First Grade Unit 2: Developing Strategies with Dice and Dominoes

Big Conceptual Idea

K-5 Progression on Counting and Cardinality and Operations and Algebraic Thinking (pp. 12-17)
K-5 Progression on Number and Operations in Base Ten (pp. 6-7)

Throughout the unit the Math Practices are introduced and used. Find student friendly posters here.

Links may require you being logged into your Bridges Educator Site. If the link does not work for you, copy and paste the http address into a browser.

Note: Module 4 has been omitted from the pacing framework.

Instructional note:

This unit’s Big Idea focuses on developing children’s reasoning strategies for addition and subtraction outlined in standard 1.OA.6 (Nevada Academic Content Standards (NVACS), 2010). This includes counting strategies. There are 3 phases of learning that students must build to develop fluency with number and work toward “knowing from memory”, by the end of 2nd grade. The three phases are: 1. Constructing meaning and counting strategies. 2. Reasoning strategies. 3. Working toward quick recall. Students in 1st grade are building fluency by engaging in strategies working in phases 1 and 2. At this point in the year some may have begun moving into phase 2, but most students will be in phase 1, and therefore they will need opportunities to directly model situations and equations and use counting strategies to find the unknown. Note that students may weave in and out of phases. Research shows that, “instruction must help students through these phases without rushing to know their facts from memory” (Van de Walle, Karp, Bay-Williams, 2013, p.171). Additionally, “drill in the absence of accomplishing these phases has repeatedly been demonstrated as ineffective” (Van de Walle, et. al., 2014, p. 184). Furthermore, it can create issues in student understanding of number sense, impact flexibility working with number and create math anxiety. “Unfortunately many classrooms focus on math facts in unproductive ways, giving students the impression that math facts are the essence of mathematics, and, even worse that the fast recall of math fact is what it means to be a strong mathematics student. Both of these ideas are wrong and it is critical that we remove them from classrooms, as they play a large role in the production of math anxious and disaffected students” (Boaler, 2015, p. 1). Keeping these arguments in mind, it is imperative that the Big Idea of this unit remain in the constructing meaning and reasoning phases, which involve subitizing, counting all, counting on, counting back, and using known facts to derive solutions (e.g. I know that 8 +9 is 17 because 8 and 8 is 16 and 9 is one more than 8 so 16 and one more is 17). The purpose is deepening student understanding of numbers and their relationships to one another. Please see the fluency resources on the district site, as well these direct links for further information.


As students move through phases of fluency they will also be progressing through Concrete, Representational and Abstract reasoning. While students are solving problems with concrete materials they should have ample opportunity to share their thinking with peers, through partner work, and whole class sharing/discussion. This could look like students being invited to bring their manipulatives to a document camera to model for others how they solved a problem. This can bring to light student misconceptions and mistakes as an opportunity to justify thinking and critique the reasoning of others.

During October Number Corner, students will have opportunities to practice creating story word problems. Unit 3 assessment will ask students to write their own story problem ending with a question. Bolster this work in Number Corner to support success by providing opportunities to explore various problem types (NVACS, 2010, p. 88).

Focus instruction on NVACS standards 1.OA.5, 1.OA.6, 1.OA.7, 1.OA.8, 1.NBT.3,1.MD.4
Essential Academic Vocabulary

**New Academic Vocabulary:**
Use these words consistently during instruction to begin to develop understanding.
*a Word Resource Card is available

<table>
<thead>
<tr>
<th>Even number*</th>
<th>Odd number*</th>
<th>Difference*</th>
</tr>
</thead>
</table>

**Review Vocabulary:**
(Vocabulary taught prior grades or units)

<table>
<thead>
<tr>
<th>Add*</th>
<th>Less Than*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addition</td>
<td>Column*</td>
</tr>
<tr>
<td>Doubles</td>
<td>Row*</td>
</tr>
<tr>
<td>Equal*</td>
<td>Equation*</td>
</tr>
<tr>
<td>Half*</td>
<td>Fact family*</td>
</tr>
<tr>
<td>Sum or Total*</td>
<td>Subtract*</td>
</tr>
<tr>
<td>Greater than*</td>
<td>Subtraction</td>
</tr>
</tbody>
</table>

Additional terminology that students may need support with:
- minus, plus, problem solving, reasonable, strategies

Standards listed in **bold** indicate a focus of the lesson.

