

# Learning Tasks

## **Math Foundations Trainer Requirements Checklist for Responsibilities**

### **1. Completion of Level 1 requirements earns 4 CEUs.**

**Requirements include:**

- 100% attendance, participation in all 5 days.
- Study readings & respond to discussion questions assigned for Level 1 training.
- Completion of all learning tasks assigned for Level 1 training.
- Successful completion of submitted homework acknowledged by trainers.

### **2. Completion of Level 2 requirements earns 3 CEUs.**

**Requirements include:**

- 100% attendance, participation in all 5 days (one of the two training weeks must be training sponsored by DPI).
- Completion of all assignments and homework acknowledged by trainers.

### **3. Assessment of conceptual math knowledge.**

**Requirements to become a Math Foundations Trainer include:**

- Aspiring trainers are responsible for documenting completion of Levels 1, 2 and all other trainer requirements. Documentation examples include: e-mails, signatures.
- Schedule math trainer assessment with DPI within 1 year of completion of Level 2 training by contacting the DPI Math SIP Coordinator.
- Pass the trainer assessment with 80% accuracy (PRIOR to scheduling any training in LEA).
- Send training dates to DPI six weeks PRIOR to training (to allow time for scheduling of observations).
- Team train during first training with a satisfactory evaluation by a master trainer.
- Complete three required observations. Two of these observations are scheduled during training days 2, 3, or 4.
- The final observation is submitted as a video tape with self-reflection completed. Directions and forms for the self-reflection will be provided when trainee is at this point.
- Submit documentation of all completed requirements to the LEA SIP Coordinator and DPI Math Sip Coordinator to be able to:
  - Attend and receive certification at Training of Trainers event.
  - Celebrate this accomplishment!

**\*\*\*Principal and EC Director Approval (signature) are required to become a Math Foundations Trainer.**

Level 1 Learning Tasks –Minimum Rubrics Score

Learning Task 5 Structures	Learning Task 6 Number Knowledge Test	Learning Task 7 Painting Walls	Learning Task 9 Revised Lesson Plan
9 out of 12	12 out of 16	12 out of 16	10 out of 12

Level 2 Learning Task—Minimum Rubrics Score

Learning Task 2 PowerPoint	Learning Task 5 Griffin Lesson Plan	Learning Task 6/8 NKT/Assessment
14 out of 16	11 out of 12	14 out of 16

Level I

## Math Foundations Level I Assignments

All Discussion Questions will be used to focus a particular day.

All Learning Tasks are to be completed individually with the exception of Learning Task 9, which will be a group effort.

### Learning Tasks (LT 5, 6 and 7-Complete Individually)

#### Learning Task for Unit 5 (See Rubric)

Recall the four structures of addition, subtraction, multiplication and division.

##### Addition

- Join and Part Whole
- Start Unknown
- Compare-Total Unknown

##### Subtraction

- The Classic “Take away” (how many left?)
- Comparison (difference between? who has more?)
- Deficit/Missing amount (what’s missing?)

##### Multiplication

- Repeated Addition
- Array/Row-Column
- Counting Principle

##### Division

- Measurement/Repeated Subtraction
- Partitive/Unitizing-Fair Shares
- Product/Factor

#### Directions

For each Operation and each Structure:

Write a simple word problem that matches the structure.

Keep the values small for simplicity.

Diagram the structure using a graphic organizer or tool. (bar diagram or number line)

Include a number sentence for each structure.

(i.e.  $2 \text{ cupcakes} + 5 \text{ cupcakes} = 7 \text{ cupcakes}$ )

You will have 12 diagrams and 12 word problems.

## Learning Task for Unit 6 (See Rubric)

Select a student who is struggling in mathematics as compared to his/her peers. Administer the Number Knowledge Test, annotating the recording sheet diligently. Make certain to read and refer to the Directions for Administration for help in administering and interpreting the Number Knowledge Test. Provide a background of the student, Analyze the results of the test to determine the student's strengths and weaknesses. Include two or three possible interventions based on strategies you have learned in Foundations of Math.

