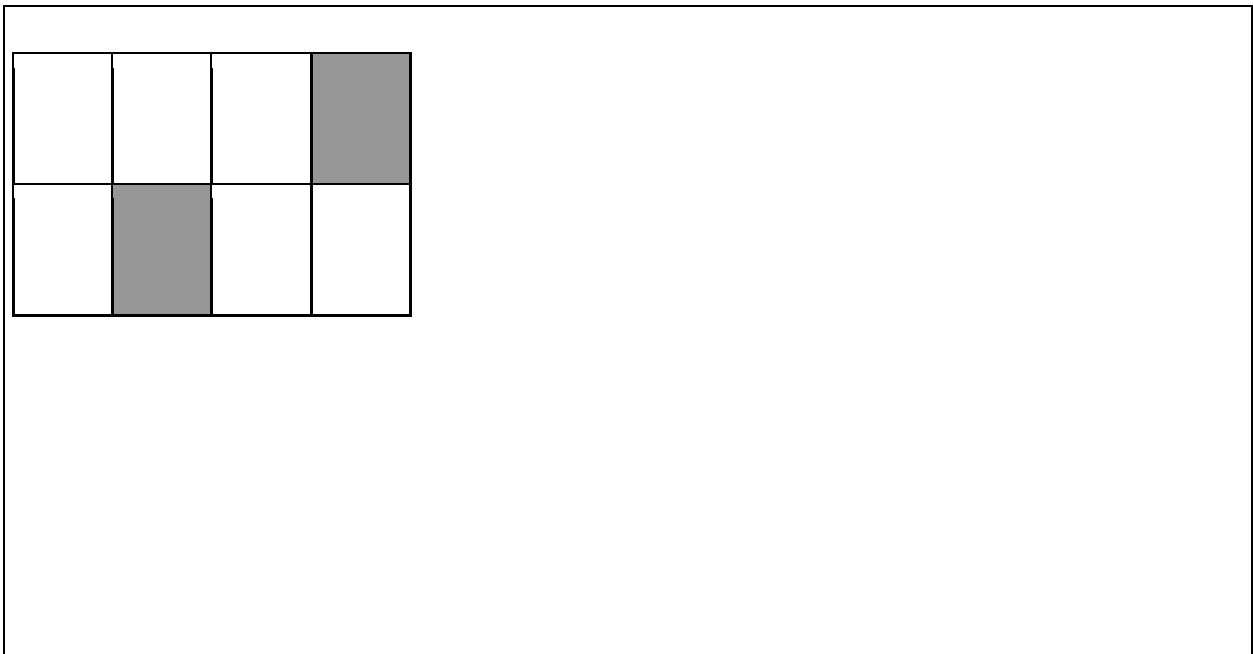
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DPP P – Shaded Shapes**Unit 20**

1. Is $\frac{1}{3}$ of the triangle shaded? Explain why or why not?



2. Is $\frac{1}{4}$ of the rectangle shaded? Explain why or why not



4th Grade DPP Probes

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DPP I – Extra Subtraction Practice**Unit 2**

Use mental math to solve the following problems.

A. $120 - 90 =$

B. $120 - 70 =$

C. $160 - 80 =$

D. $150 - 70 =$

E. $170 - 80 =$

F. $180 - 90 =$

Explain your strategy for either Question D or E.

DPP K – More Subtraction Practice**Unit 2**

Use mental math to solve the following problems.

A. $101 - 97 =$

B. $412 - 15 =$

C. $565 - 556 =$

D. $306 - 299 =$

E. $153 - 49 =$

F. $215 - 110 =$

G. Explain your strategy for solving Question B.

DPP W – Timing Reading	Unit 2
-------------------------------	---------------

It takes Jackie 20 minutes to read a chapter in her book. How many chapters can she read in 2 hours, if all the chapters are about the same length? Show your work.

DPP F – Story Solving	Unit 3
------------------------------	---------------

1. Write a story to show 5×7 . Draw a picture to go with your story.
Write a number sentence on your picture.

2. Write a story and a number sentence to show $35 \div 7$.

3. What are the other two facts in this fact family?

DPP J – How Can We Compare Two Numbers?**Unit 3**

Use mental math to solve the following problems.

A. $4003 - 3997 = \underline{\hspace{2cm}}$

B. $4007 - 3995 = \underline{\hspace{2cm}}$

C. $4001 - 3800 = \underline{\hspace{2cm}}$

D. $4000 - 500 = \underline{\hspace{2cm}}$

E. $4000 - 501 = \underline{\hspace{2cm}}$

F. $4000 - 499 = \underline{\hspace{2cm}}$

Explain your strategies for Questions A or E.

DPP C – Using Twos**Unit 4**

A. $2 \times 9 =$

B. $3 \times 200 =$

C. $2 \times 1000 =$

D. $8 \times 2 =$

E. $5 \times 20 =$

F. $20 \times 2 =$

G. $40 \times 2 =$

H. $6 \times 2 =$

I. $2 \times 7 =$

J. $0 \times 2 =$

DPP E – Finding Prime Factors—Using Factor Trees**Unit 5**

Write 90 as the product of prime numbers.

DPP T – Missing Factors**Unit 5**

The letters m and n stand for missing numbers. Find the missing numbers in each of the following number puzzles.

A. $2 \times m = 4$

B. $m \times 8 = 24$

C. $6 \times m = 36$

D. $10 \times m = 100$

E. $64 \div m = 8$

F. $81 \div 9 = m$

G. $4 \times n = 16$

H. $m \times n = 11$

I. $m^2 = 25$

Write 3 more missing number puzzles. Then, solve them.

DPP D – The Long and the Short	Unit 6
---------------------------------------	---------------

Write the following numbers in words:

A. 421

B. 8536

C. 58,972

D. 20,380

Write the following words as numbers:

E. six thousand nineteen

F. two thousand, three hundred forty-one

G. two hundred one thousand, five hundred two

.....

