erikson

early mathematics education

INNOVATIONS

Learning Lab #4

Afternoon Handouts
3rd

Who lives here?

Grandpa is a funny guy. He says that at his house there are 14 feet and 2 tails. Who might live at Grandpa's house?

Show all your work. Explain in words how you found your answer. Tell why you took the steps you did to solve the problem.

Make sure you
— show all your work in solving the problem,
— clearly label your answer,
— write in words how you solved the problem,
— write in words why you took the steps you did to solve the problem, and
— write as clearly as you can.

Exemplars Math K-2 Sample (www.exemplars.com)

Placas de Automóvil / License Plates

Espanol

En un paseo reciente buscamos placas de automóviles que tuviereran 3 números. Demuestra todas las placas que encontramos con números que al sumarse equivalen al número 6.

Explica todo tu trabajo utilizando dibujos, números, y palabras.

English

On a recent car trip we looked for license plates that had 3 numerals on them. Show all of the license plates that we found that had numbers that added up to 6.

Explain all of your work using pictures, numbers, and words.

You have four samples of student solutions to this problem.

- Examine them and discuss them with others at your table.
- Put them in order of mathematical complexity – novice, apprentice, practitioner, expert.
- What evidence of student thinking can you see that helps you assign the samples to different levels of complexity?

Level	What you notice about student work sample
Novice	
Apprentice	
Practitioner	
Expert	

119

114

83

185

908

011

171

105

196

I poot homrs oh plates.

132   209   339

501   051

006   123   510

303   141   A11

"I counted on my fingers to make 6. I was just thinking of numbers."

105   060   151

240   213   42

033   232

600   3+3   600

600

Zoom Boston
WMPl3z

Florida 060   New Jersey 600   Howwie 006

Zoom   Boston 303

N.Y. 411

N.Y. 033

I did 1+2+3
= 6 rite
away. It
was esey
to add
3 numbers.
Then I
changd
them
around.

