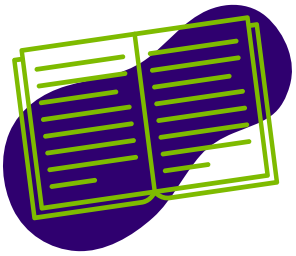
Algebra 1

Curriculum Sample

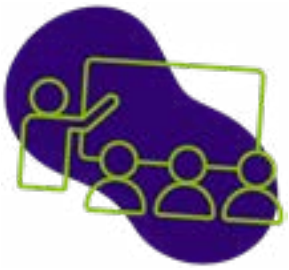
A Grade Ahead will challenge your students and help them achieve their goals!

This school year, our academy's Algebra 1 students may be participating in A Grade Ahead's Traditional program, which is completed totally on pencil and paper, or the Blended Learning program, which integrates both traditional and electronic methods to teach students. To determine your program option, please contact your local academy, or go to www.agradeahead.com.



Monthly Booklet

Each month, students receive a monthly booklet that is split into four weeks of lessons and practice problems.
(At the end of this document, you will find a partial sample with some practice questions from A Grade Ahead's Algebra 1 curriculum.)



Weekly Class

Each week, students attend a weekly class, either in person or via an online platform, and learn a lesson from a teacher. Together, the class completes practice problems to understand the weekly topic.

Register today! Visit academy.agradeahead.com to find your local academy.

A Grade Ahead's rigorous, year-round enrichment program will challenge your child with a higher academic standard. The Algebra 1 curriculum incorporates built-in math fluency with monthly curriculum topics.

As part of your student's monthly booklet, your student will receive weekly:

- **Student Goals** that explain what your child should know by the end of the week.
- **ABC Word Boxes** that define terms to know.
- **Sample/Practice Problems** to try as part of an in-class lesson.
- **Teaching Tips** for parents to review if your child forgets something later.
- **Examples** with lots of details and explanations.

Homework

In the Traditional Program, students have everything they need to participate in class and complete homework in their monthly booklets: examples, three days of homework, and detailed answer keys.

In the Blended Program, students complete homework at A Grade Ahead Online. This offers many benefits to students and parents, including interactive and colorful questions, automatic grading, rationales for every question, progress reports, and adaptive learning paths.

Want to see how A Grade Ahead works first-hand?

We have attached a sample lesson with practice questions for you to print out and try.

Register today! Visit academy.agradeahead.com to find your local academy.

agradeahead™

Sample of Monthly Booklet

Algebra 1

Print it out and try it!

Order of Operations

Teaching Tip: *Students should already be familiar with PEMDAS. Emphasize concepts using different examples. It is ok if the lesson goes quickly because some problems in the indices may take longer than usual.*

Student Goals:

- ✓ I will be able to solve expressions by following the rules of PEMDAS.
- ✓ I will be able to write an expression that follows the rules of PEMDAS.
- ✓ I will be able to reverse PEMDAS to solve simple variable equations.

Converting Decimals, Fractions, and Percents Review

Teaching Tip: *This section is provided as a resource for students in case they need to refresh on any processes. Explain processes only for areas where students show confusion during the PEMDAS examples or the indices.*

A. Decimals to Fractions

There are two kinds of decimals that are *rational*: Terminating and Repeating. Terminating decimals end at some point while repeating decimals repeat the same sequence of numbers on to infinity. Zeroes at the end of a decimal do not change the value of the decimal; you can add or drop as many zeroes as you like. For example, 1.000 = 1.

Rational decimals are decimals that can be written as fractions of integers.

To convert terminating decimals to fractions, imagine that the decimal is the numerator of a fraction whose denominator is 1. Multiply the top and bottom by a multiple of 10 that will eliminate the decimal point. Then, simplify.

Example: Turn 0.35 into a fraction.

0.35 has 2 decimal places, so remove the decimal and place 35 over 100.

$\frac{35}{100}$ can be simplified because both 35 and 100 can be divided by 5, which gives you $\frac{7}{20}$

Example: Convert 6.115 to a fraction.