## Learning Task 7 (See Rubric)

### Proportional Challenge

*Painting Walls* is a classic proportional reasoning problem. It was used with prospective teachers on a final exam. ("Prospective Elementary School Teachers' Solution Strategies and Reasoning for a Missing Value Proportion Task", Jane-Jane Lo, Western Michigan University 2004)

Jane can paint a 12-foot by 12-foot wall in  $\frac{3}{4}$  of an hour?  
How long will it take her to paint another wall that is 15 x 16 feet?

Do not solve the problem by the use of cross-multiplication.

Draw pictures to illustrate the situation in the problem.

Explain how you can use your pictures to justify your solution.

## Unit 9 - Learning Task (See Rubric) (Completed in Groups)

- Revisit your lesson plan or one that has been provided by your trainer.
- Choose one lesson plan per table to discuss as a group.
- Using your rubric in your handout section, assess the initial lesson plan with a rubric score. Record the scores in Column 1.
- Discuss as a group how you can make the initial lesson plan stronger as it relates to the content of this training.
- As a group, list five changes you could make to the lesson plan to strengthen the plan in terms of learning for the student. All five changes should not come from one area of learning from Foundations of Math.
- What would be your new rubric score with the changes added? Record those scores.
- On a sheet of paper, list the names of the participants in your group. Turn in the lesson plan, list of five changes, and the pre and post rubric scores for each of the two lessons as well as a brief group reflection on the two lesson plans.

## Readings for Foundations of Math

The articles must be read by the specified day listed below.

### Day 1 (Read Prior to Day 1)

#### Unit 1

“Reform by the Book” Ball

#### Unit 2

“Teaching Number Sense”, Sharon Griffin

“Understanding Math Anxiety”, Callahan

### Day 2 (Read Prior to Day 2)

#### Unit 3

“Magical Hopes” Deborah Ball

Assigned Chapter of Knowing and Teaching Elementary Mathematics, Liping Ma

#### Unit 4

“Arithmetic in American Mathematics Education: An Abandoned Arena?”

Liping Ma

“The Components of Number Sense: An Instructional Model for Teachers”, Val Faulkner

### Day 3 (Read Prior to Day 3)

#### Unit 5

“Subitizing” by Doug Clements

“Singapore Math” by John Hoven and Barry Garelick

### Day 5 (Read Prior to Day 5)

#### Unit 9

“Mathematics Education in the 21<sup>st</sup> Century” Deborah Ball

## Discussion Questions

**(Be prepared to discuss in groups if time permits. You do not need to write out your answers.)**

### Discussion Question for Unit 2 (Discuss in Groups on Day 2)

Reflect on your own teaching and discuss how each of the findings of the National Math Panel will impact your own instruction in the classroom or in the way in which you will assist teachers.

### Discussion Questions for Unit 5 (Discuss in Groups on Day 4)

Compare the instruction that you have seen that is guided by Hands-on-Equations to other math instruction that you have seen at the secondary level for early algebra.

### Discussion Question for Unit 6 (Discuss in Groups on Day 4)

Discuss how your understanding regarding base ten, equality/inequality and form of a number changed after exposure to this unit?

