



ALPHA PLUS

Math K-8



SUCCESS **OAS**
with

Oklahoma Academic Standards

Success with OAS Mathematics

published by
Alpha Plus Educational Systems,
Oklahoma City, OK

Written by
Oklahoma teachers,
for Oklahoma
teachers!

Alpha Plus Legacy: Curriculum Workbooks

Prepare to
PASS
Priority Academic Success Skills
Algebra I

Algebra I

Prepare to
PASS
Priority Academic Success Skills
Reading

3rd Grade

- Student workbooks originally published by Alpha Plus in the 1990s as a means to an end: **improving student mastery of PASS standards.**
- *Prepare to PASS* became a staple of teachers using the Alpha Plus model.
- When Oklahoma Academic Standards (OAS) were adopted in 2016, teachers began asking for new “Prepare to PASS” books.

Alpha Plus Evidence of Effectiveness

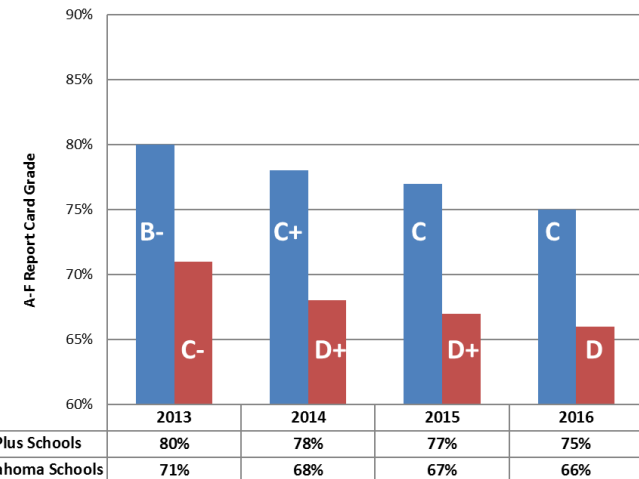
OKLAHOMA SCHOOL TESTING PROGRAM, 2017

OSTP AVERAGES BY GRADE LEVEL - ALL SCHOOLS COMPARED TO SCHOOLS USING ALPHA PLUS MODEL TOOLS IN 2016-17

Schools/Group	MATH Valid N	MATH Percent of Students Proficient & Above	ELA Valid N	ELA Percent of Students Proficient & Above
State Gr. 3	52537	44%	52431	39%
Alpha Plus Gr. 3	3061	51%	3059	46%
State Gr. 4	51208	41%	51115	37%
Alpha Plus Gr. 4	2815	48%	2814	44%
State Gr. 5	49241	35%	49155	40%
Alpha Plus Gr. 5	2620	46%	2611	45%
State Gr. 6	46647	35%	46540	40%
Alpha Plus Gr. 6	2142	43%	2145	44%
State Gr. 7	48192	34%	48107	34%
Alpha Plus Gr. 7	2135	40%	2137	39%
State Gr. 8	47965	22%	47965	34%
Alpha Plus Gr. 8	2159	28%	2156	38%
State Valid N Math:	295,790	State Valid N ELA:	295,313	
Alpha Valid N Math:	14,932	Alpha Valid N ELA:	14,922	

SOURCE: Oklahoma State Department of Education OSTP Assessment Results 2017; Reporting Level: Site and District; Subgroups: None; Date Finalized: Nov. 21, 2017. URL accessed 12-08-17 at <http://sde.ok.gov/sde/assessment-administrator-resources-administrators#ostptable>. Alpha Plus average is for schools using Alpha Plus tools in 2016-17. Call (405) 842-8408 for list of schools.
© 2018 Alpha Plus Educational Systems

Average A-F Report Card Grades for Alpha Plus & Oklahoma Schools



SOURCE: Oklahoma State Department of Education A-F Report Cards state spreadsheet accessed in November 2016, and "2016 A-F Report Card Data" in February 2017 at <http://sde.ok.gov/sde/af-grades>. Oklahoma had nearly 1,800 schools in 2015-16; Alpha Plus was used by 73 schools that also utilized professional development or had participated in job-embedded, data-driven PD in the past.