6.115 has 3 decimal places, so remove the decimal and place 6115 over 1000.

$\frac{6115}{1000}$ has 6 thousands in it, so this can be written as a mixed fraction $6\frac{115}{1000}$

115 and 1000 are both divisible by 5, so the fraction reduces to $6\frac{23}{200}$

Note: Remember that the first place of a decimal is the tenths' place, the second is hundredths', and so on. This literally tells you what the denominator of the fraction will be. This system is helpful in converting fractions to decimals, as well.

B. Fractions to Decimals

To convert fractions to decimals, multiply the numerator and denominator by a number that makes the denominator a multiple of 10. Then, move the decimal point in the numerator to the left one place for each 0 after the 1.

Example: Convert $\frac{3}{60}$ into a decimal.

$\frac{3}{60} = \frac{1}{20}$ Reduce the fraction if possible.

$\frac{1 \cdot 5}{20 \cdot 5} = \frac{5}{100}$ If possible, multiply top and bottom to put the denominator 10, 100, etc.

$\frac{5}{100} = 0.05$ The 100 on the bottom means that the 5 goes in the hundredths' place. If it were a 15 in the numerator, the decimal would be 0.15

Sometimes it is not possible to find a convenient multiple of 10. In this case, one can always use long division.

Example: Convert $\frac{4}{7}$ to a decimal by dividing 4 by 7 and then rounding to 2 decimal places.

$$
\begin{array}{r}
0.571 \\
7\overline{)\,4.000} \\
\underline{-\,35} \\
50 \\
\underline{-\,49} \\
10 \\
\underline{-\,7} \\
3
\end{array}
$$
(and so on)

$\frac{4}{7} \approx 0.57$

Note: Unless otherwise specified, round to 2 decimal places.

C. Percents (%)

Percent means "per one hundred." For example, 25 percent means 25 out of 100. 25 percent is written as 25%.

Usually, a percent is a part of a whole, "whole" being 100%. If you have driven 30% of a particular distance, then 70% or (100% – 30%) is left to drive. When you complete the drive, you have driven 100% of the distance.

D. Percents and Decimals

To convert a decimal to a percent, multiply the decimal by 100 and place a percent sign (%) after the number.

Example: $0.75 = 75 \times 100\% = 75\%$

To convert a percent to a decimal, do the opposite; remove the percent sign and move the decimal point two places to the left.

Example: $20\% = 0.2$

$65\% = 0.65$

$2\% = 0.02$

E. Percents and Fractions

In order to convert fractions to percents, the fraction should first be converted to a decimal. Then convert it from a decimal to a percent.

Example: $\frac{3}{4} = 0.75 = 75\%$

To convert a percent to a fraction, remove the percent sign and write the percent as a fraction over 100. Then, simplify.

Example: $20\% = \frac{20}{100} = \frac{1}{5}$

Example: $65\% = \frac{65}{100} = \frac{13}{20}$

Student Practice

Students must show their work in the space provided

Fill in the blank with the missing conversion (Decimal, Fraction, or Percentage). Round decimals to 3 places, where possible.

1-2. **1.125 =** _____ **=** _____

3-4. _____ **=** $\frac{7}{3}$ **=** _____

5-6. _____ **=** _____ **= 58%**

7-8. _____ **=** $(\frac{12}{16} - \frac{1}{5})$ **=** _____

9-10. _____ **=** _____ **= (73% + 8%)**

11-12. **(0.607 + 0.268) =** _____ **=** _____

PEMDAS

When solving a problem that has multiple operations, you must do the problem according to the order of operations: **PEMDAS** (**P**arentheses, **E**xponents, **M**ultiplication/**D**ivision, **A**ddition/**S**ubtraction). You must complete everything within parentheses before anything outside of parentheses; after that you perform all operations involving exponents; and so on. For these problems, it is most convenient if all numbers are either in decimal form or fraction form, instead of having a mix of both in the same problem.

Example: 27 + 39 ÷ 3

Since we must divide before we add, we start with 39 ÷ 3 = 13. The new problem is 27 + 13, so the answer is 40. If you had simply gone through the problem from left to right, then you would have done 27 + 39 first and gotten a new problem of 66 ÷ 3, which equals 22. Clearly, 40 ≠ 22, which demonstrates why the order of operations is important.

