Intermediate Mathematics

Lessons 1–20

Succeed in School

1

Student

Welcome

Welcome to Succeed in School. The Succeed in School classes will help you improve your mathematics and English skills. They will also help you learn how to study for your exams.

In the lessons, you will be taught new words that will help you talk about mathematics and solve mathematics problems. In class, we will talk about the problems we are trying to solve. Sometimes we will talk in large groups. Other times you will talk with one other person or in a small group.

Sometimes it may be easy for you to understand new things and to share what you are learning. Other times you may not understand what you are learning, or you might make mistakes. That is OK. Do not be afraid to make mistakes. Please do not make others feel sad or embarrassed when they make mistakes. We learn and grow through the mistakes we make.

It is important for you to try to be in class every day so that you learn new things. Try to come to class on time so that there is enough time for all the fun activities we will do in class. Come to class ready to learn.

You will use your workbook every day in class. Your teacher will tell you when to work on each problem so that the whole class is working on the same problems at the same time.

Each student workbook has 20 lessons. After you finish each workbook in class, you may take it home. Please share what you have learned with your family. You can practice mathematics facts and share ways to solve problems with them. They may be excited to see what you have learned.

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Contents

Class Rules

Be Responsible	Be Respectful	Be Ready
▪ Arrive on time. ▪ Stay on task. ▪ Follow instructions. ▪ Help clean up.	▪ Listen to others. ▪ Use kind words; do not tease. ▪ Do not distract others.	▪ Bring enough work to do. ▪ Bring and share resources. ▪ Ask for help. ▪ Help others.

Equations and Formulas

Use this page to write important equations and formulas that you learn about. You can use this page to review what you have learned.

Equation or Formula	Explanation

1

Add or Subtract Decimals

Part A

What You Will Learn

- You will identify the place value of decimal numbers.
- You will add decimals to the hundredths place value.

Vocabulary Words

- **sum:** the answer after adding (for example, 7 is the sum of 3 + 4)
- **difference:** The answer after subtracting (for example, 3 is the difference of 7 – 4)
- **decimal number:** a number written with a decimal point (.). The digits after the decimal point represent tenths, hundredths, thousandths, and so on. (For example, 4.5 and 0.345 are decimal numbers.)
- **addend:** a number that is added to another number
- **place value:** the value assigned to each digit in a number (for example, in the number 327, the "2" is in the "tens" place value, so it has a value of 2 tens, or 20)

Lesson

Write what you learn.

A. Reading Decimals

1) What are decimals?

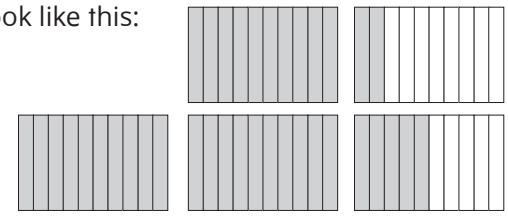
2) Where have you used or seen decimals in your life?

Read the three decimal numbers to a partner out loud. Write out in words how to say each number.

3) 5.9	
4) 108.53	
5) 22.07	

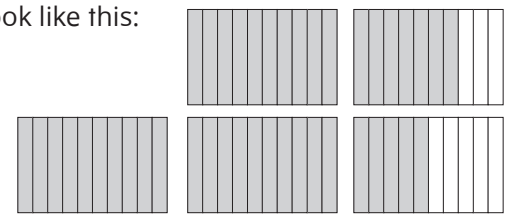
B. Adding Decimals

If we wanted to add 1.2 and 2.5 visually, it would look like this:
Solve the problem below.



$$\begin{array}{r} 1.2 \\ +\ 2.5 \\ \hline \end{array}$$

If we wanted to add 1.7 and 2.5 visually, it would look like this:
Solve the problem below.



$$\begin{array}{r} 1.7 \\ +\ 2.5 \\ \hline \end{array}$$

Activity

Circle the problem(s) that are correctly lined up.

1) $\begin{array}{r} 21.4 \\ +\ 6.82 \\ \hline \end{array}$	2) $\begin{array}{r} 12.5 \\ +\ 2.8 \\ \hline \end{array}$	3) $\begin{array}{r} 4.9 \\ +\ 2.61 \\ \hline \end{array}$

Rewrite each problem correctly. Be sure to line up the decimals and solve the problems.

1)	2)	3)

Practice

Place Value

Write the value of each underlined digit (ones, tens, hundreds, tenths, hundredths, or thousandths).

1)	$3.\underline{2}4$		2)	$1\underline{7}.5$	
3)	$51.0\underline{8}$		4)	$5.0\underline{5}$	
5)	$8.60\underline{3}$		6)	$19.\underline{2}6$	

Find the Mistakes

7) There is a mistake in the way this mathematics problem was solved. $\begin{array}{r} {\scriptstyle 1} \\ 12.3 \\ +\ \ 18 \\ \hline 14.1 \end{array}$	Solve the mathematics problem correctly:

Explain the error:

8) There is a mistake in the way this mathematics problem was solved. $\begin{array}{r} {\scriptstyle 1} \\ 32.1 \\ +\ \ 4.6 \\ \hline 37.7 \end{array}$	Solve the mathematics problem correctly:

Explain the error:

Closing

Today we learned about adding and subtracting decimals. Sometimes when you weigh something or buy something, you use decimals to know the exact weight or price of that item. It is often important to be exact in mathematics.

In the scriptures we learn of people who were exactly obedient. One example of this is in the book of Alma when Helaman led a group of young men into war. These young men "did obey and observe to perform every word of command with exactness" (Alma 57:21).

How can we be like the sons of Helaman and "perform every word of command with exactness"? When you go home today, talk with a friend or family member about how you can follow the example of the stripling warriors and be exactly obedient.

2

Add or Subtract Decimals

Part B

What You Will Learn

- You will identify the place value of decimal numbers.
- You will add decimals to the hundredths place value.

Vocabulary Words

- **sum:** the answer after adding (for example, 7 is the sum of 3 + 4)
- **difference:** the answer after subtracting (for example, 3 is the difference of 7 – 4)
- **budget:** an estimate of income and expenses for a set period of time

Note

This lesson asks you to complete problems about currency or money. In the problems about currency there are blank lines like this ___ next to the numbers in the problem. You will need to write in the currency symbol of your country before you begin the problem (for example: $5 ; ¢5 ; £5).

Lesson

Write what you learn.

1)
$$\begin{array}{r} 4.5 \\ -\ 1.3 \\ \hline \end{array}$$

2)
$$\begin{array}{r} 4.5 \\ -\ 1.8 \\ \hline \end{array}$$

Activity

Problem

A football club manager budgeted ___2280 for supplies for the upcoming season. The items that the club needs, along with estimated costs, are listed to the right.

a. What is the total cost of these supplies?
b. What is the difference between the total cost of the items and her budget?
c. Based on your work, has she stayed within her budget? If not, what recommendations would you make to bring her list within budget?

Item	Cost
Balls	490
Shorts	430.40
Shirts	133.75
Water bottles	275.10
Drinks and snacks	679.90
Towels	210.35
Socks	231.80

Show Your Work

Practice

Solve the following problems by yourself. Ask another student or the teacher for help if you get stuck. After everyone is finished, we will take turns showing how to solve the problems.

1. The maximum weight that an elevator can hold is 1125 kilograms. Four people weighing 54 kilograms, 61.5 kilograms, 80.25 kilograms, and 75 kilograms get on the elevator. How many more kilograms can the elevator hold?

2. Two friends, Brock and Ana, compare their heights. Brock is 2.03 meters tall while Ana is only 1.71 meters tall. How much taller is Brock than Ana?

3. Rachel purchased 1.41 kilograms of beef and 2.3 kilograms of chicken. How many more kilograms of chicken than beef did Rachel buy?

4. The *Tyrannosaurus rex* could grow up to 6.096 meters in height. The *Allosaurus* could grow up to 4.9 meters in height. How much taller was a *Tyrannosaurus rex* than an *Allosaurus*?

Closing

Today in our activity, we worked in groups to help each other find the correct answer. When you work in a group, not only can you receive the help you need, but you can also help others learn. This is true in your family too: as you help each other at home, each member of your family will grow.

Think about the following questions. When you get home, discuss these questions with a family member or friend:

- How do you feel after you help others?
- Is there someone you know who needs your help? How can you help them?

3

Multiply or Divide Decimals

Part A

What You Will Learn

You will multiply and divide decimals to the thousandths place value.

Vocabulary Words

- **product:** the answer after multiplying (for example, in $3 \times 4 = 12$, 12 is the product)
- **quotient:** the answer after dividing (for example, in $12 \div 4 = 3$, 3 is the quotient)
- **factor:** a number that, when multiplied by another number, produces a given number (for example, in $3 \times 4 = 12$, 3 and 4 are factors)
- **dividend:** the amount that you want to divide (for example, in $12 \div 4 = 3$, 12 is the dividend)
- **divisor:** the number that you divide the dividend by (for example, in $12 \div 4 = 3$, 4 is the divisor)
- **numerator:** the top number of a fraction, indicating how many parts we have. It is also the dividend in a division problem.
- **denominator:** the bottom number of a fraction, indicating how many equal parts make a whole. It is also the divisor in a division problem.

Lesson

Write what you learn.

A. Multiplying Decimals

1)

$$\begin{array}{r} 2.63 \\ 2.63 \\ 2.63 \\ +\ 2.63 \\ \hline \end{array}$$

2)

$$\begin{array}{r} 2.63 \\ \times \quad 4 \\ \hline \end{array}$$

B. Dividing Decimals

1) $2\overline{)6.50}$

2) $0.25\overline{)6.50}$

Rewrite this fraction so that the denominator is a whole number:

$$\frac{90.08}{0.123} =$$

Activity

Use the space provided to solve the problems in a group of 2 or 3 students.

1) $2.6 \times 3 =$	2) $12.45 \times 2 =$	3) $4.62 \div 2 =$
two and six-tenths multiplied by three	twelve and forty-five hundredths multiplied by two	four and sixty-two hundredths divided by two

Practice

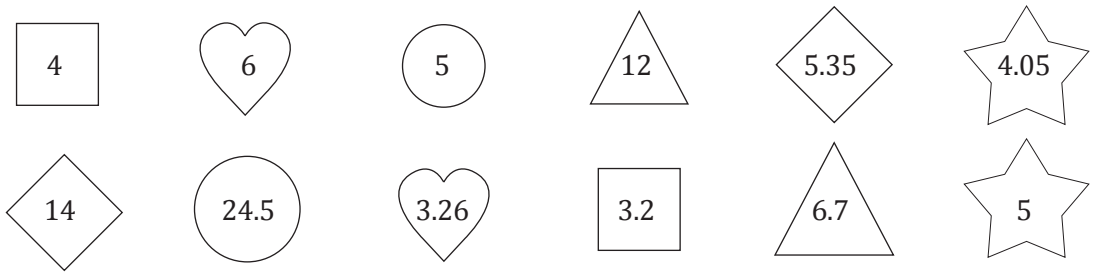
Do your best to solve the following problems by yourself. There are some examples to help you. After each problem, compare your work with a partner's. If you have different answers, try to find the mistakes. If you still need help, raise your hand and the teacher will come to help you.