DPP E – Median and Mean	Unit 6
--------------------------------	---------------

Ming experimented with 3 kinds of balls to find out which one bounced highest. He dropped each type of ball five times from 1 meter. The bounce heights for the tennis ball were:

52 cm, 47 cm, 55 cm, 52 cm, and 50 cm.

1. Find the median bounce height. Show your work.

2. Use a calculator to find the mean bounce height to the nearest cm. Show your work.

DPP I – Ana’s Purchase**Unit 6**

1. Ana bought a gallon of milk for \$2.49, a box of crackers for \$1.56, and a magazine for \$2.95. Will \$10.00 be enough to pay the bill? Show your work.

2. About how much change will Ana get back? Show your work.

DPP P – Which Is the Closest?**Unit 6**

1. Which number is closest to 4056? Show your work.

450 4000 4100 5000

2. Which number is closest to 62,096? Show your work.

7000 60,000 65,000 70,000

3. Which is a reasonable estimate for the height of a 5-story apartment building?

30 feet 50 feet 300 feet 500 feet

DPP I – Divisible by 2, 3, or 6?	Unit 7
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A. Circle the numbers that are divisible by 2. How do you know?

762

1025

8031

7532

B. Circle the numbers that are multiples of 3. How do you know?

762

1025

8031

7532

C. Which numbers have 6 as a factor? How do you know?

762

1025

8031

7532

.....

DPP O – Multiplying by 10	Unit 7
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A. $7 \times 80 =$

B. $6 \times 400 =$

C. $8000 \times 6 =$

D. $700 \times 4 =$

E. $n \times 60 = 420$

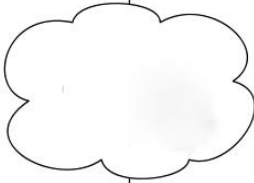
F. $800 \times n = 3200$

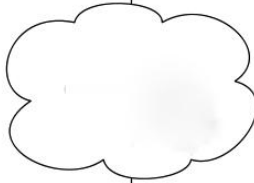
G. $10 \times 700 =$

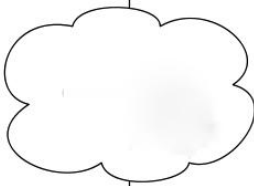
H. $0 \times 600 =$

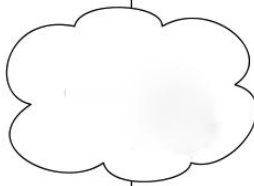
DPP B – More Multiplication**Unit 8**

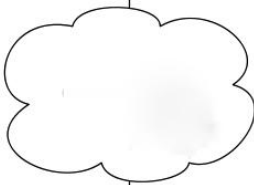
Solve the following problems. First, estimate and put your estimate in the cloud next to the problem. Then, solve each problem using pencil and paper or mental math to find the answers.

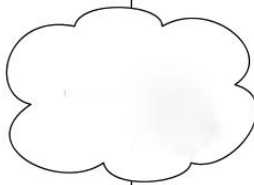
A. $26 \times 8 =$ 

B. $47 \times 6 =$ 

C. $87 \times 7 =$ 

D. $93 \times 5 =$ 

E. $63 \times 6 =$ 

F. $45 \times 8 =$ 

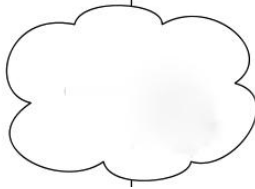
G. Explain how you solved Question 1A.

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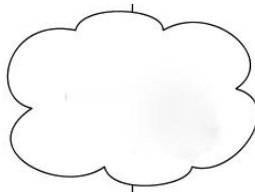
DPP N – Arithmetic Review**Unit 8**

Solve the following problems. First, estimate and put your estimate in the cloud next to the problem. Then, solve each problem using pencil and paper or mental math to find the answers.