All Alpha Plus tools align to OAS



Oklahoma Academic Standards for Mathematics 4th Grade (4)

Develop a Deep and Flexible Conceptual Understanding

Develop Accurate and Appropriate Procedural Fluency

Develop Strategies for Problem Solving

Develop Mathematical Reasoning

Develop a Productive Mathematical Disposition

Develop the Ability to Make Conjectures, Model, and Generalize

Develop the Ability to Communicate Mathematically

OKLAHOMA SCHOOL TESTING PROGRAM TEST BLUEPRINT MATHEMATICS GRADE 4

This blueprint describes the content and structure of an assessment and defines the ideal number of test items by strand and standard of the Oklahoma Academic Standards (OAS).

IDEAL PERCENTAGE OF ITEMS	IDEAL NUMBER OF ITEMS	STRANDS AND STANDARDS
44%	22	NUMBER AND OPERATIONS 4.N.1 Number Operations 4.N.2 Rational Numbers (10) 4.N.3 Money (3)
16%	8	ALGEBRAIC REASONING AND ALGEBRA 4.A.1 Numerical Patterns (4) 4.A.2 Equations (4)
28%	14	GEOMETRY AND MEASUREMENT 4.GM.1 Polygons and Polyhedra 4.GM.2 Measurement (5)

- 4.N.1 Solve real-world and mathematical problems using multiplication and division.
- 4.N.1.1 Demonstrate fluency with multiplication and division facts with factors up to 12.
- 4.N.1.2 Use an understanding of place value to multiply or divide a number by 10, 100 and 1,000.
- 4.N.1.3 Multiply 3-digit by 1-digit or 2-digit by 2-digit whole numbers, using efficient and generalizable procedures and strategies, based on knowledge of place value, including but not limited to standard algorithms.

OKLAHOMA SCHOOL TESTING PROGRAM TEST BLUEPRINT AND ITEM SPECIFICATIONS MATHEMATICS 2016-2017 | 2017-2018 GRADE 4

OAS STRAND—NUMBER & OPERATIONS (N)

OAS STANDARD	OAS OBJECTIVES	ITEM SPECIFICATIONS
4.N.1	Solve real-world and mathematical problems using multiplication and division.	
4.N.1.1	Demonstrate fluency with multiplication and division facts with factors up to 12.	
4.N.1.2	Use an understanding of place value to multiply or divide a number by 10, 100, and 1,000.	
4.N.1.3	Multiply 3-digit by 1-digit or a 2-digit by 2-digit whole numbers using efficient and generalizable procedures and strategies, based on knowledge of place value, including but not limited to standard algorithms.	
4.N.1.4	Estimate products of 3-digit by 1-digit or 2-digit by 2-digit whole numbers using rounding, benchmarks, and place value to assess the reasonableness of results. Explore larger numbers using technology to investigate patterns.	
4.N.1.5	Solve multi-step, real-world, and mathematical problems requiring the use of addition, subtraction, and multiplication of multi-digit whole numbers. Use various strategies, including the relationship between operations, the use of appropriate technology, and the context of the problem to assess the reasonableness of results.	
4.N.1.6	Use strategies and algorithms based on knowledge of place value, equality, and properties of operations to divide 3-digit dividend by 1-digit whole number divisors (e.g., mental strategies, standard algorithms, partial quotients, repeated subtraction or the commutative, associative, and distributive properties).	
4.N.1.7	Determine the unknown addend or factor in equivalent and non-equivalent expressions (e.g., $5 + 6 = 4 + \square$, $3 \times 8 < 3 \times \square$).	
	Emphasis:	
	<ul style="list-style-type: none"> Demonstrate fluency with multiplication and division facts. Use the concept of place value to multiply or divide. Multiply 3-digit by 1-digit or a 2-digit by 2-digit whole numbers. Estimate products of 3-digit by 1-digit or 2-digit by 2-digit whole numbers. Solve multi-step, real-world, and mathematical problems requiring the use of addition, subtraction, and multiplication of multi-digit whole numbers. Divide 3-digit dividends by 1-digit whole number divisors. Determine the value of an unknown addend or factor in equivalent and non-equivalent expressions. 	
	Stimulus Attributes:	
	<ul style="list-style-type: none"> Test items may include tables, pictures, charts, counters, base-10 blocks, manipulatives, and other manipulatives. 	



