## Procedures for the Calculator Accommodation:Growth Assessments and Standards of Learning (SOL) Tests

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### Introduction

The Virginia Department of Education (VDOE) has developed this document as a resource for educators and parents regarding the use of the calculator for eligible students with disabilities participating in mathematics Growth Assessments and/or Standards of Learning (SOL) mathematics and science tests.

Only students with disabilities identified under the *Individuals with Disabilities Education Improvement Act of 2004* or Section 504 of the *Rehabilitation Act of* *1973* are eligible for the use of the calculator accommodation. Decisions regarding assessment participation and testing accommodations must be made by the Individualized Education Program (IEP) Team or 504 Committee and must be documented in the respective IEP or 504 Plan. The following resources are available on the Virginia Department of Education website on the [Participation and Inclusion](https://www.doe.virginia.gov/teaching-learning-assessment/student-assessment/virginia-sol-assessment-program/participation-inclusion) page:

[*Participation in the Virginia Assessment Program: A Resource for Educators and Parents of Students with Disabilities*](https://www.doe.virginia.gov/home/showpublisheddocument/20358/638043621891530000)

[*Testing Accommodations for Students with Disabilities: Growth Assessments and Standards of Learning Tests*](https://www.doe.virginia.gov/home/showpublisheddocument/20360/638043621898870000)

Additional documents related to calculators are available on the Virginia Department of Education website:

[*Frequently Asked Questions Regarding Desmos Calculators and Special Education*](https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fvdoe.prod.govaccess.org%2Fhome%2Fshowpublisheddocument%2F20348%2F638043621856830000&wdOrigin=BROWSELINK)

[*State Approved Calculators for Standards of Learning Testing: Guidelines and Preparation Instructions for Testing.*](https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.doe.virginia.gov%2Fhome%2Fshowpublisheddocument%2F20408%2F638043623693300000&wdOrigin=BROWSELINK)

### Calculator Accommodation on Growth Assessments and Standards of Learning (SOL) Tests

Test accommodations provide students with disabilities access to state assessments and a means to demonstrate their knowledge and skill on academic content. Test accommodations are changes in the administration of an assessment which result in an adjustment to how the test is presented or how the student responds to test items. Although test accommodations do not alter the content assessed or the meaning of the resulting scores, they do provide equal access to the assessment for students with disabilities.

The calculator accommodation must be related to the individual student’s disability in mathematics as it relates to performing mathematical computations. When used appropriately, the calculator accommodation reduces or even eliminates the effects of a student’s disability in mathematics without impacting learning expectations or providing an unfair advantage. The calculator accommodation used for instruction and on classroom assessments are often integrally intertwined. It is critical to note that some mathematical capabilities and features of the calculator may be appropriate for instructional use but inappropriate and not permitted for use on state assessments. The use of the calculator accommodation is not intended to enhance student performance for students with disabilities whose skills in performing mathematical calculations are below grade level.

The calculator accommodation provided to students with disabilities must:

* be based upon individual student need and not upon the category of disability, level of instruction, or program setting;
* be justified and documented in the student's IEP or 504 Plan;
* be aligned with and a part of daily instruction; and
* foster and facilitate independence for students, not create dependence.

### Providing the Desmos Virginia Calculators or Hand-Held Calculators for Virginia Assessment Program Mathematics and Science Assessments

The Growth Assessments and SOL assessments measuring the 2016 Mathematics SOL that are administered online include access to Desmos Virginia versions of the online calculators (four-function, scientific, graphing) within TestNav, the software used for online test delivery. All students are expected to use the Desmos Virginia Calculators within TestNav during online growth assessments and SOL tests. Grades 4 and 5 SOL Mathematics tests will have the Desmos Virginia Four-Function Calculator in the toolbar for the calculator-active items of the test, and the Grade 5 SOL Science test will have the Desmos Virginia Four-Function Calculator for the entire test. The Grades 6 and 7 SOL Mathematics tests will have the Desmos Virginia Scientific Calculator in the toolbar for the calculator-active items of the test, and the Grade 8 SOL Mathematics and Science tests will have the Desmos Virginia Scientific Calculator in the toolbar for the entire test. End-of-Course (EOC) mathematics and science tests will have the Desmos Virginia Graphing Calculator in the toolbar for the entire test.

