

**Vermont Grade Expectations
Kindergarten
Support Resource
April 2008**

This document contains items keyed to the Vermont Grade Expectations for kindergarten and are designed to help clarify the Grade Expectations. While the items exemplify aspects of each GE, they may not illustrate all skills and/or concepts included in the GE. ***Furthermore, the items are not designed to be used as an assessment of the GE, but serve the purpose of exemplifying the concepts and skills within the GE. Because this is not an assessment document, the items should not be copied and used for assessment purposes.*** The examples are provided to support teachers in understanding the essence of the GE, and are a suggested resource that could be used for the teaching and learning of a concept.

Appendix A contains web links when items were drawn from outside sources. Many of these sites contain additional materials which may be useful in the instructional setting. Appendix B contains the Depth of Knowledge descriptors based on Norman Webb's work, and Appendix C contains the answers and Depth of Knowledge classification for each item. In addition, each item is numbered sequentially in the upper left hand corner for ease of reference to the answers in Appendix C.

Number and Operations

Purpose: Numbers and operations remain a cornerstone for the study of mathematics in grades K – 12. Students use numbers to quantify sets, identify location, measure, quantify the probability of an event, analyze data, and describe and interpret real-world phenomena. Having students know basic facts and compute fluently (i.e., accurately and efficiently) continues to be an important goal in mathematics education. However, knowing basic facts should be incorporated into a rich mathematics curriculum that builds conceptual understanding of these facts.

Through the school years, the amount of time spent on numbers and their operations will decrease and the types of numbers studied will change. As students progress through the elementary grades and into middle school, they will need to develop an in-depth conceptual understanding of fractions, decimals, and percents prior to doing algorithmic computations with these numbers. Conceptual development of integers and meaningful computation with them are also goals for middle grade students. The study of irrational numbers and the real number system will begin in eighth grade and continue through high school. Imaginary and complex numbers are introduced in advanced mathematics. It is important for students to model and represent the different types of numbers they study.

Students cannot appreciate the power of numbers unless they also understand the operations upon those numbers. Students need to recognize which operation to apply to a given problem situation they encounter. They need to know what effect the various operations will have on different types of numbers. They need to know the relationships among the operations and among the operations and their properties. A deep understanding of the operations and their properties will help students make sense of computation algorithms and lead to fluency in computation. A firm understanding of numbers as well as operations and their properties will provide a good foundation for the study of algebra.

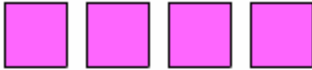
Arithmetic, Number and Operations

Kindergarten

MK: 1 Demonstrates conceptual understanding of rational numbers with respect to whole numbers by connecting oral number words and numerals (up to and including two-digit numbers to 50) to the quantities they represent using physical models and representations **and shows correct sequence of cardinal numbers.**

1

Orally state: Which set has seven objects? Write the numeral seven.



Demonstrates conceptual understanding of rational numbers with respect to whole numbers by connecting oral number words and numerals to the quantities they represent using representations.

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2

Write the numerals from 26 to 40 in the correct order.

Shows correct sequence of cardinal numbers.

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MK: 2 Demonstrates understanding of the relative magnitude of numbers from 0 to 50 by ordering whole numbers; by demonstrating one-one correspondence; and by showing the relationship between whole numbers (1 more, 1 less). Apply number parameters consistent with MK: 1.

3

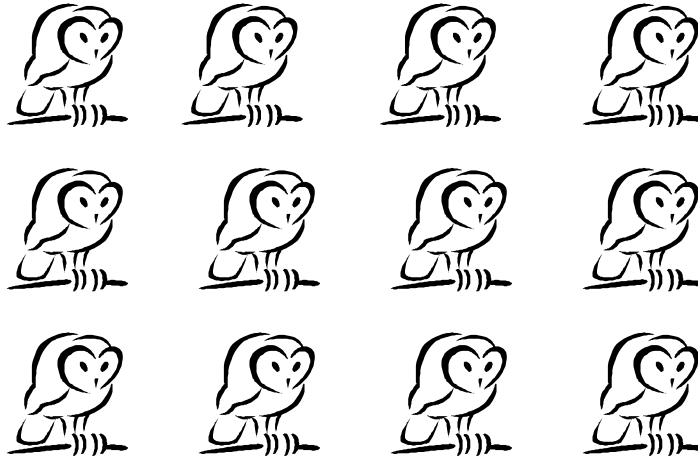
Write these numerals from smallest to largest.