<table>
<thead>
<tr>
<th>NVACS (Content and Practices)</th>
<th>Big Idea</th>
<th>Instructional Clarifications &amp; Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Module 1- Session 1: Introducing Dominoes</strong></td>
<td>Mathematical Development</td>
<td></td>
</tr>
<tr>
<td>K.CC.5</td>
<td>Access Prior Learning: -Schema about dominoes K.CC.S- Count to answer “How many?”</td>
<td>Guiding Question: Ask questions that assess and advance student understanding around the Big Mathematical Idea in the Lesson and the conceptual understanding developing throughout and among units. Teachers should be responsive to their student learners and their needs to create guiding questions to support the content from this point forward.</td>
</tr>
<tr>
<td>1.OA.5</td>
<td>Developing the Big Idea: Students work in phase 1 to deepen their understanding of numbers and their relationships to one another.</td>
<td>Instructional NOTE: • You will need the Domino Addition by Lynette Long text (this book came in your materials) • Review the MP.7 poster and support student’s natural inclination to look for structure when using dominoes which strengthens subitizing skills, and helps them see the relationships between numbers. See Math Practices in Action (p. 4)</td>
</tr>
<tr>
<td>1.OA.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MP.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Module 1- Session 2: Introducing Work Place 2A Domino Top Draw**

| Access Prior Learning: K.CC.S- Count to answer “How many?” | Instructional NOTE: • Students will likely want to count all the dots on the dominoes. Try focusing on using strategies that start with subitizing one part of the domino, and counting on from there. • Introduce Math Practice 8. Hang the poster with the others (found [here](https://bridges.mathlearningcenter.org/implementation/blog/perfecting-partner-games-practice)). With the onset of partner play games versus free explore you may want to refer to this resource from the Educator Site. Click the Implementation tab, search for the blog title perfecting partner game. |
| Developing the Big Idea: Students work in phase 1 to deepen their understanding of numbers and their relationships to one another. | Enrichment: See Game Variations on Work Place Instructions (p. T2) |
| K.CC.6 | Child Watching: (Levels of sophistication) • Watch for students who count three times (3x), count set one, count set 2 and then count all to find the total. • Watch for students subitizing smaller numbers (1-3) and counting on • Watch for students who may begin conceptually subitizing (For example, subitizing a 1 and a pattern of 3 to determine a total of 4. This is a higher level of sophistication than just subitizing the typical pattern of four dots. |
| 1.OA.5 | |
| 1.OA.6 | |
| 1.NBT.1 | |
| MP.7 | |
| MP.8 | |

### Additional Vocabulary
- Even number
- Odd number
- Difference
- Add
- Addition
- Doubles
- Equal
- Half
- Sum or Total
- Greater than
- Add*
- Less Than*
- Column*
- Row*
- Equation*
- Fact family*
- Subtract*
- Subtraction
### Module 1- Session 3: Domino Add & Compare

<table>
<thead>
<tr>
<th>Access Prior Learning:</th>
<th>Instructional NOTE:</th>
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</thead>
<tbody>
<tr>
<td>K.CC.6 - Identify if a number is greater than, less than, or equal. Kindergarten students did have exposure to the symbols as well, but the symbols were not expected in standards for mastery in kindergarten.</td>
<td>If at this point teachers have not established a set of expectations for talking in pairs, consider establishing this today. This supports a culture of discussion where students feel comfortable with an equitable practice for sharing their thinking. Many teachers have found success in assigning partners for math discussions such as partner A &amp; B, peanut butter &amp; jelly partners etc. Support the expectations by modeling how to quickly turn &quot;knee to knee, and eye to eye&quot; with their partner. Directing who speaks first &quot;jelly person first&quot; will help partners manage the dynamics of not controlling the conversation, or sitting back and letting partners do the talking work. During the game, have students share ideas with partners on finding the totals.</td>
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</tbody>
</table>