**TELT-Teacher Education and Learning to Teach**

**Passing Score -12/1 Foundations of Math**

Participant Name(s)	Rubric				
CATEGORY	4	3	2	1	Category Score
Subtraction (Key Ideas) Decomposing and Composing a Unit of Higher Value Unit (Base Ten System, Rate and Equal Exchange ); Facts within 20; Multiple ways of Regrouping; Forms of the Value; Knowledge Package	Reflection includes a reference to four Key Ideas	Reflection includes a reference to three Key Ideas	Reflection includes a reference to two Key Ideas	Reflection includes a reference to one Key Idea.	( /4)
Multiplication (Key Ideas) Distributive Law; Place Value as a System; Base Ten; Partial Products; Form of the Value and Flexibility of Mental Math; Concrete Multiplication; Knowledge Package	Reflection includes a reference to four Key Ideas	Reflection includes a reference to three Key Ideas	Reflection includes a reference to two Key Ideas	Reflection includes a reference to one Key Idea.	( /4)
Division of Fractions (Key Ideas) Conceptual understanding via story Problems; Understanding the Algorithm; Understanding through Proportional Reasoning; Flexible Forms for Computation; Relatedness of Subtraction and Division; Idea of Unit size; Properties (Multiplicative Identity and Maintaining the Value of the Quotient); Knowledge Package	Reflection includes a reference to four Key Ideas	Reflection includes a reference to three Key Ideas	Reflection includes a reference to two Key Ideas	Reflection includes a reference to one Key Idea.	( /4)
Area and Perimeter (Key Ideas) Disproving the Claim; Identifying the Possibilities; Clarifying Conditions; Explaining the Conditions; Knowledge Package; Distributive Law; Mathematical Attitude and Knowledge of Topic	Reflection includes a reference to four Key Ideas	Reflection includes a reference to three Key Ideas	Reflection includes a reference to two Key Ideas	Reflection includes a reference to one Key Idea.	( /4)

Total

( /16)

## Structures of Addition, Subtraction, Multiplication and Division

Participant Name	Learning Task 5				Rubric
CATEGORY	4	3	2	1	Category Score
Mathematical Concepts	Explanation shows complete understanding of the mathematical structures used to solve the problem(s).	Explanation shows substantial understanding of the mathematical structures used to solve the problem(s).	Explanation shows some understanding of the mathematical structures used to solve the problem(s).	Explanation shows very limited understanding of the mathematical structures used to solve the problem(s).	( /4)
Alignment of Word Problems	All four of the operations are completed and match the three structures for each operation.	All but one of the operations are completed and match the three structures for each operation. All four are completed and mostly match the structure intended.	Two of the operations are completed and match the three structures for each operation. More than two are completed, but do not match the structure intended.	One of the operations is completed and matches the three structures for each operation. More than one of the operations is completed, but do not match the structure intended.	( /4)
Diagrams and Sketches	Diagrams and/or sketches are clear and greatly add to the reader's understanding for all of the structures.	Diagrams and/or sketches are clear and greatly add to the reader's understanding for most of the structures.	Diagrams and/or sketches are somewhat difficult to understand, but seem to match the structures.	Diagrams and/or sketches are somewhat difficult to understand, and do not match the structures.	( /4)
<b>Total</b>					Passing =(9/12) ( /12)

## Number Knowledge Test

Participant Name	Learning Task 6				Rubric
CATEGORY	4	3	2	1	Category Score
Background Information	A full background of the student was provided. Student chosen has a skill level appropriate for assessment with the NKT.	Some background of the student was provided. Student chosen has a skill level appropriate for assessment with the NKT.	Little background of the student was provided. Student chosen has a skill level appropriate for assessment with the NKT.	No background of the student was provided. Student chosen does not have the skill level appropriate for assessment with the NKT.	( /4)
Data Collection (Recording Sheet)	All appropriate data was collected on the recording sheet. Detailed notations were made to assist in the interpretation of the data.	All appropriate data was collected on the recording sheet. Some notations were made to assist in the interpretation of the data.	Some data was collected on the recording sheet. Some notations were made to assist in the interpretation of the data.	The data recording sheet was incomplete with few or no notations made to assist in the interpretation of the data.	( /4)
Analysis of Weaknesses and Strengths	Weaknesses and Strengths of the student were clearly stated. A well-aligned valid analysis was developed based on the purpose of the assessment and the data recorded.	Weaknesses and Strengths of the student were stated. Some effort was made in making a valid analysis based on the purpose of the assessment and the data recorded.	Weaknesses or Strengths of the student were stated. Little to no effort was made in making a valid analysis based on the data recorded. Student weaknesses were attributed to spurious issues rather than mathematics performance as documented by the assessment.	Weaknesses or Strengths of the student may or may not be clearly stated. No effort was made in making a valid analysis based on the data recorded.	( /4)
Instructional Recommendations: Instructional Methods; Instructional Materials and Methods for Monitoring	Clear and specific recommendations for instructional interventions were suggested. Interventions were aligned with documented weakness and supported by research.	Somewhat specific recommendations for instructional interventions were suggested. Interventions were supported by research.	Recommendations were made for instructional Interventions. Recommendations were not clearly aligned with documented weakness and/or not supported by research.	No recommendation was made for Instructional interventions.	( /4)

