# SOAR Summary Multiplication and Division

**Grade 3 End Year** *(involving one-digit factors within 100)*

| | **Tier I Intervention**<br>*(Classroom Instruction)* | **Tier II Intervention**<br>*(along with Classroom Instruction)* | **Tier III Intervention**<br>*(along with Classroom Instruction)* |
|---|---|---|---|
| **Makes Sense** | • Determines what needs to be done to solve situations involving an unknown product<br>  – Equal group situations where the number of groups and size of groups is known.<br>  – Array situations where the number of rows and number of items in each row OR the number of columns and the number of items in each column is known.<br>• Determines what needs to be done to solve situations involving an unknown factor<br>  – Equal groups situations where the product and either the number of groups OR the group size is known.<br>  – Array situations where the product and either the number of rows or columns is known OR the number of items in each row or column is known. | • Determines what needs to be done to solve situations involving an unknown product<br>  – Equal group situations where the number of groups and size of groups is known.<br>  – Array situations where the number of rows and number of items in each row OR the number of columns and the number of items in each column is known.<br>• Is unable to consistently determine what needs to be done to solve situations with an unknown factor. | • Is unable to consistently determine what needs to be done to solve situations involving an unknown product.<br>• Is unable to consistently determine what needs to be done to solve situations with an unknown factor.<br>• Does not recognize words that signal "groups," such as bags, boxes, packs, rows, columns, packages, and crates.<br>*Note: Students may show an understanding of situations involving equal groups regardless of the unknown, but not show an understanding of situations involving arrays. The reverse may also be shown.* |
| **Creates Representations** | • Shows situations in multiple ways:<br>  – manipulatives<br>  – diagram<br>  – number line (a linear model showing iterations)<br>  – equation<br>  – table | • Shows similar situations using the same type of representation *(e.g., uses manipulatives to show equal group situations)*.<br>• Attempts to use different representations when situations change *(e.g., shifts between equal groups and array models depending on context)*.<br>• Is unable to consistently represent situations where a factor is unknown. | • Shows situations using only one type of representation and makes no attempt to vary the representation when the context of the situation changes *(e.g., draws arrays for all situations)*.<br>• Attempts to show situations but representations reflect unrelated mathematics *(e.g,. show the factors being added together as if they are parts of the whole instead)*. |
| **Uses Reliable Strategies** | • Uses several problem-solving strategies **involving one-digit factors:**<br>Multiplication<br>  – Uses representation<br>  – Counts all<br>  – Uses skip counting<br>  – Uses repeated addition<br>  – Knows as a fact<br>  – Uses a related fact and adjusts<br>  – Decomposes a factor, multiples, and then combines product<br>Division<br>  – Uses representation<br>  – Counts back<br>  – Uses repeated subtraction<br>  – Doles out, shares equally to a given number of groups<br>  – Knows as fact<br>  – Uses a related fact adjusts<br>  – Makes and separates out groups of a certain size | • Uses "repeated addition" and/or "skip counting" to solve for an unknown product.<br>• Uses or attempts to use "repeated subtraction" to solve for an unknown factor.<br>• Uses an appropriate problem-solving strategy for the situation but makes a minor error which results in an incorrect solution. | • Uses or attempts to use "counts all" and/or "repeated addition" to solve situations.<br>• Uses or attempts to use "repeated subtraction" to solve for an unknown factor.<br>• Uses an appropriate problem-solving strategy for the situation but makes a significant mathematical error which results in an incorrect and unreasonable solution.<br>• Attempts to use a problem-solving strategy unrelated to the mathematics of the situation. |
| **Provides Explanations** | • Writes and solves multiplication and/or division equations to represent situations *(as listed above)*.<br>• Explains the equations using the context of the situation.<br>• Writes numbers and explains the meaning of the numbers using the context of the situation. | • Writes and solves repeated addition and/or multiplication equations for situations with an unknown product *(as listed above)*.<br>• Does not write accurate division or multiplication equations for situations with an unknown factor but may write a repeated subtraction equation.<br>• Provides explanations that include repeating a rule or attributes the meaning of the numbers as being part of a "fact family" *(e.g., reference numbers and an operation without tending to what is happening in the context)*. | • Does not write multiplication or division equations but may write repeated addition or repeated subtraction equations.<br>• Writes equations that are unrelated to the mathematics of the situation. |