#### Online Tests

For students taking online Grades 5-8 MathematicsGrowth Assessments and Grades 4-8 SOL Mathematicstests, End-of-Course (EOC) MathematicsSOL tests, and Grades 5, 8, and EOC ScienceSOL tests, the appropriate Desmos Virginia Calculator will be available on the test’s toolbar for items that allow the use of a calculator. Students taking the online tests are not to be issued a hand-held calculator unless the student requires a hand-held calculator as part of an accommodation as documented in the student’s IEP or 504 Plan.

Students taking online Grades 5-8 Mathematics Growth Assessments and Grades 4-7 SOL Mathematicstests who require a hand-held calculator, as documented in the student’s IEP or 504 Plan must be tested in a 1:1 environment where the examiner manages when the student can access their hand-held calculator. The examiner must ensure that the hand-held calculator is used only with items where the online calculator appears on the toolbar in TestNav.

#### Paper Tests

Students with a documented need for paper Grades 5-8 Mathematics Growth Assessment or Grades 4-7 SOL Mathematicstests are to be issued a state-approved hand-held calculator or provided access to the Desmos Virginia Calculator in the PearsonAccessnext Training Center by the examiner following the Examiner’s Manual directions for the portion of the test where a calculator is permitted.

Students with a documented need for a paper Grade 8 SOL Mathematics tests, EOC SOL Mathematics tests, and Grades 5, 8, and EOC Science SOL tests, may use a state-approved hand-held calculator or have access to the appropriate Desmos Virginia Calculator using the Desmos Virginia Calculator tests available in the PearsonAccessnext Training Center.

#### Online Test with Requirement for Calculator on Non-Calculator Items

For students with disabilities whose IEP Team/504 Committee determined eligibility, through the use of the *Calculator Accommodation Criteria Form*, to use calculators on items in the online Grades 3-8 MathematicsGrowth Assessment or the Grades 3-7 SOL Mathematics tests for which a calculator is not allowed, the student is to be assigned the Personal Needs Profile (PNP) calculator in PearsonAccessnext and marked with Accommodation Code 26, Calculator and/or Arithmetic Tools, in PearsonAccessnext prior to signing into the test. The appropriate Desmos Virginia Calculator will be available on the student's toolbar during the entire test. Note, some test items will have a “no calculator icon” appearing on the screen so students with this accommodation need to be made aware before testing that they may use the calculator on the toolbar regardless of the icon. A student taking the online test is not to be issued a hand-held calculator unless the student requires a hand-held calculator as part of an accommodation for which they have been found eligible via the *Calculator Accommodation Criteria Form* and that accommodation is documented in the student’s IEP or 504 Plan.

#### Paper Test with Requirement for Calculator on Non-Calculator Items

Students with a documented need for a paper test and whose IEP/504 Plan determined eligibility, through the use of the *Calculator Accommodation Criteria Form*, to use calculators on sections of the paper Grades 3-8 MathematicsGrowth Assessments or Grades 3-7 SOL Mathematics tests in which a calculator is not allowed may use a state-approved hand-held calculator or have access to the appropriate Desmos Virginia Calculator using the Desmos Virginia Calculator tests available in the PearsonAccessnext Training Center.

#### IEP/504 Plan Requirements

Students may take a paper test only if the student meets the criteria for a paper test as determined by the *Documentation of Need for Paper Assessment*.

For online and paper tests, the *Calculator Accommodation Criteria Form* must be used by the IEP Team/504 Committee to determine the use of a calculator and/or arithmetic tools on non-calculator items, the need for a calculator with accessibility features, and/or the use of a calculator with additional mathematical functions. This determination must be based on:

* the student’s disability in mathematics and science that impedes the student’s ability to perform mathematical calculations.
* how the additional capabilities/features, the use of a calculator and/or arithmetic tools on non-calculator items, or the use of a calculator with accessibility features will address the student’s ability to access statewide assessments beyond what the Desmos Virginia Calculator provides.

### Calculator Accommodation Criteria for Growth Assessments and Standard of Learning (SOL) Tests

Students with disabilities must be found eligible for the calculator accommodation by their IEP Team or 504 Committee using the *Calculator Accommodation Criteria Form*. The IEP Team or 504 Committee must describe the impact of the student’s disability as it relates to performing mathematical computations to access state assessments and explain how the accommodation must go beyond the capabilities and features of the Desmos Virginia Calculator to provide access to state assessments.

