THINKING MATHEMATICS 3B

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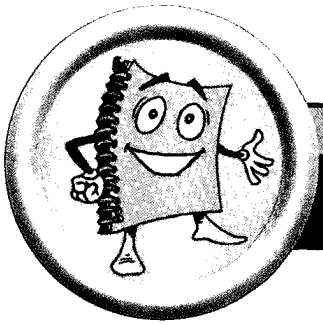


PREFACE

The *Thinking Mathematics* series is based on the latest primary mathematics syllabus. In this series, the concrete-pictorial-abstract format is used to introduce new concepts. The spiral approach is used throughout the series to consolidate and link mathematical concepts.

The series comprises textbooks and workbooks at each level. Textbook 3B comprises 7 units. Each unit is prefaced by a relevant situation from daily life and followed through with the following sections:

Do You Know? Relevant, *thought-provoking* questions are asked with regard to the real life situation presented at the beginning of each unit to *link mathematics and daily life.*

Let's Learn New concepts are explained in a straight-forward and interesting way. *Creative* and *critical thinking,* as well as *an awareness of problem-solving strategy* are developed through worked examples in this section.

Let's Try Guided sums are provided to confirm and consolidate the concepts taught.

Practice Exercises involving *critical* and *creative thinking* are provided to encourage students to look for alternative strategies in problem-solving and thus help them grow into *independent and active learners.*

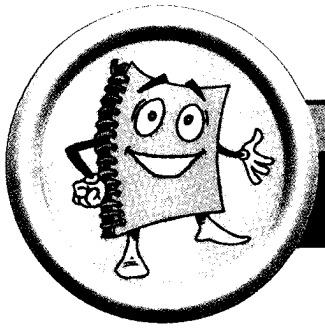
In-Class Activity Active participation from students and creative *application of mathematics to daily life,* including *IT* and hands-on activities, helps to develop lifelong learners. Cooperation and team spirit are encouraged through *group and pair work.*

Fun With Maths Mathematical concepts are extended beyond the boundaries of the classroom and brought into the realm of exploration and experiment to further engage and develop the student's interest in mathematics.

Other features of this series include:

National Education This is integrated, whenever applicable, into the series to promote a sense of nationality in the students.

Revision Exercises are provided to assist students in reviewing the concepts and skills learnt as part of examination preparation.



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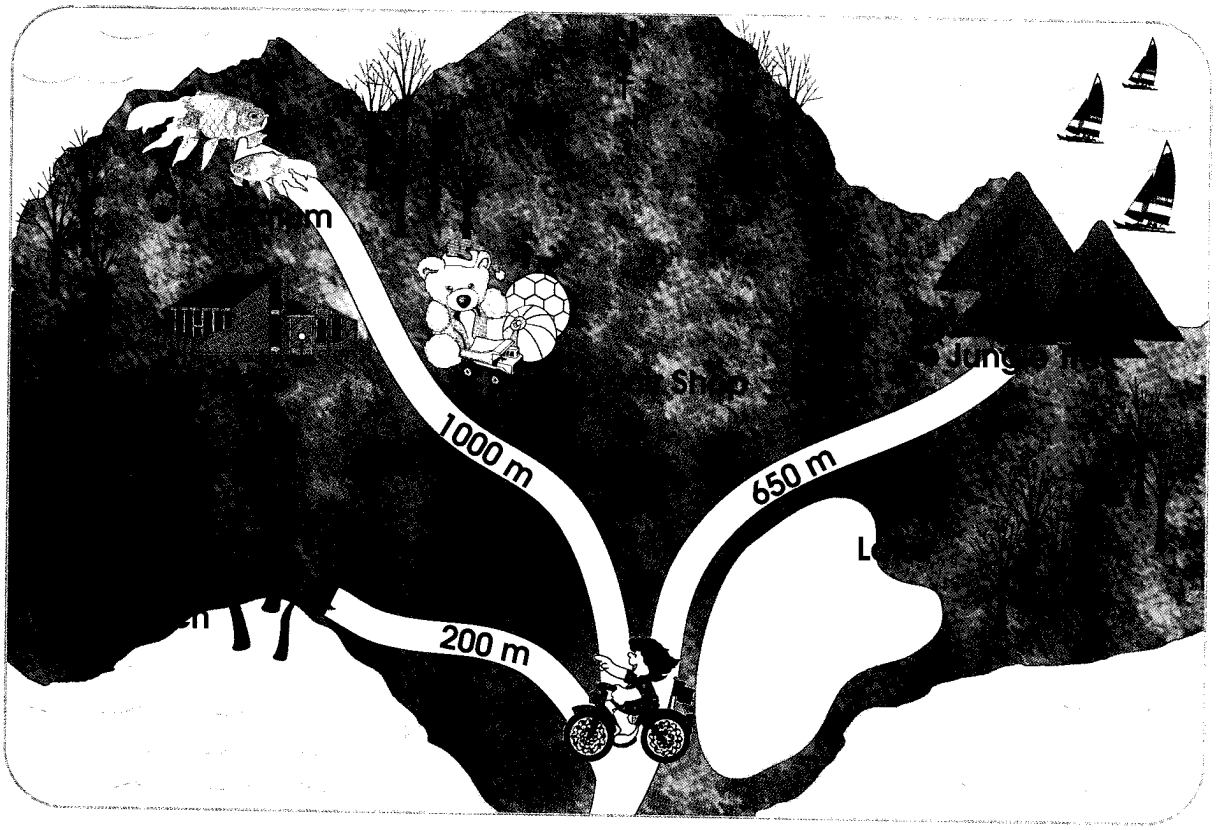
LENGTH

Discovery Island

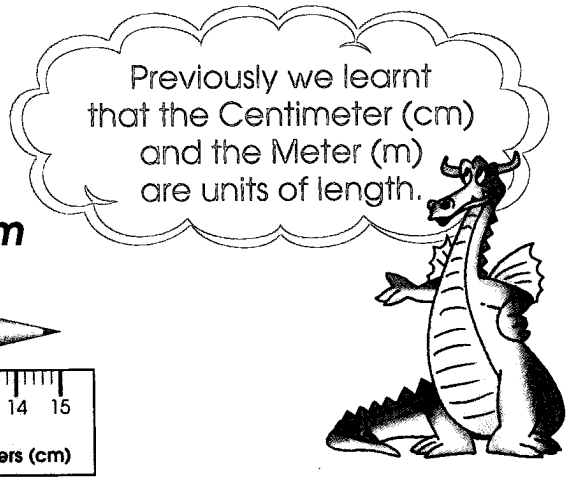


Jane is planning the route to take on Discovery Island.

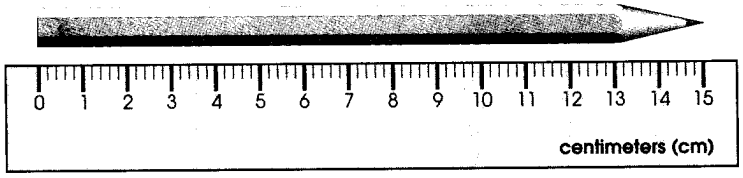
DO YOU KNOW?

Which is the furthest point to reach? A, B or C?

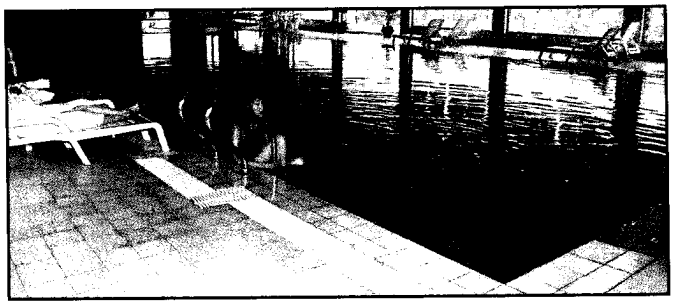
Which is the nearest?



Measuring Length in Metric System



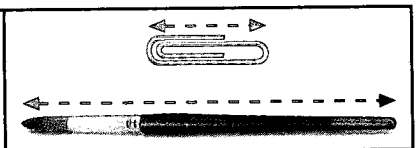
The pencil is 15 **centimeters** or 15 **cm** long.

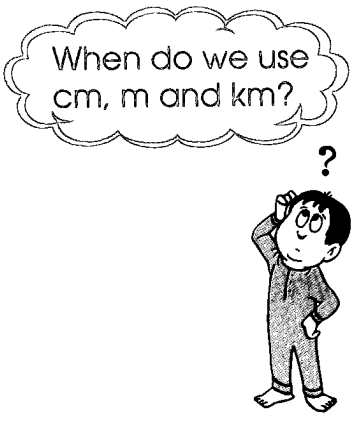


The swimming pool is 50 **meters** or 50 **m** in length.

Kilometer or **km** is also a unit of length.

Kilometer is used to measure long distances.

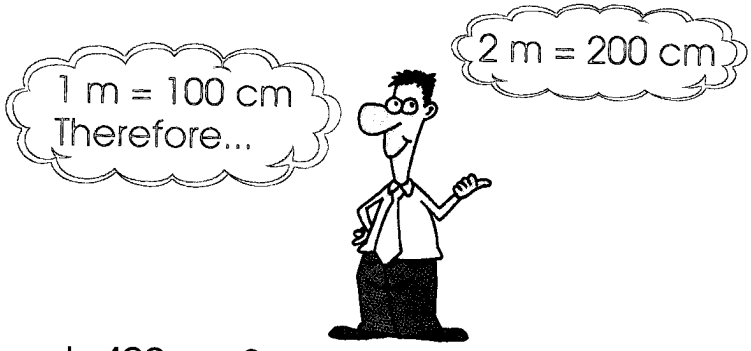
centimeters	cm	
meters	m	
kilometers	km	



Converting Length in Metric System

One kilometer is equal to 1000 meters.
One meter is equal to 100 centimeters.

How many centimeters is 2 meters?



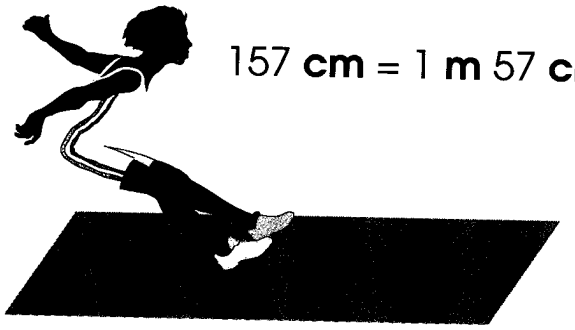
How many meters is 400 cm?

400 cm = 4 m

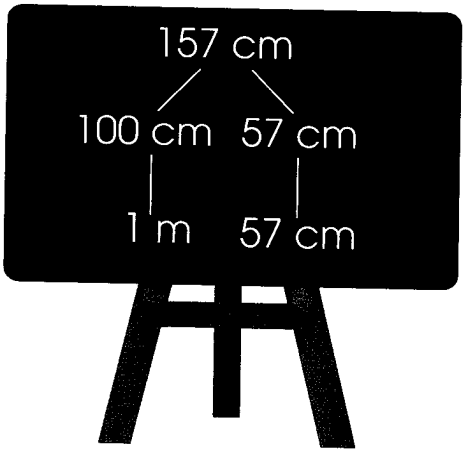
How many meters is 6 km?

