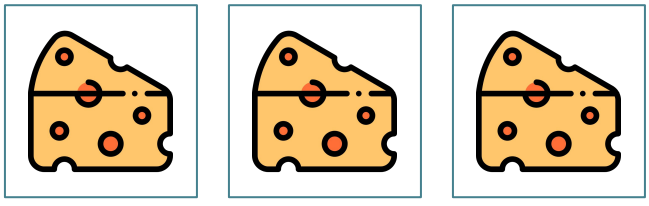
Helping With Math

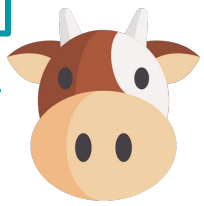
Multiplying Fractions with Whole Numbers (with denominators from 2 to 6)

GRADE 4

Multiplying fractions with whole numbers is a process of adding all the given fractions as many times as what the whole number requires.



This means <u>three times</u>
⅙ of a whole cheese



- **Multiplication** is one among the four basic operations, the three being addition, subtraction and division.
- The equation is composed of *multiplicand*, *multiplier* and *product*.
- It implies repeated addition of the multiplicand (to itself) as many times as what the multiplier implies.

MULTIPLICATION OF FRACTIONS WITH WHOLE NUMBERS

The process of multiplying a fraction and a whole number may be explained similarly with multiplying two fractions. See the example below.

Given: ½ x 5 = ?

Step 1: Express the whole number as a fraction.

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

Whole numbers have "imaginary" denominator equal to 1.

Step 2: Multiply the parts of the fraction.

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

Multiply the numerators and denominators individually.

Step 3: SImplify if possible.

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

Improper fractions shall always be transformed to mixed numbers for final answer.

One way to check the answer is by adding the fraction as many times as the value of the whole number.

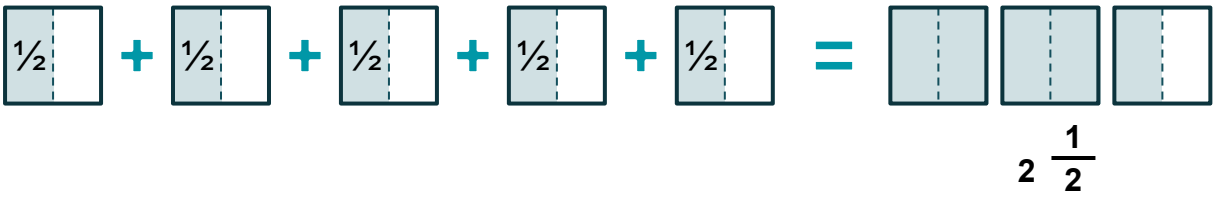
$$\frac{1}{2} \times 5 = \underset{(1)}{\frac{1}{2}} + \underset{(2)}{\frac{1}{2}} + \underset{(3)}{\frac{1}{2}} + \underset{(4)}{\frac{1}{2}} + \underset{(5)}{\frac{1}{2}} = \frac{5}{2} = \boxed{2\frac{1}{2}}$$

VISUAL MODELS

One way to determine the product of a fraction and a whole number is through **visual representation**.

Given: ½ x 5 = ?

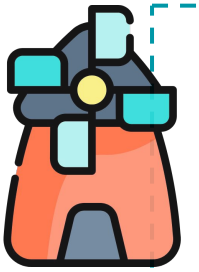
Visual Representation:



$2\frac{1}{2}$

TRANSLATING WORD PROBLEMS

When a word problem is given, one can tell that it implies multiplication with the help of clue words. Some of these clue words are listed below.



altogether	double, triple
each	factor
groups of	in all
multiply	product
times	total
twice	thrice

EXAMPLE/S:

1. "one-half times five"
2. "one-half multiplied by five"
3. "product of one-half and five"
4. "five groups of one-half"

All these translates to: "**½ x 5**" or vice versa, if commutative property of multiplication is applied

SAMPLE/APPLICATION

It was Anna's first time to go to his grandfather's farm. She was tasked to collect the apples that are ready for harvest. In total, the farm has 5 full grown apple trees. If Anna had filled ⅓ of a basket for every tree, how many baskets of apples did Anna harvest altogether?