N.Y. 501

Zoom

Zoom   Boston 312

New Jersey 213

Boston 330

Florida 051

Florida 123

N.Y. 231

Boston 015

N.Y. 114

Howwie 141

Texas 510

N.Y. 222

Boston 105

NY 150

N.Y. 024

N.Y. 402

Texas 204

N.Y. 321

New Jersey 420

Howwie 042

N.Y. 240
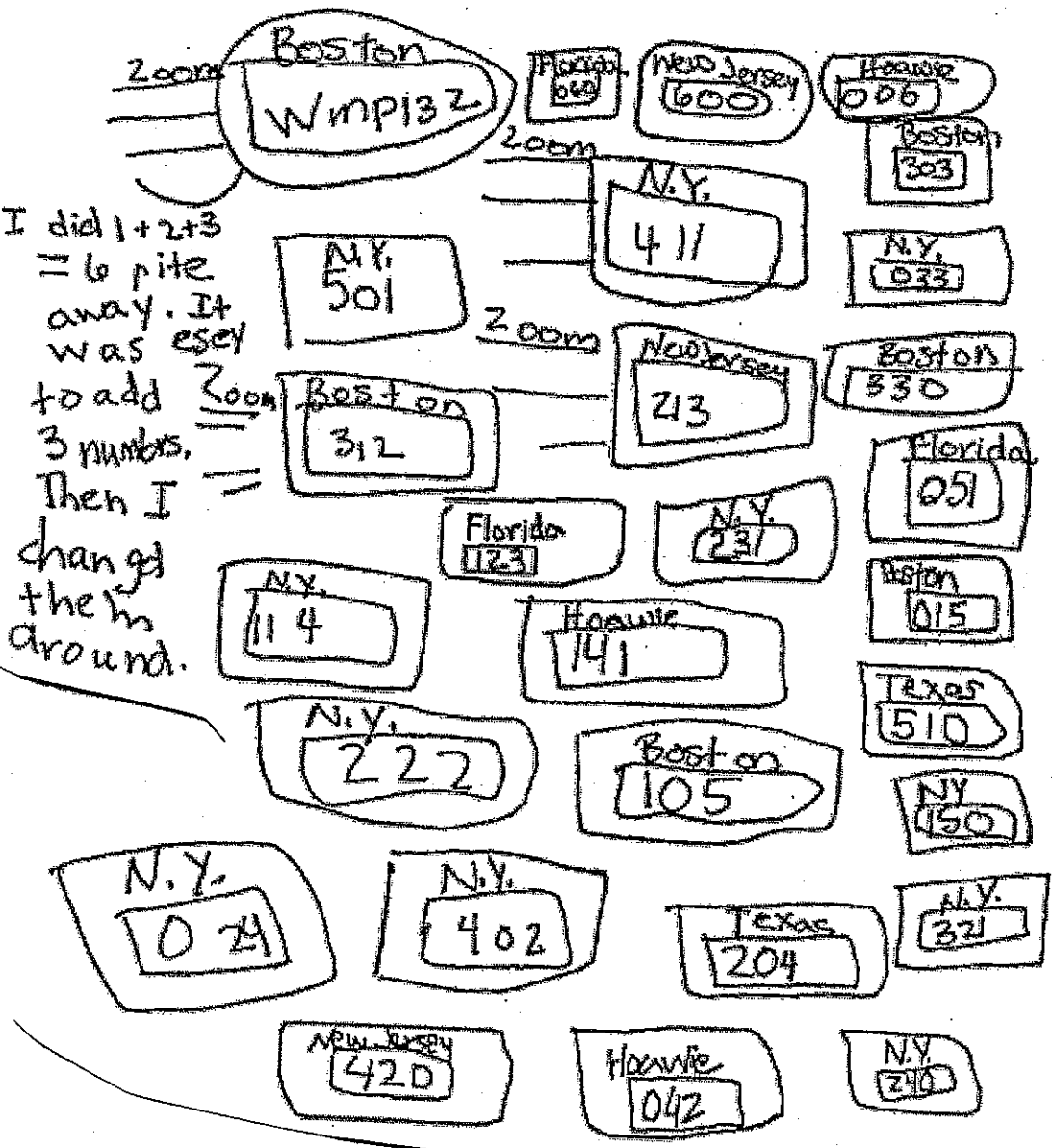
222 tripls 2+2+2=6

114 dobl #s 1+1+4=6

141 Swich 1+4+1=6
411 arond- 4+1+1=6

006 dobl 0's 0+0+6=6

060 Swich
600 arond

330 dobl 3's 0+3+3=6

303 Swich
033

The 0 can be any plase.

123 1+2+3=6
321 →backwrds
231 3+2+1=6
132 312 213

510 5+1+0=6

015 If ther are 3 numbrs then ther are 6 paterns

150

051

501

105

1+0+5=6

420
624 4+2+0=6
240
042 The same
204
402

9·5

Buying at the Stock-Up Sale

Objective To guide children as they multiply using mental math and the partial-products algorithm.

① Teaching the Lesson

materials

Key Activities
Children make up and solve problems about costs of multiple items advertised on the Stock-Up Sale posters.

Key Concepts and Skills
- Apply place-value concepts to find partial products.
  [Number and Numeration Goal 1]
- Use multiplication facts to make estimates and calculate partial products.
  [Operations and Computation Goal 3]
- Use the partial-products algorithm to multiply 1-digit by multidigit numbers.
  [Operations and Computation Goal 4]
- Make reasonable estimates.
  [Operations and Computation Goal 5]

- ☐ *Math Journal 2*, p. 217
- ☐ *Student Reference Book*, pp. 216 and 217
- ☐ Home Link 9·4
- ☐ Teaching Aid Masters (*Math Masters*, pp. 399 and 400, optional)
- ☐ slate
- ☐ tool-kit coins (optional)

See Advance Preparation

② Ongoing Learning & Practice

materials

Children play *Fraction Top-It*.

Children practice and maintain skills through Math Boxes and Home Link activities.