Calculator accommodation determination is made in the following areas:

* additional mathematical capabilities/features;
* use of calculator and/or arithmetic tools on non-calculator test items; and
* accessibility features for calculator use.

***Note:*** See *Table 1: Calculator Accommodation for Growth and Standards of Learning (SOL) Assessments* for additional guidance on the use of the calculator on statewide assessments on pages 10-11 of this document. See *Table 2: Multiple Calculator Accommodations for Growth and Standards of Learning (SOL) Assessments* for additional guidance on the use of multiple calculator accommodations on statewide assessments on pages 12-13 of this document.

When considering the calculator accommodation for state assessments, IEP Teams/504 Committees may consider information from the following:

* *Present Level of Performance (PLOP) -* provides a summary of baseline information that indicates the student’s academic achievement, identifies current functional performance, and provides an explanation of how the disability effects the student’s involvement/progress in participating in the general curriculum.
* *Classroom Observations/Student Data -* can help determine details about the student’s disability and the supports needed to access grade-level content in instruction and assessments. IEP Teams/504 Committees can review the essential skills in grade-level mathematics and science content that are primarily affected by the student’s disability.
* *Assessment History* - can provide valuable information on what the student should know and be able to do in mathematics. Review of informal classroom assessments, previous division and statewide assessments, and criterion-based evaluations can provide meaningful information regarding how the student’s disability impacts their ability to perform mathematical computations.

#### Calculators with Additional Mathematical Capabilities/Features

A calculator with additional mathematical capabilities/features is a calculator with mathematical capabilities/features that go beyond those available on the corresponding Desmos Virginia Calculator and are designed to accommodate a student’s disability.

A hand-held calculator with additional mathematical capabilities/features is allowed if the additional mathematical capabilities/features are required to access statewide assessments and are directly related to the student’s disability in performing mathematical calculations. The IEP Team/504 Committee must use the *Calculator Accommodation Criteria Form* to identify and describe how the student's disability impedes the student's ability to perform mathematical calculations and how the additional mathematical capabilities/features address the student’s ability to access statewide assessments while going beyond the capabilities/features of the Desmos Virginia Calculator. The justification statement required in the *Calculator Accommodation Criteria Form* must clearly describe the challenges that impact the student’s disability and the need for additional mathematical capabilities/features.

A hand-held calculator with additional capabilities/features is NOT allowed if:

* it is not related to the student’s disability.
* it provides an unfair advantage to the student.
* it is being provided to enhance student performance.
* it is being provided to compensate for below-grade-level mathematics skills.

#### Mathematical Capabilities for Calculators

The following charts provide help to identify the mathematical capabilities of the Desmos Virginia Four-Function and Desmos Virginia Scientific Calculators provided with Growth Assessments and SOL tests. Any mathematical capabilities/features beyond those provided on the charts are considered additional mathematical capabilities/features. If a student requires the use of a hand-held calculator, calculator application, or software that goes beyond what the Desmos Virginia Calculator provides, a Special Assessment Accommodation Request and the *Calculator Accommodation Criteria Form* for the hand-held calculator, application, or software must be submitted to the Office of Student Assessment.

Four-Function Calculators: The following features and capabilities are approved for four-function calculators used for state assessments, although not all four-function calculators will include all of these features.

| **Approved Mathematical Features/Capabilities** |
| --- |
| * Single line or multi-line display
 |
| * Add (+), Subtract (-), Multiply (x), Divide (÷)
 |
| * Square Root ($\sqrt{}$)
 |
| * Parenthesis ()
 |

Scientific Calculators: The following features and capabilities are approved for scientific calculators used for state assessments, although not all scientific calculators will include all of these features.