6 km = 6000 m

Mary has jumped a distance of 157 **cm**.
Can you convert this to meters and centimeters?



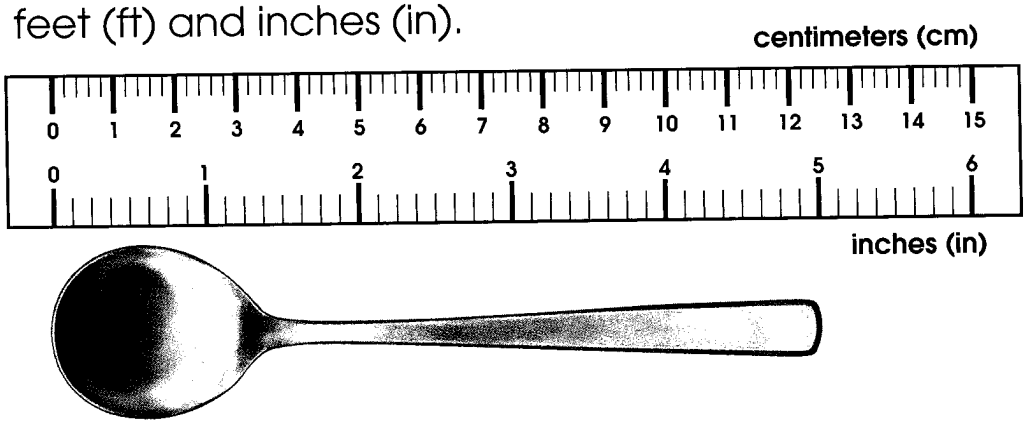
157 **cm** = 1 **m** 57 **cm**



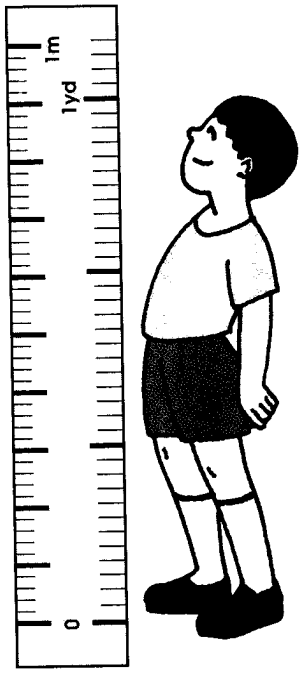
Workbook Exercise 1

Measuring Length in U.S. Customary Units

In U.S. Customary Units, length is measured in miles (mi), yards (yd), feet (ft) and inches (in).



The length of the spoon is 5 inches.



The height of the boy is 3 ft or 1 yd.

For measuring longer distances, mile is used.
Distances between cities are measured in miles.

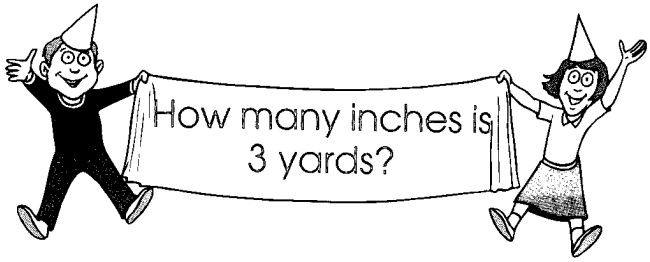
Converting Length in U.S. Customary Units

1 mile is equal to 1760 yards.
1 yard is equal to 3 feet.
1 foot is equal to 12 inches.
1 yard is equal to 36 inches.

How many miles is 3520 yards?

3520 yd = 3520 ÷ 1760 = 2 mi

A road is 2 mi 650 yd long.
We write this in yards:
2 mi = 3520 yd
2 mi 650 yd = 3520 yd + 650 yd
= 4170 yd



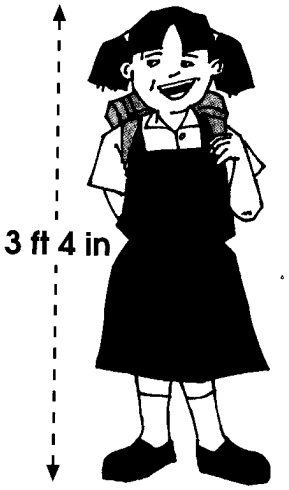
How many inches is 3 yards?

3 yd = 3 x 36 in = 108 in

Mary's height is 3 ft 4 in. Write this in inches.

3 ft = 36 in.
3 ft 4 in = 36 in + 4 in = 40 in

Therefore, 3 ft 4 in can be written as 40 in.

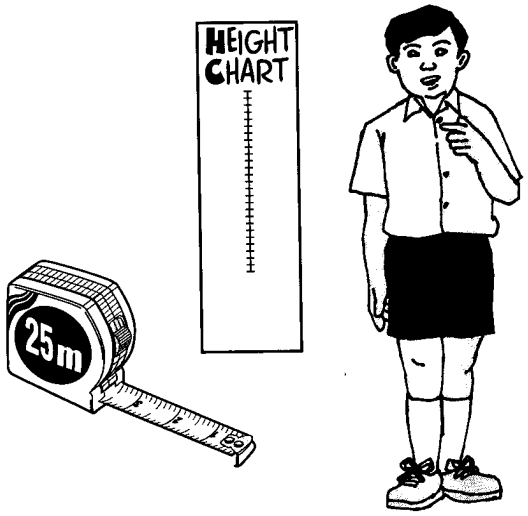


IN-CLASS ACTIVITY

Work in pairs. Use a measuring tape to find your height and your partner's height. Express the heights in

a) Centimeters

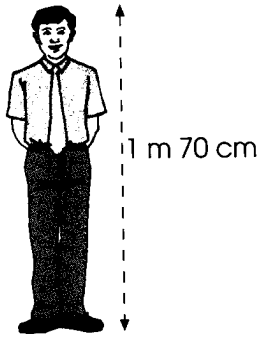
b) Feet And inches



Let's Try

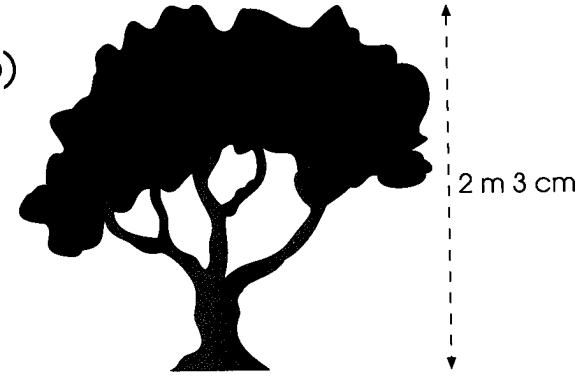
1. Write the following heights in centimeters.

a)



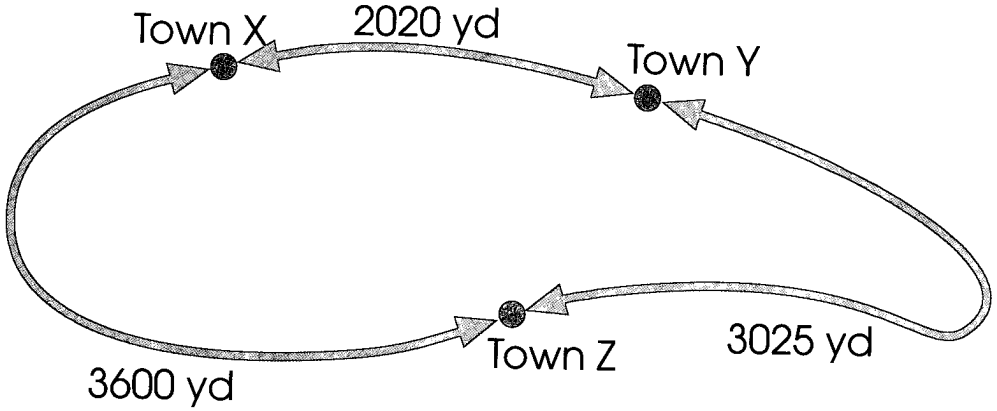
_____ cm

b)



_____ cm

2. Write the distances in miles and yards.



a) Town X is _____ mi _____ yd from Town Y.

b) Town Y is _____ mi _____ yd from Town Z.

c) Town Z is _____ mi _____ yd from Town X.

Practice 1A

1. Fill in the blanks with the correct number.

a) There are _____ meters in 8 kilometers.

b) One meter is the same as _____ centimeters.

c) _____km = 5000 m

2. Do the following conversions.

a) 180 in =____ yd____ in

b) 2 yd 29 ft =_____ ft

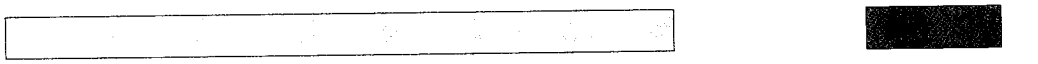
c) 3 mi 100 yd =_____ yd

d) 2076 yd =_____ mi____ yd

Addition and Subtraction of Lengths

Addition

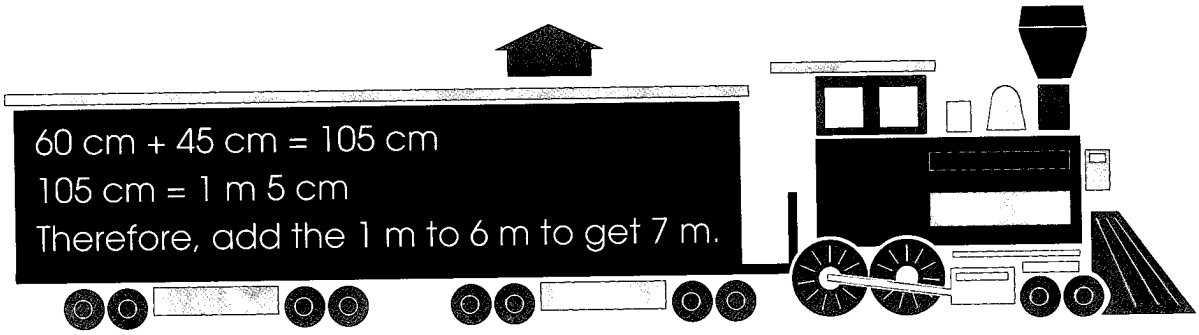
Maria has a piece of blue ribbon 5 m 60 cm long and a piece of red ribbon 1 m 45 cm long.