Examples

Multiplying	**Dividing by a whole number**	**Dividing by a non-whole number**	
$3.64 \times 4 =$ $\begin{array}{r} {\scriptstyle 2\ 1} \\ 3.64 \\ \times\quad 4 \\ \hline 14.56 \end{array}$	$15.5 \div 5 =$ $\begin{array}{r} 3.1 \\ 5\overline{)\,15.5} \\ -\ 15 \\ \hline 05 \\ -\ 5 \\ \hline 0 \end{array}$	$1.86 \div 6.2 =$ $\begin{array}{r} 0.3 \\ 62\overline{)\,18.6} \\ -\ 0 \\ \hline 186 \\ -\ 186 \\ \hline 0 \end{array}$	1. Move the divisor's decimal to the right until it becomes a whole number. 2. Move the dividend's decimal to the right by the same amount as for the divisor.

3 Multiply orDivide Decimals, Part A

Find the product of the numbers for the matching shapes.



1) Find the product of the numbers in the circles:

2) Find the product of the numbers in the stars:

3) Find the product of the numbers in the triangles:

4) Find the product of the numbers in the squares:

5) Find the product of the numbers in the hearts:

6) Find the product of the numbers in the diamonds:

Find each quotient.

7)	8)	9)	10)
$4.08 \div 2 =$	$133.2 \div 6 =$	$3.96 \div 0.9 =$	$0.54 \div 0.03 =$

Word Problem

Juan is saving ___4.50 each day. How much money will he have by the end of the second week? (Remember there are seven days in a week.)

Closing

Today we learned about multiplying and dividing decimals. We often multiply and divide decimals when we are working with money or measurements. In our class, we often teach each other and help each other learn. Doctrine and Covenants 50:22 tells us about teaching one another:

> "Wherefore, he that preacheth and he that receiveth, understand one another, and both are edified and rejoice together."

This scripture tells us that when we teach and share our knowledge with others, both the teachers and the learners are blessed. When you go home today, teach what you have learned about decimals to a younger sibling or a friend so that you may both be blessed and "rejoice together."

4

Multiply or Divide Decimals

Part B

What You Will Learn

You will multiply and divide decimals to the thousandths place value.

Vocabulary Words

- **product:** the answer after multiplying (for example, in $3 \times 4 = 12$, 12 is the product)
- **quotient:** the answer after dividing (for example, in $12 \div 4 = 3$, 3 is the quotient)
- **factor:** a number that when multiplied by another produces a given number (for example, in $3 \times 4 = 12$, 3 and 4 are factors)
- **Dividend:** the amount that you want to divide (for example, in $12 \div 4 = 3$, 12 is the dividend)
- **Divisor:** the number that you divide the dividend by (for example, in $12 \div 4 = 3$, 4 is the divisor)

Lesson and Activity

Problem

Three young women worked hard to earn money to start a business. Their goal was to raise a total of ___2100. Each day, Girl A earned about ____ 6.50, Girl B raised three times as much as Girl A, and Girl C raised half as much as Girl B.

About how many weeks did it take the girls to reach their goal of ___2100? Assume they worked five days a week.

Show Your work

Answer

Practice

Circle the number that you think matches how well you think you understand how to multiply and divide decimals.

1	2	3	4	5
Do Not Understand		Somewhat Understand		Fully Understand

Closing

Today you evaluated how confident you are about multiplying and dividing decimals. Evaluating your confidence with a topic helps you make choices about how you will practice, study, and learn in the future.

In Doctrine and Covenants 101:78, the Lord teaches us that He wants every individual to "act in doctrine and principle . . . according to the moral agency which I have given unto him." This means that the Lord wants us to make choices and act on the truths and principles we have been taught.

When you go home today, talk with a family member or friend about how the choices we make can help us draw closer to the Lord and become more like Him. Think about ways your family can make choices to grow closer to the Lord and follow the example of Jesus Christ.

5

Teach One Another

What You Will Learn

- You will understand the value of teaching one another.

Vocabulary Word

- **tangle:** to twist together into a confused mass

Lesson

Learning is one of the most important things we do in life. It is an important reason we came to earth. Many of the experiences of life can teach us and help us become more like our Heavenly Father. Everyone has things that are easy for them to learn and understand.

What are some things that are easy for you to learn?

_____

_____

We are all different, and we have different strengths. That is why it's important to teach one another. You can share your strengths with your friends, and they can share their strengths with you. When you do that, you can all be lifted because you share your knowledge and skills with each other, and everyone learns better.

Activity

Human Knot Team Activity

This activity will help us see how working together and learning from each other helps everyone.

Instructions

This activity helps everyone understand how valuable it is to work together, just as we have been discussing. The object is to work through a problem as a group.

We will go to an area where we have enough space to stand together in groups of eight to twelve students each.

Once we have divided into groups, everyone in a group will stand in a circle. They will reach their hands into the middle of the circle and grab the hands of two different people. The group will then be connected in a kind of knot.

Your goal as a group will be to figure out how to get your group untangled—without breaking any handholds—so that you are all in a single circle together, holding hands with the two people next to you.

This activity will help us see how working together and learning from each other helps everyone.

Practice

Reflect: What did you learn as you untangled yourselves in your group? How did your group work together?

Closing

Everyone can learn, and everyone has something to teach. In these Succeed in School classes, you are studying reading, writing, mathematics, and skills to become better students and better test takers.

We will do lots of activities as we learn. Often, we will work in groups of two or more people. As you work with other students, if you understand what to do and others do not, please help your group members. The best way to help other students is not to solve problems for them but to help them learn how to solve the problems themselves.

Sometimes you will be the one to teach your group how to solve problems. Other times you will need someone to teach you. It is OK to be both the teacher and the learner at different times.

How has the Succeed in School class been a different learning experience for you so far? When you go home today, talk with a friend or family member about what you have been learning in class and how it can help you become both a better teacher and a better learner.

6

Add or Subtract Fractions with Like Denominators

Part A

What You Will Learn

- You will add and subtract fractions with like denominators.
- You will simplify (reduce) fractions.

Vocabulary Words

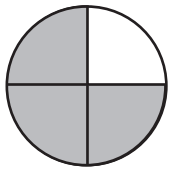
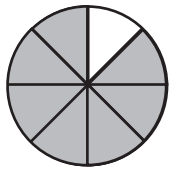
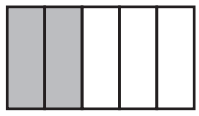
- **numerator:** the top number of a fraction, indicating how many parts we have
- **denominator:** the bottom number of a fraction, indicating how many equal parts make a whole
- **simplify:** to make a mathematics expression *look* different with smaller digits but retain the *same value*
- **reduce:** to simplify a fraction so that its denominator and numerator are as small as possible

Lesson

Write what you learn.

What is a fraction?

Write the fraction that matches each of these figures, as well as the fraction's name:

Denominator:

Numerator:

Like fractions:

A. Adding Fractions with Like Denominators

1) $\frac{1}{5} + \frac{3}{5} =$

B. Simplifying Fractions

2) $\frac{2}{8} =$

3) $\frac{2}{4} =$

4) $\frac{3}{6} =$

Activity

Add or subtract these fractions with a partner. It is OK if you are not sure how to solve the problem. We are here to support and learn from each other. If you notice that someone else is stuck, show them an example or give them a hint. After everyone has finished, the teacher will have different pairs of students come to the board and show the class how they solved the problems.

1) $\frac{4}{7} + \frac{2}{7} =$ four-sevenths plus two-sevenths	2) $\frac{2}{5} - \frac{1}{5} =$ two-fifths minus one-fifth	3) $\frac{3}{8} + \frac{1}{8} =$ three-eighths plus one-eighth

Practice

Add or subtract fractions with like denominators.

1) $\frac{3}{5} + \frac{1}{5} = \_\_\_\_$

three-fifths plus one-fifth

2) $\frac{7}{9} + \frac{1}{9} = \_\_\_\_$

seven-ninths plus one-ninth

3) $\frac{7}{9} - \frac{6}{9} = \_\_\_\_$

seven-ninths minus six-ninths

4) $\frac{6}{11} - \frac{3}{11} = \_\_\_\_$

six-elevenths minus three-elevenths

Simplify the following fractions.

5) $\frac{2}{6} = \_\_\_\_$

6) $\frac{4}{10} = \_\_\_\_$

7) $\frac{4}{12} = \_\_\_\_$

8) $\frac{6}{36} = \_\_\_\_$

6 Add or Subtract Fractions with Like Denominators, Part A

Add or subtract the following fractions, and then simplify the answer.

9) $\frac{3}{6} + \frac{1}{6} =$ ____ or _____

three-sixths plus one-sixth

10) $\frac{4}{9} - \frac{1}{9} =$ _____ or _____

four-ninths minus one-ninth

11) $\frac{10}{8} - \frac{4}{8} =$ ____ or _____

ten-eighths minus four-eighths

12) $\frac{5}{10} + \frac{5}{10} =$ _____ or _____

five-tenths plus five-tenths

Word Problems

Solve the following problems using the skills you learned today. Look at the underlined words to determine which operation (add or subtract) to use. Simplify if needed.

13) Two brothers left home for seminary. They walked $\frac{3}{10}$ of a kilometer and then sat down to rest. They then walked $\frac{2}{10}$ of a kilometer. What is the <u>total</u> distance they walked?

14) On Monday, Sister May spent $\frac{1}{4}$ of an hour studying for her lesson. On Friday, she spent another $\frac{1}{4}$ of an hour studying. What is the **total amount** of time she spent studying?

Closing

Today we learned about adding and subtracting fractions. There are many ways we use fractions every day. For example, you might use them when following a recipe, talking about sports, or figuring out how much to buy at the market.

Discuss with a family member or friend what you learned about fractions and how you can use them in your daily life.

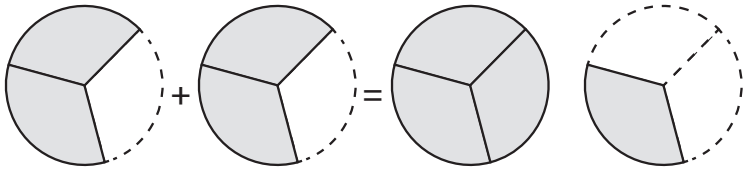
Extra Practice

These are extra problems if you want more practice.

A. Adding Fractions with the Same Denominator

Add the following fractions. Use the diagram to help solve the problem.

1) $\frac{2}{3} + \frac{2}{3} =$



B. Simplifying Fractions

Simplify the following fractions:

2) $\frac{3}{12} =$

3) $\frac{8}{12} =$

4) $\frac{16}{20} =$

5) $\frac{5}{10} =$

7

Add or Subtract Fractions with Like Denominators

Part B

What You Will Learn

- You will add and subtract fractions with like denominators.
- You will simplify (reduce) fractions.

Vocabulary Words

- **like fractions:** fractions with the same denominator

Lesson and Activity

Problem

The Church wants to build a playground in a lot next to a chapel. The lot is shaped like a rectangle. They give the job of planning the playground to the youth. The youth decide to use $\frac{4}{12}$ of the playground for a basketball court and $\frac{5}{12}$ of the playground for a football field. How much room is left for the swings?

Show your work

Answer

Check your answer

Practice

Complete the problem by filling in the blanks with two fractions with like denominators. Figure out whether the key words are instructing you to add or subtract. Make sure to simplify your answer if needed. After you solve the problem, ask a partner to check your work.