21 6 18
_____ _____ _____

Demonstrates understanding of the relative magnitude of numbers by ordering whole numbers

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4 Count the owls. .



Demonstrates one to one correspondence.

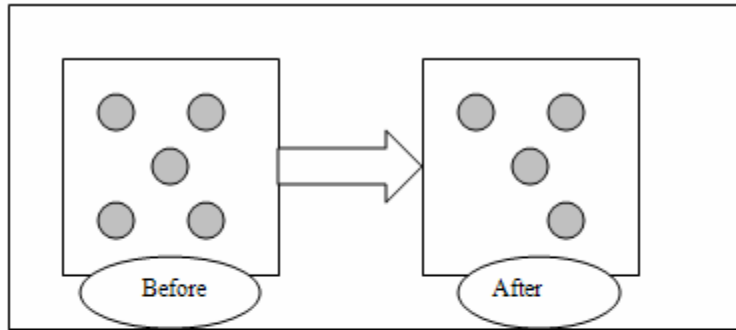
Shows the relationship between whole numbers (1 more, 1 less)

How many owls will be here if 1 more owl joins the group? How many owls will be here if you have 1 less owl?

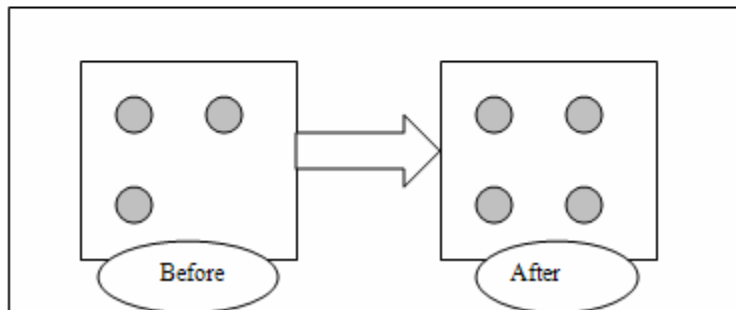
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MK: 3 Demonstrates conceptual understanding of mathematical operations involving addition and subtraction by solving problems involving situations in which one adds to, takes from.

5 Circle the box below that shows addition. (This could be done orally).



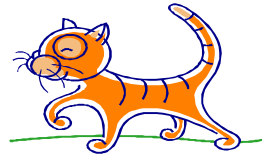
Demonstrates conceptual understanding of mathematical operations



Williamstown Elementary School

MK: 4 Accurately solves problems in context involving addition and subtraction using whole numbers

- 6 Tom's cat has 8 kittens.
Tom gives away 3 of the kittens.



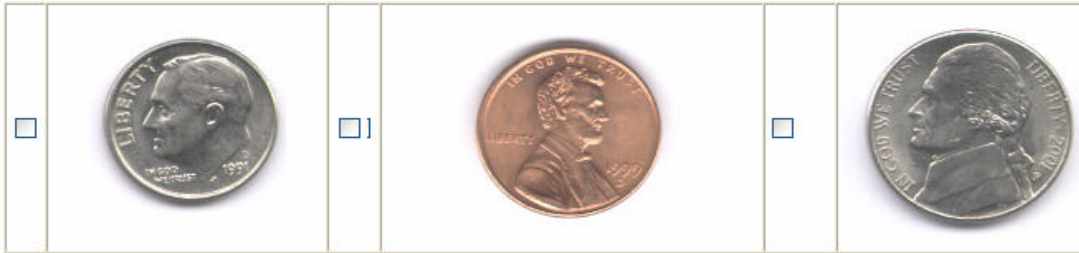
Accurately solves problems in context involving subtraction using whole numbers

How many kittens does Tom have now?
Use numbers, pictures or words to show how you know.

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MK: 5 Recognizes and names coins.

- 7 Name these coins.



Recognizes and names coins

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MK: 6 No MK: 6 at this grade level

MK: 7 Estimates and evaluates the reasonableness of solutions appropriate to grade level.

- 8 Look at these dots and tell me about how many dots you see.

Count the dots. Tom said the number of dots is closer to 10 than 30. Mary said the number of dots is closer to 30 than 10? Who is right? How do you know?