### Module 1- Session 4: Our Addition Strategies Chart

<table>
<thead>
<tr>
<th>Access Prior Learning:</th>
<th>Instructional NOTE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review of Domino Add and Compare game</td>
<td>• If at this point teachers have not established a set of expectations for talking in pairs, consider establishing this today. This supports a culture of discussion where students feel comfortable with an equitable practice for sharing their thinking. Many teachers have found success in assigning partners for math discussions such as partner A &amp; B, peanut butter &amp; jelly partners etc. Support the expectations by modeling how to quickly turn &quot;knee to knee, and eye to eye&quot; with their partner. Directing who speaks first &quot;jelly person first&quot; will help partners manage the dynamics of not controlling the conversation, or sitting back and letting partners do the talking work. During the game, have students share ideas with partners on finding the totals.</td>
</tr>
</tbody>
</table>

### Module 1- Session 5: Domino Magic Squares

<table>
<thead>
<tr>
<th>Access Prior Learning:</th>
<th>Instructional NOTE:</th>
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</thead>
<tbody>
<tr>
<td>Exposure to this idea may have occurred in the context of classroom conversations especially in previous domino lessons, however, it was not a Kindergarten standard and hasn’t been explicitly discovered yet.</td>
<td>• The Commutative Property is an emphasis and a Big Idea for students to grasp. This is the idea that it makes no difference in what order numbers are added, the same addends in a different order still produce the same total. This is an important concept to develop as it is useful in problem solving, building fluency, and mental mathematics when children construct this relationship. Note that a common misconception for students is the attempt to overgeneralize the Commutative Property to subtraction. Teachers can use situations in context and story problems to confront this misconception.</td>
</tr>
</tbody>
</table>

### Module 2- Session 1: Introducing Double-Flap Dot Cards

<table>
<thead>
<tr>
<th>Access Prior Learning:</th>
<th>Instructional NOTE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connect to previous day’s work, and highlight any “ah-ha’s” that were discovered around commutativity.</td>
<td>• This lesson could take extra time, consider stretching it into 2 days and using 1 of your 2 A/D/E days per noted on the pacing framework (assess, differentiate, extend). • The idea of the “fact family” makes its appearance here. A culturally responsive practice is to relate this concept to students’ real lives by stating that each family is made up of different members. Consider drawing a “structure” on the board, putting the three numbers in the corners of the roof’s triangle, and writing the corresponding facts in the box. If you start the largest number on the top of the house it supports the subtraction equations. • Resource from the Educator site: Game <a href="http://www.abcya.com/addition.htm">http://www.abcya.com/addition.htm</a> Supports basic facts</td>
</tr>
</tbody>
</table>

-continues on next page-
### Module 2 - Session 2: Double-Flap Picture Cards

**1.OA.1**  
**1.OA.3**  
**1.OA.4**  
**1.OA.6**  
**1.OA.8**  
**MP.1**  
**MP.2**  
**MP.4**  

**Access Prior Learning:**  
Connect to previous day’s work, and highlight any “ah-ha’s” that were discovered around commutativity, and number relationships.

**Developing the Big Idea:**  
Students work in phase 1 to deepen their understanding of numbers and their relationships to one another, develop understanding of commutativity.

**Instructional NOTE:**  
- Note the Math Practices in Action (p. 13)  
- Consider making Math Practice 1 explicit in this lesson, although the materials don’t call for it as an emphasis. Pull out the poster and introduce it and hang it with the others.  
- See the helpful blog titled *The Number Tree Model* on the Educator Site by searching under the Implementation Tab. Consider using the terms Number Tree and Fact Families in conjunction with the mathematical term Part/Part Whole to strengthen the understanding of different parts creating a whole.

**Enrichment:**  
- Observe for students who may be confused and write equations that do not relate to the numbers on their cards (see step 18)  
- Observe for students writing subtraction equations incorrectly without starting with the largest number. Use a concrete situational context to model their equation and ask “Is this true?”