⭐ **Ongoing Assessment: Recognizing Student Achievement** Use an Exit Slip.
[Number and Numeration Goal 6]

- ☐ *Math Journal 2*, p. 218
- ☐ *Student Reference Book*, p. 287
- ☐ Home Link Master (*Math Masters*, p. 283)
- ☐ Teaching Aid Master (*Math Masters*, p. 398)
- ☐ Fraction Cards

③ Differentiation Options

materials

READINESS
Children estimate the money they need to make purchases at the Stock-Up Sale.

ENRICHMENT
Children calculate sales tax on purchases at the Stock-Up Sale.

- ☐ *Math Journal 2*, p. 217
- ☐ *Student Reference Book*, pp. 216 and 217
- ☐ Teaching Masters (*Math Masters*, pp. 284, 285)
- ☐ Teaching Aid Master (*Math Masters*, p. 399)
- ☐ tool-kit dimes

Additional Information

Advance Preparation Copy and cut apart the play money on *Math Masters*, pages 399 and 400 (optional).

Technology
Assessment Management System
Exit Slip
See the ITLG.

Getting Started

Mental Math and Reflexes

Children write 1-, 2-, and 3-place decimals from dictation and indicate digits in a given place. For example:

ⵔⵔⵔ 15.8 Put an X through the digit in the tenths place. 15.X

ⵔⵔⵔ 0.47 Underline the digit in the hundredths place. 0.4Z

ⵔⵔⵔ 0.302 Circle the digit in the thousandths place. 0.30②

Math Message

Turn to page 217 in your Student Reference Book. Estimate whether $10 is enough to buy 4 rolls of gift-wrapping paper. Record your estimate on your slate. Discuss your estimation strategy with a partner.

Home Link 9·4 Follow-Up

Briefly review answers. Have volunteers model the partial-products algorithm for some of the problems.

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① Teaching the Lesson

▶ Math Message Follow-Up

WHOLE-CLASS DISCUSSION

(Student Reference Book, p. 217; Math Masters, pp. 399 and 400)

Discuss children's answers. Possible estimation strategies:

● Change $2.35 to a close-but-easier amount, such as $2.50. $4 \times \$2.50 = \$10.00$ (double $2.50 twice). $10 would be enough to buy 4 rolls if they were $2.50 per roll. Because $2.50 is more than $2.35, the cost of 4 rolls at $2.35 is less than $10.

● Change $2.35 to a different close-but-easier amount, such as $2.40. $4 \times \$2.00 = \$8.00$, and $4 \times \$0.40 = \$1.60$. Therefore, $4 \times \$2.40 = \$9.60$. Because $2.40 is more than $2.35, the cost is less than $10.

Remind children that many problems can be solved with estimation instead of exact calculation. An efficient estimation strategy requires simple mental math and gives an answer that is reasonably close to the exact answer.

Have children work in small groups to find the exact cost, using mental math or an algorithm. $9.40 Take time to have children share strategies. For example:

$4 \times \$2.00 = \$8.00$

$4 \times \$0.30 = \$1.20$

$4 \times \$0.05 = \$0.20$

$\$8.00 + \$1.20 + \$0.20 = \$9.40$

Stock-Up Sale Poster #2

Student Reference Book, p. 217

▶ **Applying the Partial-Products Algorithm** 🏃🏃 WHOLE-CLASS ACTIVITY

(*Student Reference Book*, pp. 216 and 217)

Various items are advertised on the two Stock-Up Sale posters. You or the children suggest stories that compare the cost of 5 of a given item to the cost of another quantity. For example, it will cost $0.90 more to buy 5 boxes of trash bags than it will cost to buy 4.

NOTE One mental math strategy for buying 5 items is to figure out how much 10 items would cost and then take half of that amount. For example, the cost of 10 boxes of trash bags is $31.80. Half of $31 is $15.50. Half of $0.80 is $0.40. $15.50 + $0.40 = $15.90.

Remind children that stores often lower the price of an item that is purchased in bulk to encourage customers to spend more. The store makes up for the lower profit per item by selling more items.