Problem

A jug contains ——— of a liter of orange juice.

After you pour ——— of a liter into a glass, how much is **left** in the jug?

Show your work

Answer

Closing

Elder David A. Bednar of the Quorum of the Twelve Apostles helps us better understand what it means to learn by faith:

> Learning by faith requires both "the heart and a willing mind" (D&C 64:34). Learning by faith is the result of the Holy Ghost carrying the power of the word of God both unto and into the heart. Learning by faith cannot be transferred from an instructor to a student . . . ; rather, a student must exercise faith and act in order to obtain the knowledge for himself or herself. ("Seek Learning by Faith," *Ensign*, Sept. 2007, 64.)

When you go home today, discuss with a friend or family member how you can learn by faith at home, at church, and at school.

8

Add or Subtract Fractions with Unlike Denominators

Part A

What You Will Learn

- You will add and subtract fractions with unlike denominators.
- You will simplify (reduce) fractions.

Vocabulary Words

- **numerator:** the top number of a fraction, indicating how many parts we have
- **denominator:** the bottom number of a fraction, indicating how many equal parts make a whole
- **least common multiple (LCM):** the lowest number that is a multiple of two or more given numbers (for example, 12 is the least common multiple of 2, 3, and 4)
- **simplify:** to make a mathematics expression *look* different with smaller digits but retain the *same value*

8 Add or Subtract Fractions with Unlike Denominators, Part A

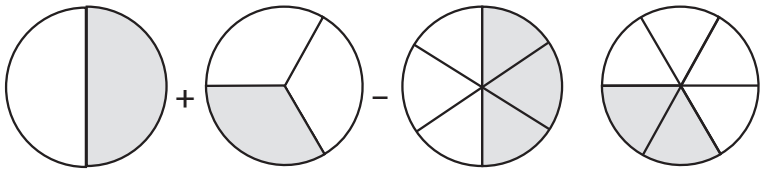
Lesson

Write what you learn.

How do we add "unlike fractions"?

1)

$$\frac{1}{2} + \frac{1}{3} =$$



Activity

Use the space provided to solve the problems in a group of 2 or 3 students.

1) $\frac{3}{8} + \frac{1}{4} =$	2) $\frac{4}{7} + \frac{2}{14} =$	3) $\frac{2}{5} + \frac{10}{25} =$
Three-eighths plus one-fourth	Four-sevenths plus two-fourteenths	Two-fifths plus ten twenty-fifths

Practice

Try to solve the following problems by yourself. If you get stuck, ask a partner for help. An example is shown below to help you.

8 Add or Subtract Fractions with Unlike Denominators, Part A

Example

Add fractions with unlike denominators

$\frac{3}{9} + \frac{1}{3} =$	To add two fractions, both denominators need to be the same.	Convert $\frac{1}{3}$ by multiplying both the numerator and denominator by 3 to get the like denominator $\frac{1 \times 3}{3 \times 3} = \frac{3}{9}$	Now you can add: $\frac{3}{9} + \frac{3}{9} = \frac{6}{9}$	Simplify by dividing both the numerator and denominator $\frac{6 \div 3}{9 \div 3} = \frac{2}{3}$

Add or subtract the following fractions. Make sure to convert the fractions so the denominators are the same before adding or subtracting. Simplify if needed.

1) $\frac{1}{2} + \frac{2}{8} =$ ___ + ___ = ___ or ___

One-half plus two-eighths

2) $\frac{5}{6} - \frac{1}{2} =$ ___ + ___ = ___ or ___

Five-sixths minus one-half

3) $\frac{1}{6} + \frac{8}{12} =$ ___ + ___ = ___ or ___

One-sixth plus eight-twelfths

4) $\frac{1}{2} + \frac{2}{7} =$ ___ + ___ = ___ or ___

One-half plus two-sevenths

5) $\frac{7}{10} - \frac{2}{5} =$ ___ + ___ = ___ or ___

Seven-tenths minus two-fifths

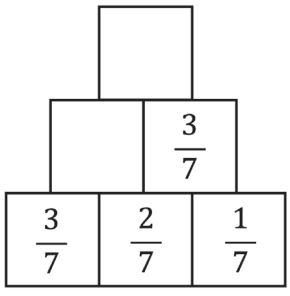
6) $\frac{2}{3} + \frac{1}{5} =$ ___ + ___ = ___ or ___

Two-thirds plus one-fifth

8 Add or Subtract Fractions with Unlike Denominators, Part A

Look at the boxes below. Each pair of blocks totals the block above them. For example, in problem #7, $\frac{2}{7}+\frac{3}{7}=\frac{5}{7}$ and $\frac{2}{7}+\frac{1}{7}=\frac{3}{7}$. Use addition and subtraction to fill in the missing fractions in each box. There is no need to simplify your answers.

7)



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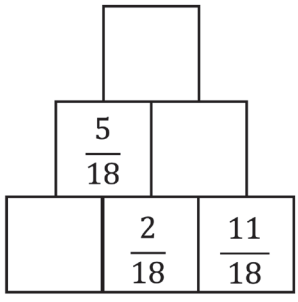

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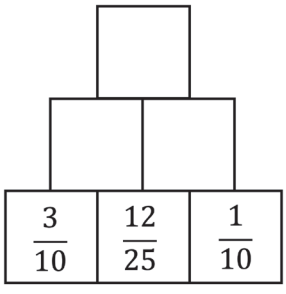

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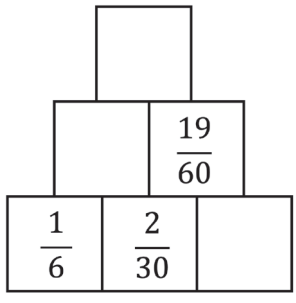


Closing

The boxes in today's activity were built on each other. Just as some of the boxes acted as a foundation on which the boxes above them were built, we must build our foundation on the Lord Jesus Christ. In Helaman 5:12 we read,

> And now, my sons, remember, remember that it is upon the rock of our Redeemer, who is Christ, the Son of God, that ye must build your foundation; that when the devil shall send forth his mighty winds, yea, his shafts in the whirlwind, yea, when all his hail and his mighty storm shall beat upon you, it shall have no power over you to drag you down to the gulf of misery and endless wo, because of the rock upon which ye are built, which is a sure foundation, a foundation whereon if men build they cannot fall.

When you go home today, share your testimony of how you are working to build your foundation on the rock of your Redeemer. How can you help those around you strengthen their foundations and have faith in Jesus Christ?

Extra Practice

These are extra problems if you want more practice.

Adding Fractions with Unlike Denominators

With a partner, add each fraction. Make sure to add only after you have common denominators first.

1) $\frac{1}{3}+\frac{5}{8}=$	2) $\frac{3}{8}+\frac{1}{4}=$	3) $\frac{2}{5}+\frac{1}{15}=$

Subtracting Fractions with Unlike Denominators

Subtracting fractions is just like adding fractions. We need to have the same denominator first, and then we subtract the numerators. Subtract the following fractions.

4) $\frac{5}{6}-\frac{1}{4}=$

5) $\frac{5}{6}-\frac{7}{12}=$

9

Add or Subtract Fractions with Unlike Denominators

Part B

What You Will Learn

- You will add and subtract fractions with unlike denominators.
- You will simplify (reduce) fractions.

Vocabulary Words

- **numerator:** the top number of a fraction, indicating how many parts we have
- **denominator:** the bottom number of a fraction, indicating how many equal parts make a whole
- **least common multiple (LCM):** the lowest number that is a multiple of two or more given numbers (for example, 12 is the least common multiple of 2, 3, and 4)

Lesson and Activity

Problem

For Ken's 50th birthday party, his wife ordered a giant sandwich to feed all the guests. Their friends ate $\frac{3}{5}$ of the sandwich, their family ate $\frac{3}{10}$ of it, and Ken ate $\frac{1}{15}$ himself!

a. How much more did their friends eat than their family (not including Ken)?

b. How much more did their family eat than Ken?

c. How much of the sandwich, if any, was left after the party?

Show Your Work

Answer

Check Your Answer

Practice

Take a few minutes to share with someone sitting near you one thing you learned about adding or subtracting fractions with unlike denominators. Write or draw what you learned below:

Closing

Sister Mary N. Cook, former First Counselor in the Young Women General Presidency, said:

> God gave you moral agency and the opportunity to learn while on earth, and He has a work for you to do. To accomplish this work, you have an individual responsibility to seek learning. ("Seek Learning: You Have a Work to Do," *Liahona,* May 2012, 120)

As your family is studying from *Come, Follow Me* this week, talk about how you can seek learning in all areas of your lives.

10

Mathematics Exam Preparation

Problem Study Guide

What You Will Learn

- You will learn and apply study skills that you can use throughout the school year to help prepare for mathematics exams.
- You will create a study guide for specific mathematics skills.

Vocabulary Words

- **study guide:** a guide that has the information, hints, skills, and examples a student needs to study for an exam

Lesson

Ways to Prepare for Your Mathematics Exams

In the Succeed in School class, you will get to practice most of these strategies. Each one will help you prepare for your mathematics exams.

1. **Know your basic mathematics facts** (addition, subtraction, multiplication, and division for numbers 0–12). They are the foundation of mathematics. The ability to solve basic mathematics facts quickly will help you when you are solving more difficult mathematics problems.
2. **Use your school assignments and class tests to help prepare for exams.** Circle all the problems that you do not know how to do, and ask for help with those problems in class the next day. As you correct your school assignments in class, circle all the problems you did wrong, and take notes on how to do them correctly. Save these notes to help make a study guide as the exam gets closer.
3. **Know your mathematics vocabulary.** Keep a list of vocabulary words and study them. Make flashcards or have a friend or family member quiz you on them.
4. **Pray for help** to focus on the things you are learning and to help you remember them for your tests.
5. **Be prepared.** The night before a test, make sure you **have all the things you will need,** such as paper, pens, or a calculator.
6. **Study at a time when you are alert** and not hungry or tired. Study in places where there are few distractions.
7. **Work through mathematics problems once a week or more regularly.** Practice the problems that you struggle with. Do not wait until the last minute to study. Short daily or weekly study sessions are better than one long session the night before the exam.
8. **Repetition is important!** Read and reread your class notes, mathematics worksheets, homework, and topics in the textbook. While you are reviewing your notes, close your eyes or cover your notes to see if you can remember important details without looking at them. You can also pretend that you are explaining the material to someone else and summarize the material out loud.
9. **Create your own study guides** for each mathematics skill. A **study guide** is a document that has the information, hints, skills, and examples you need to study for an exam. Here are some ideas to help you make your study guide:
   - From your notes, make an outline of each major mathematics skill.
   - Make flashcards for studying mathematics vocabulary.
   - Create a list of mathematics equations that need to be memorized and add to this as you learn new ones.
   - Make up your own quiz or test based on your notes, and have a friend, parent, or sibling test you.

Another strategy is to review mathematics exam questions from past years. Practice solving problems and notice which problems and skills are more difficult for you. Solving problems and practicing the skills you will need on your exams will help you feel more confident and ready to take your exams.

What other things have you learned that can help you prepare for your exams? Write them in the space below:

Activity

When solving a mathematics problem, it helps to do the work in steps. Use this process to organize your mathematics notes and prepare for exams.