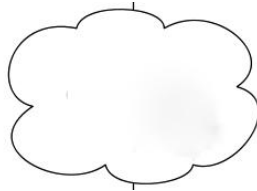
A. $3005 + 61 + 458 =$



B. $17 + 608 + 3 + 1060 =$



C. $917 - 145 =$

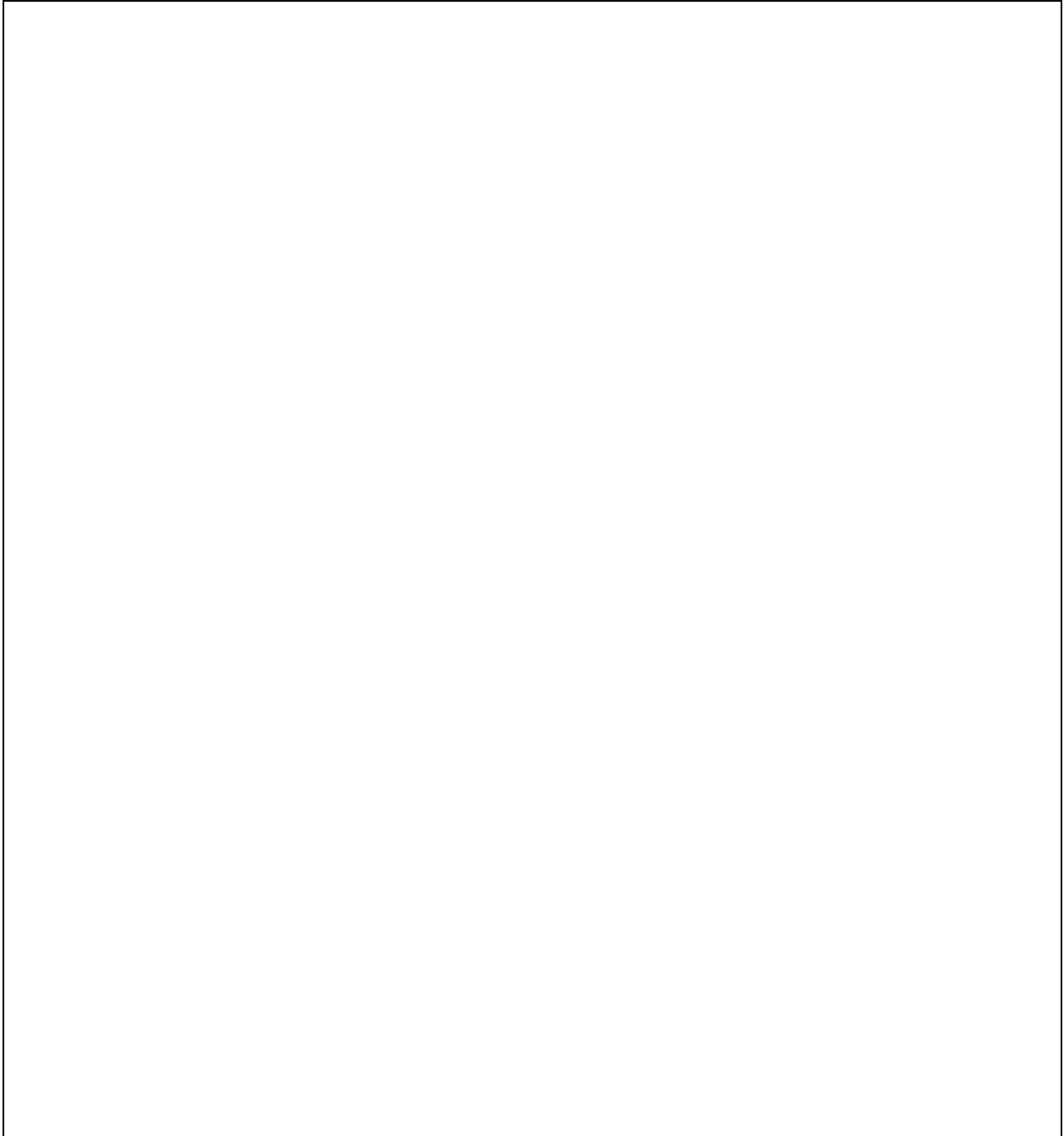


D. Explain how you made your estimate for Question B.

DPP Q – Sharing Money

Unit 8

Five children found \$4.00 in the hall at school. The principal said they could share it, if no one claimed it. How much would each child get? Show your work.



DPP E – Division Stories

Unit 9

The following two problems can be solved using division.

1. Mrs. Randall gave each of her children \$4 to spend on games at the neighborhood carnival. If Mrs. Randall gave out \$20 in all, how many children does she have? Show your work.

2. One package of bus tokens contains 10 tokens. Keenya’s mother needs 40 tokens to get to and from work for one month. How many packages does Keenya’s mother need? Show your work.

DPP K – More Fact Practice	Unit 9
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Find n to make each number sentence true.

A. $8 \times 5 = n$

B. $n \times 7 = 70$

C. $n \div 4 = 5$

D. $80 \div n = 10$

E. $10 \times n = 50$

F. $30 \div 5 = n$

G. $9 \times 10 = n$

H. $15 \div n = 5$

I. $n \times 8 = 80$

J. $10 \div 10 = n$

Explain how you solved either Question C or J.

DPP M – Multiplying with Zeros**Unit 10**

A. $80 \times 20 =$ B. $40 \times 3 =$ C. $3000 \times 40 =$ D. $20 \times 500 =$

E. $50 \times 30 =$ F. $600 \times 2 =$ G. $0 \times 20 =$ H. $10 \times 30 =$

DPP U – Smallest, Largest, and In Between**Unit 10**

For the following base-ten shorthand, the flat is one whole. Write the number beside each base-ten shorthand.

1.  _____

2.  _____

3.  _____

4.  _____

A. Which is the smallest?

B. Which is the largest?

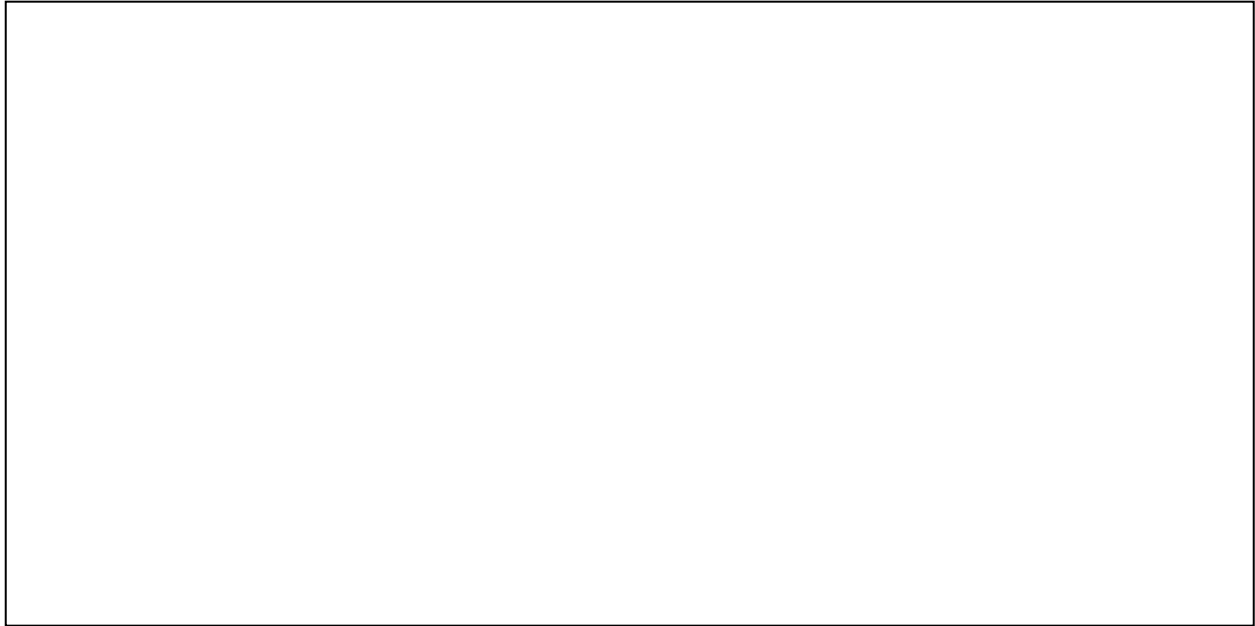
C. Which are equal?