For each story, children find answers in one of two ways:

▷ Using mental math. Have children discuss and share strategies.

▷ Using the partial-products algorithm (Lesson 9-4) with dollars and cents. For the first few stories, write the algorithm on the board while the children suggest partial products.

Compare the cost of buying 5 boxes of trash bags to buying 4 boxes of trash bags. (Story examples are based on *Student Reference Book*, page 217.)

● What is the cost of 4 boxes of trash bags at $3.75 per box? $15.00

$$
\begin{array}{r}
\$3.75 \\
\times\ \ \ 4 \\
\end{array}
$$

$$
\begin{array}{r}
4\ [\$3.00s] \rightarrow\ 12.00 \\
4\ [\$0.70s] \rightarrow\ \ \ 2.80 \\
4\ [\$0.05s] \rightarrow\ \underline{+\ 0.20} \\
\$15.00 \\
\end{array}
$$

● What is the cost of 5 boxes of trash bags at the special price of $3.18 per box? $15.90

$$
\begin{array}{r}
\$3.18 \\
\times\ \ \ 5 \\
\end{array}
$$

$$
\begin{array}{r}
5\ [\$3.00s] \rightarrow\ 15.00 \\
5\ [\$0.10s] \rightarrow\ \ \ 0.50 \\
5\ [\$0.08s] \rightarrow\ \underline{+\ 0.40} \\
\$15.90 \\
\end{array}
$$

- How much more do 5 boxes of trash bags cost than 4 boxes of trash bags? $15.90 − $15.00 = $0.90

Compare the cost of buying 2 boxes of greeting cards to the cost of buying 5 boxes of greeting cards.

- What is the cost of 2 boxes of greeting cards at $3.29 per box? $6.58

- What is the cost of 5 boxes of greeting cards at $2.63 per box? $13.15

- How much more does it cost to buy 5 boxes of greeting cards than 2 boxes of greeting cards? $6.57

▶ Solving Stock-Up Sale Stories

☆☆ PARTNER ACTIVITY

(Math Journal 2, p. 217; Student Reference Book, p. 217)
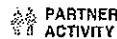
Children work together to solve the problems on journal page 217 using the information on page 217 in their *Student Reference Books*. Some problems call for an exact answer, but others require an estimate. Children show the number models they use to estimate. To support English language learners, explain that the phrase *at least* in Problem 1 on page 217 means *the minimum to be bought.*

② Ongoing Learning & Practice

▶ Playing *Fraction Top-It*

☆☆ PARTNER ACTIVITY

(Student Reference Book, p. 287; Math Masters, p. 398)

Children practice comparing fractions by playing *Fraction Top-It.* For game instructions, see Lesson 8-6 or page 287 in the *Student Reference Book*. Have children use an Exit Slip to record at least five rounds using the symbols >, <, and = to compare the fraction pairs.

✔ Ongoing Assessment: Recognizing Student Achievement

Exit Slip ★

Use an Exit Slip (*Math Masters*, page 398) to assess children's progress toward comparing fractions. Children are making adequate progress if they are able to record at least 5 pairs of fractions with the appropriate comparison symbols. Some children may be able to compare the fractions without using Fraction Cards.

(Number and Numeration Goal 6)

▶ Math Boxes 9·5

(*Math Journal 2*, p. 218)

Mixed Practice Math Boxes in this lesson are paired with Math Boxes in Lesson 9-7. The skill in Problem 6 previews Unit 10 content.

▶ Home Link 9·5

(*Math Masters*, p. 283)

Home Connection Children use mental math or the partial-products algorithm to solve multiplication number stories.

3 Differentiation Options

READINESS

▶ **Estimating Costs**

PARTNER ACTIVITY
5–15 Min

(*Math Masters*, p. 284; *Student Reference Book*, pp. 216 and 217)

To provide experience with estimating money amounts, have children determine the number of dollar bills and dimes they need to make purchases. Use the Stock-Up Sale posters on pages 216 and 217 in the *Student Reference Book*. Children record their work on *Math Masters*, page 284.