1. Write any important mathematics formulas, vocabulary, and notes.
2. Write a sample mathematics problem.
3. Complete the problem one step at a time. If there are more than five steps, combine steps as needed.
4. Write the answer and check your answer by working backwards to make sure it is correct.
5. Look back on the mathematics problem. Do you feel confident you can solve problems like this, or do you need more practice?

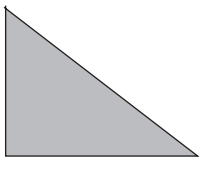
Mathematics Problem Study Guide Worksheet, Example

1. **Important Mathematics Formulas, Vocabulary, and Notes:**

Pythagorean Theorem:

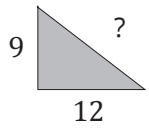
- Used only for triangles that have a right angle.
- Longest side = hypotenuse
- Equation: $a^2 + b^2 = c^2$ (c is the longest side)

Draw:



2. **Mathematics Problem Example:**

Find the length of the missing side in the triangle:



3. **Solving the Problem Step by Step:**

Step One: $a = 9, b = 12, c = ?$

Step Two: $a^2 + b^2 = c^2$

$9^2 + 12^2 = c^2$

Step Three: $81 + 144 = c^2$

Step Four: $225 = c^2$

Step Five: $\sqrt{225} = \sqrt{c^2}$

Step Six: $15 = c$

4. **Answer:**

$c = 15$

Check your answer:

$a^2 + b^2 = c^2$

$9^2 + 12^2 = 15^2$

$81 + 144 = 225$

5. **What Do I Need to Work On?**

Square roots are hard for me. I need more practice.

Practice

1. Write any important mathematics formulas, vocabulary, and notes.
2. Write a sample mathematics problem that will help you practice the skill described in your notes.
3. Complete the problem one step at a time. If there are more than five steps, combine steps as needed.
4. Write the answer and check your answer by working backwards to make sure it is correct.
5. Look back on the mathematics problem. Do you feel confident you can solve problems like this, or do you need more practice?

1. Important Mathematics Formulas, Vocabulary, and Notes:	2. Mathematics Problem Example:
	3. Solving the Problem Step by Step:
4. Answer:	5. What Do I Need to Work On?

Closing

Your family members and friends can support you in preparing for your exams. Think about a strategy you learned today, and discuss with a family member or friend how it will help you prepare for your exams.

11

Multiply Fractions

Part A

What You Will Learn

- You will multiply fractions by whole numbers.
- You will multiply fractions by fractions.

Vocabulary Words

- **product:** the answer after multiplying (for example, in $3 \times 4 = 12$, 12 is the product)
- **area model:** a way of representing multiplication graphically using a rectangle (for example, the length and width of the rectangle represent the factors, and the area of the rectangle represents their product)

11 Multiply Fractions, Part A

Lesson

Write what you learn.

1) If I have 4 halves of cake, how many cakes do I have? Draw a picture to represent that.

Commutative Property: **a × b = b × a**

2) $4 \times \frac{1}{2}$

3) What is $\frac{3}{4} \times \frac{5}{8}$? Solve using an area model.

Activity

Fill out the chart and show how to solve the multiplication problem in four different ways. The first way is to draw an area model. The second way is to write a story problem. The third way is to draw a picture. The fourth way is to solve it using numbers, like an equation.

Area Model

Story

$\frac{1}{5} \times \frac{3}{4} =$

Visual

Numerical

Practice

1) What is $\frac{2}{3} \times \frac{1}{4}$?

2) Check your answer using an area model.

3) What is three-fourths of 4?

4) Check your answer using an area model.

Closing

As you go throughout the week, notice where mathematics is used in your everyday life. For example, you might use mathematics when buying something at the market or when calculating how fast you are travelling. Share what you find with a family member or friend.

12

Multiply Fractions

Part B

What You Will Learn

- You will multiply fractions by whole numbers.
- You will multiply fractions by fractions.

Vocabulary Word

- **product:** the answer after multiplying (for example, in $3 \times 4 = 12$, 12 is the product)

Lesson

Write what you learn.

Imagine that you have 5 containers of rice, and each container has $\frac{1}{4}$ of a kilogram of rice in it. How many kilograms of rice do you have in all?

When multiplying fractions, we _____ the _____ to get the _____ _____, and we _____ the _____ to get the _____ _____.

(Use these words to fill in the blanks: numerators, new denominator, multiply, multiply, denominators, new numerator)

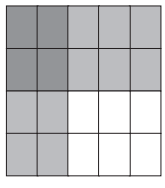
As an equation, we can write this rule as $\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$

Activity

Work with a partner to solve the problems. Use the array model to help you solve each problem. Simplify your answers.

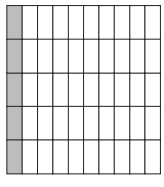
1) $\frac{2}{5} \times \frac{2}{4} =$

Two-fifths multiplied by two-fourths



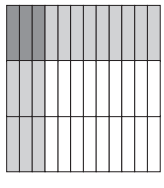
2) $4 \times \frac{1}{10} =$

Four multiplied by one-tenth



3) $\frac{3}{12} \times \frac{1}{3} =$

Three-twelfths multiplied by one-third



Practice

Multiply the following fractions.

H $\frac{2}{3} \times \frac{1}{5} =$	**I** $7 \times \frac{1}{2} =$	**P** $\frac{2}{3} \times \frac{5}{7} =$	**E** $3 \times \frac{2}{9} =$
S $32 \times \frac{1}{2} =$	**T** $5 \times \frac{2}{10} =$	**R** $\frac{1}{10} \times \frac{2}{5} =$	**O** $\frac{4}{7} \times \frac{10}{10} =$
C $\frac{1}{6} \times \frac{3}{1} =$	**G** $\frac{2}{5} \times \frac{1}{5} =$	**Y** $2 \times \frac{2}{10} =$	
L $\frac{3}{4} \times \frac{12}{3} =$	**A** $\frac{2}{5} \times \frac{3}{2} =$	**U** $\frac{3}{8} \times 2 =$	

1	$\frac{2}{15}$	$\frac{2}{3}$		$\frac{2}{15}$	$\frac{4}{7}$	3	$\frac{2}{5}$

$\frac{2}{25}$	$\frac{2}{15}$	$\frac{4}{7}$	16	1

1	$\frac{2}{3}$	$\frac{3}{5}$	$\frac{1}{2}$	$\frac{2}{15}$	$\frac{2}{3}$	16

1	$\frac{1}{25}$	$\frac{3}{4}$	1	$\frac{2}{15}$

What is the hidden phrase? Write it below:

How can the Holy Ghost help you learn truth? Write your thoughts in the lines below:

Closing

Moroni 10:5 states, "And by the power of the Holy Ghost ye may know the truth of all things."

Think about this question: How does the Holy Ghost help you to know the truth?

When you go home today, talk with a friend or family member about how the Holy Ghost can act as a personal guide. You may also wish to share your testimony about how the Holy Ghost blesses your life.

13

Divide Fractions

Part A

What You Will Learn

- You will divide fractions by fractions.
- You will divide fractions by whole numbers.

Vocabulary Word

- **reciprocal of a fraction:** the reciprocal of a fraction is found by "flipping" the numerator and denominator. For example, the reciprocal of $\frac{a}{b}$ is $\frac{b}{a}$. The reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$. The reciprocal of $\frac{1}{4}$ is $\frac{4}{1}$, or 4.

13 Divide Fractions, Part A

Lesson

Write what you learn.

How do we divide "unlike fractions"?

1)

$$3 \div \frac{1}{4} =$$

2) A recipe calls for 2 cups of flour, but your measuring cup only holds $\frac{1}{3}$ of a cup. How many thirds of a cup should you add?

3) Write out "three divided by three-fourths" as a mathematics expression.
Solve:

"Keep, switch, flip"

1. "Keep" the first number the same.
2. "Switch" division to multiplication.
3. "Flip" the last number's numerator and denominator.

Activity

With a partner, divide the fractions using the "keep, switch, flip" method.

Problem A	**Problem B**
$6 \div \frac{3}{4} =$ Six divided by three-fourths	$\frac{1}{4} \div \frac{1}{12} =$ One-fourth divided by one-twelfth

Fraction Tic-Tac-Toe Game

This game is called Tic-Tac-Toe. It is a simple game children often play. Today you will play Tic-Tac-Toe using mathematics. Choose a partner to play against for the Tic-Tac-Toe game on the next page.

Player 1 chooses a square and solves the problem. If the answer is correct, player 1 draws an "X" over the square. Then player 2 chooses a square and solves the problem. If the answer is correct, player 2 draws an "O" over the square. The two players take turns. Whichever player gets three "X"s or "O"s in a row first wins. Make sure to simplify your answers.

13 Divide Fractions, Part A

Game 1:

$\frac{1}{3} \div \frac{3}{5}$	$\frac{1}{4} \div 2$	$\frac{2}{5} \div \frac{1}{2}$
$2 \div \frac{1}{5}$	$\frac{2}{6} \div \frac{2}{5}$	$10 \div \frac{1}{4}$
$\frac{1}{7} \div \frac{2}{3}$	$\frac{1}{8} \div \frac{5}{6}$	$\frac{2}{7} \div 3$

Game 2:

$\frac{4}{6} \div \frac{2}{3}$	$\frac{1}{2} \div 6$	$\frac{6}{8} \div \frac{4}{5}$
$10 \div \frac{2}{3}$	$\frac{3}{10} \div \frac{1}{2}$	$1 \div \frac{1}{6}$
$\frac{7}{10} \div \frac{3}{4}$	$\frac{1}{3} \div \frac{4}{5}$	$\frac{1}{3} \div 2$

Practice

Divide the following fractions. Make sure to simplify the answer.

1) $\frac{2}{4} \div \frac{3}{4} = \frac{\quad}{\quad} \times \frac{\quad}{\quad} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$

Two-fourths divided by three-fourths

2) $\frac{1}{5} \div \frac{1}{5} = \frac{\quad}{\quad} \times \frac{\quad}{\quad} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$

One-fifth divided by one-fifth

3) $\frac{1}{6} \div \frac{2}{6} = \frac{\quad}{\quad} \times \frac{\quad}{\quad} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$

One-sixth divided by two-sixths

4) $6 \div \frac{1}{4} = \frac{\quad}{\quad} \times \frac{\quad}{\quad} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$

Six divided by one-fourth

5) $\frac{2}{3} \div 3 = \frac{\quad}{\quad} \times \frac{\quad}{\quad} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$

Two-thirds divided by three

6) $\frac{3}{5} \div 4 = \frac{\quad}{\quad} \times \frac{\quad}{\quad} = \frac{\quad}{\quad} = \frac{\quad}{\quad}$

Three-fifths divided by four

Closing

When you go home today, play Tic-Tac-Toe with a friend or family member. You do not have to use mathematics. You can draw the Tic-Tac-Toe board using paper and pen or even using a stick to draw in the dirt on the ground.

14

Divide Fractions

Part B

What You Will Learn

- Divide fractions by fractions.
- Divide fractions by whole numbers.

Vocabulary Word

- **reciprocal of a fraction:** the fraction turned upside down (for example, the reciprocal of $\frac{a}{b}$ is $\frac{b}{a}$; the reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$; the reciprocal of $\frac{1}{4}$ is $\frac{4}{1}$)

Lesson

Use what you learned in the previous lesson to fill in the blanks.