Total

Passing = ( 12/16 )

( /16)

## Painting Walls

Participant Name	Learning Task 7				Rubric	Category Score
CATEGORY	4	3	2	1		
Mathematical Reasoning	Uses complex and refined mathematical reasoning.	Uses effective mathematical reasoning	Some evidence of mathematical reasoning.	Little evidence of mathematical reasoning.		( /4)
Explanation	Explanation is detailed and clear.	Explanation is clear.	Explanation is a little difficult to understand, but includes critical components.	Explanation is difficult to understand and is missing several components OR was not included.		( /4)
Diagrams and Sketches	Diagrams and/or sketches are clear and greatly add to the reader's understanding of the problem.	Diagrams and/or sketches are clear and somewhat helps the reader 's understanding of the problem.	Diagrams and/or sketches are somewhat difficult to understand as and may not add to the reader's understanding of the problem.	Diagrams and/or sketches are difficult to understand and do not add to the reader's understanding of the problem.		( /4)
Mathematical Errors	90-100% of the steps and solutions have no mathematical errors.	Almost all (85-89%) of the steps and solutions have no mathematical errors.	Most (75-84%) of the steps and solutions have no mathematical errors.	More than 75% of the steps and solutions have mathematical errors.		( /4)
<b>Total</b>					<b>Passing = ( 12/16 )</b>	<b>( /16)</b>

## Final Lesson Revision

Participant Name(s)

Learning Task 9

Rubric

CATEGORY	4	3	2	1	Category Score
Rubrics for the Lesson Plans	Both lessons have a rubric score and are accurately analyzed.	Both lessons have a rubric score and are somewhat accurately analyzed.	Both lessons have a rubric score, but the scores do not accurately reflect the changes in the lesson.	Rubric scores are present, but there was little effort to align them to an appropriate score.	( /4)
Changes included the use of: (The Components of Number Sense), (Language, Cognition, Mathematical Structure) and (Connection to Prior Learning)	Lesson has five valid changes. There is strong evidence of change with respect to all three categories listed.	Lesson has four valid changes. There appears to be evidence of change with respect to all three categories listed.	Lesson has at least three valid changes. There is evidence of change with respect to at least two categories listed.	Lesson has less than three valid changes. There is some evidence of change with respect to some of the categories listed.	( /4)
Reflection on the two Lessons	Reflections about the two lessons strongly emphasize the growth made in the areas of the Components of Number Sense, Mathematical Language and Structure and Connections	Reflections about the two lessons discuss the growth made in the areas of the Components of Number Sense, Mathematical Language and Structure and Connections	Reflections about the two lessons discuss the growth made in most of areas of the Components of Number Sense, Mathematical Language and Structure and Connections	Reflections about the two lessons somewhat discusses the growth made in the areas of the Components of Number Sense, Mathematical Language and Structure and Connections	( /4)

Total

Passing = (9/12)

( /12)

Level II

## Math Foundation Level II assignments:

### Learning Task for Unit 2

Please visit the following site:

<http://www.ed.gov/about/bdscomm/list/mathpanel/index.html>

Using this site and the summary brochure (Summary of Math Panel report “Foundations for Success”), prepare a PowerPoint presentation from the information regarding the findings of the Math Panel.

In lieu of a PowerPoint of the findings of the National Math Panel, develop a presentation on the key ideas of Foundations of Math.

Present the presentation at a faculty meeting or similar get together.

You should turn in your PowerPoint presentation along with a sign in sheet of the participants.

NOTE: Learning Task 2 can be done in groups. (Four or fewer participants)

The following Learning Tasks must be done individually.