ENRICHMENT

▶ **Finding Stock-Up Store Sales Tax**

PARTNER ACTIVITY
15–30 Min

(*Math Journal 2*, p. 217; *Math Masters*, p. 285)

To apply children's understanding of multiplication in the context of money, have them add a 10 percent sales tax to the problems on journal page 217. They show their work on *Math Masters*, page 285.

Name _____ Date _____ Time _____

Dollars and Dimes

Use the Stock-Up Sale posters on pages 215 and 217 in your *Student Reference Book*. Suppose that you have only dollars and dimes. Write the least amount of money you could use to buy each item.

Use dollars and dimes to help you.

Items to Be Purchased	Dollars and Dimes Needed
Example: 1 box of 12 Greeting Cards Price: $3.29	3 dollars, 3 dimes Total $ 3.30
1 roll of Gift-Wrapping Paper Price: $2.35	2 dollars, 4 dimes Total $ 2.40
1 roll of Transparent Tape Price: $0.84	0 dollars, 9 dimes Total $ 0.90
1 box of Tissues Price: $0.73	0 dollars, 8 dimes Total $ 0.80
1 Paperback Book Price: $2.99	3 dollars, 0 dimes Total $ 3.00

Math Masters, p. 284

Name _____ Date _____ Time _____

10% Sales Tax at the Stock-Up Sale

You will need *Math Journal 2*, page 217 and your *Student Reference Book*. Figure out how much money Mason, Vic, and Andrea will each need if a 10% sales tax is added to their purchases.

• One way to figure the 10% sales tax is to find 1/10 of the dollars and then 1/10 of the cents. Then add the amounts.
• If 1/10 of the cents amount is between pennies, round to the higher amount.

Example: 10% of $2.43

1/10 of $2.00 is $0.20; 1/10 of $0.40 is $0.04. 1/10 of $0.03 is less than a penny so round to the higher amount, or $0.01. $0.20 + $0.05 = $0.25. So 10% of $2.43 is $0.25.

1. How much will Mason need for 5 bars of soap with 10% sales tax?

$3.25 + $0.33 = $3.58

2. How much will Vic need for 5 toothbrushes at the sale price with 10% sales tax?

$5.65 + $0.57 = $6.22

3. How much will Andrea need for 5 bottles of glue at the sale price with 10% sales tax?

$4.70 + $0.47 = $5.17

Math Masters, p. 285

Lesson 1

Lizardland Problems

Lesson Overview

Estimated Class Sessions

1

Students solve problems involving multiplication by using clues they find in a drawing of the Lizardland Amusement Park. They write and solve their own multiplication problems about the drawing.

Key Content

- Solving and writing problems involving multiplication.
- Communicating solutions and strategies verbally and in writing

Math Facts

DPP Task B provides practice with multiplication facts.

Homework

Assign the homework on the *Lizardland Problems* Activity Pages.

Assessment

Use the *Observational Assessment Record* to note students' abilities to solve multiplication problems and explain their reasoning.

Curriculum Sequence

Before This Unit

Students developed multiplication concepts by solving word problems in Grade 3 Unit 3 and Unit 7.

After This Unit

Students will continue to develop multiplication concepts through problem solving in Grade 3 Unit 16 Lesson 2 *Fill 'er Up*, Unit 19 *Multiplication and Division Problems*, and the Daily Practice and Problems.

Materials List

Supplies and Copies

Student	Teacher
Supplies for Each Student • calculator	**Supplies**
Copies	**Copies/Transparencies** • poster made by enlarging the Lizardland picture found on *Lizardland Problems*, optional (*Student Guide* Pages 140–141) • 1 copy of *Observational Assessment Record* to be used throughout this unit (*Unit Resource Guide* Pages 13–14)

All blackline masters including assessment, transparency, and DPP masters are also on the Teacher Resource CD.

Student Books
Lizardland Problems (*Student Guide* Pages 140–144)

Daily Practice and Problems and Home Practice
DPP items A–B (*Unit Resource Guide* Page 17)

Note: Classrooms whose pacing differs significantly from the suggested pacing of the units should use the Math Facts Calendar in Section 4 of the *Facts Resource Guide* to ensure students receive the complete math facts program.