Example: $4\frac{1}{2} + 3.7 - 5.13$

In this problem there are two decimals and one fraction. Because there are more decimals, it is easier to convert all of the numbers to decimals. The new problem looks like 4.5 + 3.7 – 5.13. As far as the order of operations is concerned, addition and subtraction happen at the same time. Therefore we perform the operations from left to right.

4.5 + 3.7 = 8.2
8.2 – 5.13 = 3.07

Example: $(6 - 2 \cdot 4)^2 \div 2$

Remember, parentheses come first. That means whatever is inside the parentheses must be calculated before anything outside of it. In this case, we have $6 - 2 \cdot 4$ inside the parentheses. Don't forget that order of operations still applies, and multiplication comes before addition, so we calculate $2 \cdot 4 = 8$ first. Now we have $6 - 8 = -2$.

Next comes the exponent. $(-2)^2 = (-2) \cdot (-2) = 4$
Our new problem is $4 \div 2 = 2$.
$(6 - 2 \cdot 4)^2 \div 2 = 2$.

Example: $\sqrt{54.36 - 18.36} \div 0.25$

Remember, square root comes first, so what is inside must be simplified so that the root can be found.
$54.36 - 18.36 = 36$
$\sqrt{36} = 6$
$6 \div 0.25 = 6 \div \frac{1}{4} = 6 \cdot 4 = 24$

Note: This week, the only exponents that students will be expected to use are squares and square roots, and only positive roots will be used. More exponents will be covered in Week 3.

Word problems this week will focus mainly on writing expressions that can be solved using PEMDAS. They will also utilize fractions, decimals, and percentages.

Example: For every 250 bubbles that the bubble machine blows, it uses 2 ounces of bubble solution. If the machine started with 12 ounces, and Fred spilled 7, write an expression that calculates how many bubbles the machine can make without being refilled. Then, evaluate.

Dividing 250 by 2 gives how many bubbles can be blown per ounce. 12 – 7 gives the number of ounces available after the spill. Multiply them together to get the total possible bubbles. Therefore, our expression is:

$(250 \div 2)(12 - 7)$
$(250 \div 2)(12 - 7) = 125 \cdot 5 = 625$ bubbles

Student Practice

Students must show their work in the space provided

Calculate the following using PEMDAS.

13. $(1+2\cdot7)^2-400\div16$

14. $\frac{6}{(2-4)}\cdot4+(5^2-30)\div5$

15. $(1-0.9)\cdot87-(0.52-0.82)$

16. $(24\div8)^2\div(3\cdot4-9)+(-4)^2$

17. $0.75-3\div(15-17)^2+\frac{1}{4}\cdot8$

18. $(0.26+0.54)\cdot20\div(8-4)\cdot(0.5)^2$

Student Practice

Students must show their work in the space provided

Place the parentheses in the appropriate locations to evaluate the following. If no parentheses are needed, write "none needed."

19. $5\cdot2\cdot8-1=70$

20. $5\cdot2\div8-3=2$

21. $45-6+3\cdot32\div4=63$

22. $45\div9+12\div4\cdot10+5=120$

23. $6\div12+3\div4=\frac{1}{10}$

24. $6\cdot12\div3-4=0$

Student Practice

Students must show their work in the space provided.

Make an expression. Then, evaluate. You may use a calculator.

25. At Angkor Wat in Cambodia, 13 temples have 15 statues each, 5 temples have 23 statues each, and 1 temple has 12 statues. How many statues are there in all?

26. Freida is baking cookies. On each cookie sheet, there is room for 2 rows of 4 cookies each and one row of 3 cookies. Freida baked 5 sheets of cookies. How many cookies did she make?

27. Eighty students go to lunch. $\frac{3}{10}$ of them get 2 containers of milk to drink; the rest of them get one container. How many containers of milk do they drink altogether?