Provide the information being asked below.

1.) What is asked?

2.) What are the given?

3.) What word gives the clue on what operation shall be used?

4.) Write mathematical equation that translates the word problem.

5.) Solve for the answer.

6.) Provide a visual representation.

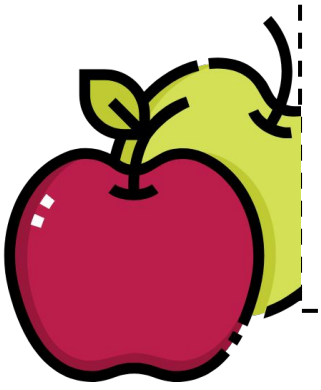


TABLE OF ACTIVITIES

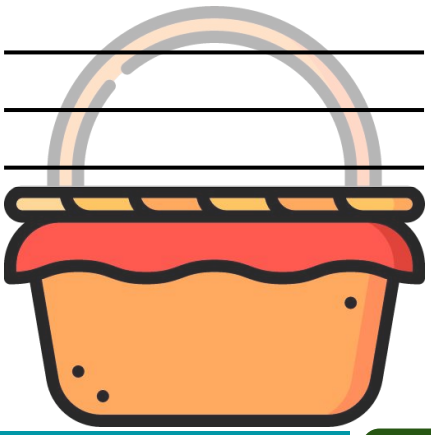
HARVEST THE CLUES

Help Old John gather up the fruit-clues. Draw a line through every word you found and list them on the space provided.

Hi there! I am Old John. I need to find all the fruit-clues but my a bit of poor eyesight is making me slow. These so-called “fruit-clues” are the clue words implying multiplication hidden in the word search below. Help him out before the pests find it first.

M	T	I	M	S	O	T	H	R	I	C	E	D
H	A	K	L	W	T	U	O	V	A	H	J	L
M	U	L	T	I	P	L	Y	D	O	F	A	L
S	F	J	T	R	D	C	U	C	W	A	E	N
C	N	G	J	O	K	L	A	E	Y	C	I	O
Z	V	N	U	F	G	P	C	C	I	T	K	B
L	X	B	X	V	R	E	C	W	C	O	D	C
A	L	C	S	O	O	C	T	S	X	R	P	S
E	C	A	D	A	U	S	E	H	C	X	O	T
A	F	U	N	O	P	H	C	A	E	X	U	H
F	C	S	W	I	S	E	M	I	T	R	R	D
T	E	R	G	I	O	W	Z	Q	O	C	J	B
F	D	Y	K	Y	F	V	X	W	T	C	X	O
V	T	R	P	E	C	I	F	E	A	X	T	T
E	H	E	D	S	E	E	D	S	L	Z	E	H

Fruit-clues:



FERTILIZE THE VEGGIES

Fertilizers are used to supply essential nutrients to the crops. Compute for the total number of bags of fertilizers using the visual models.

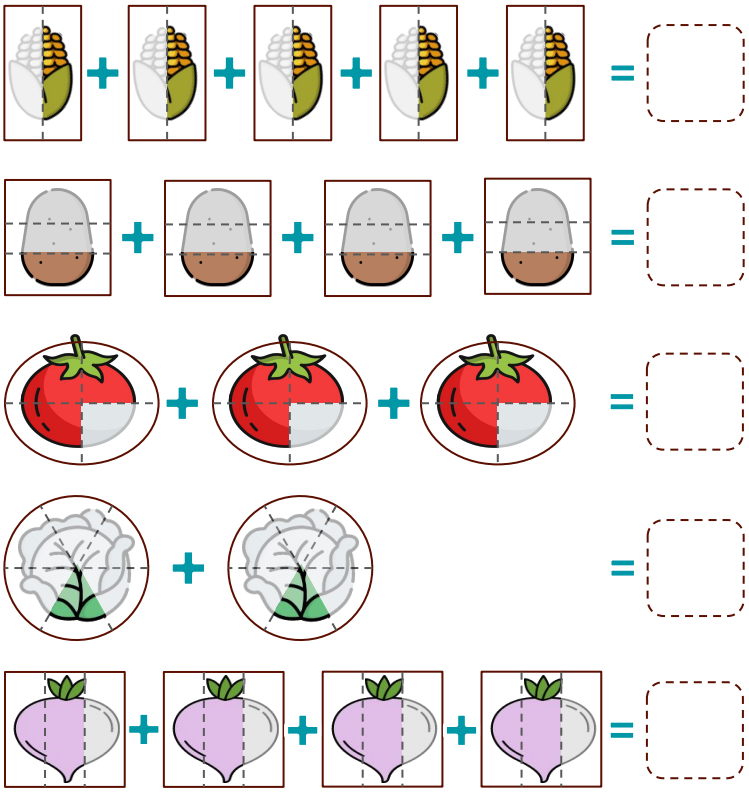
Different amounts of fertilizers are needed for different vegetable crops. Look for the number of cups of fertilizers to be used for a certain area of lot planted with different crops. The visual models may help in getting the answers easier.