Assessment Tools
Observational Assessment Record (*Unit Resource Guide* Pages 13–14)

Daily Practice and Problems

A. Bit: Mental Arithmetic: Adding 99
(URG p. 17)

Write down these problems; then, solve them. Look for patterns.

1. 131 + 99 =
2. 555 + 99 =
3. 97 + 99 =
4. 103 + 99 =
5. 355 + 99 =
6. 769 + 99 =
7. 327 + 99 =
8. 82 + 99 =
9. 777 + 99 =

B. Task: Multiplication Story
(URG p. 17)

1. Write a story and draw a picture about 3 × 5. Write a number sentence on your picture.
2. Write a story and draw a picture about 9 × 5. Write a number sentence for your picture.

You may wish to hang the Lizardland poster in the classroom a few days before the activity begins. Ask students to begin thinking of math questions they could ask about the poster.

Ask students to solve *Questions 1–5* on the *Lizardland Problems* Activity Pages. They will have to look carefully at the picture (on the wall or in their books) to find the information needed to answer the problems. Students can solve all the problems using multiplication; however, they should be allowed to use any methods they wish, including calculators. Encourage students to check their answers by finding solutions in different ways.

It is important for students to talk about their solution strategies. For this reason, we recommend they work together in pairs. A whole-class discussion should follow to allow students to talk about different solution paths. Highlight the ways multiplication is used in the problems and include appropriate number sentences. Emphasize the relationship between addition number sentences and multiplication sentences.

> ## TIMS Tip
>
> Ask students to trade and solve each other's Lizardland problems.

Question 5 asks students to write their own multiplication problems. Students enjoy working with larger numbers, so their problems might involve numbers that they do not yet know how to multiply. Do not discourage students from using large numbers; problems that are too hard can be modeled with base-ten pieces or solved using calculators. Problems involving two-digit by one-digit multiplication will be dealt with in Unit 19, but many students will enjoy thinking about them now.

Lizardland Problems

Student Guide - page 140

Student Guide - page 14

1. Mr. Brown bought ice cream for his five children at the stand near Picnic Park. How much did he spend?

2. How many blocks are in the wall? Include the blocks that are covered by signs.

3. Each block in the front wall is 8 inches high.
   A. How high is the wall?
   B. Could you climb over it?
   C. Could you jump over it?
   D. Explain.

4. George has been watching the Lizard-Go-Round. It takes 30 seconds to go around one time.
   A. How many minutes does it take to go around eight times?
   B. How many times does it go around in $2\frac{1}{2}$ minutes?

5. Write a problem about Lizardland, and solve it using multiplication.

Homework

Refreshments

1. Tom is at the refreshment stand with his parents. They are buying three hot dogs, two fries, two lemonades, and one milk. How much will their order cost?

SG · Grade 3 · Unit 11 · Lesson 1   Lizardland Problems

Student Guide - page 142 (Answers on p. 32)

Buying Balloons

2. Mary's mother bought one balloon for Mary and one for Louise. How much did she pay?

3. José is near the Lizard Kingdom. How much did his balloons cost?

The Skyway

4. Joel wants to ride the Skyway. He is the one in line who is wearing the big hat and sunglasses. He noticed that a new car is loaded every 2 minutes. How long will he have to wait after the car that is now being loaded leaves?
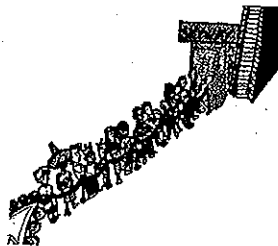
The Lizard Show

5. Seats for today's Lizard Show are selling fast. So far, $400 has been collected. How many seats are left? Show your work with number sentences.