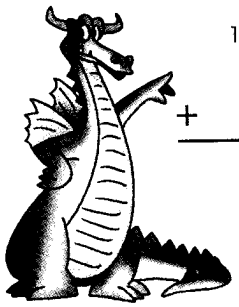
5 m 60 cm + 1 m 45 cm

The total length of the ribbons is:

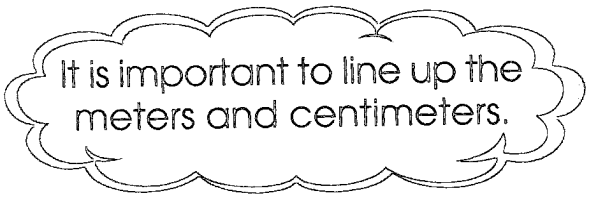
5 m 60 cm $\xrightarrow{+1\text{ m}}$ 6 m 60 cm $\xrightarrow{+45\text{ cm}}$ 7 m 5 cm



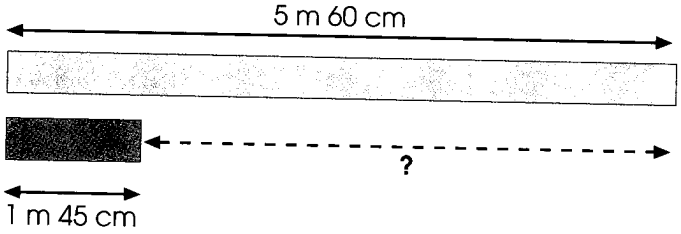
We can also write the additions as,



$$\begin{array}{r} {}^{1}5\text{ m }6\text{ }0\text{ cm} \\ +\ 1\text{ m }4\text{ }5\text{ cm} \\ \hline 7\text{ m }0\text{ }5\text{ cm} \end{array}$$



How much longer is the blue ribbon than the red ribbon?

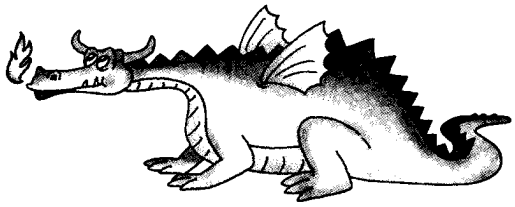


Subtraction

5 m 60 cm $\xrightarrow{-1\text{ m}}$ 4 m 60 cm $\xrightarrow{-45\text{ cm}}$ 4 m 15 cm

We can also write the above subtractions as,

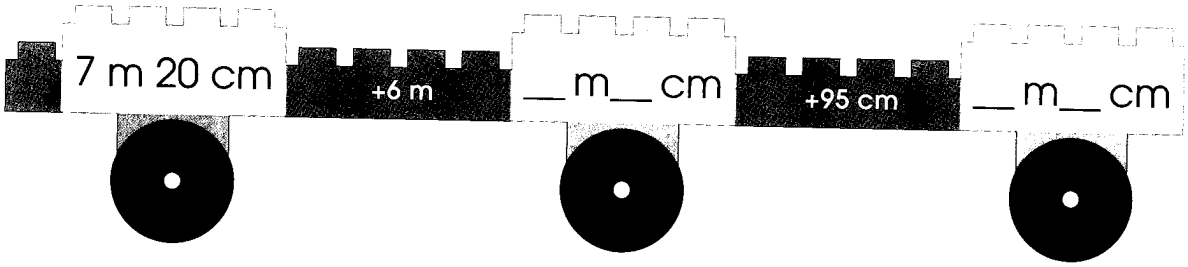
$$\begin{array}{r} 5\text{ m }\overset{5}{\cancel{6}}\,\overset{1}{0}\text{ cm} \\ -\ 1\text{ m }4\,5\text{ cm} \\ \hline 4\text{ m }1\,5\text{ cm} \end{array}$$



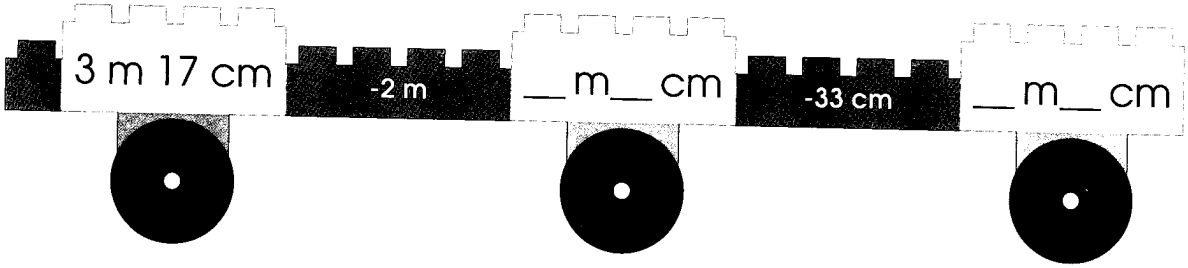
Let's Try

Fill in the blanks.

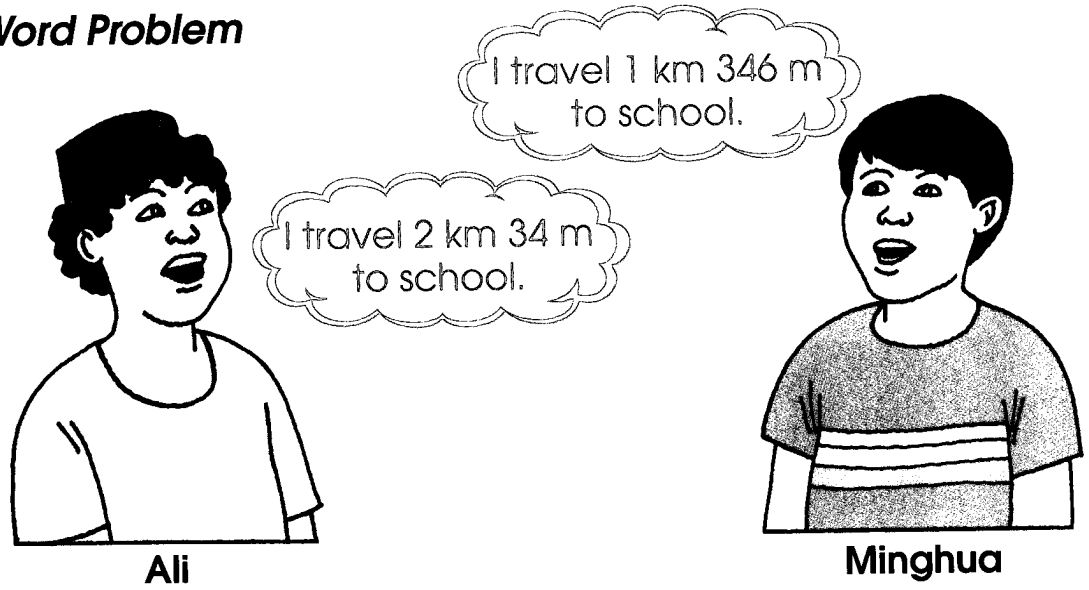
a)



b)



Word Problem



What distance do both the boys travel in all?

$$\begin{array}{r} 2\text{ km }0\,3\,4\text{ m} \\ +\ 1\text{ km }3\,4\,6\text{ m} \\ \hline 3\text{ km }3\,8\,0\text{ m} \end{array}$$

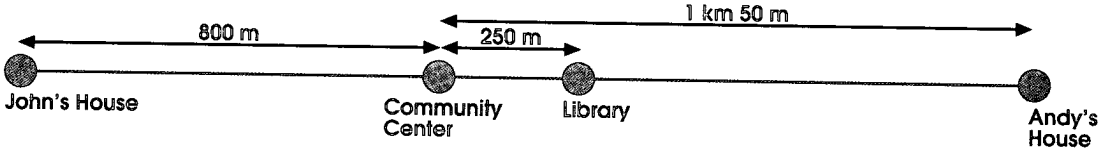
Who traveled the longer distance?
How much longer?

$$\begin{array}{r} 2\text{ km }0\,3\,4\text{ m} \\ -\ 1\text{ km }3\,4\,6\text{ m} \\ \hline 0\text{ km }6\,8\,8\text{ m} \end{array}$$

Ali traveled 688 m longer than Minghua.

Let's Try

1.



a) Who lives nearer to the Community Center, John or Andy?_____
How much nearer?

1 km 50 m - 800 m = _____ m
= _____ m

_____ lives _____ m nearer to the Community Center.

b) John goes to the Community Center first and then to the Library. What is the total distance he travels? Write your answer in kilometers and meters.

800 m + 250 m =_____ m
=_____ km _____ m

The total distance is _____ km _____ m.

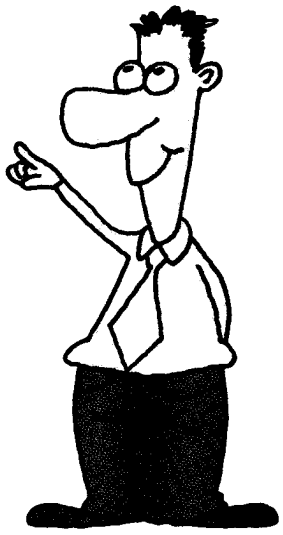
Practice 1B

1. Add the following.

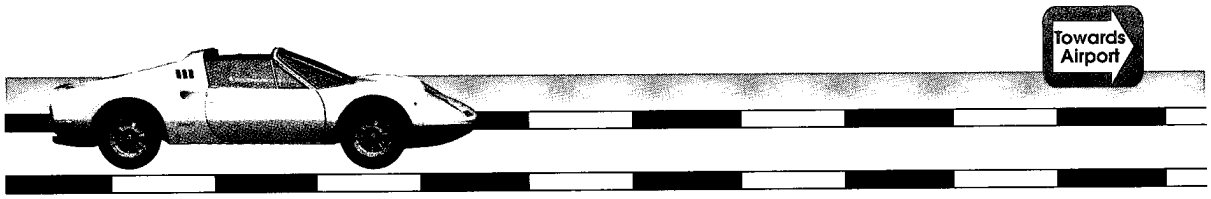
a) 2 mi 420 yd + 5 mi
b) 3 km 150 m + 50 m
c) 4 mi 200 yd + 900 yd

2. Subtract the following.

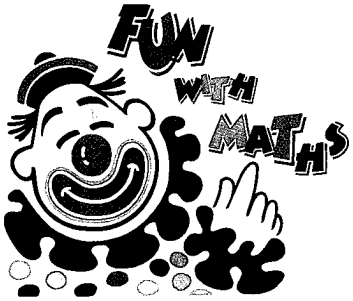
a) 1 km - 300 m
b) 2 km - 1 km 75 m
c) 5 mi 850 yd - 4 mi



3. A journey from Mr. Smith's home to the Airport is 20 km long. He discovers a shorter route that is 15 km 700 m long. How much shorter is this new route?



Workbook Exercise



The next time you are in a field or on a running track, estimate and mark out 'a hundred meters'.

Find out how long it takes you and one of your friends to run this distance.

How long does it take to run this distance ?

Record your findings.

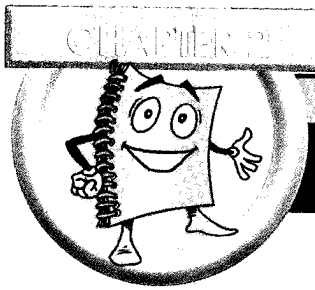
Name	:	_____	_____
Time to walk 100 m	:	_____	_____
Time to run 100 m	:	_____	_____

Find out how long it would take 4 children to complete the '400 meters' relay race, if each child runs a hundred meters.

Time taken to complete 400 m relay

= ____ + ____ + ____ + ____

= ____



MASS

Mary bought a bag of potatoes and a bag of tomatoes at the supermarket.