The table contains the following:

- **Column A** - crops planted.
- **Column B** - amount of fertilizer for every sq. meter of lot planted with crops.
- **Column C** - total area of lot.

A	*B* *(cups)*	C (sq. m)
corn	½	5
potato	⅓	4
tomato	¾	3
cabbage	⅙	2
turnip	⅔	4

VISUAL REPRESENTATION:



PAINT THE BARN

A farm may contain multiple barns depending on how large the farm is. Read the situation below and solve for the answer.

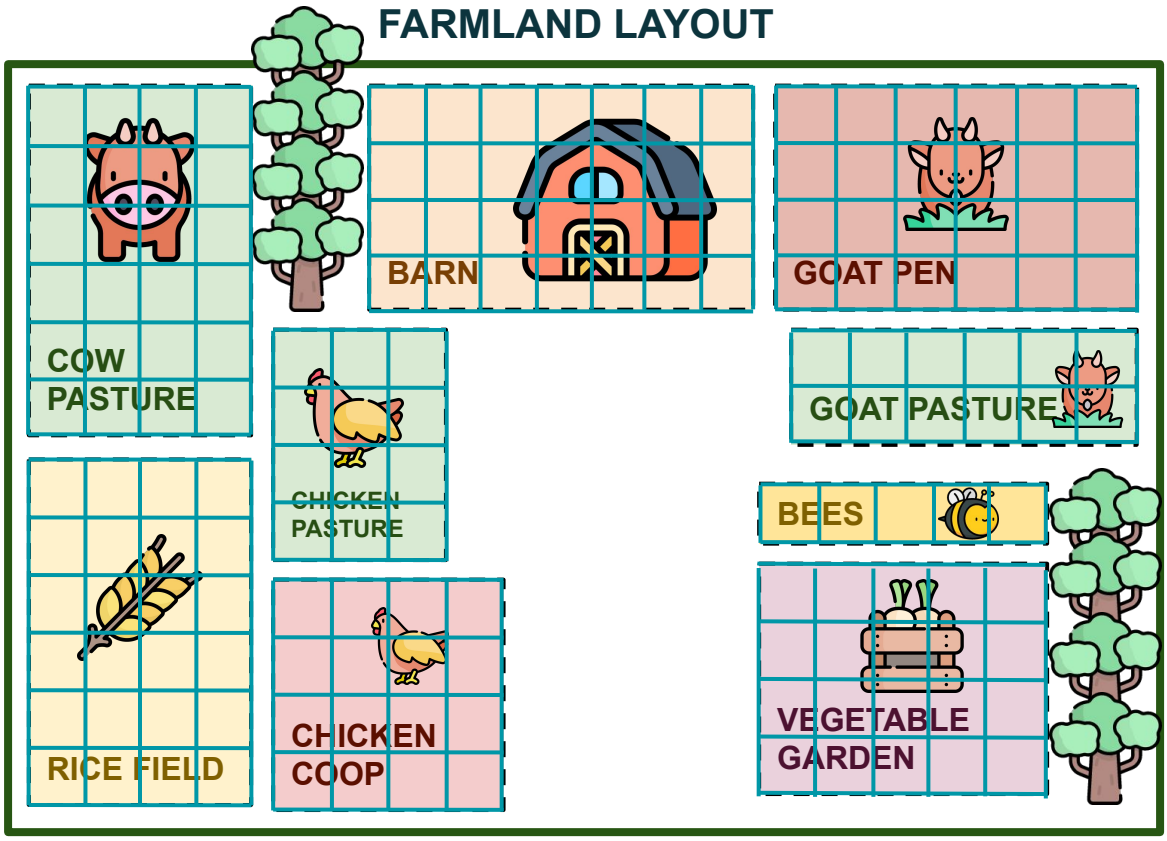
The owner of the farm decided to paint different colors on the barns having different purposes, so that new visitors may easily determine where to go in the farm. Help him find out the amount of each color of paint that the project would consume using the table below.