?????

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MK: 8 No MK: 8 at this grade level

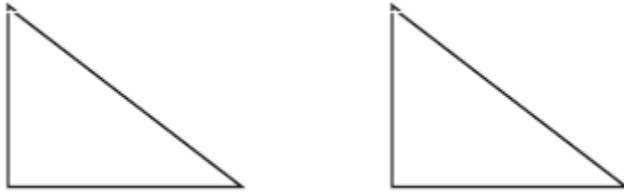
Geometry and Measurement

Purpose: Geometry and the related area of measurement help students represent, describe, and make sense of the world in which they live. Geometry is also a natural place for students to develop their reasoning and justification skills. We live in a three-dimensional world. To interpret, understand, and appreciate that world, students need to develop an understanding of space. In addition, success in mathematics depends, in part, on the development of spatial abilities. Spatial skills include making and interpreting drawings, forming mental images, and visualizing changes. Measurement is the process of assigning a numerical value to an attribute of an object. The study of measurement provides students with techniques and tools they will need to describe and analyze their world. It also provides an opportunity to make connections within mathematics and between mathematics and other curricular areas. High school students must develop more mature insights into the essential role of measurement as a link between the abstractness of mathematics and the concreteness of the real-world. In both areas, geometry and measurement, students need to investigate, experiment, and explore geometric properties using both technology and hands-on materials.

Geometry and Measurement Kindergarten

MK: 9 Uses attributes, composition, or decomposition to sort or classify objects using at least one attribute (e.g., color).
Recognizes and names polygons (triangles, squares, rectangles) and circles in their environment.

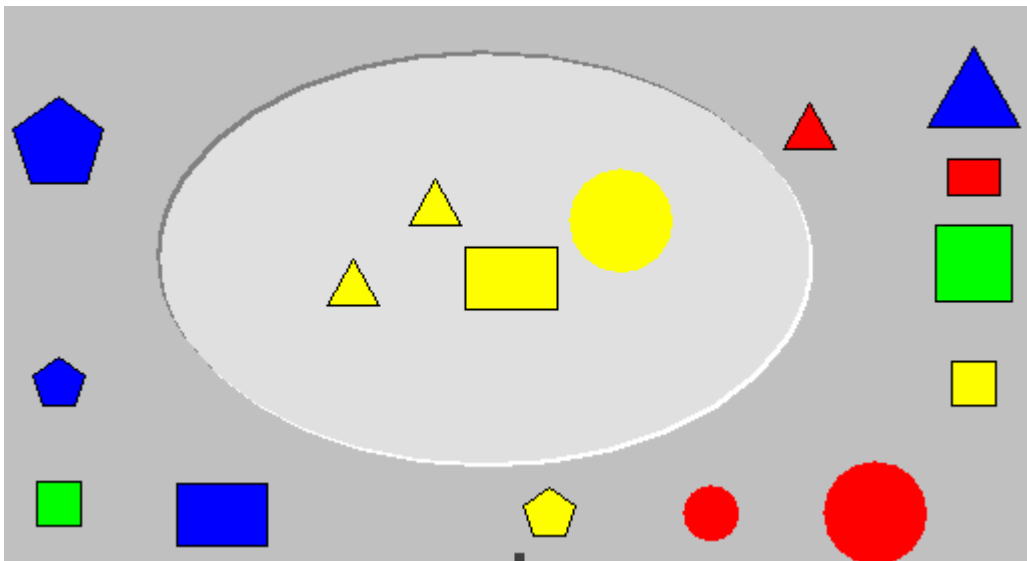
- 9 What shape is the piece below? Use these shape pieces to make a square.
Find something in our classroom shaped like a square.



Uses composition to classify objects;
Recognizes and names polygons in their environment

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- 10 The shapes inside the circle are alike in one way. Some of the shapes outside the circle belong with the shapes inside the circle. Which shapes belong inside the circle?



Uses attributes to sort or classify objects using at least one attribute (e.g., color).

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11 Name the geometric shape of each object? (triangle, square, rectangle, circle)



picture frame



A car tire

Recognizes polygons in the environment



a ruler,



and a road sign

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MK: 10 No **MK: 10** at this grade level

MK: 11 No **MK: 11** at this grade level

MK: 12 No **MK: 12** at this grade level

MK: 13 No **MK: 13** at this grade level

MK: 14 No **MK: 14** at this grade level

MK: 15 Identifies the appropriate standard tool used to measure length, temperature, and weight.