Mass of an object is the matter contained in it.

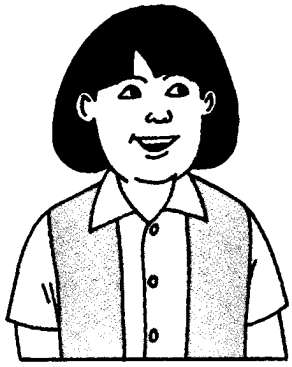
What is the mass of the potatoes she bought?

What is the mass of the bag of tomatoes?

Is the bag of potatoes lighter than the bag of tomatoes?

Measuring And Converting Mass In Metric System

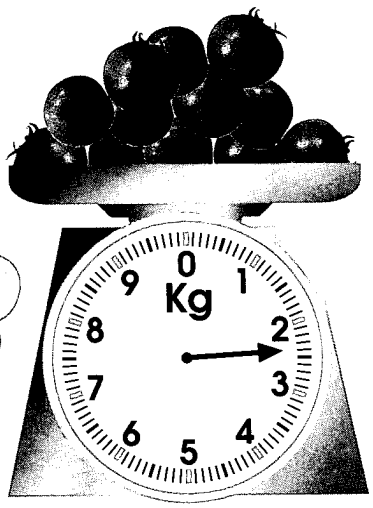
The **kilogram (kg)** and the **gram (g)** are units of mass in Metric System.



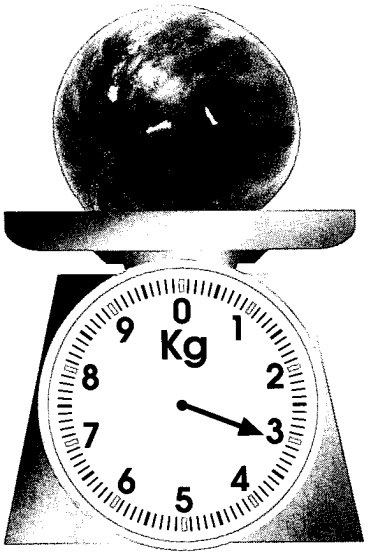
Previously we learnt that the kilogram is used to measure heavier masses like people or cartons of goods, and the gram is used to measure lighter masses like packets of sweets.

1 kg = 1000 g

The mass of the tomatoes is 2 kg 400 g.
We write this in g :



2 kg = 2000 g
Therefore,
2 kg 400 g = 2000 g + 400 g
= 2400 g



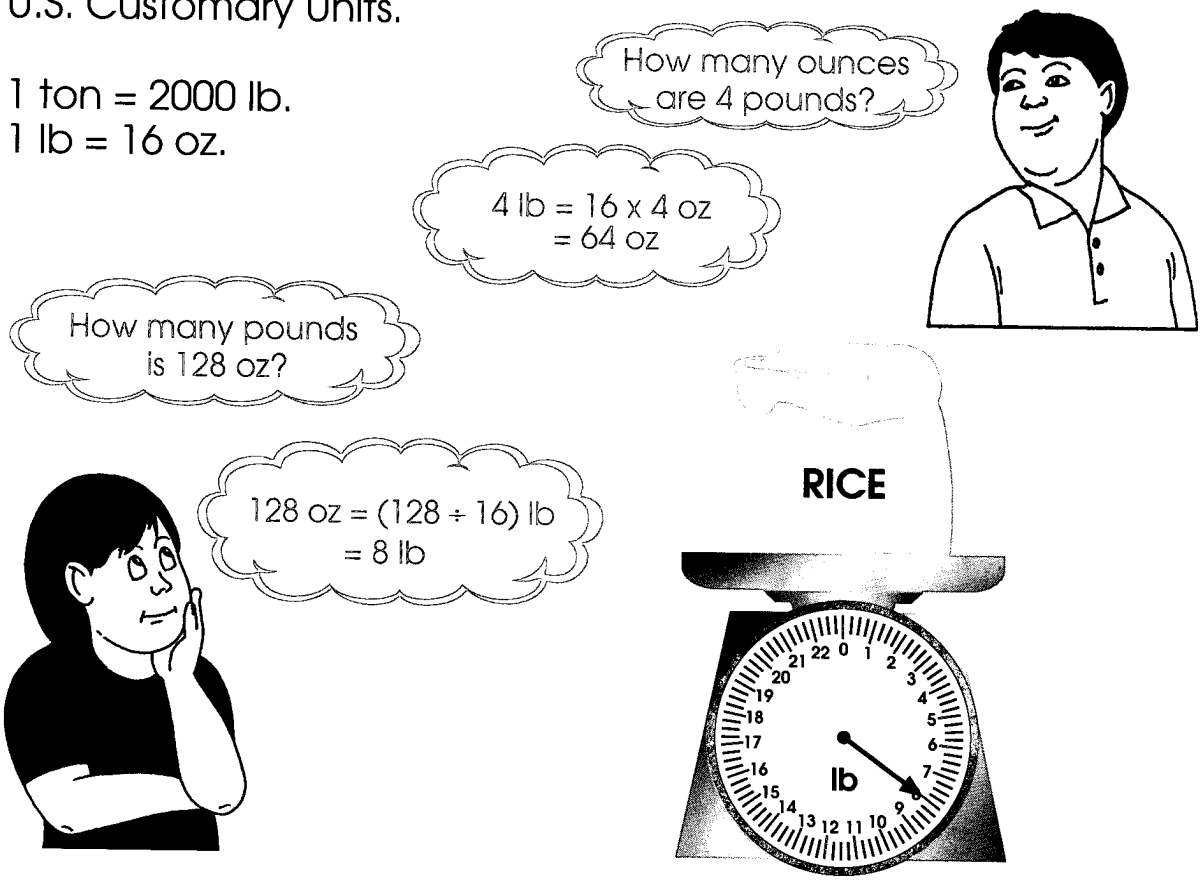
The mass of the watermelon is 3100 g.
We write this in kg and g:

3100 g = 3000 g + 100 g
= 3 kg + 100 g
= 3 kg 100 g

Measuring And Converting Mass In U.S. Customary Units

The ton (t), pound (lb) and ounce (oz) are the units of mass in U.S. Customary Units.

1 ton = 2000 lb.
1 lb = 16 oz.

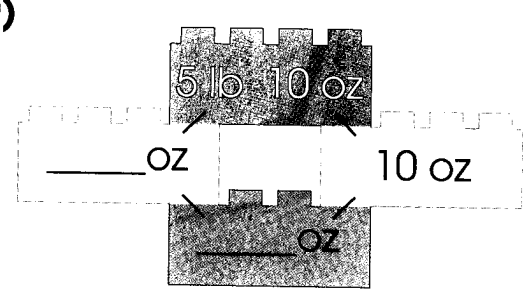


The smallest division shown in the scale above corresponds to 4 oz, thereby representing 16 oz in 1 lb.

Let's Try

1. Complete the boxes with the correct answer.

a)



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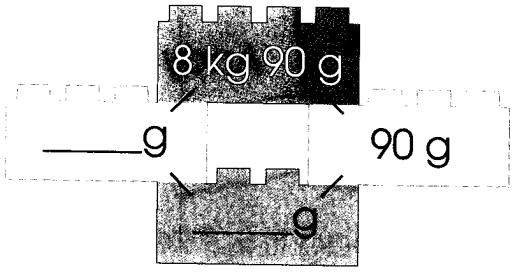
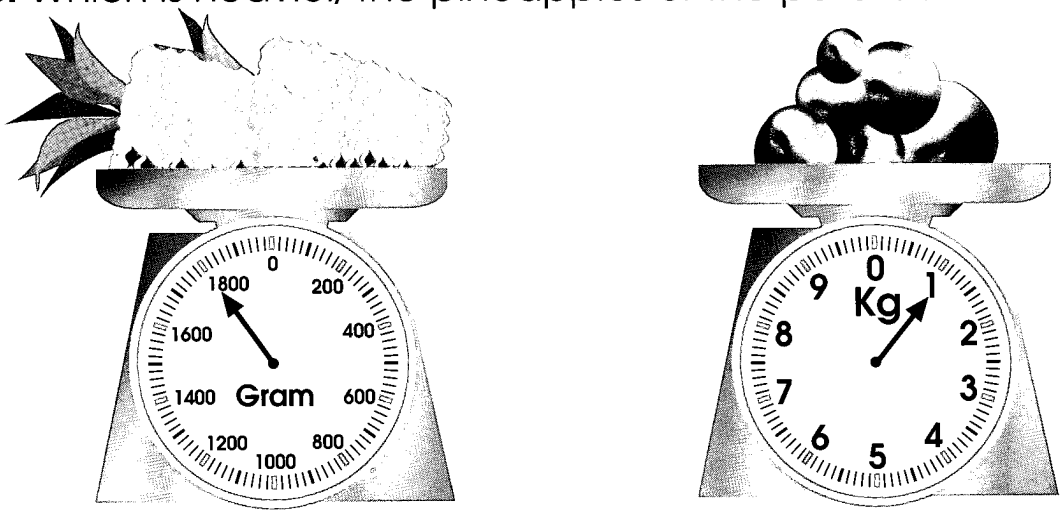


2. Fill in the blanks.

a) 3 tons = _____ lb.

b) 8 kg 75 g = ____ g

3. Which is heavier, the pineapples or the potatoes?



The _____ are heavier than the _____ .

Practice 2A

1. Write in kilograms and grams.

a) 1230 g = 1 kg 230 g

b) 5069 g = _____ kg _____ g

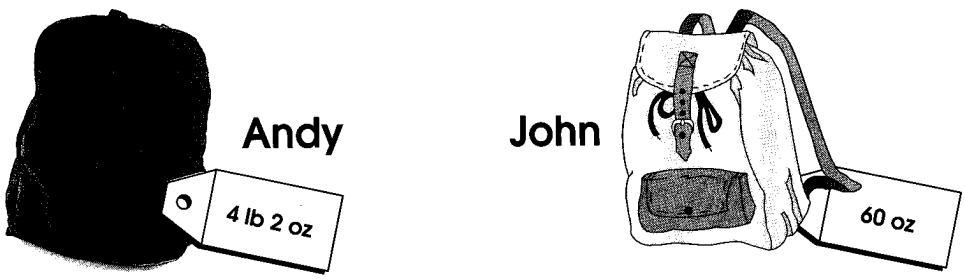
c) 4009 g = _____ kg _____ g

d) 2000 g = _____ kg _____ g

e) 6432 g = _____ kg _____ g

f) 10 000 g = _____ kg _____ g

2. Whose schoolbag is lighter?



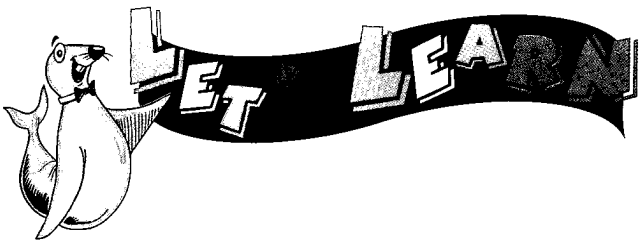
_____'s bag is lighter than _____'s bag.