D. Put the numbers you wrote in order from smallest to largest.

--

DPP X – Dividing It Up	Unit 10
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$26 \div 8 =$ Write a story for $26 \div 8$. Then, draw a picture. Include any remainder in your picture. Solve the problem.



DPP D – Decimals	Unit 11
-------------------------	----------------

Write each of the following decimals using base-ten shorthand. The flat is one whole.

- A. 2.02
- B. 0.6
- C. 2.6
- D. 0.06
- E. 2.16

F. Write the decimals in order from smallest to largest.



DPP E – Missing Number**Unit 11**

A. $n \times 300 = 900$

B. $7 \times n = 490$

C. $80 \times n = 640$

D. $6 \times n = 36,000$

E. $n \times 40 = 160$

F. $900 \times n = 8100$

.....

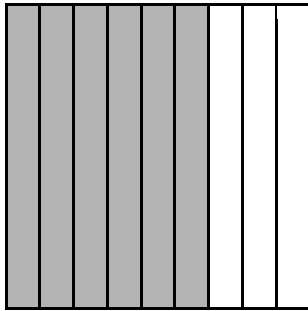
DPP S – Measuring Volume**Unit 11**

Romesh filled and empties a 250-ml cylinder into a large container 6 times. After the sixth time, the container was full. What is the volume of the container in milliliters? Show your work.

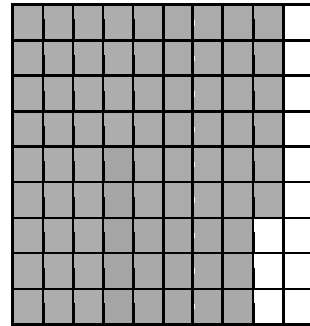
DPP I – Decimals and Pictures	Unit 12
--------------------------------------	----------------

Write a decimal for the shaded part of each picture. The flat is one whole.