### Learning Task for Unit 5

Think of a lesson that you have recently taught or seen taught. What teaching strategies of Sharon Griffin were used in the lesson? (Quantity, Math Structure, Symbolic) Which teaching strategies from these three areas were missing from the lesson? How could you adjust this lesson to make certain all teaching strategies were incorporated?

Submit:

1. The original lesson in Word format. Highlight in yellow any of the Griffin strategies that are included in this lesson.
2. In the same Word document, insert any appropriate changes you would make to the original lesson that supports the Griffin model. Highlight these changes in green. Remember that these changes would include research-based practices learned in Foundations of Math.

### Learning Task for Unit 6

Further assess the student you assessed with the Number Knowledge Test. If that student is not available, administer the Number Knowledge Test to a different struggling student. Using the data from the Number Knowledge Test, determine where you need more information about the student. Use any further assessment tool such as the Math Instruction Checklist, probes from Intervention Central or teacher made assessments to gain more insight into the student's areas of need. Determine where instruction should begin for this student. In Unit 8, you will use this beginning point to create an initial learning plan for your student.

### Learning Tasks Unit 8:

Use the Number Knowledge Test results from the child who you felt was struggling in mathematics (Unit 5). Use the information provided from the further assessment that you did with the student to create an initial learning plan with a beginning goal, objective and a couple of structured learning activities.

Keep in mind that the learning plan needs to cover a few days to no more than a week at a time. We must consider if this short-term plan is working before we continue with the initially planned instruction. Include in this plan how you will monitor progress with data and what further assessment information might be needed? A suggested template has been provided for your convenience.

## PowerPoint on the NMP/FofM

Participant Name(s)	Level 2		Learning Task 2	Rubric	Category Score
CATEGORY	4	3	2	1	
Sequencing of Information; Length of Presentation; Sign-in Sheet	Information is organized in a clear, logical way. It is easy to anticipate the type of material that might be on the next slide. There are between 8 and 12 slides. Sign-in Sheet is included with signatures of participants.	Most information is organized in a clear, logical way. One slide or item of information seems out of place. There are less than 8 or more than 12 slides. Sign-in Sheet is included with signatures of participants.	Some information is logically sequenced. An occasional slide or item of information seems out of place. There are less than 8 or more than 12 slides. Sign-in sheet is included with names of participants, but not signatures.	There is no clear plan for the organization of the information. There are an inappropriate number of slides in the presentation. There is no sign-in sheet.	( /4)
Formatting (Graphics, Background, Spelling and Grammar, Font Choice)	Presentation is attractive and the background, graphics and font formats do not detract from the overall presentation.	Presentation is <u>somewhat</u> attractive and the graphics, background and font formations do not detract from the overall presentation.	All graphics are attractive, but do not seem to support the content of the presentation. The background does not detract from the text. The font may be a little difficult to read.	Presentation has several graphics that detract from the presentation or a font and background that make it difficult to view the text or graphics.	( /4)
Spelling and Grammar	Presentation has <u>no</u> misspellings or grammatical errors.	Presentation has <u>1-2</u> misspellings but no grammatical errors.	Presentation has <u>1-2</u> grammatical errors but no misspellings	Presentation has <u>more than 2</u> grammatical errors and/or spelling errors.	( /4)
Content-Accuracy of the National Math Panel Findings/Foundations of Math Training	The Presentation has <u>accurate and key ideas</u> that summarized the key findings of the National Math Panel/Foundations of Math Training. At least five key ideas are highlighted and explained.	<u>Most</u> of the content is accurate, but there is one piece of information that might be inaccurate. At least four key ideas are highlighted and explained from the findings of the National Math Panel/Foundations of Math Training.	The content is <u>generally accurate</u> , but some if the information is irrelevant. At least three key ideas are highlighted and explained from the findings of the National Math Panel/Foundations of Math Training.	The content contains more than one factual error Only two key ideas are highlighted and explained from the findings of the National Math Panel/Foundations of Math Training.	( /4)

Total

Passing Score 14/16 ( /16)