3. Underline the correct answer.

a) 1 kg 46 g is (heavier than / equal to / lighter than) 1060 g.

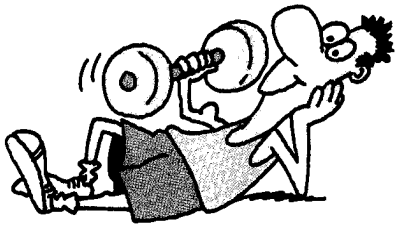
b) 3 kg 500 g is (heavier than / equal to / lighter than) 3050 g.

Workbook Exercise 3



Addition and Subtraction of Mass

Addition



Add 1 kg 400 g and 1 kg 270 g.

Method 1:

Method 2:

This can be written as:

1 **kg**	4	0	0 **g**
+ 1 **kg**	2	7	0 **g**
2 **kg**	6	7	0 **g**

Find the difference between 4 lb 6 oz and 1 lb 10 oz.

4 lb 6 oz - 1 lb 10 oz = ?

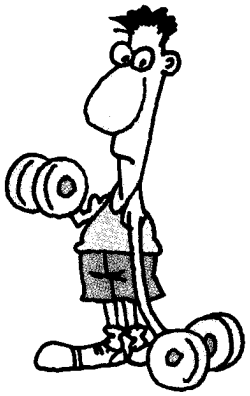
Method 1:

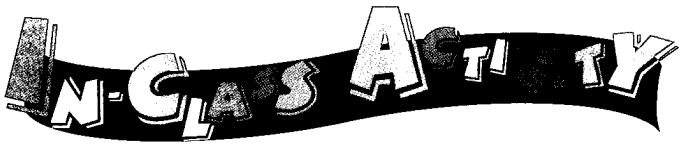
4 lb 6 oz → (-1 lb) → 3 lb 6 oz → 2 lb 22 oz → (-10 oz) → 2 lb 12 oz

Method 2:

We can write this as: 4 lb 6 oz = 3 lb 22 oz

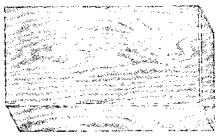
$$\begin{array}{r} 3 \text{ lb } 22 \text{ oz} \\ -1 \text{ lb } 10 \text{ oz} \\ \hline 2 \text{ lb } 12 \text{ oz} \end{array}$$



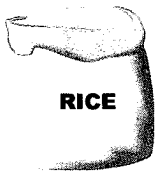


A carton can hold a mass up to a limit of 7 lb without breaking. Discuss...

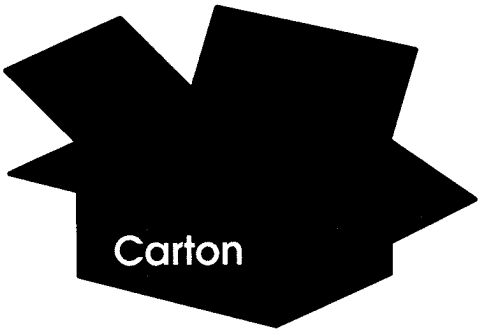
a) How many of each item can be put into the carton?



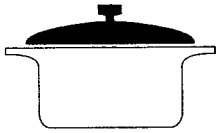
4 lb 8 oz



2 lb

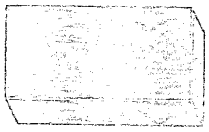


8 oz

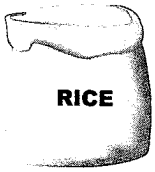


2 lb 8 oz

Record your working and answers below.

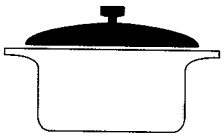


No. of items: _____



No. of items: _____

No. of items: _____



No. of items: _____

Working
4 lb 8 oz + 4 lb 8 oz =?

b) What is the total mass of the four different items?

c) Can we put one of each item into the carton without breaking it? Why? Show your working.

Let's Try

Do the following sums.

a)

3 **kg** 507 **g**	
+ 1 **kg** 120 **g**	

b)

7 **kg** 397 **g**	
+ 1 **kg** 120 **g**	

c)

5 **kg** 797 **g**	
- 1 **kg** 676 **g**	

d)

4 **kg** 047 **g**	
- 1 **kg** 158 **g**	

Can you do the sums above using any other method?

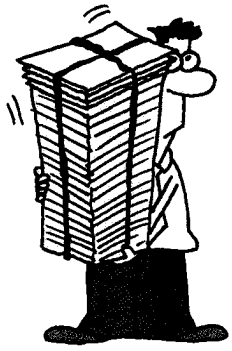
Practice 2B

1. Add the following.

a) 1 kg 200 g + 5 kg = 6 kg 205 g

b) 4 kg 300 g + 2 kg 70 g = _____ kg _____ g

c) 3 kg 750 g + 450 g = _____ kg _____ g



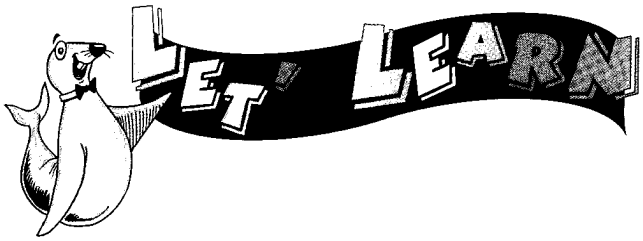
2. Subtract the following.

a) 4 kg 600 g - 900 g = _____ kg _____ g

b) 3 kg 10 g - 500 g = _____ kg _____ g

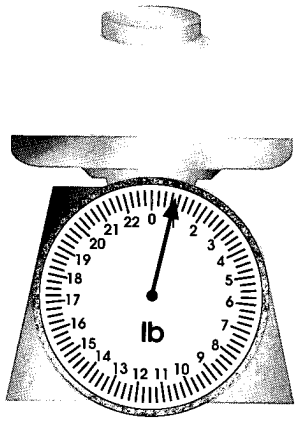
c) 5 kg - 2 kg 706 g = _____ kg _____ g

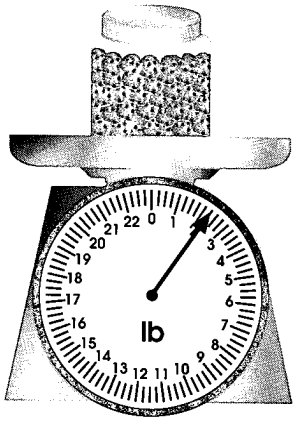
Workbook Exercise 2



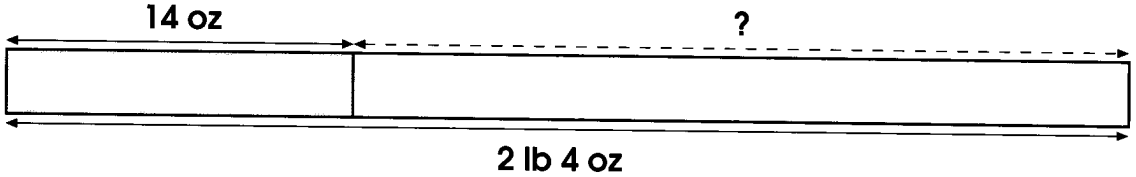
Word Problem

The mass of the empty cookie jar is 14 oz. When filled with cookies, its mass is 2 lb 4 oz.

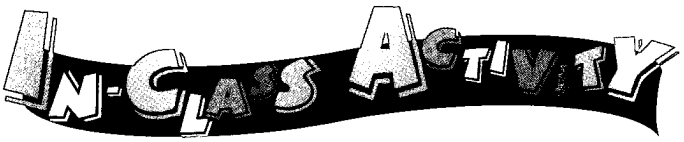




Let's draw a model for this.



We know that 2 lb 4 oz = 36 oz.
Mass of the cookies = 2 lb 4 oz - 14 oz
= 36 oz - 14 oz
= 22 oz = 1 lb 6oz



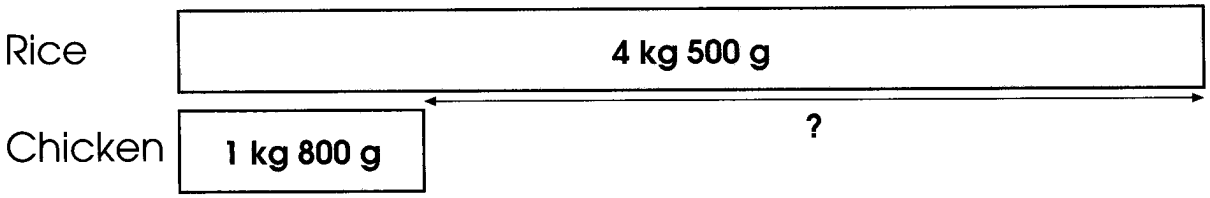
Work in groups of 4. Using the masses given below, write your own word problem involving mass. The word problem can involve addition and/or subtraction. Then draw a model to explain how to get the answer.

2 kg 400 g 900 g

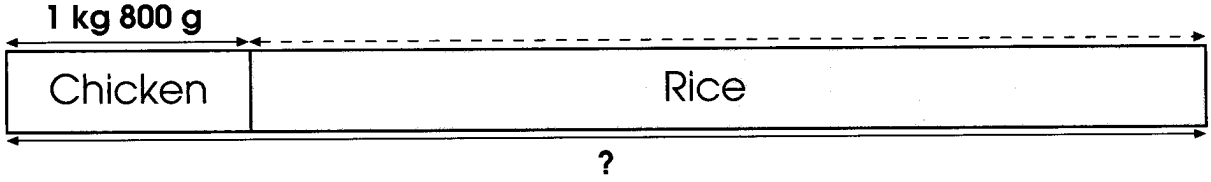
Let's Try

Look at the pictures carefully. Answer the questions by completing the given model.

a) Is the sack of rice heavier than the chicken?
How much heavier?

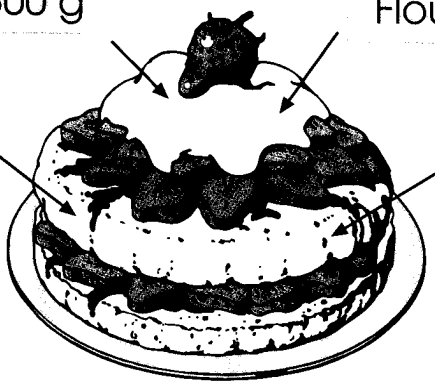


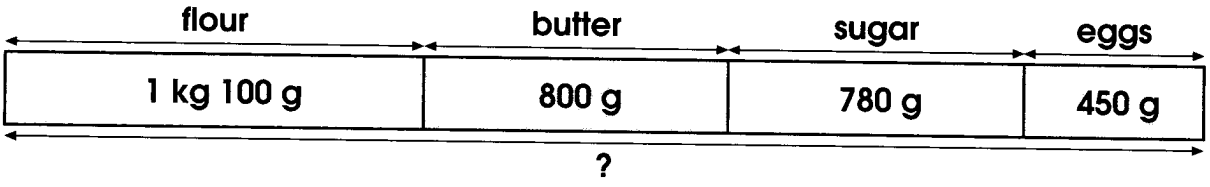
b) What is the total mass of the sack of rice and the chicken?