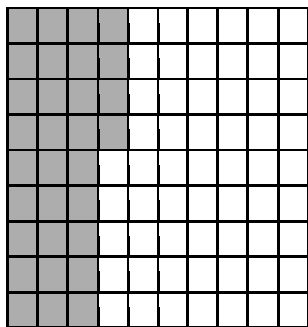
1. _____



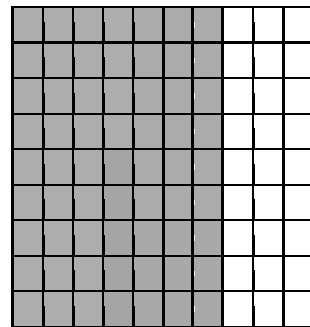
3. _____



2. _____



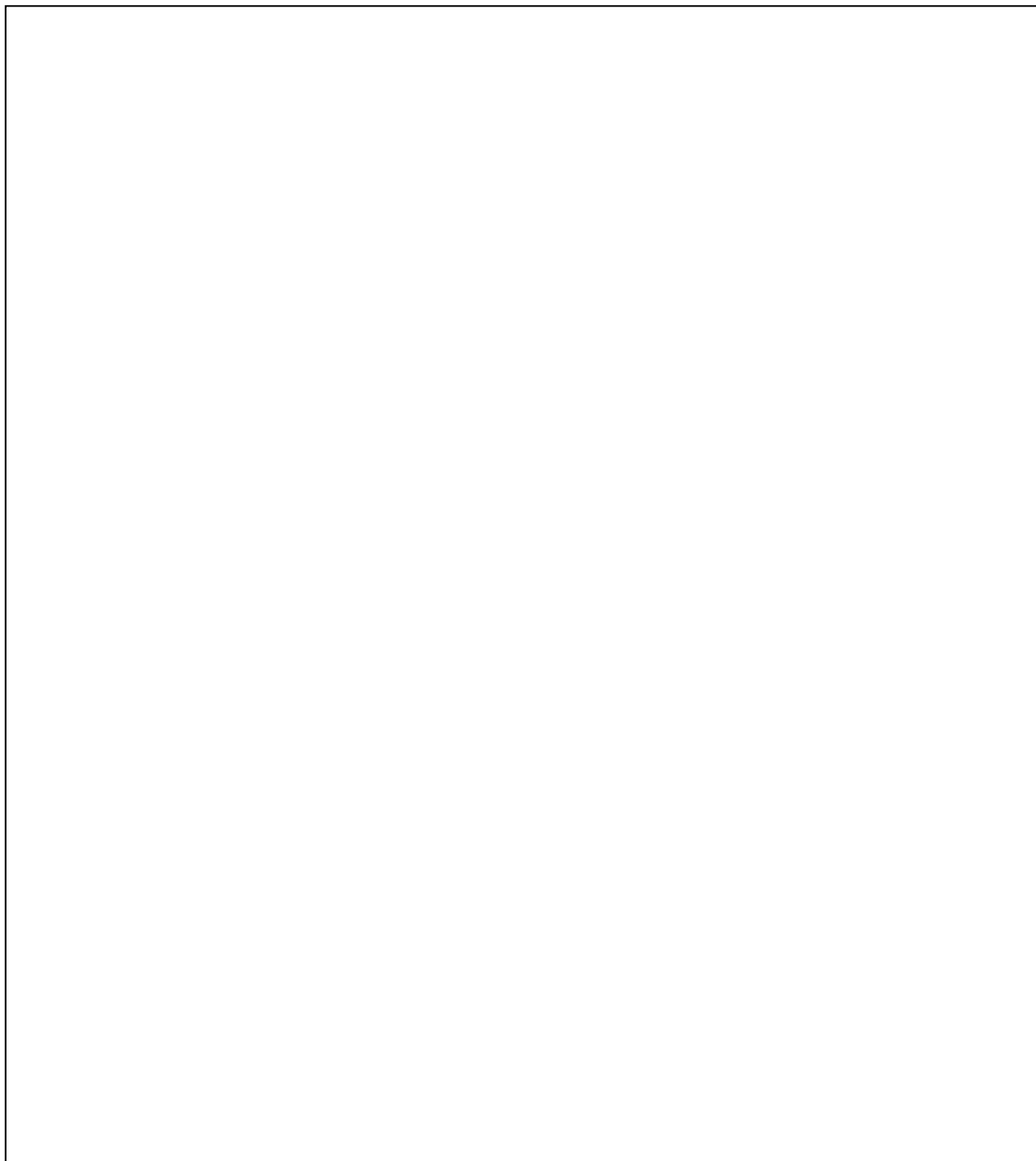
4. _____



DPP P – Division Stories

Unit 12

Write a division story for $28 \div 9$. Then, draw a picture. Include any remainder in your picture. Solve the problem.



DPP S – Words to Numbers

Unit 12

1. Write the following words as numbers.

- A. two-thirds B. six-tenths C. five-eighths D. one-twelfth

2. Write the following numbers as words.

- A. $\frac{3}{4}$ B. $\frac{7}{9}$ C. $\frac{1}{2}$ D. $\frac{2}{5}$

DPP E – Trumpet Practice**Unit 13**

Ana's trumpet teacher told her to practice $\frac{3}{4}$ hour every day. Since 1 hour = 60 minutes, Ana used this number sentence to find the number of minutes she must practice each day:

$$\frac{3}{4} = \frac{?}{60}$$

1. Complete Ana's number sentence to find the number of minutes in $\frac{3}{4}$ hour.
2. Use Ana's method or your own strategies to find the following:
 - A. How many minutes are in $\frac{1}{4}$ hour?
 - B. How many minutes are in $\frac{1}{2}$ hour?
 - C. How many minutes are in $\frac{1}{3}$ hour?
 - D. How many minutes are in $\frac{1}{6}$ hour?
 - E. How many minutes are in $1\frac{1}{4}$ hours?
 - F. How many minutes are in 3.5 hours?

DPP M – TV Survey

Unit 13

Use paper and pencil to solve the following problems.

1. According to a recent study, the average American eighth grader spends about 4 hours a day watching TV. How many hours in a year will an eighth grader spend watching TV? Show your work.

2. A school year is approximately 180 days long. How many hours is a student in school if a school day is 6 hours long? Show your work.

DPP Y – Order Fractions**Unit 13**

1. Which is greater $\frac{1}{12}$ or $\frac{1}{10}$? How did you decide?

2. Which is greater $\frac{3}{5}$ or $\frac{3}{8}$? How did you decide?

3. Which is greater $1\frac{1}{2}$ or $\frac{5}{4}$? How did you decide?

DPP F – Lots of Money	Unit 14
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Pretend you are at the store without your calculator or paper and pencil. See how many of the answers you can figure out in your head. Tell what strategies you used.

How much change will you receive from a \$10 bill if you spend the following amounts?

A. \$5.60

B. \$7.45

C. \$1.97

D. \$4.25

DPP J – Adding and Subtracting	Unit 14
---------------------------------------	----------------

Use mental math to solve the following problems.

A. $1700 + 400 =$

B. $4300 - 400 =$

C. $1450 + 350 =$

D. $1658 - 500 =$

E. $5033 + 9100 =$

F. $2099 + 301 =$

G. Explain your mental math strategy for Questions C and D.

DPP L – Related Multiplication and Division Sentences	Unit 14
--	----------------

Find a number for n in each number sentence that makes the statement true.

A. $4 \times n = 2400$

B. $2400 \div 4 = n$

C. $n \times 9 = 360$

D. $360 \div 9 = n$

E. $7 \times n = 63,000$

F. $63,000 \div 7 = n$

G. $6 \times n = 54$

H. $54 \div 6 = n$

I. $9 \times n = 4500$

J. $4500 \div 9 = n$

K. $8 \times n = 560$

L. $560 \div 8 = n$

M. $3 \times n = 0$

N. $0 \div 3 = n$

DPP G – Fractions**Unit 16**

Which is larger? Explain how you decided on yours answers.

A. $\frac{1}{12}$ or $\frac{1}{10}$?

B. $\frac{3}{2}$ or $1\frac{1}{4}$?

C. $\frac{6}{12}$ or 0.5?

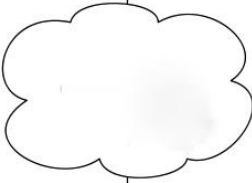
D. $\frac{5}{8}$ or 0.4?

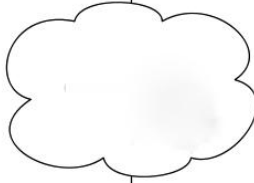
5th Grade DPP Probes

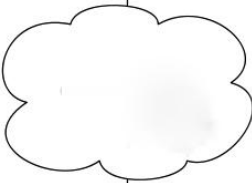
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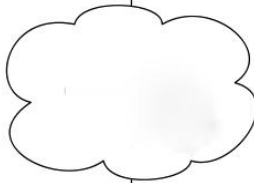
DPP A – Addition and Subtraction Practice**Unit 2**

Solve the following problems. First, estimate and put your estimate in the cloud next to the problem. Then, solve each problem using pencil and paper to find the answers.