1) Dividing by 5 is the same as multiplying by _____.

2) Dividing by $\frac{2}{7}$ is the same as multiplying by _____.

3) Dividing by a number is the same as _____.

"Keep, switch, flip"

1. "Keep" the first number the same.
2. "Switch" division to multiplication.
3. "Flip" the last number's numerator and denominator.

Activity

In groups, work together to complete the following problems. Make sure to simplify your answers and to involve all group members in the work. Think of different ways to solve the problem. For example, you may draw a picture, write out an equation, or make a chart. If there are unfamiliar words, use a dictionary and help each other.

Problem 1

A real estate developer has 20 hectares of land. She wants to build homes on the land. The city requires each housing plot to be $\frac{2}{5}$ of a hectare in size. How many houses can fit on the 20 hectares?

Show Your Work

Answer

Problem 2

Kwesi is trying to solve $\frac{8}{9} \div \frac{2}{3}$. He rewrites the statement as $\frac{9}{8} \times \frac{2}{3}$ and gets $\frac{18}{24}$ or $\frac{3}{4}$. Is Kwesi correct? If so, explain why. If not, explain why and rework the problem correctly.

Show Your Work

Answer

Practice

Solve the following problems. Ask a partner for help if you get stuck. Once most of the class finished, you will take turns showing the class how to solve the problems.

1) Which expression is greater, $\frac{7}{8} \div \frac{3}{16}$ or $\frac{8}{9} \div \frac{2}{3}$?

2) Evaluate each expression. In other words, find the final value after you add, subtract, multiply, or divide.

a. $\frac{2}{3} + \frac{5}{6} =$

b. $\frac{4}{5} - \frac{2}{11} =$

c. $\frac{8}{9} \times \frac{3}{4} =$

d. $\frac{12}{7} \div \frac{24}{14} =$

Closing

In the next two days, find a sibling or friend to whom you can teach the "keep, switch, flip" method for dividing fractions. Teach them to "keep" the first number the same, "switch" division to multiplication, and "flip" the numerator and denominator of the second number.

15

Mathematics Exam Preparation

Using a Study Guide

What You Will Learn

Learn how to create and use a study guide to prepare for an upcoming exam.

Lesson

Creating a study guide can help you organize what you already know and what you still need to study for an upcoming test or exam. Creating a study guide is a form of studying itself because in creating it you carefully review all the material for a test.

Tips to Creating a Study Guide:

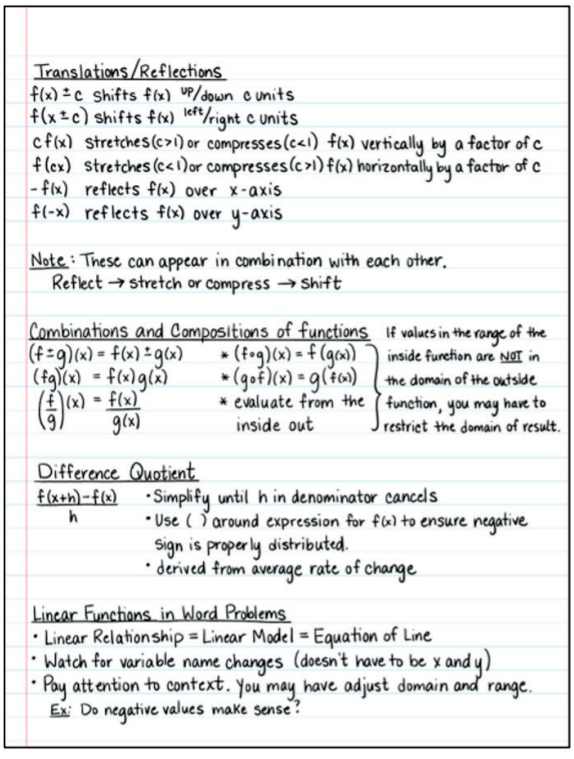
- First, you can gather together class notes, textbooks, homework assignments, and past tests or quizzes.
- When you have gathered all the information, identify which facts and terms are most important.
- Try not to put too much in your study guide. Be brief and choose what is most important.
- If you know a term or subject really well, you do not need to include it. Do not spend time studying what you already know.
- If information is unlikely to be included on a test, do not spend time studying that either.

Activity

Look at the example below of one way to create a study guide for an upcoming math test.

Discuss the following questions in a group of 2–3 students:

- What makes this guide easy to use when studying for an exam?
- What is something you like about how this guide is organized?



Translations/Reflections

$f(x) \pm c$ shifts $f(x)$ up/down c units
$f(x \pm c)$ shifts $f(x)$ left/right c units
$cf(x)$ stretches ($c>1$) or compresses ($c<1$) $f(x)$ vertically by a factor of c
$f(cx)$ stretches ($c<1$) or compresses ($c>1$) $f(x)$ horizontally by a factor of c
$-f(x)$ reflects $f(x)$ over x-axis
$f(-x)$ reflects $f(x)$ over y-axis

Note: These can appear in combination with each other.
Reflect → stretch or compress → shift

Combinations and Compositions of functions

$(f \pm g)(x) = f(x) \pm g(x)$
$(fg)(x) = f(x)g(x)$
$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}$

* $(f \circ g)(x) = f(g(x))$
* $(g \circ f)(x) = g(f(x))$
* evaluate from the inside out

If values in the range of the inside function are NOT in the domain of the outside function, you may have to restrict the domain of result.

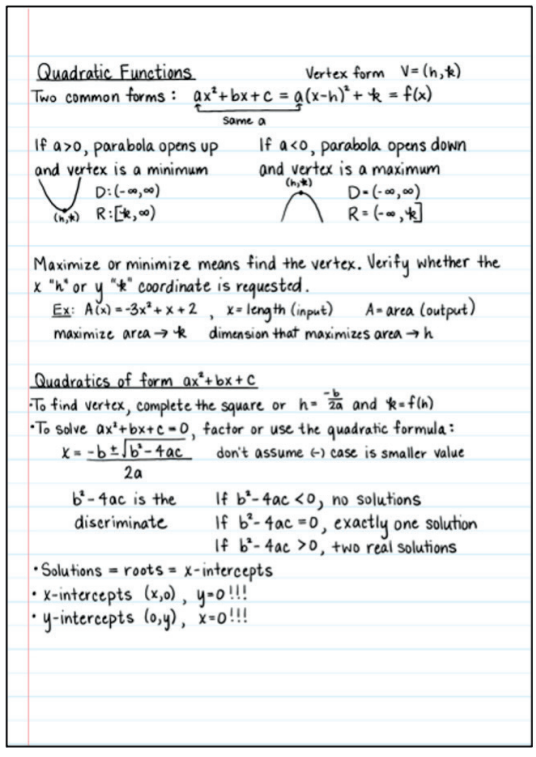
Difference Quotient

$\frac{f(x+h)-f(x)}{h}$

- Simplify until h in denominator cancels
- Use ( ) around expression for $f(x)$ to ensure negative sign is properly distributed.
- derived from average rate of change

Linear Functions in Word Problems

- Linear Relationship = Linear Model = Equation of Line
- Watch for variable name changes (doesn't have to be x and y)
- Pay attention to context. You may have adjust domain and range.
  Ex: Do negative values make sense?



Quadratic Functions Vertex form $V=(h,k)$

Two common forms: $\underbrace{ax^2+bx+c}_{\text{same } a} = a(x-h)^2+k = f(x)$

If $a>0$, parabola opens up and vertex is a minimum
D: $(-\infty,\infty)$
R: $[k,\infty)$

If $a<0$, parabola opens down and vertex is a maximum
D: $(-\infty,\infty)$
R: $(-\infty,k]$

Maximize or minimize means find the vertex. Verify whether the x "h" or y "k" coordinate is requested.
Ex: $A(x) = -3x^2+x+2$, x = length (input) A = area (output)
maximize area → k dimension that maximizes area → h

Quadratics of form ax^2+bx+c

- To find vertex, complete the square or $h = \frac{-b}{2a}$ and $k = f(h)$
- To solve $ax^2+bx+c=0$, factor or use the quadratic formula:
  $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$ don't assume (-) case is smaller value

b^2-4ac is the discriminate
If $b^2-4ac<0$, no solutions
If $b^2-4ac=0$, exactly one solution
If $b^2-4ac>0$, two real solutions

- Solutions = roots = x-intercepts
- x-intercepts $(x,0)$, $y=0$!!!
- y-intercepts $(0,y)$, $x=0$!!!

Practice

Ways to Use a Study Guide

- Find a way to recall or remember the information. Have someone quiz you, or just cover up the bullet points under each key word or concept and try to remember the definitions and details on your own.
- You can also use your study guide to create note cards. Put key words or formulas on one side and the bulleted information on the other. Review these note cards over and over until you can remember the information on them.
- Studying in a group can be helpful because other students might have information in their notes or on their study guides that you missed.

Think about someone in your life who can help you study. Perhaps it is an older sibling, a teacher, a parent, or a friend.

Make a list of people who can help you study:

Closing

We learn a lot in school, but that is not the only place where we learn important lessons. Alma 34:32 reminds us that life itself is a time to prepare: "This life is the time for men to prepare to meet God; yea, behold the day of this life is the day for men to perform their labors."

We prepare to meet God in many ways as we keep the commandments, exercise faith, and so forth. As we complete our daily tasks, we also prepare for our future and for opportunities to serve, work, and lead.

When you go home today, talk with a family member or friend about how the things you are learning now can help prepare you for your future.

16

Improper and Mixed Fractions

Part A

What You Will Learn

- You will multiply and divide mixed fractions.
- You will convert improper fractions to mixed fractions, and vice versa.

Vocabulary Words

- **proper fraction:** A fraction where the numerator is less than the denominator (for example, $\frac{2}{3}$)
- **improper fraction:** A fraction where the numerator is greater than the denominator (for example, $\frac{4}{3}$)
- **mixed number:** A number made up of a whole number and a proper fraction (for example, $3\frac{1}{2}$ or $12\frac{1}{4}$)
- **convert:** To change the unit of measurement without changing the actual size or amount of the thing being measured (for example, converting millimeters to centimeters)

Lesson

Write what you learn.

A. Types of Fractions

1) Draw pictures to represent the fractions $\frac{1}{2}$ and $\frac{5}{2}$.

$\frac{1}{2}$ is called a _____ fraction because the numerator (1) is *less* than the denominator (2).

$\frac{5}{2}$ is called an _____ fraction because the numerator (5) is greater than the denominator (2).

B. Converting a Mixed Number to an Improper Fraction

$\frac{5}{2} = 2\frac{1}{2}$

$2\frac{1}{2}$ is called a _____ number because it has a whole number, 2, as well as a proper fraction, $\frac{1}{2}$.

Writing Whole Numbers as Fractions

1) Write the whole number 1 as a fraction with 2 as the denominator: $1 = \frac{}{2}$	2) Write the whole number 2 as a fraction with 2 as the denominator: $2 = \frac{}{2}$
3) Write the whole number 1 as a fraction with 3 as the denominator: $1 = \frac{}{3}$	4) Write the whole number 2 as a fraction with 3 as the denominator: $2 = \frac{}{3}$

Use three steps to convert the mixed number $2\frac{1}{2}$ into an improper fraction, $\frac{5}{2}$:

- **Step 1:** Multiply the whole number (2) by the denominator (2). ($2 \times 2 = 4$)
- **Step 2:** Add the result (4) to the original numerator (1) to get 5. ($4 + 1 = 5$)
- **Step 3:** Put 5 over the denominator (2) to get $\frac{5}{2}$.

$$2\frac{3}{5} =$$

C. Converting an Improper Fraction to a Mixed Number

1) Convert $\frac{5}{2}$ to a mixed number.