4th Grade CROSSWALK for the Oklahoma Academic Standards for Mathematics Developed in collaboration with Think Through Math & the Network of Oklahoma Mathematics Consortia

4 th Grade Crosswalk				Notes
Oklahoma Academic Standards and Objectives	Related	Expanded	New	
Numbers and Operations (N)				
4.N.1 Solve real-world and mathematical problems using multiplication and division.				
4.N.1.1 Demonstrate fluency with multiplication and division facts with factors up to 12.	X			• See PASS 4.2.2.b.i and 3.2.2.b.ii
4.N.1.2 Use an understanding of place value to multiply or divide a number by 10, 100 and 1,000.			X	• New
4.N.1.3 Multiply 3-digit by 1-digit or 2-digit by 2-digit whole numbers, using efficient and generalizable procedures and strategies, based on knowledge of place value, including but not limited to standard algorithms.	X			• See PASS 4.2.2
4.N.1.4 Multiply 3-digit by 1-digit or 2-digit by 2-digit whole numbers, using efficient and generalizable procedures and strategies, based on knowledge of place value, including but not limited to standard algorithms.				• See PASS 4.2.2

Introducing: *Success with OAS Mathematics*

K-8 math series on state-adopted textbook list with OAS lesson plans using research-based elements of instruction:

Real-World Connections

Modeling / Guided Practice

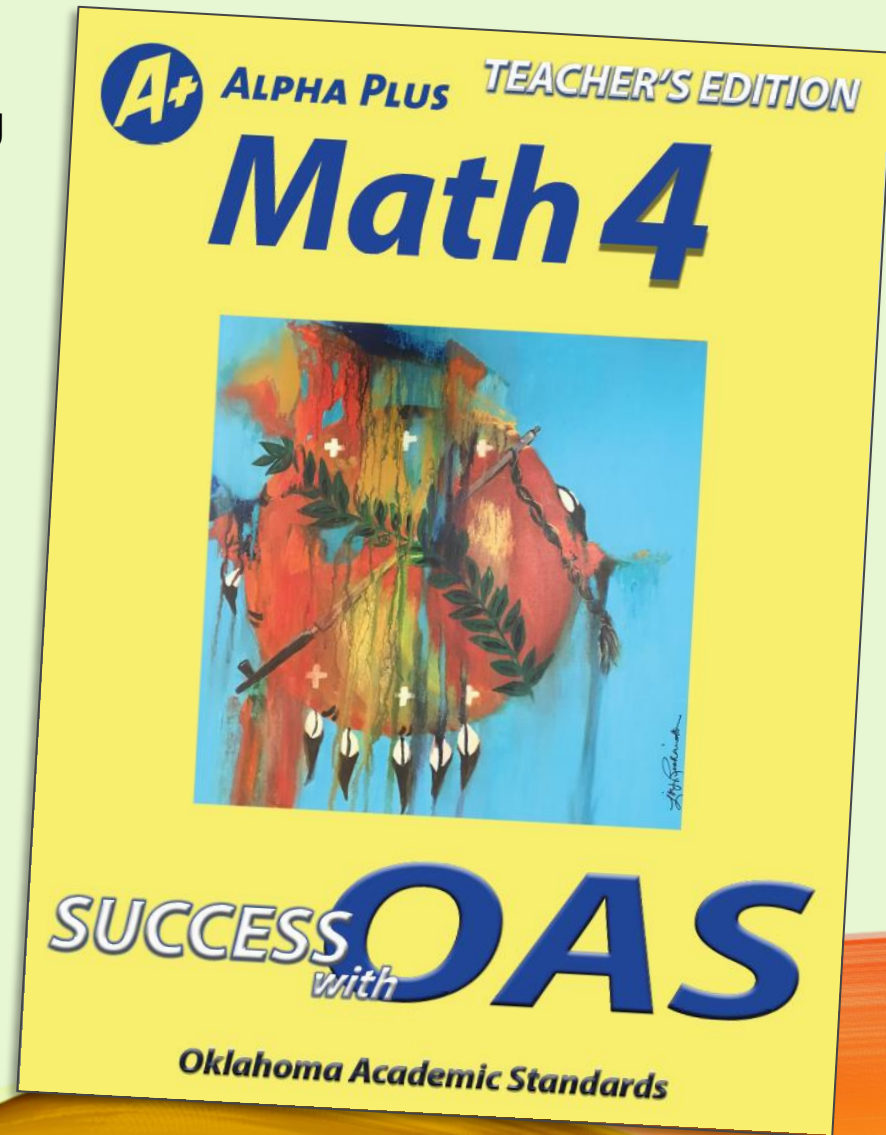
Vocabulary

Independent Practice

Continuous Review

Extension Activities

Teacher Guide with summative assessment and math facts worksheets



Success with OAS is structured differently than national textbooks.