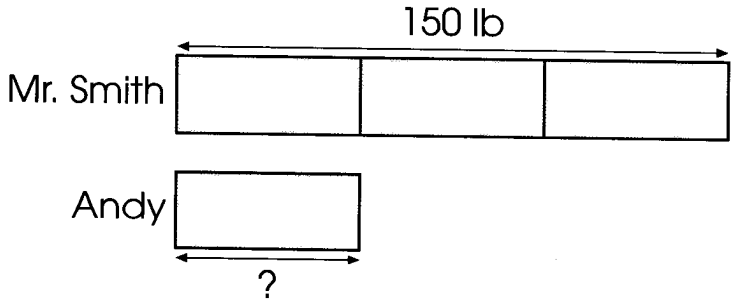
Practice 2C

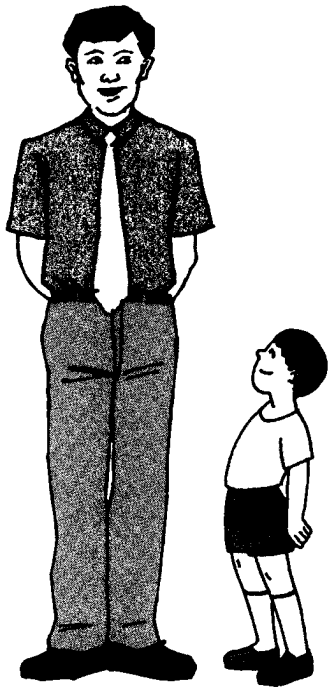
1. Joyce bakes a large cake using all these ingredients. What is the total mass of all the ingredients she uses?





2. Mr. Smith has a mass of 150 lb. He is 3 times as heavy as his son, Andy. What is Andy's mass?



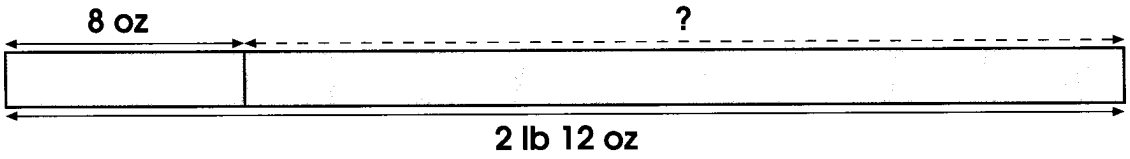


3 parts = 150 lb

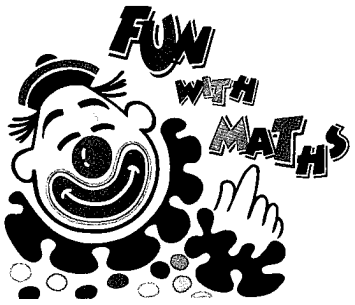
1 part = lb

Andy's mass is _____ lb.

3. A bottle has a mass of 8 oz. Ravi fills it with marbles and finds the mass of the bottle with marbles. The total mass of the bottle and marbles is 2 lb 12 oz. What is the mass of marbles?



Workbook Exercise 3



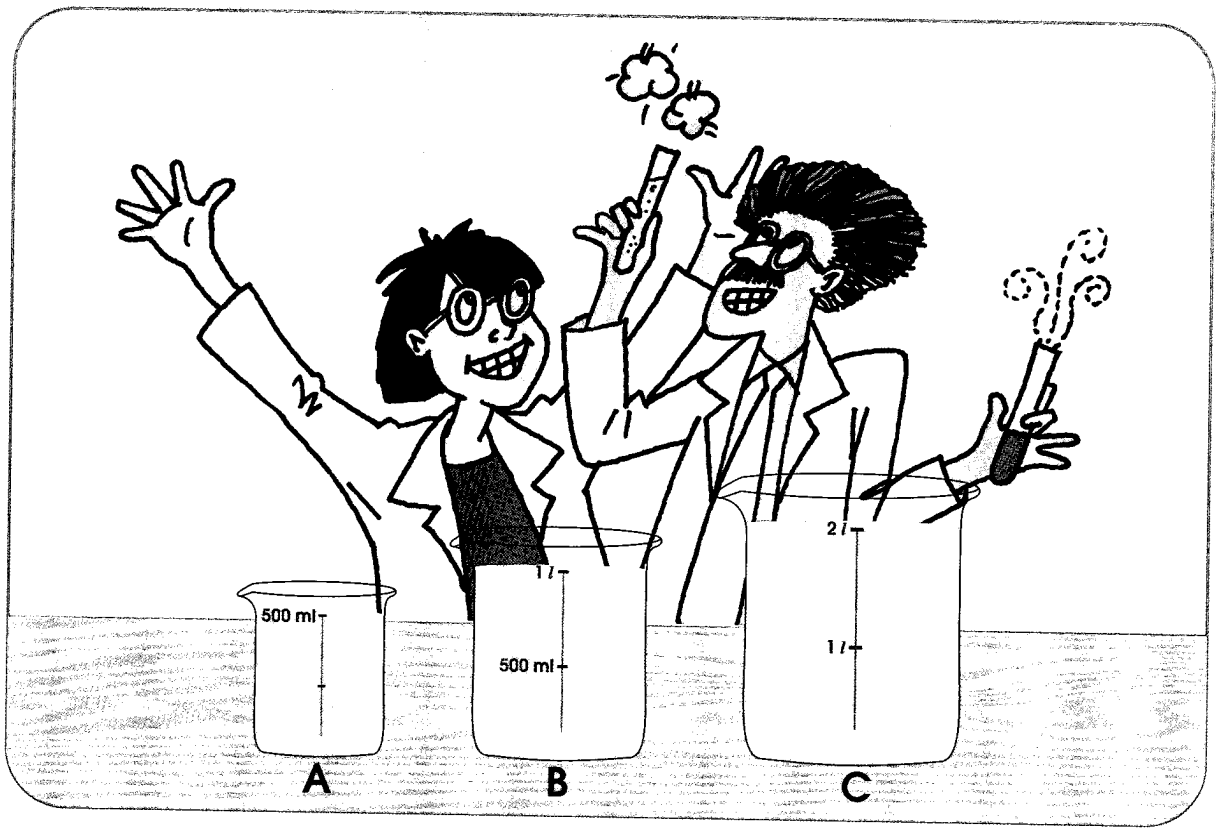
Maria and Joyce are baking cookies. Maria gives Joyce the following list of ingredients to prepare to make the cookies.

250 flour
100 butter
2 sugar
3 water

Is there enough information on this list for Joyce to prepare for the cooking session? Explain.

CHAPTER 3

VOLUME



Volume is defined as the amount of space taken up by an object.
Liquid volume refers to the amount of space taken up by a liquid in a container.
Look at the different volumes of water shown.

Which beaker contains the largest volume of water?

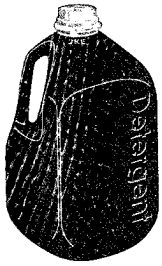
Measuring and converting volume in Metric System

Previously we learnt that liter is a unit used to measure volume.

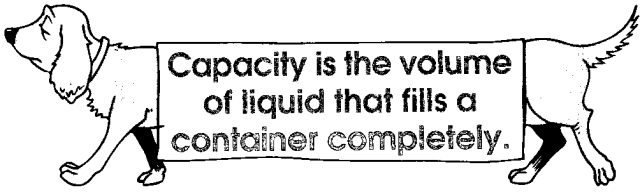
Liter is used to measure the volume of liquids.

John drank 1 **liter** of water this morning.

The capacity of the liquid detergent bottle is 3 *l*.

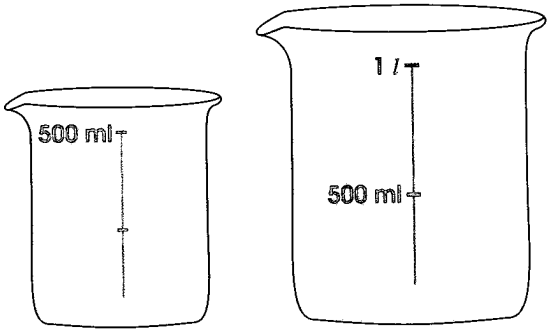


The capacity of the milk bottle is 1 *l*.



Milliliters

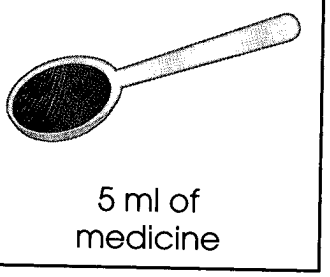
The unit **milliliter** or **ml** is used to measure smaller volumes.



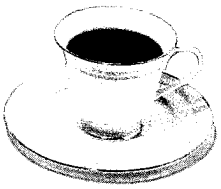
A **B**

500 ml is **less than** 1 *l*.

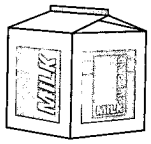
Beaker A contains less water than Beaker B.



5 ml of medicine

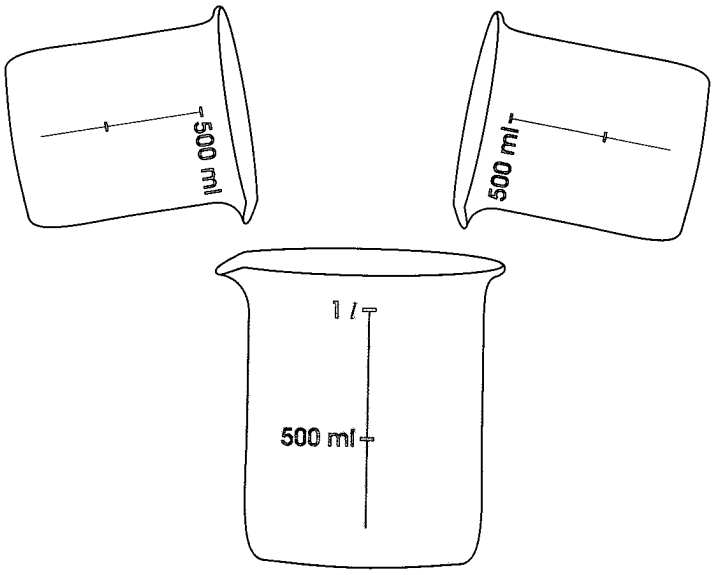


150 ml of coffee



250 ml of chocolate milk

Let's pour the water from two full 500 ml beakers into a 1 *l* beaker.



The volume of water in the beaker is 1000 ml.

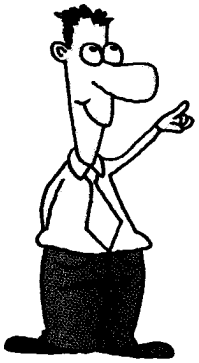
1 liter is equal to 1000 milliliters.

How many milliliters is 4 *l*?