2) Convert the improper fraction $\frac{13}{5}$ to a mixed number.

3) What is the method for converting an improper fraction to a mixed number?

Activity

Solve each expression and write the answer as a mixed number or a proper fraction. Once you have solved all four, turn to the answer key on the next page to check your work. Do not look at the answers until you have tried to solve all the problems on this page.

1) $2\frac{3}{5} + 1\frac{3}{5}$

2) $3\frac{1}{4} - 2\frac{3}{8}$

3) $1\frac{1}{3} \times 2 =$

4) $\frac{7}{4} \div \frac{3}{4}$

16 Improper and Mixed Fractions, Part A

Answers

1) $2\frac{3}{5} + 1\frac{3}{5}$

Convert to improper fractions:

$= \frac{13}{5} + \frac{8}{5}$

Add the fractions:

$= \frac{21}{5}$

Convert to mixed number:

$= \mathbf{4\frac{1}{5}}$

---

2) $3\frac{1}{4} - 2\frac{3}{8}$

Convert to improper fractions:

$= \frac{13}{4} - \frac{19}{8}$

Get a common denominator:

$= \frac{26}{8} - \frac{19}{8}$

Subtract the fractions:

$= \mathbf{\frac{7}{8}}$

---

3) $1\frac{1}{3} \times 2$

Convert to improper fractions:

$= \frac{4}{3} \times \frac{2}{1}$

Multiply the fractions:

$= \frac{8}{3}$

Convert to mixed number:

$= \mathbf{2\frac{2}{3}}$

---

4) $\frac{7}{4} \div \frac{3}{4}$

"Keep, switch, flip":

$= \frac{7}{4} \times \frac{4}{3}$

Multiply the fractions:

$= \frac{28}{12}$

Simplify the fractions:

$= \frac{14}{6} = \frac{7}{3}$

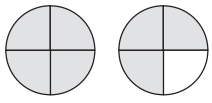
Convert to mixed number:

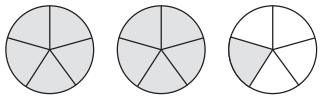
$= \mathbf{2\frac{1}{3}}$

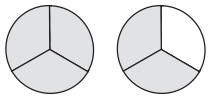
Practice

Look at each image and then write the improper fraction and mixed number that it represents.

	Improper Fraction	Mixed Number

1) 

2) 

3) 

Multiply or divide the fractions. Convert them to a mixed or whole number.

4) $\frac{7}{3} \times \frac{4}{3} =$

5) $\frac{9}{4} \times \frac{2}{3} =$

6) $\frac{9}{3} \div \frac{3}{2} =$

Multiply or divide the mixed numbers. Convert them to improper fractions before multiplying. Then convert them back to mixed numbers.

7) $1\frac{1}{4} \times 2\frac{2}{3} =$

8) $2\frac{1}{4} \div 1\frac{1}{4} =$

9) $3\frac{1}{2} \times 1\frac{1}{3} =$

Word Problem

10) An envelope's height is $8\frac{3}{5}$ centimeters. Its width is $1\frac{1}{2}$ times longer than its height What is the envelope's width?

Closing

Sometimes learning mathematics, just like many things in our lives, can be difficult. Speak with a friend or family member about what helps them when they face difficult things in life. What gives them comfort and strength during these times?

17

Improper and Mixed Fractions

Part B

What You Will Learn

- You will apply your knowledge of adding, subtracting, multiplying, and dividing fractions to real-life situations.
- You will practice converting between mixed numbers and improper fractions.

Vocabulary Words

- **proper fraction:** a fraction where the numerator is less than the denominator (for example, $\frac{2}{3}$)
- **improper fraction:** a fraction where the numerator is greater than the denominator (for example, $\frac{4}{3}$)
- **mixed number:** a number made up of a whole number and a proper fraction (for example, $3\frac{1}{2}$ or $12\frac{1}{4}$)
- **convert:** to change the units of measurement without changing the actual size or amount of the thing being measured (for example, converting millimeters to centimeters)

Lesson

Problem 1

Sara picked tomatoes from her garden and got about 12 liters of chopped tomatoes. She used $6\frac{1}{2}$ liters of the tomatoes to make a sauce. She then used $1\frac{5}{6}$ liters of the tomatoes to make soup. She separated the remaining chopped tomatoes into 4 equal portions and froze them. About how many liters of tomatoes were in each portion that she froze?

Show Your Work

Answer

Activity

With a new partner, write your own word problem using fractions. You can add, subtract, multiply, or divide them. After you write the problem, you and your partner will solve it and then show your answer to another pair of students. For more of a challenge, try using a mixed number in your word problem.

Problem

Show Your Work

Answer

Practice

Solve each problem. Remember first to convert mixed numbers to improper fractions.

1) $6\frac{4}{5} + \frac{1}{5}$	2) $\frac{5}{3} - 1\frac{1}{6}$
3) $\frac{10}{4} \times \frac{12}{5}$	4) $3\frac{4}{7} \div \frac{10}{7}$

Closing

When you go home today, write a new word problem for a friend or family member. Use this word problem to teach someone what you learned in class today.

18

Add and Subtract Integers

Part A

What You Will Learn

- You will add and subtract integers.
- You will understand various ways to interpret the " – " sign (the minus sign).
- You will understand that subtraction is equivalent to addition of the opposite.

Vocabulary Words

- **integer:** a positive or negative whole number, or zero
- **negative:** a number that is less than zero and is shown with the negative symbol: "–" (for example, negative 5, which is 5 units below zero, is written as –5)

Lesson

Write what you learn.

How are the following problems similar, and how are they different? How might we write them out mathematically? Work on each problem with the other students at your table.

Negative Integers

What can the minus sign (–) mean in math?

1. If the summer temperature during the day was 32 degrees and in the evening it dropped by 20 degrees, what was the temperature at night?

2. If the winter temperature during the day was 5 degrees and in the evening it dropped by 20 degrees, what was the temperature at night?

Activity

Solve the following problems. When adding and subtracting negative numbers, you may want to use the number line.

-12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12

1) $12 - 4 =$	2) $-12 - 4 =$
3) $12 + (-4) =$	4) $-12 + (-4) =$

Subtracting a number is the same as _____

_____

Practice

Solve the following integer problems. The answer to each question represents a letter.

(W)	4 + (–11) =	(O)	–10 + (–3) =
(S)	12 – (–4) =	(C)	–5 + 7 =
(G)	–6 – (–2) =	(T)	11 – 8 =
(I)	11 – (–3) =	(A)	8 – (–7) =
(E)	15 – 11 =	(H)	7 – 10 =
(U)	–2 + 8 =	(M)	–8 – (–20) =
(D)	8 + (–9) =	(R)	1 – (–8) =
(N)	3 + (–2) =	(L)	–13 + 8 =

Mystery Phrase: Write the letter that matches each answer on the lines below:

14		2	15	1		-1	-13		15	-5	-5			
3	-3	14	1	-4	16		3	-3	9	-13	6	-4	-3	
2	-3	9	14	16	3		-7	-3	14	2	-3			
16	3	9	4	1	-4	3	-3	4	1	16		12	4	

What does this scripture mean to you? (Philippians 4:13)

Closing

How can you do all things through Christ? Bear your testimony of this scripture to a friend or family member after class today.

19

Add and Subtract Integers

Part B

What You Will Learn

- You will add and subtract integers.
- You will understand various ways to interpret the " – " symbol (the minus sign).
- You will understand that subtraction is equivalent to addition of the opposite.

Vocabulary Words

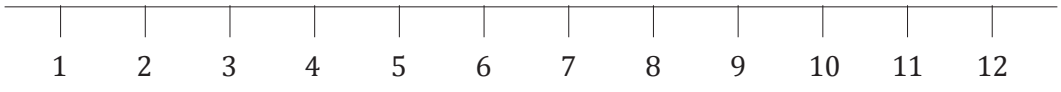
- **integer:** a positive or negative whole number, or zero
- **negative:** a number that is less than zero and is shown with the negative symbol: "–" (for example, negative 5, which is 5 units below zero, is written as –5)

Lesson

Write what you learn.

With a partner, discuss and write below any questions or ideas that you had last lesson about adding and subtracting integers. For example, when you add two negative numbers, will the sum be positive or negative?

$5 + 2 - (-4) =$



Activity

Problem

Zane and Sabra were digging tunnels close to each other. Zane started 10 meters below the surface. He went down another 18 meters, then went up 5 meters. Then he went down 12 more meters and rested.

Sabra started at the surface. He went down 22 meters, then went up 5 meters. Then he went down another 18 meters and rested.

Who rested at a greater depth: Zane or Sabra? Write two equations—one to show Zane's digging, and one to show Sabra's digging.

Show Your Work

Answer

Practice

Evaluate each expression.

1) $-12 + (-6) =$	2) $-9 - (-1) =$
3) $-10 + 3 =$	4) $-8 - 6 =$
5) $\frac{3}{4} \times 12 =$	6) $\frac{1}{2} \times \frac{8}{3} =$
7) $\frac{5}{6} \div \frac{1}{3} =$	8) $\frac{12}{5} \div 4 =$

Find the Error

Two students named Peace and Joseph both made mistakes while solving problems Identify the error in their work. Then correctly rework each problem.

9) Peace's work: **Step 1:** $4 - (-2) + 10 = 4 + (-2) + 10$ **Step 2:** $4 + (-2) + 10 = 2 + 10$ **Step 3:** 12	
10) Joseph's work: **Step 1:** $-11 + (-2) - 10 = -13 - 10$ **Step 2:** $-13 - 10 = 13 + (-10)$ **Step 3:** 3	

Closing

Anytime you count something, you are using integers. Remember that integers are all positive and negative whole numbers and zero. Now that you have learned more about integers, try to notice throughout the week how often you use integers in your life. Share with a family member or friend ways you use integers. Show them the rules for adding or subtracting integers.

20

Mathematics Self-Evaluation

This is not a test. It is a way to see how well you understand the mathematics skills that you have learned in these lessons. This evaluation will help you know which mathematics skills you have mastered and which skills you still need to practice.

Circle the answer for each question. Show your work next to each problem. After everyone has finished, the teacher will go through each question and explain the answer.