## Griffin Lesson Revision

Participant Name(s)	Level 2	Learning Task 5	Rubric	Category Score	
CATEGORY	4	3	2	1	
Appropriate Lesson Plan with Sharon Griffin Components (Quantity, Math Structure, Symbolic)	Original Lesson Plan is included with <u>all</u> of the Griffin Strategies identified and highlighted in yellow.	Original lesson plan is included with <u>most</u> of the Griffin Strategies identified and highlighted in yellow.	Original lesson plan is included, but the Griffin strategies are <u>not</u> identified.	No lesson plan is included.	( /4)
Valid Changes to the Griffin Plan (Quantity, Mathematical Structure and Symbolic)	Lesson has at least <u>five</u> valid changes. There is strong evidence of change with respect to <u>all three</u> categories listed.	Lesson has at least <u>four</u> valid changes. There appears to be evidence of change with respect to <u>all three</u> categories listed.	Lesson has at least <u>three</u> valid changes. There is evidence of change with respect to <u>at least two</u> categories listed.	Lesson has <u>less than three</u> valid changes. There is some evidence of change with respect to <u>some</u> of the categories listed.	( /4)
Research-Based Practices from Foundations of Math (The Components of Number Sense, Language, Diagram Literacy, Connection to Prior Learning; Explicit Instruction)	At least <u>four</u> researched-based practices are addressed with <u>specific examples</u> .	At least <u>three</u> researched-based practices are addressed with <u>specific examples</u> .	<u>Two or fewer</u> researched-based practices are addressed and/or the examples are <u>not specific</u> .	Only <u>one</u> researched-based practice is addressed and/or there are <u>no</u> examples of the researched-based practice.	( /4)

Total

Passing Score 11/12 ( /12)

## Number Knowledge Test Follow-Up and Assessment with Learning Plan

Participant Name	Level 2		Learning Task 6 and 8	Rubric	Category Score
CATEGORY	4	3	2	1	
Assessment Tools and Analysis	The recording document(s) for the Number Knowledge Test and any additional probes and checklists are included and accurately analyzed.	The recording document(s) are not included. Information from the assessments are included and accurately analyzed.	The Number Knowledge test data is not used to narrow appropriate probe choices. Actual probes or checklists are included along with an accurate analysis of those probes.	The recording documents from any of the probes are not included, but an attempt was made to analyze the data from the assessment session.	( /4)
Learning Plan (Initial Goal)	A <u>specific and appropriate</u> initial instructional target is outlined.	An <u>appropriate</u> initial instructional target is outlined.	An instructional target is outlined but is not the optimum instructional target for the assessed student.	An initial instructional target is <u>not identified</u> .	( /4)
Learning Plan (Improvement Goals and Objectives and Activities)	At least <u>three specific goals and objectives</u> are listed with at least <u>one</u> structured learning activity for each goal is submitted.	At least <u>two specific goals and objectives</u> are listed with at least <u>one</u> structured learning activity for each goal is submitted.	<u>One goal and objective</u> is listed with at least <u>one</u> specific structured learning activity is submitted for this goal.	Only goals or learning activities are submitted.	( /4)
Learning Plan (Monitoring) (Persons responsible for the intervention; Assessment Probes; Probe Analysis)	At least <u>two sets of probes</u> are included to monitor the learning progress and are <u>accurately analyzed</u> . The interventionist's title is listed.	At least <u>one set of probes</u> are included to monitor the learning progress and is <u>accurately analyzed</u> . The interventionist's title is listed.	<u>One or two sets of probes</u> are included, but the <u>analysis is not accurate</u> in determining the next steps in the instructional plan. The title of the interventionist may or may not be included.	There are <u>no probes and/or analyses</u> included. The title of the interventionist may or may not be listed.	( /4)

Passing Score 14/16 ( /16)

# Individual Learning Plan

Student Name \_\_\_\_\_

## **Assessment Result**

Assessment	Results	Observations
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

## **Improvement Goals and Measures:**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

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## **Person(s) Responsible for Interventions**

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