Lizardland Problems   SG · Grade 3 · Unit 11 · Lesson 1

dent Guide - page 143 (Answers on p. 32)

Leaping Lizard Roller Coaster

6. How many people can ride in all eight cars of the roller coaster at one time?

7. Jean wants to ride the roller coaster. There are 24 people in front of Jean. She is the one at the end of the line. Will there be enough room for her the next time it is loaded, or will she have to wait?

Ticket Sales

8. The Moore family—Grandmother Moore, Mr. and Mrs. Moore, and the three Moore children—is eating lunch beside Lizard Lake. It is Saturday. How much did they spend on admission tickets for the carnival? (Hint: The admission ticket price is beside the ticket taker at the front gate.)

9. How much would the Moores have saved on admission if they had come on Tuesday?

SG · Grade 3 · Unit 11 · Lesson 1   Lizardland Problems

Student Guide - page 144 (Answers on p. 33)

Math Facts

For DPP Task B students write a story and draw a picture for 9×5 and 3×5.

Homework and Practice

- Nine problems are provided for homework on the *Lizardland Problems* Activity Pages in the *Student Guide*.

- Select a few of the problems students wrote during the activity to assign for homework as well.

- Using DPP Bit A students build mental math skills by adding 99 to three-digit numbers.

Assessment

Use the *Observational Assessment Record* to note students' progress solving multiplication problems and explaining solution strategies.

Exemplars® Standards-Based Math Rubric*

	Problem Solving	Reasoning and Proof	Communication	Connections	Representation
Novice	No strategy is chosen, or a strategy is chosen that will not lead to a solution. Little or no evidence of engagement in the task present.	Arguments are made with no mathematical basis. No correct reasoning nor justification for reasoning is present.	No awareness of audience or purpose is communicated. or Little or no communication of an approach is evident or Everyday, familiar language is used to communicate ideas.	No connections are made.	No attempt is made to construct mathematical representations.
Apprentice	A partially correct strategy is chosen, or a correct strategy for only solving part of the task is chosen. Evidence of drawing on some previous knowledge is present, showing some relevant engagement in the task.	Arguments are made with some mathematical basis. Some correct reasoning or justification for reasoning is present with trial and error, or unsystematic trying of several cases.	Some awareness of audience or purpose is communicated, and may take place in the form of paraphrasing of the task. or Some communication of an approach is evident through verbal/written accounts and explanations, use of diagrams or objects, writing, and using mathematical symbols. or Some formal math language is used, and examples are provided to communicate ideas.	Some attempt to relate the task to other subjects or to own interests and experiences is made.	An attempt is made to construct mathematical representations to record and communicate problem solving.
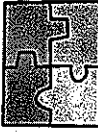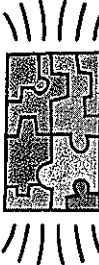
*Based on revised NCTM standards.

Exemplars® Standards-Based Math Rubric (cont.)*
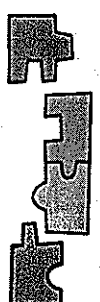
	Problem Solving	Reasoning and Proof	Communication	Connections	Representation
Practitioner	A correct strategy is chosen based on mathematical situation in the task. Planning or monitoring of strategy is evident. Evidence of solidifying prior knowledge and applying it to the problem solving situation is present. Note: The practitioner must achieve a correct answer.	Arguments are constructed with adequate mathematical basis. A systematic approach and/or justification of correct reasoning is present. This may lead to... • clarification of the task. • exploration of mathematical phenomenon. • noting patterns, structures and regularities.	A sense of audience or purpose is communicated. and/or Communication of an approach is evident through a methodical, organized, coherent sequenced and labeled response. Formal math language is used throughout the solution to share and clarify ideas.	Mathematical connections or observations are recognized.	Appropriate and accurate mathematical representations are constructed and refined to solve problems or portray solutions.
Expert	An efficient strategy is chosen and progress towards a solution is evaluated. Adjustments in strategy, if necessary, are made along the way, and / or alternative strategies are considered. Evidence of analyzing the situation in mathematical terms, and extending prior knowledge is present. Note: The expert must achieve a correct answer.	Deductive arguments are used to justify decisions and may result in formal proofs. Evidence is used to justify and support decisions made and conclusions reached. This may lead to... • testing and accepting or rejecting of a hypothesis or conjecture. • explanation of phenomenon. • generalizing and extending the solution to other cases.	A sense of audience and purpose is communicated. and/or Communication at the Practitioner level is achieved, and communication of argument is supported by mathematical properties. Precise math language and symbolic notation are used to consolidate math thinking and to communicate ideas.	Mathematical connections or observations are used to extend the solution.	Abstract or symbolic mathematical representations are constructed to analyze relationships, extend thinking, and clarify or interpret phenomenon.