Adding and Subtracting Decimals	**Show Your Work**
1) $133.65 - 5.85 =$ A) 127.80 B) 97.30 C) 132.20 D) 127.60	
Multiplying Decimals	
2) $13.2 \times 4 =$ A) 5.28 B) 47.6 C) 52.8 D) 4.76	

Dividing Decimals

3) $1.36 \div 2 =$

A) 1.08
B) 0.48
C) 0.68
D) 0.46

4) $3.96 \div 0.9 =$

A) 0.04
B) 0.44
C) 1.40
D) 4.4

Adding Fractions with Unlike Denominators

5) $\frac{3}{4} + \frac{1}{8} =$

A) $\frac{4}{12}$
B) $\frac{3}{8}$
C) $\frac{7}{8}$
D) $\frac{4}{8}$

Simplifying Fractions

6) Simplify $\frac{8}{12} =$

A) $\frac{1}{8}$
B) $\frac{8}{4}$
C) $\frac{2}{3}$
D) $\frac{2}{4}$

Multiplying Fractions and Simplifying

7) $\frac{4}{6} \times \frac{1}{4} =$

A) $\frac{2}{6}$

B) $\frac{6}{24}$

C) $\frac{4}{12}$

D) $\frac{1}{6}$

Dividing Fractions and Simplifying

8) $\frac{1}{5} \div \frac{2}{5} =$

A) $\frac{1}{2}$

B) $\frac{2}{25}$

C) $\frac{5}{25}$

D) $\frac{1}{5}$

Mixed Numbers and Improper Fractions

9) $1\frac{1}{2} \times \frac{4}{5} =$

A) $1\frac{4}{10}$

B) $1\frac{2}{5}$

C) $1\frac{1}{5}$

D) $\frac{12}{5}$

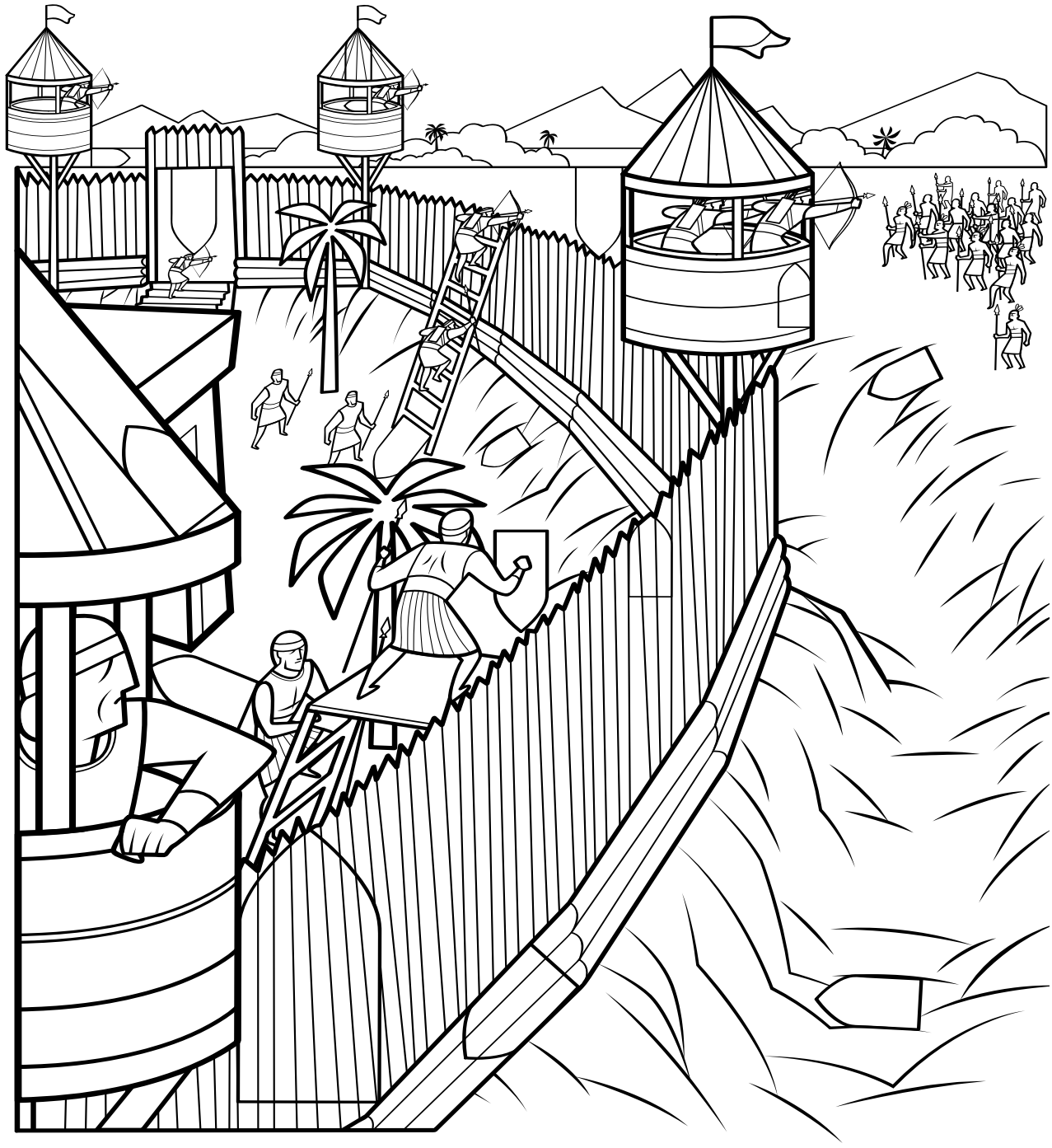
10) $\frac{10}{8} + \frac{5}{16} =$ A) $\frac{10}{8}$ B) $\frac{25}{16}$ C) $\frac{9}{16}$ D) $\frac{15}{24}$	
Adding or Subtracting Integers	
11) $6 + (-4) - 2 =$ A) -5 B) 0 C) -4 D) 4	
12) $(-7)-1+10+(-4)=$ A) -2 B) 2 C) 0 D) -4	

Review the problems you missed. Then practice the skills you need to improve. Talk with your Succeed in School teacher if you need extra help to master these skills.

Extra Activity Pages

The following pages have extra activities for you to complete if you arrive early, if you're waiting for others to finish assessments or activities, or if you have extra time at the end of class.

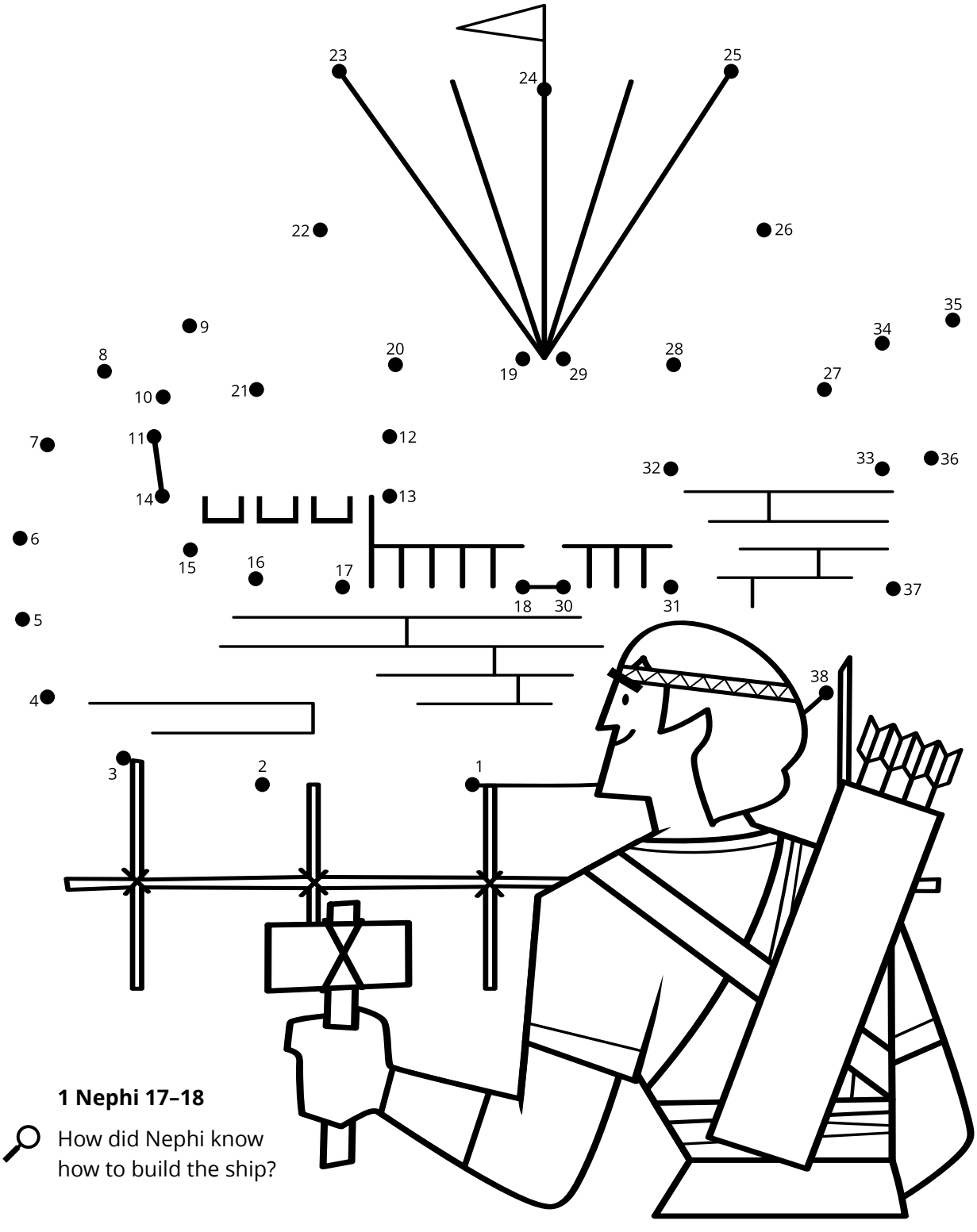
The Nephites built fortified (strong) walls and dug ditches around their cities to protect them from the Lamanite armies. Find 15 shields to help the Nephites protect their city.



Alma 49

Why were the Lamanites astonished (surprised)?