| **Approved Mathematical Features/Capabilities** |
| --- |
| **General Features:** |
| * Single line or multi-line display
 |
| * QWERTY keyboard
 |
| * Horizontal fraction bar (This feature displays a “stacked” fraction where the numerator appears over the denominator. This does not provide decimal-to- fraction conversion.)
 |
| * AOS: (Algebraic Operating System)
 |
| * Fixed Decimal Capabilities
 |
| * Scientific Notation (EE or EXP)
 |
| **Math Functions:** |
| * Add (+), Subtract (-), Multiply (x), Divide (÷)
 |
| * Correct Order of Operations (M, D, A, S) performed by calculator
 |
| * One constant (K)
 |
| * Parenthesis ()
 |
| * Change Sign (+/-)
 |
| * Powers of 10 (10x)
 |
| * Percent (%), Square (x²), Cube (x3), Inverse (¹/x), Raise number to a power (xˆy), Pi (π), Square Root ($\sqrt{}$), Cube Root $\sqrt[3]{}$
 |
| **Trigonometry:** |
| * Sine (sin), Cosine (cos), Tangent (tan), and Inverses (sin-1, cos-1, tan-1)
 |
| * Hyperbolic Functions (hyp)
 |
| **Statistics:** |
| * One-Variable Statistics/Two-Variable Statistics
 |
| * Combinations (nCr), Permutations (nPr), and Factorials (x!)
 |
| * Logarithm (log), Natural Log (In), Exponential (ex)
 |

#### Calculator and/or Arithmetic Tools on Non-Calculator Test Items

The use of a calculator and/or arithmetic tools on non-calculator items on a math test is intended to provide basic access to the math test. It is not intended for use by students who can complete basic computations but are below grade level in their general math knowledge. The use of arithmetic tools is intended to serve the same function as a simple calculator (e.g., four-function calculator).

A calculator and/or arithmetic tools used on non-calculator test items should be directly related to the student’s disability and required for access. The IEP Team/504 Committee must use the *Calculator Accommodation Criteria Form*, and the justification statement must clearly identify and describe the student's disability in mathematics that impedes the student's ability to perform mathematical calculations on non-calculator items and provide an explanation of how the use of a calculator and/or arithmetic tools on non-calculator items will address the student’s ability to access these items.

#### Arithmetic Tools

Arithmetic Tools are defined as arithmetic tables, arithmetic charts, or arithmetic machines that serve the same function as a four-function calculator. The range of addition, subtraction, multiplication, or division facts represented on an arithmetic table/chart/machine may vary.

*Note: If the arithmetic tool is being used as a math aid only and not functioning as a calculator, the Calculator Accommodation Criteria Form is not required, and the arithmetic tool should be documented in the student’s IEP/504 Plan and coded as Accommodation Code 19, Math Aid.*

#### Accessibility Features for Calculator Use

Calculators with accessibility features (e.g., large button, large display, audio) are allowable for students who, due to the nature of their disability, require the specific features to access the Growth Assessments or SOL tests.

The scientific calculators described below may be used by students with visual impairments, including blindness; however, the conditions described for the specific calculator must be followed during testing. A visual impairment, including blindness, means an impairment in vision that, even with correction, adversely affects a child’s educational performance. The term includes both partial sight and blindness (34 CFR §300.8(c) (13)). The term “visual impairment” does not include children who have learning problems that are primarily the result of visual-motor or perceptual deficits; although, visually impaired students may also have these additional diagnoses.

***SciPlus-3200VA and SciPlus-3300VA Scientific Calculators***

Sight Enhancement Systems, Inc., has developed two modified single-line display scientific calculators with specific model names, *SciPlus-3200VA* (large button and large screen) and *SciPlus-3300VA* (large button, large screen, and talking), that are comparable to scientific calculators on the Virginia Department of Education’s list of approved calculators for SOL tests and Growth Assessments. SciPlus calculators that do not have the letters “VA” included in the model’s name have additional mathematical capabilities and are not approved for use on state assessments.

* The *SciPlus-3200VA* and *SciPlus-3300VA* *Scientific Calculators* are comparable to other VDOE-approved scientific calculators, so if the IEP Team/504 Committee determines that the student requires the accessibility features, these calculators may be used without submitting a Special Assessment Accommodation Request. If the talking feature will be used, the student must be tested individually or use headphones/earbuds so other students are not distracted. The student’s test record should be coded with Accommodation Code 28.

***Orion TI-30XS MultiView Talking Scientific Calculator***

The *Orion TI-30XS MultiView Talking Scientific Calculator* is a modified version of the standard *TI-30XS MultiView Scientific Calculator*. The modifications are provided through an attached device with three accessible buttons controlling the speech features of the calculator. In addition to the accessibility features, this calculator has additional mathematical capabilities beyond other VDOE-approved scientific calculators that include a multi-line display with edit, cut and paste features, and fraction and (x, y) table capabilities. If the IEP Team/504 Committee determines that the student requires both the accessibility features and the additional mathematical capabilities to access the state assessment, then the calculator can be used without submitting a Special Assessment Accommodation Request and the following specific conditions must be implemented:

* If the talking feature will be used, the student must be tested individually or use headphones/earbuds so other students are not distracted.
* The student’s test record should be coded with Accommodation Code 28.