Barn Types	Color	Consumed per Barn	Barns in the Farm	Total Amount of Paint
chicken barn	orange	$\frac{1}{4}$ barrel	5	
dairy barn	white	$\frac{2}{5}$ barrel	2	
feeds barn	brown	$\frac{1}{6}$ barrel	4	
hog barn	peach	$\frac{3}{4}$ barrel	1	
horse barn	brown	$\frac{3}{5}$ barrel	2	
sheep barn	gray	$\frac{3}{4}$ barrel	2	
tobacco barn	black	$\frac{1}{3}$ barrel	3	
tractor barn	red	$\frac{5}{6}$ barrel	2	

PLOTTING THE FARM

The farm is composed of spaces containing different crops and livestock. Compute for the area of every space plotted below.

Count the boxes and multiply it to the equivalent of each box to find the area (**1 box = ⅖ sq. meters**)



*MEASUREMENTS ARE NOT SCALED

a. barn _____ **d.** chicken pasture _____ **g.** goat pen _____

b. bees _____ **e.** cow pasture _____ **h.** rice field _____

c. chicken coop _____ **f.** goat pasture _____ **i.** veg. garden _____

FARMWORK

There are lots of things to be done in a farm. Provide the necessary information to solve the following word problems.

WORD PROBLEMS	QUESTIONS
1 Mario was tasked to harvest milk from the cows in the farm. If it takes him $\frac{2}{5}$ hour in doing the task to each cow, hour many hours will it take for him to collect milk from 2 cows?	**Given :** **Clue Word :** **Equation :** **Answer :**
2 Luigi needs to shear wools of 3 sheeps. How long will he be done doing so if he can shear wools of each sheep in $\frac{1}{4}$ hours?	**Given :** **Clue Word :** **Equation :** **Answer :**
3 Mush can clean one barn in $\frac{5}{6}$ hours. There are 3 barns that he need to clean. What is the total number of hours needed for him to do the work?	**Given :** **Clue Word :** **Equation :** **Answer :**
4 Turt wants to deliver the harvested apples to the market nearby. How many kilograms of apples are there if he carried 5 baskets containing $\frac{3}{5}$ kilogram each?	**Given :** **Clue Word :** **Equation :** **Answer :**

FARM PRODUCTS

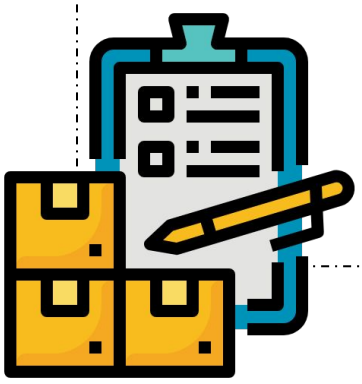
Different foods are produced from farms. Help Grandpa compute for his farm's production.

Hi there! I am Grandpa. I want to ask for some help in doing my farm's inventory. Please provide the total production from the details I've collected.

THE PRODUCTION FOR THE MONTH OF FEBRUARY:

TOTAL:

1. 9 buckets of $\frac{2}{3}$ liter of cow milk = _____ liters
2. 7 trays of $\frac{5}{6}$ kilogram of egg = _____ kilograms
3. 3 sacks of $\frac{3}{4}$ kilogram of wool = _____ kilograms
4. 15 packs of $\frac{1}{2}$ kilogram of meat = _____ kilograms
5. 10 bottles of $\frac{3}{5}$ liter of grape wine = _____ liters
6. 17 jars of $\frac{1}{4}$ liter of strawberry jam = _____ liters
7. 10 pcs of $\frac{3}{5}$ meter log = _____ meters
8. 7 baskets of $\frac{3}{4}$ pounds of orange = _____ pounds
9. 20 sacks of $\frac{4}{5}$ kilograms of wheat = _____ kilograms



DAMAGED HARVEST

Pests lessen the expected harvest. Below are some of the farm pest scenarios. Solve for the answers.