- Organized by OAS Objective
- Ordered according to suggested curriculum map (Alpha Plus Pacing Calendar)
- Objectives detailed in Table of Contents and in each lesson (both teacher guides and student books)

Order	Strand Number	Strand Description
1	4.GM.1.1	Identify points, line segments, rays, angles, endpoints, and parallel and perpendicular lines in various contexts.
2	4.GM.1.2	Describe, classify, and sketch quadrilaterals, including squares, rectangles, trapezoids, rhombuses, parallelograms, and kites. Recognize quadrilaterals in various contexts.
3	4.GM.1.3	Given two three-dimensional shapes, identify similarities, and differences.
4	4.GM.2.1	Measure angles in geometric figures and real-world objects with a protractors or angle ruler.
5	4.GM.2.2	Find the area of polygons that can be decomposed into rectangles.
6	4.GM.2.3	Using a variety of tools and strategies, develop the concept that the volume of rectangular prisms with whole-number edge lengths can be found counting the total number of same-sized unit cubes that fill a shape without gaps or overlaps. Use appropriate measurements such as cm^3 .
7	4.GM.2.4	Choose an appropriate instrument and measure the length of an object to the nearest whole centimeter or quarter-inch.
8	4.GM.2.5	Solve problems that deal with measurements of length, when to use liquid volumes, when to use mass, temperatures above zero and money using addition, subtraction, multiplication, or division as appropriate (customary and metric).
9	4.GM.3.1	Determine elapsed time.
10	4.GM.3.2	Solve problems involving the conversion of one measure of time to another.
11	4.N.1.1	Demonstrate fluency with multiplication and division facts with factors up to 12.
12	4.N.1.2	Use an understanding of place value to multiply or divide a number by 10, 100, and 1,000.
13	4.N.1.3	Multiply 3-digit by 1-digit or 2-digit by 2-digit whole numbers, using efficient and generalizable procedures and strategies, based on knowledge of place value, including but not limited to standard algorithms.

29

4.A.1.3

Create growth patterns involving geometric shapes and define the single operation rule of the pattern.

Teacher's Guide

4.A.1.3 Create growth patterns involving geometric shapes and define the single operation rule of the pattern.

Teacher's Guide

- How to connect each objective in context of the lives of students
- Key vocabulary words from state standards, item specs
- Step-by-step suggestions on how to teach each objective

Real-World Connections

Geometric patterns are shapes that we see every day, such as in decorative borders. The Real-world Connection in the student book is an example of using patterns to form a border. Geometric shapes build into patterns, repeating shapes become patterns. Numerical patterns come from a series of numbers that have a repeating value. For example, if you started with the number two and added two for the pattern you would create the pattern 2, 4, 6, 8, 10, 12, and so on.

Vocabulary

geometric pattern, geometric shapes, numerical patterns

Modeling

Step 1: Discuss a pattern with shapes.

A pattern can be designed that is repeated, a sequence that recurs, or an ordered set of numbers or shapes arranged according to a rule.

What comes next in pattern 1?

Pattern 1:



Because the order of the shapes keeps repeating, it is easy to see that a triangle and then a circle come next.

Step 2: Discuss patterns and rules.

What comes next in pattern 2?

Pattern 2:



Student book

- Starts with real-world context to lesson
- Key vocabulary words defined in lesson and in glossary at back
- Guided Practice examples - integral to classroom discussion - provide models to use when students complete Independent Practice items

Guided Practice

Name: _____

4.A.1.3 Create growth patterns involving geometric shapes and define the single operation rule of the pattern.

Real-World Connections

It was Melanie's grandmother's birthday on Sunday and Melanie wanted to make her grandma a card. She decided that her front cover needed a border, so she started drawing shapes around the edge. She started with a square, next she drew two circles. Then she drew three triangles, and finally came a star. She decided to continue the pattern until she bordered the front cover. Halfway through her pattern, her mother called her to eat supper. She left after drawing two triangles. What shape and how many did she need to place on the border to continue the pattern?