If the IEP Team/504 Committee determines that the student requires the accessibility features of the *Orion TI-30XS MultiView Talking Scientific Calculator,* but the student does not require the additional mathematical capabilities to access the state assessment, then the student may use this calculator during testing but must not use the fraction or (x, y) table keys. It is not necessary to submit a Special Assessment Accommodation Request; however, the following specific conditions must be implemented:

* If the talking feature will be used, the student must be tested individually or use headphones/earbuds so other students are not distracted.
* The test examiner and a proctor must be present during the entire test session. The test examiner will administer the assessment while the proctor will observe and verify test conditions are met including, if applicable, the requirement that the student not use the fraction and/or (x, y) table keys during the test.
* The test examiner and proctor must sign a statement verifying that the test administration was conducted according to the *School Division Personnel Test Security Agreement* and that test conditions specified in this document were met. This written verification must be retained on file and secured in the office of the Division Director of Testing until after scores have been received and verified and the school division’s Authorization to Report (ATR) is approved for that test administration.
* The student’s test record should be coded with Accommodation Codes 27 and 28.

***Orion TI-36X Scientific Calculator***

The *Orion TI-36X Scientific Calculator* is a talking scientific calculator that is comparable to other VDOE-approved scientific calculators except that it has fraction capabilities.

If the IEP Team/504 Committee determines that the student requires both the accessibility features and the additional mathematical capabilities to access the state assessment, then the calculator can be used without submitting a Special Assessment Accommodation Request. In this case, however, the following specific conditions must be implemented:

* If the talking feature will be used, the student must be tested individually or use headphones/earbuds so other students are not distracted.
* The student’s test record should be coded with Accommodation Code 28.

If the IEP Team/504 Committee determines that the student requires the accessibility features of the *Orion TI-36X Scientific Calculator*, but the student does not require the additional mathematical capabilities to access the state assessment, then the student may use this calculator during testing but must not use the fraction key. It is not necessary to submit a Special Assessment Accommodation Request; however, the following specific conditions must be implemented:

* If the talking feature will be used, the student must be tested individually or use headphones/earbuds so that other students are not distracted.
* The test examiner and a proctor must be present during the entire test session. The test examiner will administer the assessment while the proctor will observe and verify test conditions are met including, if applicable, the requirement that the student not use the fraction key during the test.
* The test examiner and proctor must sign the affidavit verifying that the test administration was conducted according to the *School Division Personnel Test Security Agreement* and that test conditions specified in this document were met. This written verification must be retained on file and secured in the office of the Division Director of Testing until after scores have been received and verified and the school division’s Authorization to Report (ATR) is approved for that test administration.
* The student’s test record should be coded with Accommodation Codes 27 and 28.

**Table 1: Calculator Accommodation for Growth and Standards of Learning (SOL) Assessments**

The following table provides additional guidance for the use of one calculator accommodation on Growth and SOL tests.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Accommodation:** | **Code** | **Availability** | **Required Forms** | **Calculator** | **Additional Notes** |
| **CACF1** | **SAAR2** |
| Calculator with Additional Mathematical Capabilities | 2728 | All Math and Science Tests | X | X | Approved Hand-Held CalculatorORCalculator App/Software | **Online and Paper Format:**An approved calculator is provided to the student and the examiner must ensure that all requirements of the Special Assessment Accommodation Request are met.  |
| Calculator with Accessibility Features | 28 | All Math and Science Tests | X |  | Approved Hand-Held Calculator | **Online and Paper Format:**An approved calculator with the appropriate accessibility feature is provided to student for use on the entire test. |
| 1Calculator Accommodation Criteria Form 2Special Assessment Accommodation Request  |
| **Accommodation:** | **Code** | **Availability** | **Required Forms** | **Calculator** | **Additional Notes** |
| **CACF1** | **SAAR2** |
| Calculator/Arithmetic Tools | 26 | Available only for Grades 3–7 Math Tests | X |  | **Online Format:**Desmos | **Online Format:**The Test Coordinator sets up Desmos to appear on the toolbar for the entire test. **PNP must be coded for the calculator to appear for every test item.**Students must ignore the "no calculator" icon when visible. |
| **Paper Format:**Approved hand-held calculator OR Desmos Calculator | **Paper Format:**An approved calculator is provided to student for use on the entire test.ORThe Test Coordinator uses the Pearson Training Center to set up a Desmos calculator test run on a student Chromebook while the student is testing on paper. The Chromebook with Desmos will only be provided for the entire test. |