28. When Mireille mows one of her neighbor's lawn, they pay her $7.25. This week, she mowed 4 neighbors' lawns. One of them gave her a $3.50 tip. How much did Mireille earn this week from mowing lawns?

Answers of Student Practice

For Questions 1-12, use the method shown in answer 1-2.

1-2) $\frac{9}{8}$; 112.5% [The fraction for 1.125 is $\frac{1,125}{1,000}$; divide both by 25 = $\frac{25}{40}$; Divide both by 5 = $\frac{9}{8}$; Given 1.125 move the decimal two places to the right to get 112.5 and add a percent sign.]

3-4) 2.333; 233.3%

5-6) 0.58; $\frac{29}{50}$

7-8) 0.55; 55% [First, subtract to get $\frac{11}{20}$]

9-10) 0.81; $\frac{81}{100}$ [First, add to get 81%]

11-12) $\frac{7}{8}$; 87.5% [First, add to get 0.875]

13) 200 $[(1 + 14)^2 – 25 = (15)^2 – 25 = 225 – 25 = 200]$

14) -13 $[(6\div(2 – 4))\bullet 4 + (5^2 – 30)\div 5 = (6\div(-2))\bullet 4 + (25 – 30)\div 5 = (-3)4 + (-5)\div 5 = -12 – 1 = -13]$

15) 9 $[(1 – 0.9)\cdot 87 – (0.52 – 0.82) = 0.1\bullet 87 – (-0.3) = 8.7 + 0.3 = 9]$

16) 19 $[(24\div 8)^2\div(3\bullet 4 – 9) + (-4)^2 = 3^2 \div(12 – 9) + 16 = 9\div 3 + 16 = 3 + 16 = 19]$

17) 2 $[0.75 – 3\div(15 – 17)^2 + (\frac{1}{4})\cdot 8 = 0.75 – 3\div(-2)^2 + 2 = 0.75 – \frac{3}{4} + 2 = 2]$

18) 1 $[(0.26 + 0.54)\bullet 20\div(8 – 4)\bullet(0.5)^2 = 0.8\bullet 20\div 4\bullet(0.25) = 16\div 4\bullet \frac{1}{4} = 4\bullet \frac{1}{4} = 1]$

19) $5\bullet 2\bullet(8 – 1) = 70$

20) $5\bullet 2\div(8 – 3) = 2$

21) none needed

22) $(45\div 9 + 12\div 4)\bullet(10 + 5) = 120$

23) $6\div(12 + 3)\div 4 = 1/10$

24) $6\bullet(12\div 3 – 4) = 0$

25) $13\bullet 15 + 5\bullet 23 + 12 = 195 + 115 + 12 = 322$ statues

26) $5(2\bullet 4 + 3) = 5(8 + 3) = 5(11) = 55$ cookies

27) $2(\frac{3}{10})(80) + 1(\frac{7}{10})(80) = 2(24) + 1(56) = 48 + 56 = 104$ containers of milk

28) $(4\bullet 7.25) + 3.5 = 29 + 3.5 = \$32.50$

Head online to complete all days of the course:

GRDA1: Order of Operations (W1)

Now, more than ever, kids need supplemental education!

A Grade Ahead makes it easy for you to help your students get caught up—and even stay ahead of—their peers. Our students are top performers at the heads of their classes who get into Ivy League schools and perform well on standardized tests. They reach their goals of becoming doctors, engineers, and other well-paid professionals.

Check out your academy's home page for pricing and more details at academy.agradeahead.com.

Why A Grade Ahead?

1. Our curriculum is outstanding, with clear lessons and homework activities that are challenging and interesting. They are not boring and repetitive like some other programs.
2. Our parents love us, with more than 90% referring us to their friends and families year after year. See what real parents are saying in "Our Results".
3. Our small group classes are like tutoring, only better.
4. It's cost–effective. Unlike private tutoring, A Grade Ahead's classes are affordable and provide a fun environment to learn.

Is your student ready to join the 34,600 other students who have benefited from our pragmatic, effective approach?

Register today to see what A Grade Ahead can do for your family.

Register today! Visit academy.agradeahead.com to find your local academy.