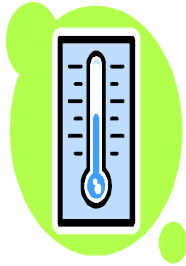
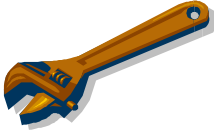
12 Find 3 things in our classroom we could measure using this tool.



Identifies the appropriate standard tool used to measure length

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13 Which tool below do we use to measure the outside temperature?



Identifies tool to measure temperature

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14 Which two tools can we use to measure time?



Identifies clock and calendar as tools used to measure time

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MK: 16 Determines elapsed and accrued time as it relates to **before/after and sequences of events (first, next, last)**, and identifies a clock and calendar as measurement tools.

15 Orally state: Here are some of the activities we do in our classroom each day:

RECESS CALENDAR LUNCH MATH CIRCLE TIME

Determines elapsed and accrued time as it relates to before/after and sequences of events (first, next, last).

What do we do first in the morning? What do we do after lunch?

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MK: 17 No **MK: 17** at this grade level

MK: 18 Find and name locations with simple relationships (i.e., near, far, above, below, next to).

16 Cut out each figure and follow these directions:

- Put the dog near the dog dish.
- Put the birds above the dog house.
- Put the cat next to the dog.

Find and name
locations with
simple relationships



Functions and Algebra

Purpose: Algebra is the language through which much of mathematics is communicated. Students in Kindergarten begin to explore algebraic concepts using informal representations (e.g., words, physical models, tables, graphs). In later years students will progress to more abstract representations. The study of patterns is one of the central themes of algebraic thinking and leads to an understanding of relations and functions. Students at all grade-levels should recognize, describe, and generalize patterns and build mathematical models to describe, interpret, and predict the behavior of real-world phenomenon. Algebraic processes are important tools that students can use throughout their lives.

Functions and Algebra Concepts Kindergarten

Standard 7.8: Functions and Algebra Concepts

MK: 19 Identifies and extends to specific cases a variety of patterns including sequences of shapes, sounds, movement, colors, letters, and numbers by extending the pattern to the next one, two, or three elements.

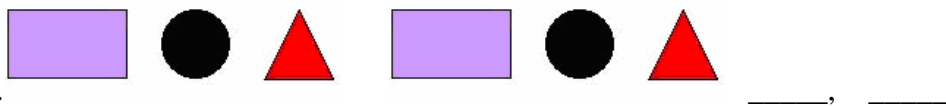
17 What color will come next in this repeating pattern?



Identifies and extends to specific cases a variety of patterns including sequences of color by extending the pattern to the next one element.

Vermont Department of Education

18 Draw the next two shapes in this repeating pattern.

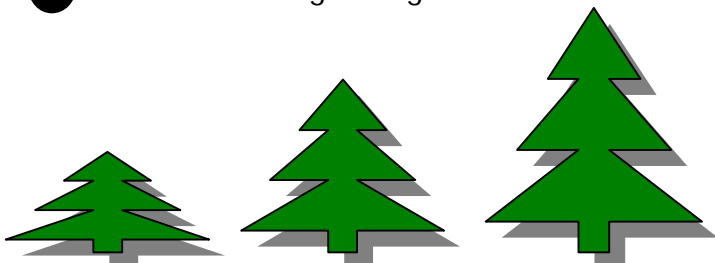


Identifies and extends to specific cases a variety of patterns including sequences of shape by extending the pattern to the next two elements.

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MK: 20 Demonstrates a conceptual understanding of change qualitatively (growth—student growing taller).