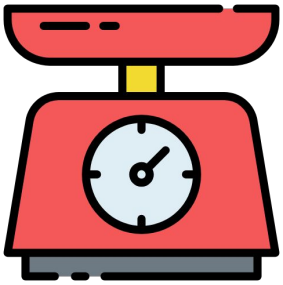
A pest exterminating team was called for killing pests that damage the harvests of the farm. At the end of their extermination, they decided to give a report on the owner of the farm on how much crops and livestock were damaged. Help them out by using the given details below.

PESTS	DESCRIPTION OF DAMAGE	TOTAL DAMAGE
a) Rats 	Damaged $\frac{1}{5}$ of every chicken barn's poultry.The farm has 5 chicken barns.	
b) Rice Bugs 	Damaged $\frac{1}{6}$ of every sq. meter of rice field. The farm has 100 sq. meters of rice field.	
c)  Crickets	Damaged $\frac{2}{5}$ of every sq. meter of fodder (grass fed on animals). The farm has 20 sq. meters of growing fodder.	
d)  Snails	Damaged $\frac{3}{4}$ of every sq. meters of young rice plant. The farm newly planted 15 sq. meters of rice.	
e)  Nematodes	Damaged $\frac{1}{3}$ of every type of vegetable crops. There are 8 different vegetable crops planted in the farm.	

WEIGH THEM ALL

Emma gathered different fruits. Find out how much every basket of each kind of fruit weighs.

A basket contains a specified number of different fruits. As the weight of each piece of fruit was given, look for the total weight in the given units.



Weigh a basket containing 35 pieces of strawberries given that every strawberry weighs $\frac{1}{6}$ of a kilogram.

How heavy is a basket of mango containing 6 pieces of the said fruit if one piece is as heavy as $\frac{1}{3}$ pounds?

How much weight is given by 3 equal sizes of pineapple contained in a basket if a piece is $\frac{3}{5}$ kilograms?

If a piece of cherry weighs $\frac{5}{6}$ of a gram, weigh a basket that has 50 cherries in grams.

A kiwi is $\frac{3}{4}$ pounds heavy. How much weight does a basket of 5 kiwi fruits of the same size make?

FARM EQUIPMENT

Farm equipment were usually invested for their big contribution in making farm works easier. Solve how much work they can do.

1. A tractor is primarily used to pull other farm equipments. If it can pull an equipment from the chicken barn to the storage in $\frac{2}{3}$ hours, how long will it take to pull 5 of the equipment from the same points?

ANSWER:

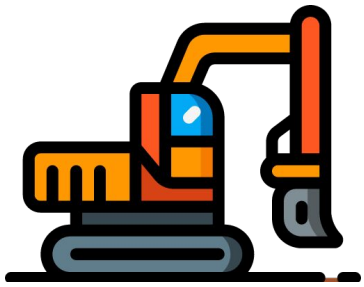
2. What is the total length of the logs that a pickup truck can bring to the storage if one load contains $\frac{5}{6}$ kilometer-log and there are 4 loads of it?

ANSWER:

3. A lawn mower is used to cut grass surface at even height. The owner took record of its work and found out that it can cut through a yard of grass in $\frac{1}{6}$ of a minute. How long will it take to cut grass with a distance of 10 yards?

ANSWER:

4. A digger, an equipment used to dig into the earth, can gather a volume of $\frac{3}{4}$ cubic meters in one dig. How much soil is gathered after 7 digs?



ANSWER:

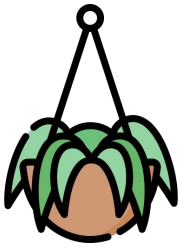
WATERING THE PLANTS

One primary way to take care of most of the plants is to water it regularly. Read the problems carefully and solve for the answer.

Find out how much water was consumed by the plants below.