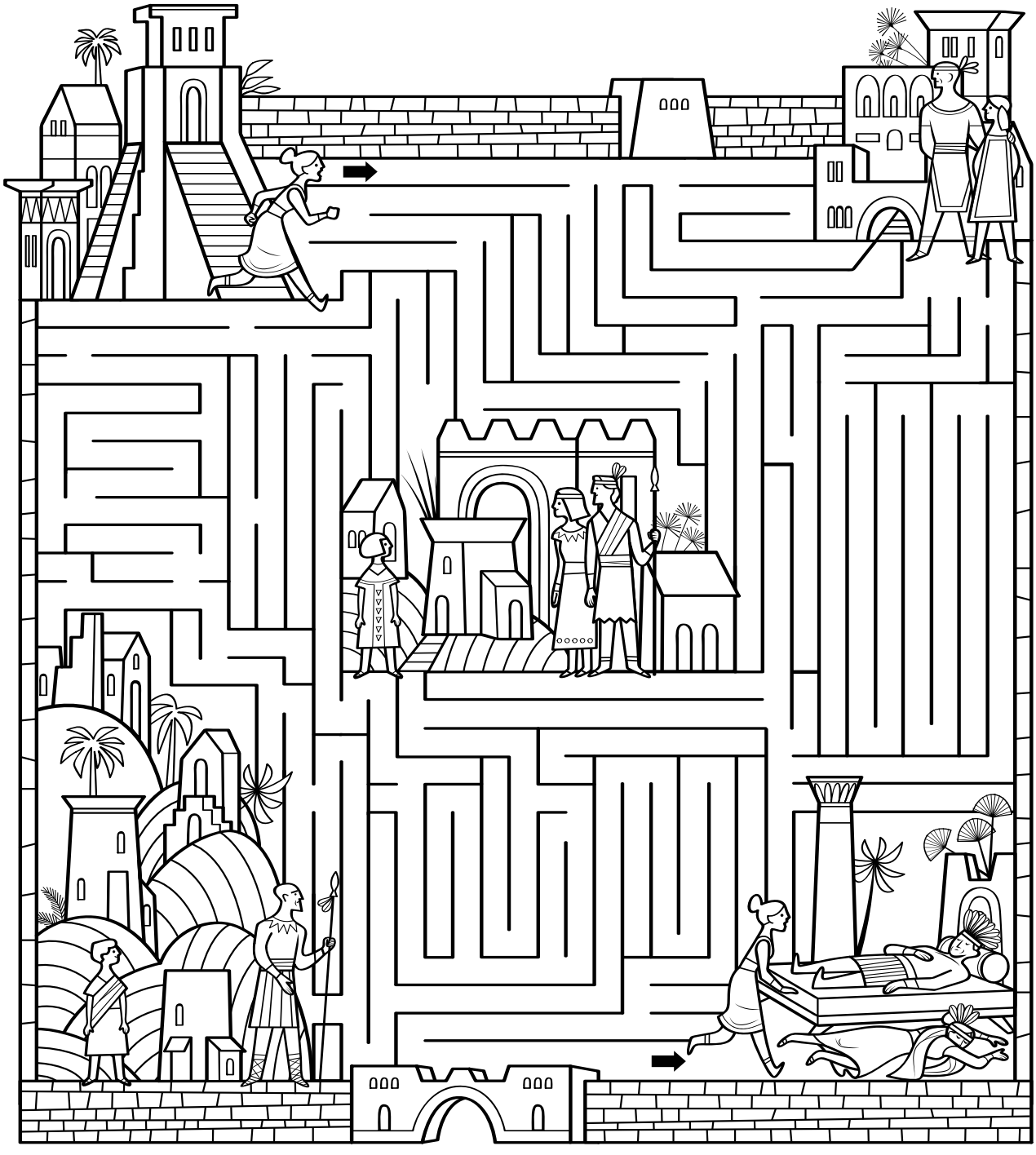
The Lord told Nephi to build a boat to carry his family across the waters to the promised land. Connect the dots to help **Nephi build the ship.**



1 Nephi 17–18

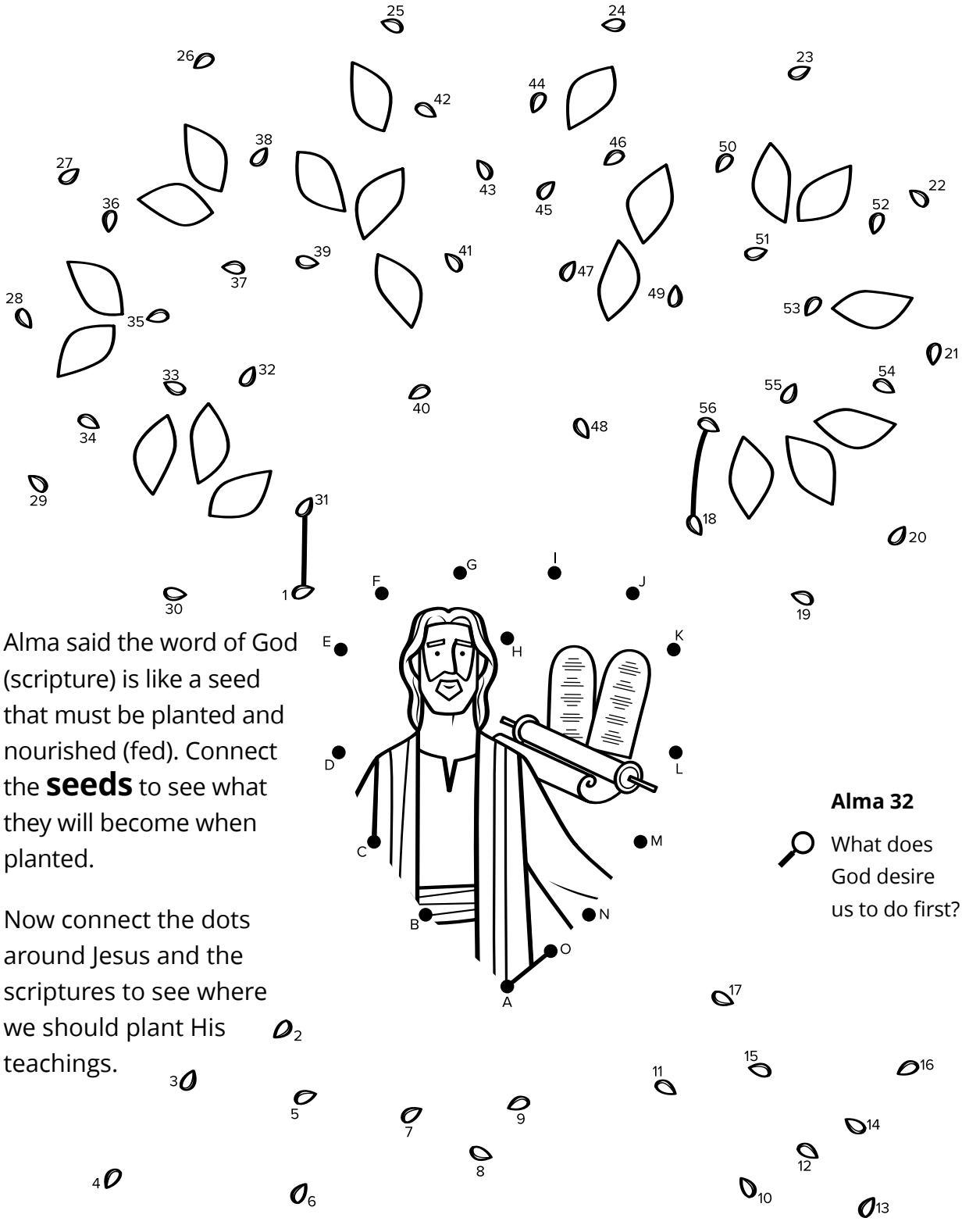
How did Nephi know how to build the ship?

King Lamoni and the queen fell into a trance (dream) when Ammon taught them about God's plan and the coming of Christ. Follow the path of **Abish** as she tells the people what happened.



Alma 19

Why did Abish want to tell everyone about the king and queen?



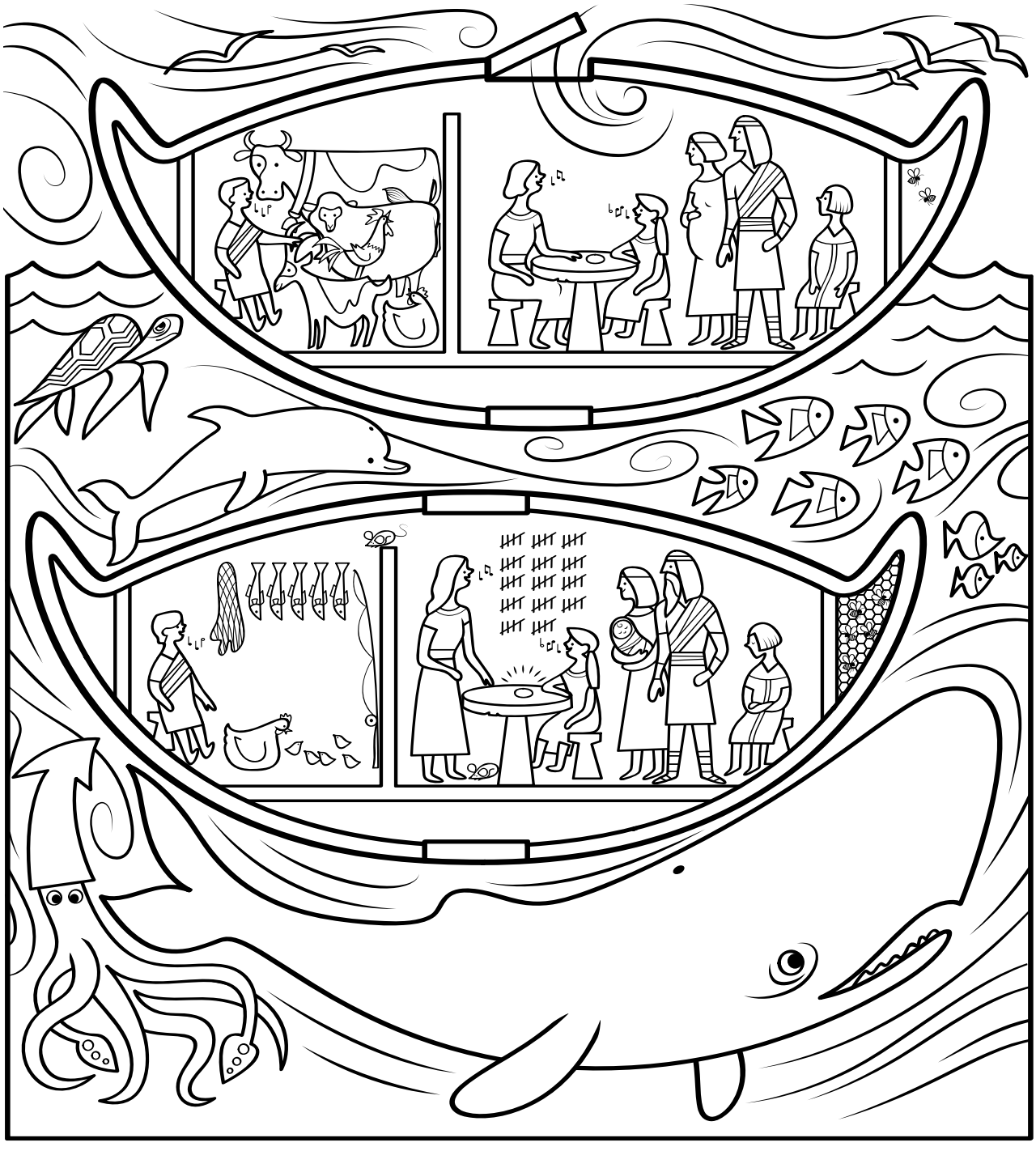
Alma said the word of God (scripture) is like a seed that must be planted and nourished (fed). Connect the **seeds** to see what they will become when planted.

Now connect the dots around Jesus and the scriptures to see where we should plant His teachings.

Alma 32

What does God desire us to do first?

The Lord caused the wind to blow the **Jaredites' barges** to the promised land. Find 13 differences in their journey above and below the sea.

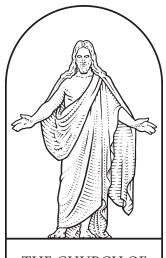


Ether 6

What did the Jaredites do while in the barges?

"To follow Christ is to become more like Him. It is to learn from His character. As spirit children of our Heavenly Father, we do have the potential to incorporate Christlike attributes into our life and character. The Savior invites us to learn His gospel by living His teachings. To follow Him is to apply correct principles and then witness for ourselves the blessings that follow."

—Elder Dieter F. Uchtdorf, "Christlike Attributes—the Wind Beneath Our Wings," *Liahona*, Nov. 2005, 102



THE CHURCH OF
JESUS CHRIST
OF LATTER-DAY SAINTS