1Calculator Accommodation Criteria Form

2Special Assessment Accommodation Request

**Table 2: Multiple Calculator Accommodations for Growth and Standards of Learning (SOL) Assessments**

The following table provides additional guidance for the use of multiple calculator accommodations on Growth and SOL tests.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Accommodation:** | **Code** | **Availability** | **Required Forms** | **Calculator** | **Additional Notes** |
| **CACF1** | **SAAR2** |
| Calculator with Additional Mathematical Capabilities **AND** Calculator/Arithmetic Tools | 262728 | Applicable to all Math and Science Tests | X | X | Approved Hand-Held CalculatorORCalculator App/Software | **Online and Paper Format:**An approved calculator is provided to the student and the examiner must ensure that all requirements of the Special Assessment Accommodation Request are met. |
| Calculator/Arithmetic Tools **AND** Calculator with Accessibility Features | 2628 | Applicable to all Math and Science Tests | X |  | Approved Hand-Held Calculator | **Online and Paper Format:**An approved calculator is provided to the student and the examiner must ensure that all requirements of the Special Assessment Accommodation Request are met. |
| 1Calculator Accommodation Criteria Form 2Special Assessment Accommodation Request  |
| **Accommodation:** | **Code** | **Availability** | **Required Forms** | **Calculator** | **Additional Notes** |
| **CACF1** | **SAAR2** |
| Calculator with Additional Mathematical Capabilities **AND** Calculator with Accessibility Features | 2728 | Applicable to all Math and Science Tests | X | X | Approved Hand-Held CalculatorORCalculator App/Software | **Online and Paper Format:**An approved calculator is provided to the student and the examiner must ensure that all requirements of the Special Assessment Accommodation Request are met. |
| Calculator with Additional Mathematical Capabilities **AND** Calculator/Arithmetic Tools, **AND** Calculator with Accessibility Features. | 262728 | Applicable to all Math and Science Tests | X | X | Approved Hand-Held CalculatorORCalculator App/Software | **Online and Paper Format:**An approved calculator is provided to the student and the examiner must ensure that all requirements of the Special Assessment Accommodation Request are met.  |

1Calculator Accommodation Criteria Form

2Special Assessment Accommodation Request

### Sample Justification Statements for the Calculator Accommodation Criteria Form

#### *The following samples are offered only as examples and do not represent an exhaustive list of potential disabilities or justification statements.*

#### Sample A: Additional Mathematical Capabilities/Features

Alison will participate in the grade 6 mathematics SOL test this spring. Alison has an abstract reasoning deficit and conceptual misunderstandings of skills which specifically impede her ability to understand fractions and relevant information needed to solve word problems. She has difficulty with applying the correct procedures and rules for problem solving. When ordering fractions, Alison has a difficult time with the relationship between the numerator and denominator and understanding that the larger the denominator, the smaller the fractional parts. She has consistent difficulties finding the common denominator when adding and subtracting fractions. When subtracting fractions, she subtracts the smaller numerator from the larger denominator. When multiplying fractions, she does well multiplying fractions but struggles with simplifying when appropriate. She experiences extreme difficulty with dividing fractions and becomes lost with switching the operation from division to multiplication and then inverting the second fraction (reciprocal). She will often flip the first fraction, or flip both fractions, and then multiply. When given a word problem, she has difficulty translating the information in the word problem into a mathematical equation to solve. Alison becomes frustrated when trying to determine how to put the numbers in the correct order in a problem and when trying to determine the correct operation to use. If she experiences a word problem that includes fractions, it becomes very frustrating for her to differentiate information that is relevant from information that is irrelevant in the problem.