A. $356 + 76 =$ 

B. $1037 - 763 =$ 

C. $484 + 158 =$ 

D. $4656 - 2937 =$ 

DPP E – Making Change**Unit 2**

David buys a CD that costs \$14.49. He gives the sales clerk a \$20 bill. How much change will he receive? Name the least number of coins and bills he can receive. Show your work.

DPP G – Write the Number	Unit 2
---------------------------------	---------------

Write a number that has:
Show your work.

- A. 6 tens and 3 ones
- B. 91 hundreds and 6 tens
- C. 73 tens
- D. 8 hundreds and 14 ones
- E. 50 tens and 8 ones

.....

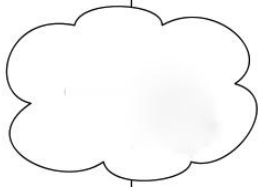
DPP O – A Juicy Problem	Unit 2
--------------------------------	---------------

Two shipments of fruit were delivered to the school cafeteria. One shipment delivered 8 sacks of oranges, 50 pounds to a sack. In the other shipment, there were 7 sacks, also 50 pounds to a sack. How many pounds of fruit were delivered to the cafeteria in all? Show your work.

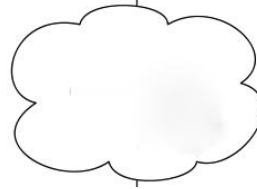
DPP V – Multiplication Practice**Unit 2**

Solve the following problems. First, estimate and put your estimate in the cloud next to the problem. Then, solve each problem using pencil and paper to find the answers.

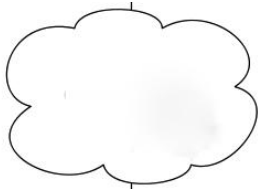
A.
$$\begin{array}{r} 46 \\ \times 7 \\ \hline \end{array}$$



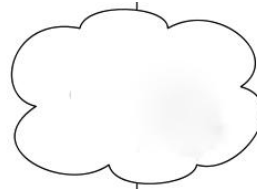
B.
$$\begin{array}{r} 77 \\ \times 16 \\ \hline \end{array}$$



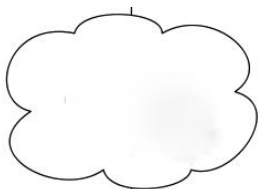
C.
$$\begin{array}{r} 54 \\ \times 35 \\ \hline \end{array}$$



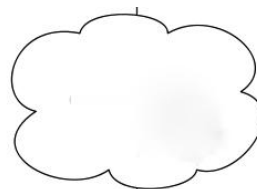
D.
$$\begin{array}{r} 38 \\ \times 30 \\ \hline \end{array}$$



E.
$$\begin{array}{r} 62 \\ \times 40 \\ \hline \end{array}$$



F.
$$\begin{array}{r} 7134 \\ \times 5 \\ \hline \end{array}$$



DPP C – Multiplying by 10s	Unit 3
-----------------------------------	---------------

Solve:

A. $30 \times 20 =$

B. $80 \times 30 =$

C. $200 \times 60 =$

D. $50 \times 300 =$

E. $1000 \times 30 =$

F. $900 \times 200 =$

G. $6000 \times 300 =$

H. $20 \times 200 =$


I. $7000 \times 3 =$


Write a rule for multiplying with zeros.

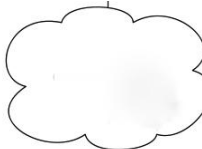
DPP G – Arithmetic Review**Unit 3**

Solve the following problems. First, estimate and put your estimate in the cloud next to the problem. Then, solve each problem using pencil and paper or mental math to find the answers.

A.
$$\begin{array}{r} 54 \\ \times 8 \\ \hline \end{array}$$
 

B.
$$\begin{array}{r} 534 \\ + 963 \\ \hline \end{array}$$
 

C.
$$\begin{array}{r} 730 \\ \times 6 \\ \hline \end{array}$$
 

D.
$$\begin{array}{r} 5001 \\ - 3989 \\ \hline \end{array}$$
 

DPP I – Mixed Numbers and Improper Fractions**Unit 3**

1. Write an improper fraction for each mixed number.

A. $\frac{15}{4}$

B. $\frac{24}{8}$

C. $\frac{29}{3}$

2. Write a whole number or a mixed number for each improper fraction.

A. $6\frac{2}{3}$

B. $9\frac{1}{2}$

C. $5\frac{1}{3}$

DPP C – Equivalent Fractions**Unit 4**

Complete the number sentences with the correct value for n.

A. $\frac{4}{8} = \frac{n}{2}$

B. $\frac{2}{3} = \frac{6}{n}$

C. $\frac{12}{9} = \frac{n}{3}$

D. $\frac{5}{12} = \frac{10}{n}$

E. $\frac{20}{16} = \frac{5}{n}$

DPP H – Fractions Between 0 and 1**Unit 4**

1. Name at least two fractions between $\frac{1}{2}$ and 1.

2. Name at least two fractions between $\frac{1}{4}$ and $\frac{3}{4}$.

3. Name at least two fractions between 0 and $\frac{1}{2}$ with a denominator of 10.

4. Name at least two fractions between $\frac{7}{8}$ and 1.

5. Name at least two fractions between 0 and $\frac{1}{2}$ with a numerator that is not 1.

DPP S – Multiplying and Dividing by Multiples of 10	Unit 4
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A. $800 \times 80 =$

B. $25,000 \div 50 =$

C. $4900 \div 7 =$

D. $10,000 \div 10 =$

E. $40 \times 400 =$

F. $8100 \div 90 =$

.....