SOAR: Supporting Ongoing Achievement Responsively

# SOAR Summary Multiplication and Division *(with Whole Numbers ONLY)*
## Grade 4 End Year *(involving one-digit and/or two-digit factors)*

| | | Tier I Intervention<br>(Classroom Instruction) | Tier II Intervention<br>(along with Classroom Instruction) | Tier III Intervention<br>(along with Classroom Instruction) |
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| **Makes Sense** | | *In addition to understanding what needs to be done to solve for an unknown product or factor in equal group and array situations AND*<br>• Determines what needs to be done to solve for an unknown product in<br>  – Compare situation where the number of times more and the group size is known OR the number of times fewer and the group size is known.<br>• Determines what needs to be done to solve for an unknown factor in<br>  – Compare situations where the product and either the number times more or fewer OR the group size is known. | *In addition to understanding what needs to be done to solve for an unknown product or factor in in equal group and array situations BUT:*<br>• Is unable to determine what needs to be done to solve compare situations with an unknown product AND/OR compare situations with an unknown factor. | • Is unable to consistently determine what needs to be done to solve equal group or array situations involving an unknown product.<br>• Is unable to consistently determine what needs to be done to solve equal group or array situations with an unknown factor.<br>• Is unable to determine what needs to be done to solve compare situations with an unknown product AND/OR compare situations with an unknown factor.<br>*Note: A student may consistently show an understanding of equal groups situations OR array situations regardless of the unknown, but not show an understanding of both of these types of situations.* |
| **Creates Representations** | | • Shows situations in multiple ways:<br>  – manipulatives<br>  – diagram<br>  – number line ( a linear model showing iterations)<br>  – equation<br>  – table | • Shows similar situations using the same type of representation *(e.g., uses counters to show equal group situations)*.<br>• Attempts to use different representations when situations changes *(e.g., shifts between equal groups and array models depending on context)*.<br>• Is unable to accurately represent situations involving multiplicative comparisons. | • Shows or attempts to show situations using only one type of representation and makes no attempt to vary the representation when the context of the situation changes *(e.g., draws arrays for all situations)*.<br>• Is unable to consistently represent situations where a factor is unknown.<br>• Is unable to accurately represent situations involving multiplicative comparisons. |
| **Uses Reliable Strategies** | | • Uses several problem-solving strategies **involving one-digit and two-digit factors:**<br>Multiplication<br>  – Uses skip counting<br>  – Uses repeated addition<br>  – Uses known facts<br>  – Uses a related fact and adjusts<br>  – Decomposes a factor, multiples, and then combines product<br>Division<br>  – Counts back<br>  – Uses repeated subtraction<br>  – Doles out, shares equally to a given number of groups<br>  – Knows as fact<br>  – Uses a related fact and adjusts<br>  – Makes and separates out groups of a certain size | • Uses only one or two of the previously listed problem-solving strategies. | • Uses or attempts to use "counts all," "repeated addition," and/or "skip counting" to solve for an unknown product.<br>• Uses or attempts to use "repeated subtraction" to solve for an unknown factor.<br>• Uses an appropriate problem-solving strategy for the situation but makes a minor error that results in an incorrect solution. |
| **Provides Explanations** | | • Writes and solves multiplication and/or division equations to represent situations *(listed above)*.<br>• Explains the equations using the context of the situation. | • Writes and solves equations for situations with an unknown product *(may be repeated addition or multiplication)*.<br>• Writes and solves equations for situations with an unknown factor *(may be repeated subtraction, division, or multiplication with an unknown factor)*.<br>• Explains the equations using the context of the situation.<br>• Is unable to write accurate equations for situations involving comparative multiplication. | • Writes and solves equations for situations with an unknown product *(maybe repeated addition or multiplication)*.<br>• Is unable to write accurate equations for division or multiplication with an unknown factor.<br>• Is unable to write accurate equations for situations involving comparative multiplication.<br>• Provides explanations that include repeating rules or "fact families" *(e.g., reference numbers and an operation without tending to what is happening in the context)*. |

*NOTE: By Grade 5, the expectation is for students to understand and fluently multiply and divide multi-digit numbers. Consider this expectation when determining the tier of intervention services that may be needed to support the students beyond Grade 4.*