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<table>
<thead>
<tr>
<th>Module 3 - Session 1: Domino Flash</th>
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</thead>
<tbody>
<tr>
<td><strong>Access Prior Learning:</strong></td>
</tr>
<tr>
<td>- Subitizing</td>
</tr>
<tr>
<td>- Counting up</td>
</tr>
<tr>
<td><strong>Developing the Big Idea:</strong></td>
</tr>
<tr>
<td>Some students may still be working</td>
</tr>
<tr>
<td>in Phase 1 to deepen their</td>
</tr>
<tr>
<td>understanding of numbers and their</td>
</tr>
<tr>
<td>relationships to one another.</td>
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<tr>
<td>However, many students should be</td>
</tr>
<tr>
<td>transferring into Phase 2 of</td>
</tr>
<tr>
<td>fluency development, and begin</td>
</tr>
<tr>
<td>using reasoning strategies.</td>
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<tr>
<td><strong>Instructional NOTE:</strong></td>
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<tr>
<td>Read the Math Practices in Action (p. 6)</td>
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<tr>
<td>- When creating the strategies</td>
</tr>
<tr>
<td>chart, rather than just writing</td>
</tr>
<tr>
<td>the equation (the abstract form),</td>
</tr>
<tr>
<td>consider drawing a representation</td>
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<tr>
<td>of the strategy. Frequently</td>
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<tr>
<td>modeling how to represent math</td>
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<tr>
<td>thinking by drawing an</td>
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<tr>
<td>illustration will support</td>
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<tr>
<td>students' development from the</td>
</tr>
<tr>
<td>concrete to the abstract.</td>
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<tr>
<td><strong>Enrichment:</strong></td>
</tr>
<tr>
<td>Child Watching:</td>
</tr>
<tr>
<td>- Observe for students struggling</td>
</tr>
<tr>
<td>to model equations on the number</td>
</tr>
<tr>
<td>rack or represent them with written</td>
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<tr>
<td>equations</td>
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<tr>
<td>- Observe for students who made</td>
</tr>
<tr>
<td>need another “flash” or a</td>
</tr>
<tr>
<td>slightly longer “flash”</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Module 3 - Session 2: Dot Doubles</th>
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</thead>
<tbody>
<tr>
<td><strong>Access Prior Learning:</strong></td>
</tr>
<tr>
<td>- Subitizing</td>
</tr>
<tr>
<td>- Counting up</td>
</tr>
<tr>
<td><strong>Developing the Big Idea:</strong></td>
</tr>
<tr>
<td>Students moving from Phase 1 to</td>
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<tr>
<td>Phase 2 in fluency development,</td>
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<tr>
<td>deepen their understanding of</td>
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<tr>
<td>numbers and their relationships</td>
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<tr>
<td>to one another by using reasoning</td>
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<tr>
<td>strategies.</td>
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<tr>
<td><strong>Instructional NOTE:</strong></td>
</tr>
<tr>
<td>Read About This Session (p. 8)</td>
</tr>
<tr>
<td>- Observe for students struggling</td>
</tr>
<tr>
<td>to double the numbers (use unifix</td>
</tr>
<tr>
<td>cubes, or practice counting on</td>
</tr>
<tr>
<td>using the same dots)</td>
</tr>
<tr>
<td><strong>Enrichment:</strong></td>
</tr>
<tr>
<td>Child Watching:</td>
</tr>
<tr>
<td>- Observe for students struggling</td>
</tr>
<tr>
<td>with counting on</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Module 3 - Session 3: Introducing Work Place 2E Spin &amp; Add</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access Prior Learning:</strong></td>
</tr>
<tr>
<td>- Subitizing</td>
</tr>
<tr>
<td>- Counting up</td>
</tr>
<tr>
<td><strong>Developing the Big Idea:</strong></td>
</tr>
<tr>
<td>Students moving from phase 1 to</td>
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<tr>
<td>phase 2 in fluency development,</td>
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<tr>
<td>deepen their understanding of</td>
</tr>
<tr>
<td>numbers and their relationships</td>
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<tr>
<td>to one another by using reasoning</td>
</tr>
<tr>
<td>strategies.</td>
</tr>
<tr>
<td><strong>Instructional NOTE:</strong></td>
</tr>
<tr>
<td>Read the Work Place Instructions Game Variations (p. T7)</td>
</tr>
<tr>
<td>- Observe for students struggling</td>
</tr>
<tr>
<td>with counting on</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Module 3 - Session 4: Introducing Work Place 2F Spin &amp; Subtract</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access Prior Learning:</strong></td>
</tr>
<tr>
<td>- Subitizing</td>
</tr>
<tr>
<td>- Counting up</td>
</tr>
<tr>
<td><strong>Developing the Big Idea:</strong></td>
</tr>
<tr>
<td>Students moving from phase 1 to</td>
</tr>
<tr>
<td>phase 2 in fluency development,</td>
</tr>
<tr>
<td>deepen their understanding of</td>
</tr>
<tr>
<td>numbers and their relationships</td>
</tr>
<tr>
<td>to one another by using reasoning</td>
</tr>
<tr>
<td>strategies.</td>
</tr>
<tr>
<td><strong>Instructional NOTE:</strong></td>
</tr>
<tr>
<td>The action of counting backwards</td>
</tr>
<tr>
<td>can be more of a struggle for</td>
</tr>
<tr>
<td>students, as they typically do</td>
</tr>
<tr>
<td>not have as much experience. When</td>
</tr>
<tr>
<td>using counting back with</td>
</tr>
<tr>
<td>subtraction, students have to</td>
</tr>
<tr>
<td>manage counting backwards while</td>
</tr>
<tr>
<td>keeping track of how many counts</td>
</tr>
<tr>
<td>back they made (thus counting up</td>
</tr>
<tr>
<td>simultaneously). Consider using</td>
</tr>
<tr>
<td>a number line to support, but</td>
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<tr>
<td>watch for students actually</td>
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<tr>
<td>counting the number they start</td>
</tr>
<tr>
<td>with resulting in being off by</td>
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<tr>
<td>an one number.</td>
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<tr>
<td><strong>Enrichment:</strong></td>
</tr>
<tr>
<td>Child Watching:</td>
</tr>
<tr>
<td>- Observe for students counting</td>
</tr>
<tr>
<td>the beginning number twice when</td>
</tr>
<tr>
<td>counting backwards</td>
</tr>
<tr>
<td>- Observe for students struggling</td>
</tr>
<tr>
<td>to orally count backwards</td>
</tr>
<tr>
<td><strong>Enrichment:</strong></td>
</tr>
<tr>
<td>See the Work Place Instructions Game Variations (p. T10)</td>
</tr>
<tr>
<td>- Observe for students counting</td>
</tr>
<tr>
<td>the beginning number</td>
</tr>
<tr>
<td>twice when counting backwards</td>
</tr>
<tr>
<td>- Observe for students struggling</td>
</tr>
<tr>
<td>to orally count backwards</td>
</tr>
</tbody>
</table>
Module 3- Session 5: Unit 2 Assessment