DPP E – Multiplying by 10s	Unit 5
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A. $30 \times 90 =$

B. $80 \times 90 =$

C. $900 \times 60 =$

D. $50 \times 900 =$

E. $1000 \times 90 =$

F. $900 \times 200 =$

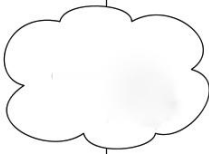
G. $4000 \times 900 =$

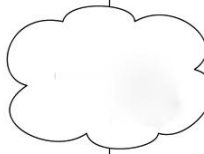
H. $70 \times 900 =$

I. $9000 \times 9 =$

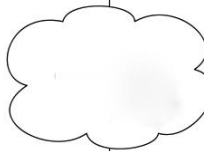
DPP N – Let's Practice**Unit 5**

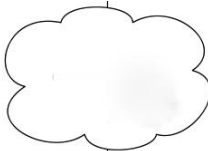
Solve the following problems. First, estimate and put your estimate in the cloud next to the problem. Then, solve each problem using pencil and paper to find the answers.

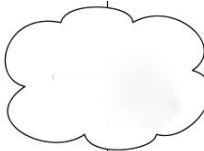
A.
$$\begin{array}{r} 18 \\ \times 63 \\ \hline \end{array}$$
 

B.
$$\begin{array}{r} 565 \\ + 739 \\ \hline \end{array}$$
 

C.
$$\begin{array}{r} 2,706 \\ - 1,187 \\ \hline \end{array}$$
 

D.
$$\begin{array}{r} 37 \\ \times 29 \\ \hline \end{array}$$
 

E. $5,170 \div 5 =$ 

F. $17,235 \div 9 =$ 

DPP T – Comparing Fractions**Unit 5**

Write a number sentence to compare the following fractions. Use $<$, $>$, or $=$ in your sentence.

A. $\frac{1}{10}$, $\frac{7}{8}$

B. $\frac{4}{8}$, $\frac{5}{10}$

C. $\frac{4}{5}$, $\frac{1}{2}$

D. $\frac{2}{3}$, $\frac{7}{12}$

E. $\frac{3}{10}$, $\frac{3}{8}$

F. $\frac{11}{12}$, $\frac{5}{12}$

Explain your thinking for Questions A and B.

DPP H – Fractions**Unit 6**

Circle the number closest to the actual sum or difference. Show how you estimated your answer.

1. $7/8 + 12/13$ is closest to:

- A. $1/2$
- B. 1
- C. $1\ 1/2$
- D. 2

2. $4/9 + 5/8$ is closest to:

- A. $1/2$
- B. $3/4$
- C. 1
- D. 2

3. $8/9 - 1/12$ is closest to:

- A. 0
- B. $1/2$
- C. 1

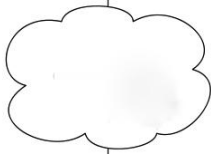
4. $1/2 - 4/9$ is closest to:

- A. 0
- B. $1/4$
- C. $1/2$

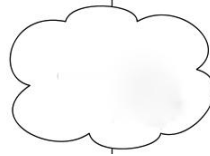
DPP I – Practice**Unit 6**

Solve the following problems. First, estimate and put your estimate in the cloud next to the problem. Then, solve each problem using pencil and paper to find the answers.

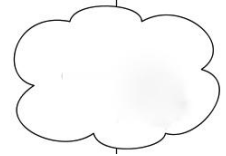
A. $870 \div 6 =$



B. $7,045 \div 8 =$



C. $34 \times 56 =$

**DPP O – Multiplying and Dividing with Zeros****Unit 6**

A. $80 \times 400 =$

B. $2,800 \div 70 =$

C. $7 \times 80,000 =$

D. $700 \times 6,000 =$

E. $4,800 \div 600 =$

F. $240 \div 4 =$

Write a rule for dividing with zeros.

DPP U – Missing Decimal Points**Unit 7**

Professor Peabody forgot to put decimal points in the numbers below. He does know that the "6" in each number stands for six-tenths.

Rewrite each number and put a decimal point in each number so that the 6 stands for six-tenths.

A. 1360

B. 1206

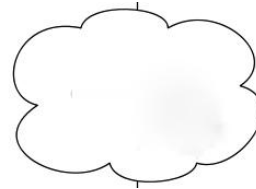
C. 603

D. 126

E. 367

D. 1634

Estimate the sum of the six numbers you wrote.



What is the actual sum? _____

DPP Y – Adding and Subtracting Fractions**Unit 7**

Solve the following problems. First, circle a number to estimate the answer to each problem. Then, solve each problem using pencil and paper to find the answers.

A. $\frac{3}{5} + \frac{3}{10} =$

B. $\frac{7}{8} - \frac{1}{2} =$

Answer is close to:

A. 0

B. $\frac{1}{2}$

C. 1

Answer is close to:

A. 0

B. $\frac{1}{2}$

C. 1

C. $\frac{1}{6} + \frac{1}{3} =$

D. $\frac{1}{2} - \frac{1}{3} =$

Answer is close to:

A. 0

B. $\frac{1}{2}$

C. 1

Answer is close to:

A. 0

B. $\frac{1}{2}$

C. 1

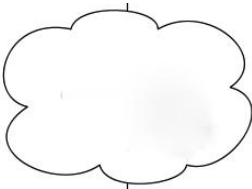
DPP G – Quick Change**Unit 8**

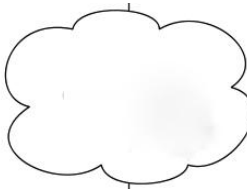
Change the following fractions to decimals and then to percents. Show your work.

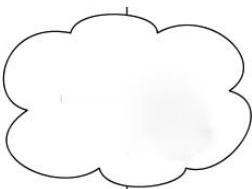
A. $\frac{23}{100}$	B. $\frac{3}{4}$	C. $\frac{30}{50}$	D. $\frac{68}{100}$
E. $\frac{5}{10}$	F. $\frac{2}{8}$	G. $\frac{9}{100}$	H. $\frac{2}{40}$

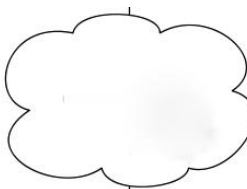
DPP A – Division Practice**Unit 9**

Solve the following problems. First, estimate and put your estimate in the cloud next to the problem. Then, solve each problem using pencil and paper or mental math to find the answers.