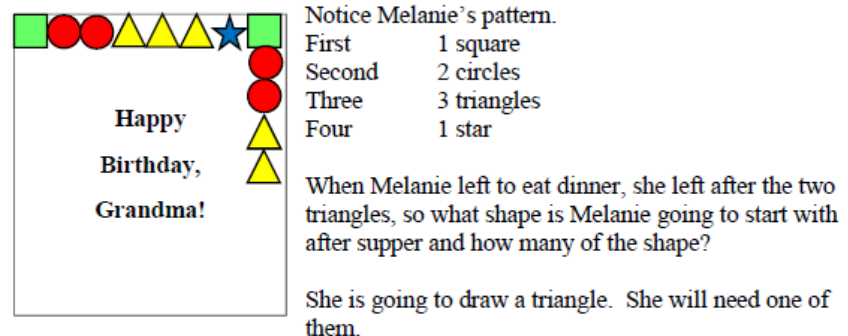
Vocabulary

geometric pattern	a pattern that is repeated using geometric shapes, like wallpaper or wrapping paper
geometric shape	shape made up of a set of points or vertices and lines connecting the points in a closed chain, as well as the resulting interior points
numerical pattern	a sequence or arrangement with some rule that determines the next term in the sequence

Examples

In order to determine geometric shape patterns, you need to look at the shapes carefully and notice what order they are placed in to see what comes next.

Look at Melanie's card.



Notice Melanie's pattern.

First	1 square
Second	2 circles
Three	3 triangles
Four	1 star

When Melanie left to eat dinner, she left after the two triangles, so what shape is Melanie going to start with after supper and how many of the shape?

She is going to draw a triangle. She will need one of them.

Guided Practice (4.A.1.3)

Name: _____

Answer the following questions.

7. Draw a picture of the next growing pattern.



Answer: _____

8. Draw a picture of the next growing pattern.



Answer: _____

Draw the next pattern with the given rule.

9.



IN



Rule: Multiply by 5

OUT

Independent Practice (4.A.1.3)

Name: _____

Answer the following questions.

13. Draw a picture of the next growing pattern.



Answer: _____

14. Draw a picture of the next growing pattern.



Answer: _____

15. Draw a picture of the next growing pattern.



Answer: _____

16. Draw a picture of the next growing pattern.

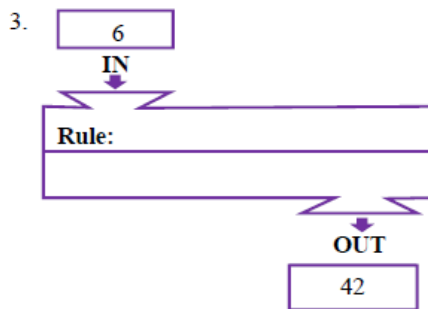
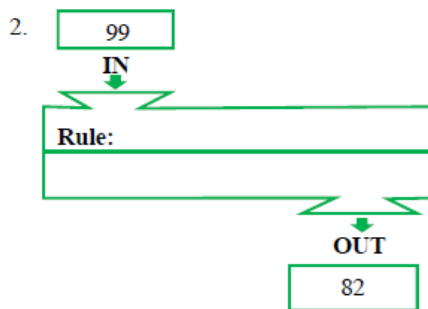
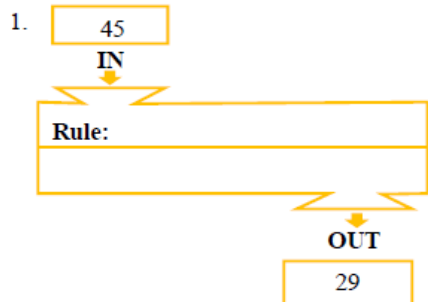


Answer: _____

Continuous Review (4.A.1.3)

Name: _____

For questions 1 through 3, determine the rule for the function machine.



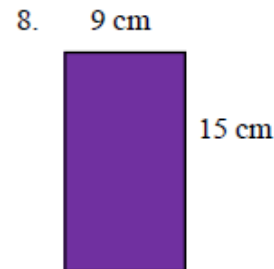
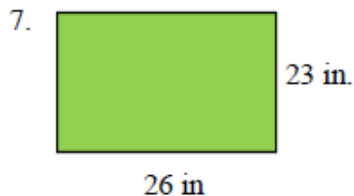
For questions 4 through 6, determine the missing addend or factor to make the numerical statement true.