19 This tree is growing. Draw the next tree.



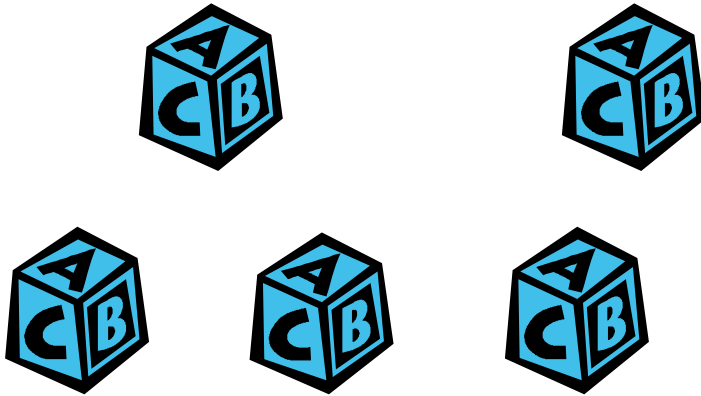
Demonstrates conceptual understanding of change qualitatively

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MK: 21 No **MK: 21** at this grade level

MK: 22 **Demonstrates conceptual understanding of equality** by showing equivalence between two expressions ($4+1=5$; $2+3=5$) by **solving** one-step equations involving whole number addition or subtraction using models or verbal explanations.

20 Look at these blocks.



Demonstrates conceptual understanding of equality by showing equivalence between two expressions using models

Use these blocks to make an addition number sentence which equals 5.

Use these blocks to make a new addition number sentence which equals 5.

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21 Look at this number sentence.

$$4 = \square + \square$$

Demonstrates conceptual understanding of equality by solving one-step equations involving whole number addition using models or verbal explanations

Each \square has the same value. Tell me the value of each \square ?

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Data, Statistics and Probability

Purpose: Collecting, organizing, and displaying data, as well as interpreting and analyzing the information to make decisions and predictions, have become very important in our society. Statistical instruction should be carried out in a spirit of investigation and exploration so students can answer and formulate questions about data. Probability should be studied in familiar contexts. Students need to investigate fairness, chances of winning, and uncertainty. Technology should be used as a tool throughout the investigation process.




Standard 7.9: Data, Statistics, and Probability Concepts Kindergarten

MK: 23 Interprets a given representation (models and tally charts) through written or verbal/scribed response to answer questions related to the data, or to analyze the data to formulate conclusions.

(IMPORTANT: Analyzes data consistent with concepts and skills in MK: 24.)

Favorite Pets for Our Class

22

| Favorite Pets | | |
|---|-------------|--------|
| Pet | Tally Marks | Number |
|  | | 10 |
|  | | 4 |
|  | | 6 |

Interprets a given representation (models and tally charts) through written or verbal/scribed response to answer questions related to the data

Do more students in our class have cats as pets or dogs as pets?

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MK: 24 Analyzes patterns, trends, or distributions in data in a variety of contexts using “more,” “less,” or “equal.” (e.g., “In a plus 2 pattern, there will be more items on the fifth day than on the first day.”)

23

Patty is saving pennies. On Sunday Patty adds 2 pennies to her bank. On Monday Patty adds 4 pennies to her bank. On Tuesday Patty adds 6 pennies to her bank. This pattern continues.

Analyzes patterns, trends or distribution in data using more, less or equal

Will Patty have more pennies on Thursday than on Saturday? Show or tell how you know.

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24 This tally chart shows the favorite lunches of students in our class. Which 2 lunches were the favorite for an equal number of students?

Favorite Lunches

| Lunch | Number of Students |
|-----------|--------------------|
| Taco | |
| Chicken | |
| Spaghetti | |
| Hamburger | |
| Pizza | |

Vermont Department of Education

MK: 25 Organizes and displays data using diagrams, models, or tally charts through written or verbal/scribed response to answer questions related to the data, to analyze the data to formulate conclusions.
 (IMPORTANT: *Analyzes data consistent with concepts and skills in MK: 24.*)

25 Record the weather for each day in a month using a diagram, model or tally chart.

- How many sunny days were there?
- How many rainy days were there?
- Were there more days when you would wear sunglasses or more days when you would wear a raincoat? Tell how you know.

Organizes and displays data using diagrams, models or tally charts through verbal/scribed response to answer questions related to the data; analyzes data to formulate conclusions

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MK: 26 No **MK: 26** at this grade level

MK: 27 No **MK: 27** at this grade level

MK: 28 In response to a teacher - or student-generated question or hypothesis, collects appropriate data and makes observations about the data through written or verbal/scribed response.

(IMPORTANT: *Analyzes data consistent with concepts and skills in MK: 24.*)

26 Do more children in our class have pet dogs or pet cats? Make a tally chart to show the number of children in our class who have pet dogs and the number of children in our class who have pet cats.