1. An aloe vera plant does not need too much water. If a plant box of the said plant needs $\frac{1}{3}$ liter of water, how much water shall 4 plant boxes of aloe vera consume for it to grow properly?

Answer: _____



2. A hanging plant is watered daily. It has been 5 days since it was given to the new owner. How much water has it consumed if it takes up to $\frac{1}{6}$ liter of water everyday?

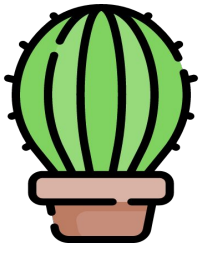
Answer: _____

3. A cactus plant only needs to be watered weekly, with $\frac{3}{4}$ ounce of water. If you have been watering it for one straight year (1 year = 52 weeks), how many ounces of water has the cactus plant consumed?

Answer: _____

4. An orchid plant needs to be kept moist. Thus, the owner waters it with $\frac{1}{6}$ ounce of water, thrice, everyday. How much water will it consume for one week or 7 days?

Answer: _____



5. A bamboo plant needs to be watered $\frac{3}{4}$ liters, twice, everyday. In 5 days, how much water has it already consumed?

Answer: _____

ANSWER GUIDE

Activity 1

altogether	times	in all
each	twice	product
groups of	double	total
multiply	factor	thrice

Activity 2

corn	= 2 ½
potato	= 1 ⅓
tomato	= 2 ¼
cabbage	= ⅓
turnip	= 2 ⅔

Activity 5

1. Given : ⅖ hour, 2 cows
   Clue Word: each
   Equation : ⅖ x 2 = ?
   Answer : ⅘ hours
2. Given : 3 sheeps, ¼ hrs
   Clue Word: each
   Equation : 3 x ¼ = ?
   Answer : ¾ hours
3. Given : ⅚ hours, 3 barns
   Clue Word: total
   Equation : ⅚ x 3 = ?
   Answer : 2 ½ hours
4. Given : 5 baskets, ⅗ kg
   Clue Word: each
   Equation : 5 x ⅗ = ?
   Answer : 3 kilograms

Activity 3

orange	=	1 ¼ barrel
white	=	⅘ barrel
brown	=	⅔ barrel
peach	=	¾ barrel
brown	=	1 ⅕ barrel
gray	=	1 ½ barrel
black	=	1 barrel
red	=	1 ⅔ barrel

Activity 9

1. 3 ⅓ hours
2. 3 ⅓ kilometers
3. 1 ⅔ yards
4. 5 ¼ cubic meters

ANSWER GUIDE

Activity 4

a. 11 ⅕ sq. meters
b. 2 sq. meters
c. 6 ⅖ sq. meters
d. 4 ⅘ sq. meters
e. 9 ⅗ sq. meters
f. 4 ⅘ sq. meters
g. 9 ⅗ sq. meters
h. 9 ⅗ sq. meters
i. 8 sq. meters

Activity 6

1. 6 liters
2. 5 ⅝ kg
3. 2 ¼ kg
4. 7 ½ kg
5. 6 liters
6. 4 ¼ liters
7. 6 meters
8. 5 ¼ pounds
9. 16 kg

Activity 7

a. 1 chicken barn
b. 16 ⅔ sq. meters of rice field
c. 8 sq. meters of growing fodder
d. 11 ¼ sq. meters of newly planted rice
e. 2 ⅔ of every vegetable

Activity 8

5 ⅝ kilograms of strawberry
2 pounds of mango
1 ⅘ kilograms of pineapple
41 ⅔ grams of cherries
3 ¾ pounds of kiwi

Activity 10

1. 1 ⅓ liters
2. ⅚ liters
3. 39 ounces
4. 3 ½ ounces
5. 7 ½ liters

Copyright Notice

Thank you

Thank you so much for purchasing and downloading this resource.

We hope it has been useful for you in the classroom and that your students enjoy the activities.

For more teaching and homeschooling resources like this, don't forget to come back and download the new material we add every week!

Thanks for supporting **Helping With Math**. We can provide teachers with low-cost, high-quality teaching and homeschooling resources because of our loyal subscribers and hope to serve you for many years to come.

- The Entire Helping With Math Team :)