*Based on revised NCTM standards.

Exemplars® Jigsaw Student Rubric

Level	Problem Solving	Reasoning and Proof	Communication	Connections	Representation
Novice Makes an effort No or little understanding	I did not understand the problem.	My math thinking is not correct.	I used no math language and/or math notation.	I did not notice anything about the problem or the numbers in my work.	I did not use a math representation to help solve the problem and explain my work.
Apprentice Ok, good try Unclear if student understands	I only understand part of the problem. My strategy works for part of the problem.	Some of my math thinking is correct.	I used some math language and/or math notation.	I tried to notice something, but it is not about the math in the problem.	I tried to use math representation to help solve the problem and explain my work, but it has mistakes in it.
Practitioner Excellent Clear Strong understanding Meets the standard	I understand the problem and my strategy works. My answer is correct.	All of my math thinking is correct.	I used math language and/or math notation throughout my work.	I noticed something about my math work.	I made a math representation to help solve the problem and explain my work, and it is labeled and correct.
Expert Wow, awesome! Exceptional understanding!	I understand the problem. I used a rule, and/or verified that my strategy is correct.	I showed that I knew more about a math idea that I used in my plan. Or, I explained my rule.	I used a lot of specific math language and/or notation throughout my work.	I noticed something in my work, and used that to extend my answer and/or I showed how this problem is like another problem.	I used another math representation to help solve the problem and explain my work in another way.

Rúbrica Rompecabezas de Exemplars® para Estudiantes

Nivel	Solución de Problemas	Razonamiento y Pruebas	Communicación	Conexiones	Representación
Novato Hace un esfuerzo Ninguna o poca comprensión	No comprendí el problema.	Mi razonamiento matemático no es correcto.	No usé ni lenguaje matemático ni anotación matemática.	No observé nada sobre el problema ni los números en mi trabajo.	No usé una representación matemática para ayudar a solucionar el problema ni para explicar mi trabajo.
Aprendiz Está bien, un buen esfuerzo No está claro si el estudiante comprende el problema o no	Comprendo sólo una parte del problema. Mi estrategia funciona para parte del problema.	Parte de mi razonamiento matemático es correcto.	Usé algo del lenguaje matemático y/o anotación matemática.	Intenté observar algo, pero no es sobre las matemáticas en el problema.	Intenté usar una representación matemática para ayudar a solucionar el problema y explicar mi trabajo, pero hay errores.
Practicante Excelente Claro Comprensión fuerte Llega al estandard	Comprendo el problema y mi estrategia funciona. Mi respuesta es correcta.	Todo mi pensamiento matemático es correcto.	Usé lenguaje matemático y/o anotación matemática en todo mi trabajo.	Observé algo sobre mi trabajo matemático.	Hice una representación matemática para ayudar a solucionar: el problema y explicar mi trabajo y está claramente indicada y correcta.
Experto ¡Wow! ¡Qué chévere! ¡Comprensión excepcional!	Comprendo el problema. Usé una regla y/o verifiqué que mi estrategia es correcta.	Demostré que sabía más sobre una idea matemática que lo que usé en mi plan. O, expliqué mi regla.	Usé mucho lenguaje matemático específico y/o anotaciones en todo mi trabajo.	Observé algo en mi trabajo y lo usé para extender mi respuesta y/o mostré cómo este problema se parece a otro problema.	Usé otra representación matemática para ayudar a solucionar el problema y explicar mi trabajo de otra manera.