In response to a teacher or student generated question, collects appropriate data and makes observations about the data through written or verbal/scripted response

Do more children in our class have pet dogs or pet cats? Show how you know.

Think of a question you could answer by collecting data. Collect data to answer the question you asked.

Vermont Department of Education

MK: 29 No **MK: 29** at this grade level

**Standard 2.5: Mathematical Dimensions,
Standard 7.10: Mathematical Problem Solving and Reasoning—Applications**

MK: 30 Demonstrate understanding of mathematical problem solving² and communication through:³

- **Approach & Reasoning**—The reasoning, strategies, and skills used to solve the problem;
- **Connections**—Demonstration of observations, applications, extensions, and generalizations;
- **Solution**—All of the work that was done to solve the problem, including the answer;
- **Mathematical Language**—The use of mathematical language in communicating the solution;
- **Mathematical Representation**—The use of mathematical representation to communicate the solution; and
- **Documentation**—Presentation of the solution.

² Problem-solving situations are mathematical problems that reflect the levels of mathematics in the Grade Level Expectations.

³ See *Vermont Elementary and Middle Level Mathematics Portfolio Scoring Guide* for additional information.

APPENDIX A

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October 2006.

Idaho Department of Education

National Library of Virtual Manipulatives. <http://nlvm.usu.edu/en/nav/vlibrary.html>

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APPENDIX B: Implied Cognitive Demand and Depth of Knowledge

A fundamental criterion used to develop the NECAP GLEs and GSEs is that the expectations should explicitly indicate cognitive demand (how content interacts with process) and that there should be a mix of cognitive demand levels at all grades. One should not assume that students at lower grades do less cognitively demanding work. The cognitive demand or depth of knowledge required by an expectation or an assessment item is related to the number and strength of connections of concepts and procedures that a student needs to make to produce a response, including the level of reasoning required along with self-monitoring. Furthermore, there are additional factors that influence cognitive demand including contextual requirements, language, the number and variety of representations, requirements for generalizations to new situations, and the opportunity to learn.

It is important to note that depth of knowledge is not synonymous with difficulty. As an example, solving a multi-step linear equation with variables on both sides may be a difficult task for middle school students; however, the task can be solved by applying a standard procedure making the task of low complexity.

The NECAP states believe that expectations and assessments should be aligned in terms of their cognitive complexity. That is, the cognitive complexities of the assessment items should match those of the standards (what students are expected to know and be able to do). To ensure this alignment, the NECAP states have adopted Norman L. Webb's (senior researcher with the Wisconsin Center for Educational Research) Depth of Knowledge classification system. Norman Webb's system is based on four levels of classification. The full descriptions of each level are given on pages 4 and 5. The levels can be summarized as follows.

| | |
|---------|--------------------|
| Level 1 | Recall |
| Level 2 | Skill/Concept |
| Level 3 | Strategic Thinking |
| Level 4 | Extended Thinking |

The NECAP states, together with a committee of educators, analyzed the GLEs and GSEs for their implied cognitive demand. All aspects of each expectation were analyzed and the implied cognitive demand levels were recorded. One of the charges of the NECAP test item review committees is to ensure that assessment items align not only with the expectations but also with their implied cognitive demands. The range of cognitive demands for each GLE and GSE is summarized in Table 1. It should be noted that the highest level listed for each GLE and GSE should be thought of as a "ceiling" not a "target". A NECAP goal is to write items that cover the range of the levels indicated and not just the highest level. If one assesses only at the "target" level, all GLEs with a level 3 (for example) as their "ceiling" would only be assessed at level 3. This would potentially have two negative impacts on the assessment: 1) The assessment as a whole would be too difficult, and 2) important information about student learning along the achievement continuum would be lost. To the extent possible, each GLE and GSE should be assessed at the "ceiling" and at least one level below the "ceiling" in order to provide additional diagnostic information to educators. Furthermore, Table 2 shows an example of an expectation and how the different aspects of the expectation interact with Table 1.