<table>
<thead>
<tr>
<th>Standards</th>
<th>Access Prior Learning:</th>
<th>Instructional NOTE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.OA.1</td>
<td>Strategies used throughout Unit 2 for adding and finding missing addends.</td>
<td></td>
</tr>
<tr>
<td>1.OA.3</td>
<td></td>
<td></td>
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<tr>
<td>1.OA.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.OA.6</td>
<td></td>
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<tr>
<td>1.OA.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MP.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MP.4</td>
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<td></td>
</tr>
</tbody>
</table>

Developing the Big Idea:
Students moving from phase 1 to phase 2 in fluency development, deepen their understanding of numbers and their relationships to one another by using reasoning strategies.

Instructional NOTE:
- See Unit 2 Assessment Scoring Guide in Assessment Binder under the Unit Assessment Tab (p. 20).
- Consider using the Grade 1 Math Progress Report: Quarter 1 documents in your assessment binder (p. 36) under the Assessment Overview tab as a tool for report cards. Pay close attention to how the standards are broken down into chunks. For example, 1.OA.6 is adjusted to Adds and subtracts to 10.
- Students may struggle with problem 2, which asks them to write a story problem to match an equation. Students have not had many opportunities to practice this independently. Use this formatively to identify student strengths and needs and support over time.

Enrichment:
- Child Watching: See Support and Intervention page in Assessment Binder (p. 13) Observe for and consider using intervention resources if you see students struggling with:
  - Counting forward to 30 from a number other than 1
  - Counting backward to 0 from any number up to and including 10
  - Representing addition and subtraction with objects, fingers, or drawings
  - Solving addition and subtraction story problems within 10 by using objects or drawings.
  - Consider intervention resources if you see the above

Standards listed in bold indicate a focus of the lesson.

References