4. $7 + 6 = \underline{\quad} + 9$ 5. $4 \times 3 > 5 \times \underline{\quad}$ 6. $23 + 2 = 5 \times \underline{\quad}$

Continuous Review (4.A.1.3)

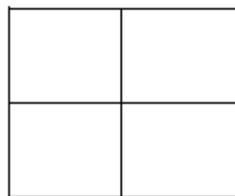
Name: _____

For question 7 and 8, find the area of each shape (hint: $A = L \times W$)



For question 9 and 10, multiply each problem.

9. 91×37



10. 356×7



Continuous Review

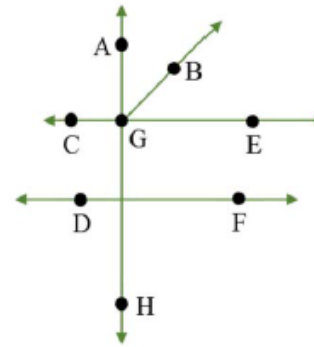
- | | | |
|------------|-----|-------------------------|
| (4.A.1.2) | 1. | Subtract 16 |
| (4.A.1.2) | 2. | Subtract 17 |
| (4.A.1.2) | 3. | Multiply by 7 or add 36 |
| (4.N.1.7) | 4. | 4 |
| (4.N.1.7) | 5. | 0, 1, 2 |
| (4.N.1.7) | 6. | 5 |
| (4.GM.2.2) | 7. | 598 in^2 |
| (4.GM.2.2) | 8. | 135 cm^2 |
| (4.N.1.3) | 9. | 3,367 |
| (4.N.1.3) | 10. | 2,492 |

Comprehensive assessment

- Stand-alone summative assessment
- Comparable to state test in content, format, emphasis
- Different items than summative in Alpha Plus Online
- Can be used as pre- and post-test for course

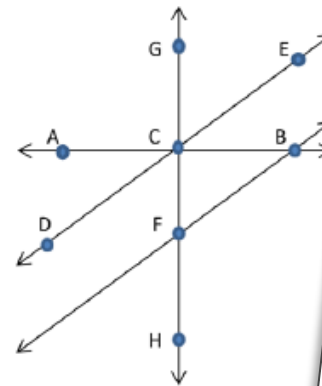
1. Choose the correct letter that represents two lines.

- A \overline{CG} and \overline{GE}
- B \overline{DF} and \overline{GB}
- C \overline{GB} and \overline{GA}
- D \overline{AH} and \overline{DF}



2. Name the set of lines that make perpendicular lines.

- A \overline{AB} and \overline{GH}
- B \overline{AC} and \overline{AB}
- C \overline{DE} and \overline{FB}
- D \overline{AB} and \overline{DE}



3. A shape with 4 sides that must include one pair of parallel sides

- A Rhombus
- B Parallelogram
- C Triangle
- D Trapezoid

Answer Key

4th Grade

(4.GM.1.1)	1.	D
(4.GM.1.1)	2.	A
(4.GM.1.2)	3.	D
(4.GM.1.3)	4.	C
(4.GM.1.3)	5.	C
(4.GM.2.1)	6.	B
(4.GM.2.2)	7.	B
(4.GM.2.3)	8.	C
(4.GM.2.3)	9.	D
(4.GM.2.4)	10.	C
(4.GM.2.5)	11.	A
(4.GM.3.1)	12.	D
(4.GM.3.1)	13.	A
(4.GM.3.2)	14.	B
(4.GM.3.2)	15.	C
(4.N.1.1)	16.	C
(4.N.1.1)	17.	A
(4.N.1.2)	18.	B
(4.N.1.2)	19.	A
(4.N.1.3)	20.	B
(4.N.1.3)	21.	B
(4.N.1.4)	22.	C
(4.N.1.4)	23.	C
(4.N.1.5)	24.	A
(4.N.1.5)	25.	D
(4.N.1.6)	26.	B
(4.N.1.6)	27.	C

Alpha Plus provides:

- Lesson-plan content aligned to state standards
- Assessments that measure mastery
- Powerful data for decision-making

Alpha Plus tools give educators more time to teach.



Alpha Plus has developed successful methods and curricula that have been improving student achievement since 1992.

Written by Oklahoma teachers for Oklahoma teachers, *Success with OAS* is a vital part of the Alpha Plus “Way to an A.”

- Jan Barrick

Chief Executive Officer
Alpha Plus Systems, Inc.



ALPHA PLUS
Educational Systems, Inc.

3315 NW 63rd Street, Oklahoma City, OK 73116
405-842-8408 www.alphaplus.org