Alison uses the fraction key on the TI-30Xa calculator for instruction and classroom quizzes and tests to assist her when computing with fractions having like and unlike denominators. When provided with the fraction key on classroom quizzes and tests, she accurately demonstrates understanding of the mathematical procedures necessary to solve the problems. The use of the fraction key on the TI-30Xa calculator will provide access to the SOL mathematics test by eliminating the confusion and consistent difficulties that occur when solving problems that involve fractions.

#### Sample B: Calculator and/or Arithmetic Tools on Non-Calculator Test Items

Joey will be participating in the grade 4 mathematics SOL test this spring. Joey’s disability includes a visual-spatial deficit and memory deficit. His visual-spatial deficit interferes with his ability to perform math problems correctly. He often misaligns numbers in columns for calculations and has difficulty with place value. When given a problem like 65 + 5, he will add all numbers together, not understanding the values of the ones and tens columns; thus, 65 + 5 becomes 16 instead of 70. He often writes his answers in reverse, so the value of 12 + 6 is written as 81 instead of 18. If given a double-digit subtraction problem, whether the greater number is at the top or bottom, he subtracts the lesser number from the greater number, as with single-digit subtraction. Joey’s memory deficit interferes with his ability to recall procedures and rules for solving problems. When adding, subtracting, or multiplying, he often forgets to regroup to the ten’s place. When given a two-digit or three-digit problem, he will add, subtract, and multiply the ones column correctly, but he will forget to regroup to the tens column and will add the tens column as a single-digit problem. He often misidentifies operational signs and will identify the division sign as an addition sign.

Joey uses the TI-108 hand-held calculator for instruction, classroom quizzes, and tests to assist with computation and calculations. When provided with this calculator he can perform his math calculations without misaligning numbers in columns and minimizes his memory deficits when regrouping or writing his answers. The use of the state-approved hand-held calculator on non-calculator test items will give Joey access to the SOL test and will address frustration and confusion with calculations that relate to his visual-spatial and memory deficits.

#### Sample C: Accessibility Features for Calculator Use

Riley will participate in an EOC Geometry SOL test this spring. Riley is diagnosed with an eye condition called Stargardt macular dystrophy. This eye condition impacts Riley’s central vision and color perception, making it difficult to complete detailed tasks such as reading, writing, and seeing details clearly. In mathematics, her vision is distorted and blurred, making it difficult to see text, numbers, and objects in the distance and to recognize shapes.

Riley uses the Orion TI-84 Talking Graphing Calculator during instruction and classroom assessments. The audio output on the talking graphing calculator will give Riley access to quizzes, tests, and statewide assessments because it will read aloud each number, symbol, or operation she enters to ensure she has entered numbers and operations correctly. It will also speak the answer to the problem so she can verify her answer before selecting her response on paper.

#### Sample D: Additional Mathematical Capabilities/Features, Use of Calculator on Non-Calculator Items, and Accessibility Features

Austin will participate in the grade 7 mathematics SOL test this spring. Austin is a student with low vision and has dyscalculia which directly impacts his working memory. Austin has diabetic retinopathy. He has floating spots in his vision that come and go making it difficult for him to make out images, shapes, and numbers. In mathematics, the deficit in his working memory prevents him from performing accurate math calculations, prohibits his ability to reason and problem solve, or perform basic math calculations due to a loss of information. Austin struggles with processing numbers and quantities. For example, he cannot connect a number to the quantity it represents (the number 4 to four blocks). Austin struggles with recalling basic math facts and makes errors by performing the incorrect operation when adding, subtracting, multiplying, or dividing numbers. When asked to express nine hundred seventy-four as a number, Austin’s response is 90074 instead of 974. With word problems, Austin has difficulty in identifying the type of problem he is being asked to solve and struggles to identify the relevant pieces of information needed and a strategy for solving the problem. Given his disability, Austin has difficulty comparing and explaining fractions and understanding that the numerator and denominator have different meanings.

Austin uses a TI-30XS Talking Scientific Calculator for instruction and classroom assessments. The audio output on the talking scientific calculator gives Austin access to quizzes, tests, and statewide assessments because it will read aloud each number, symbol, or operation he enters to ensure has entered numbers and operations correctly. Additionally, it has the fraction key to assist Austin with solving problems with fractions. Austin uses this talking calculator due to his loss of working memory, which allows him to demonstrate his ability to solve mathematical problems.