A. $678 \div 4 =$ 

B. $200 \div 5 =$ 

C. $56 \div 5 =$ 

D. $1264 \div 8 =$ 

DPP E – Estimating with Ease	Unit 9
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See if you can figure out these problems in your head. Then, write down your reasoning for each answer.

A About how many 12s are in 140?
B. About how many 25s are in 370?
C. About how many 20s are in 345?

DPP E – Estimating with Ease**Unit 10**

Compare each pair of division problems. Fill in the box with $<$, $>$, or $=$.

A. $16 \div 2$ $16 \div 3$

B. $18 \div 4$ $18 \div 3$

C. $48 \div 4$ $48 \div 3$

D. $471 \div 4$ $471 \div 3$

E. $471 \div 4$ $471 \div 7$

F. $1000 \div 8$ $1000 \div 12$


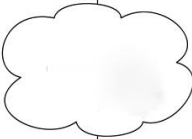
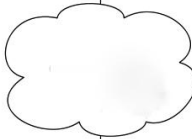
G. $1052 \div 8$ $1176 \div 8$




H. $1057 \div 432$ $100 \div 89$

Write an explanation for Questions F and G.

DPP L – Fractions**Unit 10**

Solve the following problems. First, estimate and put your estimate in the cloud next to the problem. Then, solve each problem by adding or subtracting the fractions.

A. $\frac{3}{8} + \frac{1}{4} =$  B. $\frac{4}{5} + \frac{2}{3} =$  C. $\frac{11}{12} - \frac{1}{3} =$ 

D. $\frac{8}{9} - \frac{1}{3} =$  E. $\frac{11}{12} + \frac{1}{6} =$  F. $\frac{7}{10} - \frac{2}{5} =$ 

Explain your estimation strategy for Question E.

DPP L – Divisibility Rules**Unit 11**

Put a mark in the box next to the number to show that a number is divisible by 2, by 3, by 6. Look at the example.

Remember, a number is divisible by 3 if the sum of its digits are divisible by 3.

	Divisible by 2	Divisible by 3	Divisible by 6
Example 12	X	X	X
26			
258			
368			
939			
1,032			

Write the divisibility rule for 6.

DPP O – Fractions**Unit 1**

Find at least one number for n that makes each sentence true. If there is more than one correct answer, explain. Example:

- $\frac{n}{4} > \frac{3}{8}$.
- n can be 2 because $\frac{2}{4} > \frac{3}{8}$.
- n can also be 3 because $\frac{3}{4} > \frac{3}{8}$.

A. $\frac{1}{5} = \frac{n}{25}$

B. $\frac{6}{21} = \frac{2}{n}$

C. $\frac{n}{12} < \frac{3}{4}$

D. $\frac{7}{8} < \frac{n}{16}$

DPP P – Finding Factors

Unit 11

1. Find all the factor pairs for the following numbers. Tell which numbers are prime.

A. 23

B. 25

C. 39

D. 73

E. 1278

2. Draw a factor tree for each composite number above. Then, write its prime factorization. Use exponents when possible.

DPP Y – Mental Math	Unit 13
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A. $\frac{1}{2} \times 100 =$ B. $\frac{1}{2} \times 60 =$ C. $\frac{1}{2} \times 80 =$ D. $\frac{1}{2} \times 82 =$

E. $\frac{1}{4} \times 200 =$ F. $\frac{1}{4} \times 80 =$ G. $\frac{1}{6} \times 60 =$ H. $\frac{1}{6} \times 54 =$

Explain your strategy for finding $\frac{1}{6}$ of a number.

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DPP F – Speaking of Parts	Unit 13
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Remember that fractions, decimals, and percents are all ways of speaking about parts of a whole. Fill in the chart with equivalent names for the given numbers. Reduce all fractions to lowest terms

	Fraction	Decimal	Percent
A.		0.10	
B.	$\frac{1}{2}$		
C.			15%
D.		0.4	
E.	$\frac{3}{100}$		
F.			30%
G.	$\frac{3}{4}$		
H.		0.01	

DPP A – Scheduling Activities	Unit 14
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Ms. Internet schedules the following times for each of three activities she wants her students to complete at the computer. How many minutes are assigned for each activity? Show your work.

A. Word processing: 8:48 to 9:54 A.M.

B. Graphing data from an experiment: 9:55 to 10:17 A.M.

C. Geography game: 10:20 to 10:43 A.M.

DPP R – Shirts**Unit 14**

A closet has 20 shirts.

1. $\frac{1}{5}$ of the shirts are dress shirts. How many dress shirts are in the closet?
Show your work.

2. $\frac{1}{2}$ of the shirts are work shirts. How many work shirts are in the closet?
Show your work.

3. The rest of the shirts are t-shirts. What fraction of the shirts are t-shirts? Show your work.

DPP T – Fractions and Mixed Numbers**Unit 14**

Rewrite each of the following as mixed numbers with no improper fractions. All fractions should be in lowest terms.

A. $8 \frac{10}{6}$

B. $\frac{27}{6}$

C. $3 \frac{9}{4}$

D. $\frac{88}{12}$

Create an example of a mixed number with an improper fraction. Solve your example.

DPP L – In Proportion**Unit 16**

Solve the following. Explain your solutions.

1. If a hotel charges \$270 for a 6-night stay, how much is a 2-night stay? Show your work.
2. If I walk half a mile in ten minutes, how far can I walk in one hour? Show your work.
3. For every eight children on a field trip there needs to be one adult chaperone. If there are 136 students going on the trip, how many chaperones are needed? Show your work.
4. For every \$20 the students collect in the school fundraiser, \$5 goes toward decorating the cafeteria. If \$1315 went toward the decoration project, how much money was collected in all? Show your work.