4 *l* = 4000 ml

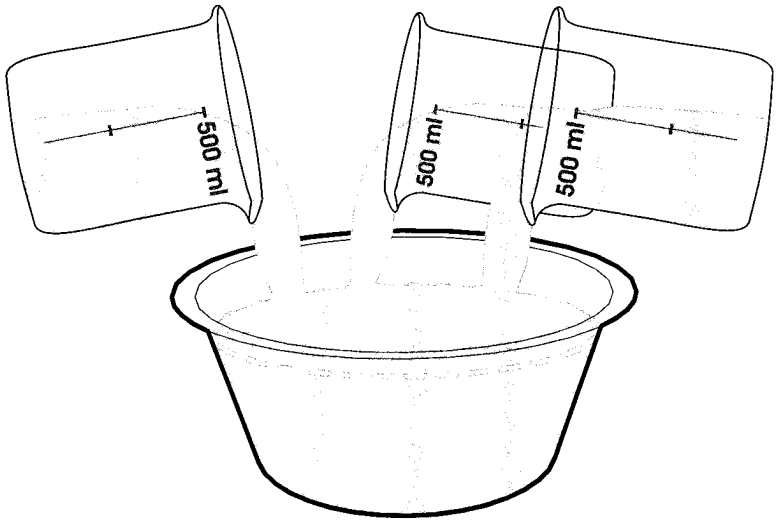
How many liters is 6000 ml?

6000 ml = 6 *l*



1 *l* = 1000 ml

The volume of a bowl of syrup is 1500 ml.
How do we write this volume in liters and milliliters?



We write the volume in liters and milliliters:

1500 ml = 1 *l* 500 ml

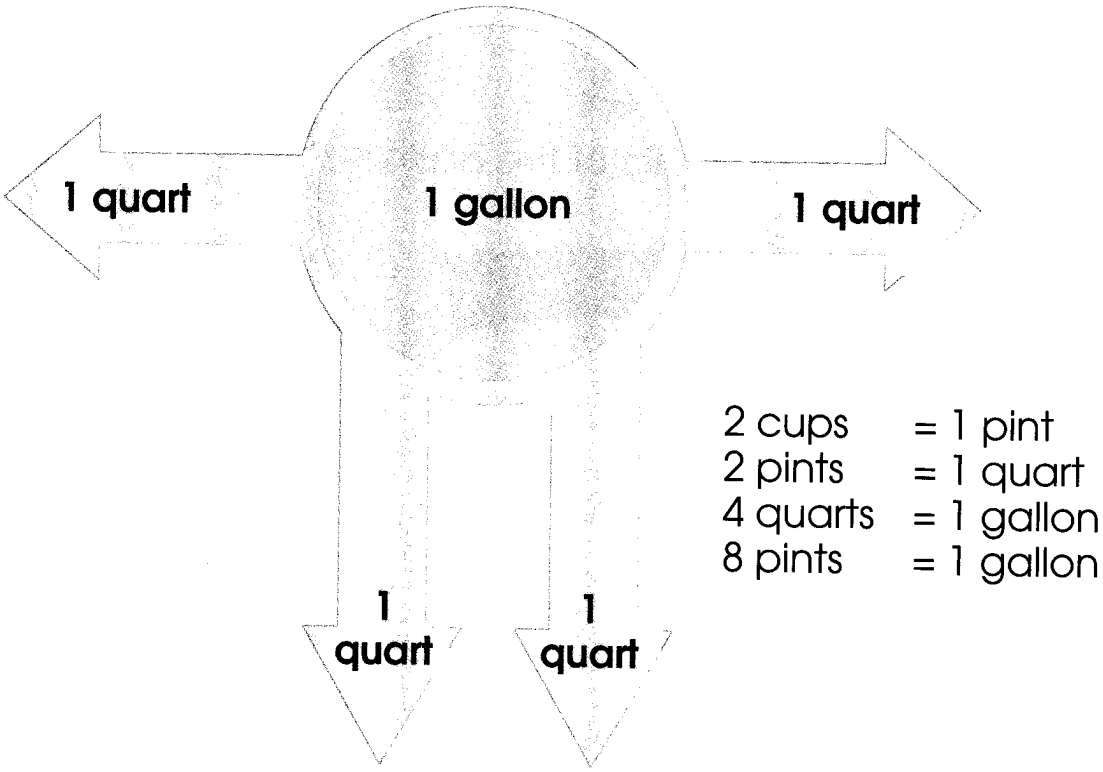
The capacity of this bottle of orange juice is 1 *l* 250 ml.
We can write this as 1250 ml.

1 *l* = 1000 ml
1 *l* 250 ml = 1000 ml + 250 ml
= 1250 ml

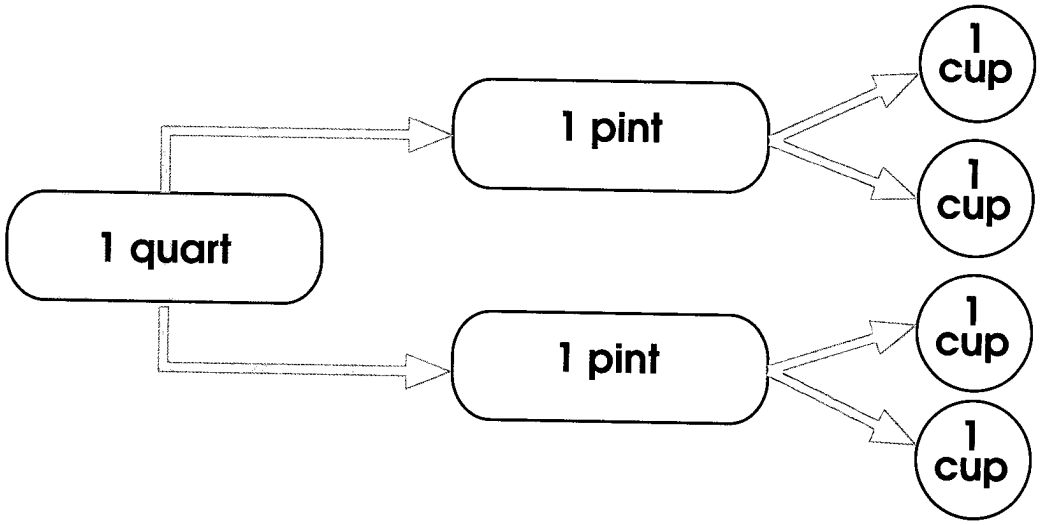
Measuring and converting volume in U.S. customary units

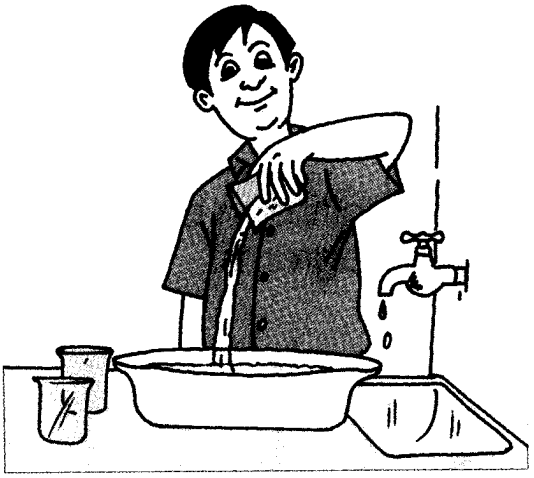
The U.S. Customary Units for measuring volume are cups, pints (pt), quarts (qt) and gallons (gal).

The volume conversions in U.S. Customary Units can be understood with the help of the following diagrams:

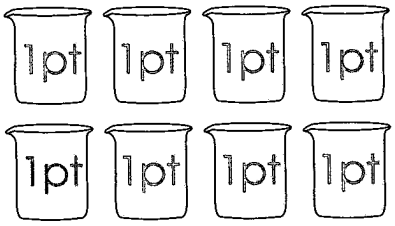


2 cups = 1 pint
2 pints = 1 quart
4 quarts = 1 gallon
8 pints = 1 gallon





8 pints of water are needed to fill up this basin completely.

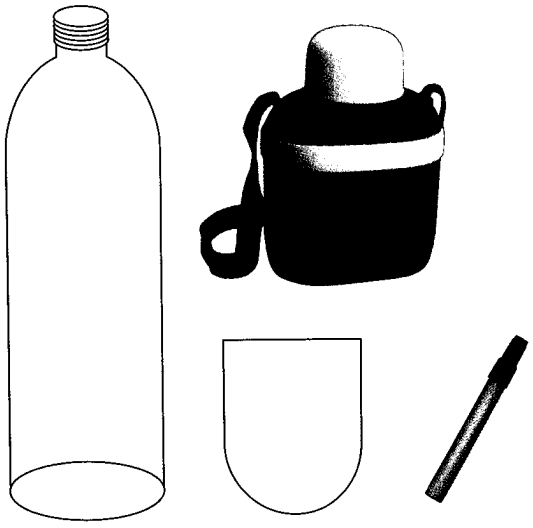


We say that the **capacity** of the basin is 8 pints or 1 gallon.

IN-CLASS ACTIVITY

In this activity, you will make your own measuring bottle which you can use to measure volumes.

- **A large half gallon plastic bottle**
- **A measuring cup**
- **A marker**
- **A child's water bottle**



Making the measuring bottle :

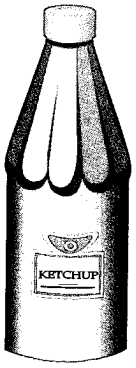
1. Measure a cup of water.
2. Pour the water into the plastic bottle.
3. Note the water level and mark the level of water on the side of the bottle as '1 cup'.
4. Repeat the above steps until you have 8 markings on the plastic bottle.
5. Now you have a measuring bottle that can be used to measure volumes of liquids.

Workbook Exercise 1

Let's Try

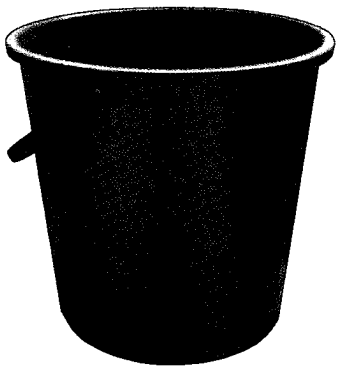
What is the most suitable unit of measurement to describe the following volumes? Write 'ml' or '*l*'.

a)



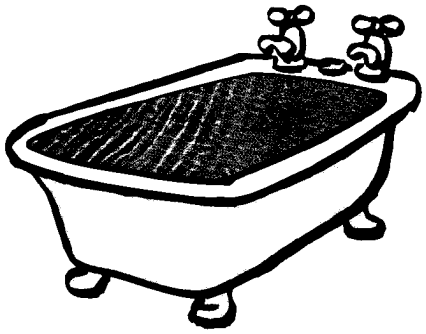
300 of ketchup.

b)



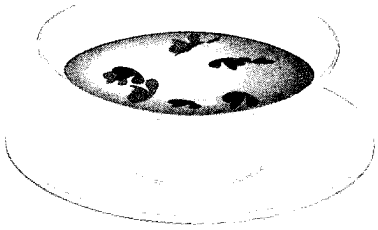
9 of water.

c)



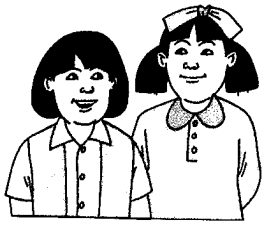
70 of water.

d)



200 of soup.