Vermont Grade Expectations Implied Cognitive Demand and Depth of Knowledge

| | K | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | HS |
|---|-----|-----|-------|-------|-------|-------|-------|-------|-------|-------|
| Arithmetic, Numbers and Operations | | | | | | | | | | |
| M1 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| M2 | 1,2 | 1,2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | |
| M3 | 2 | 2 | 1,2 | 2 | 2 | 2,3 | 2,3 | 2,3 | | |
| M4 | 1 | 1,2 | | 1,2,3 | 1,2,3 | 1,2,3 | 1,2,3 | 1,2,3 | 1,2,3 | 1,2,3 |
| M5 | 1 | 1 | 1,2 | | | | | | | |
| M6 | | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| M7 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| M8 | | 1,2 | 2 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 |
| Geometry and Measurement Concepts | | | | | | | | | | |
| M9 | 1 | 1 | 1,2,3 | 1, 2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2,3 | 1,2,3 |
| M10 | | | | | | | | 1,2 | 1,2,3 | |
| M11 | | 1 | 1,2 | 2 | 1,2 | 1,2 | 1,2 | 2,3 | | 2,3 |
| M12 | | | | 2 | 2 | 1,2 | 1,2 | 1,2 | | |
| M13 | | | | | 2 | 2 | 1,2 | 1,2,3 | 1,2,3 | 1,2,3 |
| M14 | | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2,3 | 1,2,3 | 1,2,3 | 1,2,3 |
| M15 | 1 | 1 | 1 | 1 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| M16 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| M17 | | | | | | | | 1,2 | 1,2 | 1,2 |
| M18 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | | | |
| Functions and Algebra Concepts | | | | | | | | | | |
| M19 | 1,2 | 1,2 | 2 | 2 | 2 | 2 | 2,3 | 2,3 | 2,3 | 2,3 |
| M20 | 2 | 1,2 | 1,2 | 2 | 2 | 2 | 1,2 | 1,2,3 | 1,2,3 | 1,2,3 |
| M21 | | | | | 1 | 1 | 1,2 | 1,2 | 1,2 | 1,2 |
| M22 | 1,2 | 1,2 | 1 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2,3 | 1,2,3 |

| | | | | | | | | | | |
|---|-----|-----|-------|-------|--------|-------|-------|-------|-------|-------|
| Data, Statistics, and Probability Concepts | | | | | | | | | | |
| M23 | 2,3 | 2,3 | 1,2,3 | 1,2,3 | 1,2, 3 | 1,2,3 | 1,2,3 | 1,2,3 | 2,3 | 2,3 |
| M24 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 1,2,3 |
| M25 | 2,3 | 2,3 | 2,3 | 1,2 | 2,3 | 1,2 | 2,3 | 2,3 | 2,3 | 2,3 |
| M26 | | | 2 | 2 | 2,3 | 2,3 | 2,3 | 2,3 | 2,3 | 1,2,3 |
| M27 | | 1,2 | 1,2 | 1,2 | 1,2 | 1,2,3 | 1,2,3 | 1,2,3 | 1,2,3 | 1,2,3 |
| M28 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 |
| M29 | | | | 2,3 | 1,2,3 | 1,2,3 | 2,3 | 2,3 | 2,3 | 2,3 |
| M30 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 | 3,4 |

Note: GEs assessed on the NECAP are shaded gray.

Depth of Knowledge Descriptors for Mathematics

Norman L. Webb

March 28, 2002

Mathematics Depth of Knowledge Levels

Level 1 (Recall) includes the recall of information such as a fact, definition, term, or a simple procedure, as well as performing a simple algorithm or applying a formula. That is, in mathematics a one-step, well-defined, and straight algorithmic procedure should be included at this lowest level. Other key words that signify a Level 1 include “identify,” “recall,” “recognize,” “use,” and “measure.” Verbs such as “describe” and “explain” could be classified at different levels depending on what is to be described and explained.

Level 2 (Skill/Concept) includes the engagement of some mental processing beyond a habitual response. A Level 2 assessment item requires students to make some decisions as to how to approach the problem or activity, whereas Level 1 requires students to demonstrate a rote response, perform a well-known algorithm, follow a set procedure (like a recipe), or perform a clearly defined series of steps. Keywords that generally distinguish a Level 2 item include “classify,” “organize,” “estimate,” “make observations,” “collect and display data,” and “compare data.” These actions imply more than one step. For example, to compare data requires first identifying characteristics of the objects or phenomenon and then grouping or ordering the objects. Some action verbs, such as “explain,” “describe,” or “interpret” could be classified at different levels depending on the object of the action. For example, if an item required students to explain how light affects mass by indicating there is a relationship between light and heat, this is considered a Level 2. Interpreting information from a simple graph, requiring reading information from the graph, also is a Level 2. Interpreting information from a complex graph that requires some decisions on what features of the graph need to be considered and how information from the graph can be aggregated is a Level 3. Caution is warranted in interpreting Level 2 as only skills because some reviewers will interpret skills very narrowly, as primarily numerical skills, and such interpretation excludes from this level other skills such as visualization skills and probability skills, which may be more complex simply because they are less common. Other Level 2 activities include explaining the purpose and use of experimental procedures; carrying out experimental procedures; making observations and collecting data; classifying, organizing, and comparing data; and organizing and displaying data in tables, graphs, and charts.

Mathematics Depth of Knowledge Levels continued

Level 3 (Strategic Thinking) requires reasoning, planning, using evidence, and a higher level of thinking than the previous two levels. In most instances, requiring students to explain their thinking is a Level 3. Activities that require students to make conjectures are also at this level. The cognitive demands at Level 3 are complex and abstract. The complexity does not result from the fact that there are multiple answers, a possibility for both Levels 1 and 2, but because the task requires more demanding reasoning. An activity, however, that has more than one possible answer and requires students to justify the response they give would most likely be a Level 3. Other Level 3 activities include drawing conclusions from observations; citing evidence and developing a logical argument for concepts; explaining phenomena in terms of concepts; and using concepts to solve problems.

Level 4 (Extended Thinking) requires complex reasoning, planning, developing, and thinking most likely over an extended period of time. The extended time period is not a distinguishing factor if the required work is only repetitive and does not require applying significant conceptual understanding and higher-order thinking. For example, if a student has to take the water temperature from a river each day for a month and then construct a graph, this would be classified as a Level 2. However, if the student is to conduct a river study that requires taking into consideration a number of variables, this would be a Level 4. At Level 4, the cognitive demands of the task should be high and the work should be very complex. Students should be required to make several connections—relate ideas *within* the content area or *among* content areas—and have to select one approach among many alternatives on how the situation should be solved, in order to be at this highest level. Level 4 activities include designing and conducting experiments; making connections between a finding and related concepts and phenomena; combining and synthesizing ideas into new concepts; and critiquing experimental designs.

References

New Hampshire, Rhode Island, and Vermont Department of Education. (2004). *Draft Tri-State New England (TSNE) Mathematics Test Specifications*. New Hampshire, Rhode Island, and Vermont Department of Education.

Webb, L. Norman. (2002). *Depth of Knowledge Levels for Four Content Areas*.

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APPENDIX C:
Answers and DoK Codes for Examples

| Item Number | Answer | Depth of Knowledge |
|--------------------|---|---------------------------|
| 1 | Red circles - 7 | 1 |
| 2 | 26,27,28, 29,30,31,32,33,34,35,36,37,38,39,40 | 2 |
| 3 | 6,18,21 | 2 |
| 4 | 13,11 | 2 |
| 5 | Second box | 2 |
| 6 | 5 | 1 |
| 7 | Dime, penny, nickel | 1 |
| 8 | 5 dots 10 Answers will vary | 2 |
| 9 | Place hypotenuses together | 1 |
| 10 | Yellow square and yellow pentagon | 1 |
| 11 | Frame-square; ruler-rectangle; tire-circle; sign-triangle | 1 |
| 12 | Answers will vary | 1 |
| 13 | Thermometer | 1 |
| 14 | Clock and calendar | 1 |
| 15 | Answers will vary depending on class schedule | 1 |
| 16 | Dog near the water, bird above the doghouse, and the cat next to the dog. | 1 |
| 17 | Pink | 2 |
| 18 | Purple rectangle, black circle | 2 |
| 19 | Taller tree. | 1 |
| 20 | $2+3$, $4+1$, $5+0$ | 2 |
| 21 | 2 | 2 |
| 22 | Cats | 2 |
| 23 | There will be more on Saturday. Answers will vary. | 3 |
| 24 | Answers will vary | 2 |
| 25 | Answers will vary | 3 |
| 26 | Answers will vary | 3 |