Mary and Shufen are asked which is more, 250 ml or 1 *l*. Mary says 250 ml is more than 1 *l*. Shufen says 1 *l* is more than 250 ml. Who is right? Why? Discuss and present your argument in class.



Practice 3A

1. Match to show the most suitable capacities.

Less than 1 liter

•

1 liter

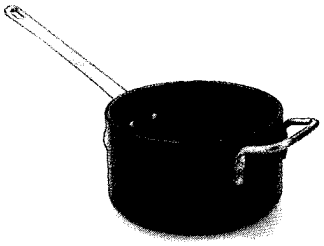
•

•

More than 1 liter

2. Fill in the blanks with the correct unit of volume (ml or *l*).

a) Mother adds about 1200 _____ of water into her cooking pot to make some soup.



b) My father drives his car to the gasoline station. He pumps about 40 _____ of gasoline into the car fuel tank.

Let's Try

1. Fill in the blanks.

a)

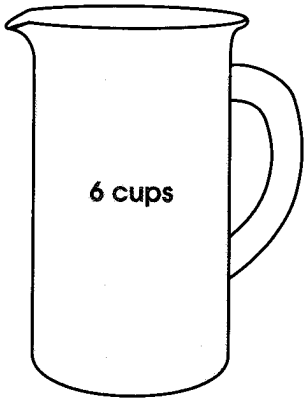
1 pt 1 cup = ___ cups

b)

1 gal 2 pt = ___ pt

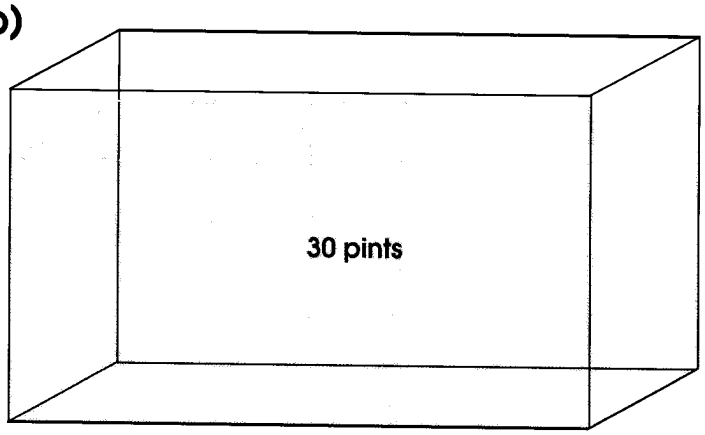
2. Fill in the blanks.

a)



= _____qt _____ cups

b)



= _____ gal_____ pt

Practice 3B

1. Write in pints (pt).

a) 4 qt = _____

b) 6 cups = _____

c) 5 gal = _____

d) 3 qt 1 pt = _____

2. Write in quarts (qt).

a) 6 gal = _____

b) 6 pt = _____

c) 12 cups = _____

d) 1 gal 4 pt = _____

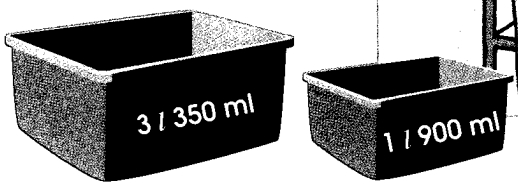
Workbook Exercise 2

Addition and Subtraction of Volumes

Addition

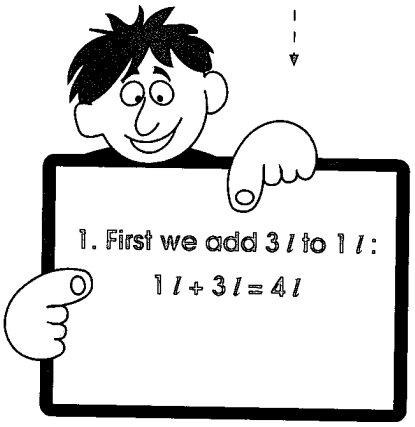
Andy found two tanks in his storeroom.
Look at their capacities:

What is the total capacity of
both the tanks?



The total capacity of the 2 containers is:

1 *l* 900 ml + 3 *l* → 4 *l* 900 ml + 350 ml → 5 *l* 250 ml

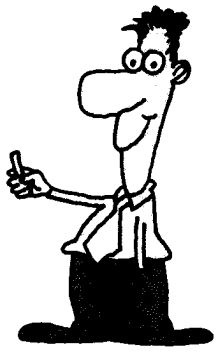


1. First we add 3 *l* to 1 *l*:
   1 *l* + 3 *l* = 4 *l*

2. Next we add 900 ml and 350 ml:
   900 ml + 350 ml = 1250 ml
3. Then, we convert this to liters and milliliters:
   1250 ml = 1 *l* 250 ml
4. Remember to add the 1 *l* to 4 *l*:
   4 *l* + 1 *l* = 5 *l*

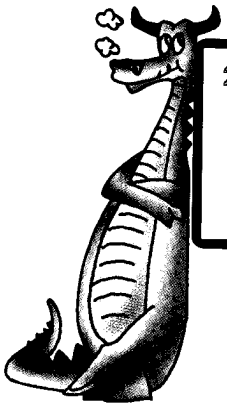
Let's write the additions in another way.

$$\begin{array}{r} {\scriptstyle 1} \\ 1\,l\ 900\ \text{ml} \\ +\ 3\,l\ 350\ \text{ml} \\ \hline 5\,l\ 250\ \text{ml} \end{array}$$



What is the difference in the capacities of the 2 containers?

3 *l* 350 ml - 1 *l* → 2 *l* 350 ml - 900 ml → 1 *l* 450 ml



2 *l* 350 ml is rewritten as 1 *l* 1350 ml
Therefore, 2 *l* 350 ml - 900 ml
= 1 *l* 1350 ml - 900 ml
= 1 *l* 450 ml

Let's write the subtractions in this way:

$$\begin{array}{r} {}^{2}\not{3}\ \not{l}\ {}^{1}3\,5\,0\ \text{ml} \\ -\ 1\ l\ 9\,0\,0\ \text{ml} \\ \hline 1\ l\ 4\,5\,0\ \text{ml} \end{array}$$

So the difference in capacities of two containers is 1 *l* 450 ml.

Let's Try

Peter the painter used the following volumes of red and yellow paints.

1 *l* 750 ml

4 *l* 500 ml

a) What is the total volume of paint Peter used?

1 *l* 750 ml → **+ 4 *l*** → ___ *l* ___ ml → **+ 500 ml** → ___ *l* ___ ml

$$\begin{array}{r} 1\ l\ 7\,5\,0\ \text{ml} \\ +\ 4\ l\ 5\,0\,0\ \text{ml} \\ \hline l\ \ \ \ \text{ml} \end{array}$$

750 ml + 500 ml
= 1250 ml
= 1 *l* 250 ml

The total volume of paint he used is _____ *l* _____ ml.

b) How much more yellow paint than red paint did peter use?

4 *l* 500 ml - 1 *l* ___ *l* ___ ml - 750 ml ___ *l* ___ ml

4 *l*	5	0	0	ml
- 1 *l*	7	5	0	ml
l				ml

Peter used ___ *l* ___ ml more yellow paint than red paint.

Practice 3C

1. Add the following.

a) 1 *l* 500 ml + 60 ml

b) 1 gal 6 pt + 3 gal 4 pt

c) 2 *l* 800 ml + 1 *l* 340 ml

d) 2 qt 1 pt + 1 qt 2 cups

2. Subtract the following.

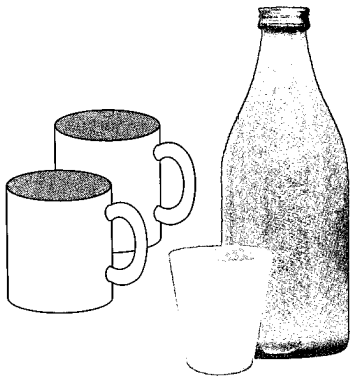
a) 2 *l* - 850 ml

b) 5 *l* 5 ml - 2 *l* 90 ml

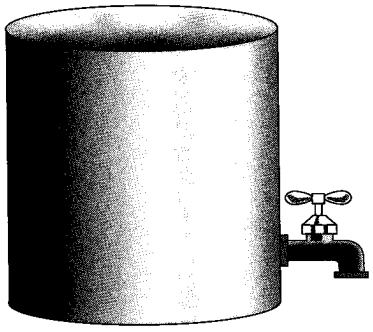
c) 3 *l* 300 ml - 1 *l* 400 ml

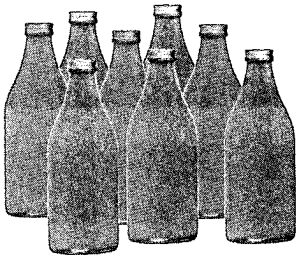
d) 10 *l* - 5 *l* 250 ml

3. Some orange juice from a bottle is poured into 2 mugs and a glass till they are completely full. The capacity of each mug is 300 ml and the capacity of the glass is 250 ml. What is the volume of the orange juice poured?

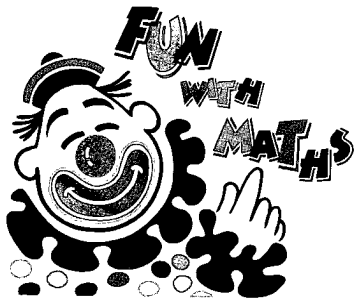


4. Joyce fills up an empty container with 8 bottles of pineapple juice. Each bottle contains 2 pints of pineapple juice. What is the capacity of the container in gallons?



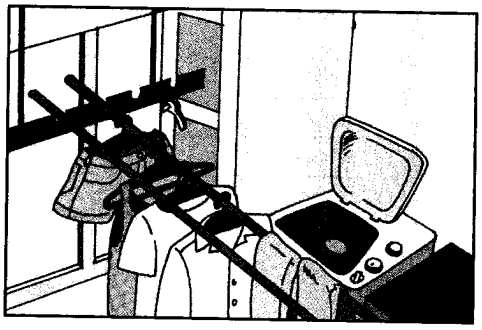


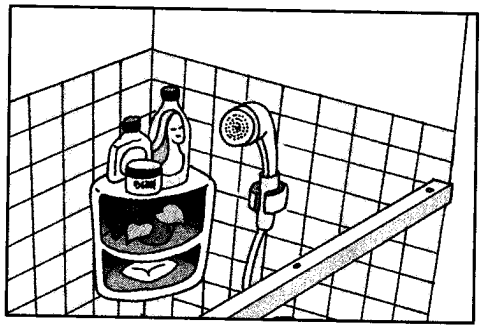
5. A bottle had a capacity of 4 qt. It was completely filled with oil at first. John used 4 cups of the oil. What volume of oil is left in the bottle?



Water, water, everywhere !

These are some of the ways we use water in our daily lives:





Do you know that...

In some parts of the world, there is so little water that people often re-use water. For example, they may save the water used to wash vegetables, and then wash the dishes with it.

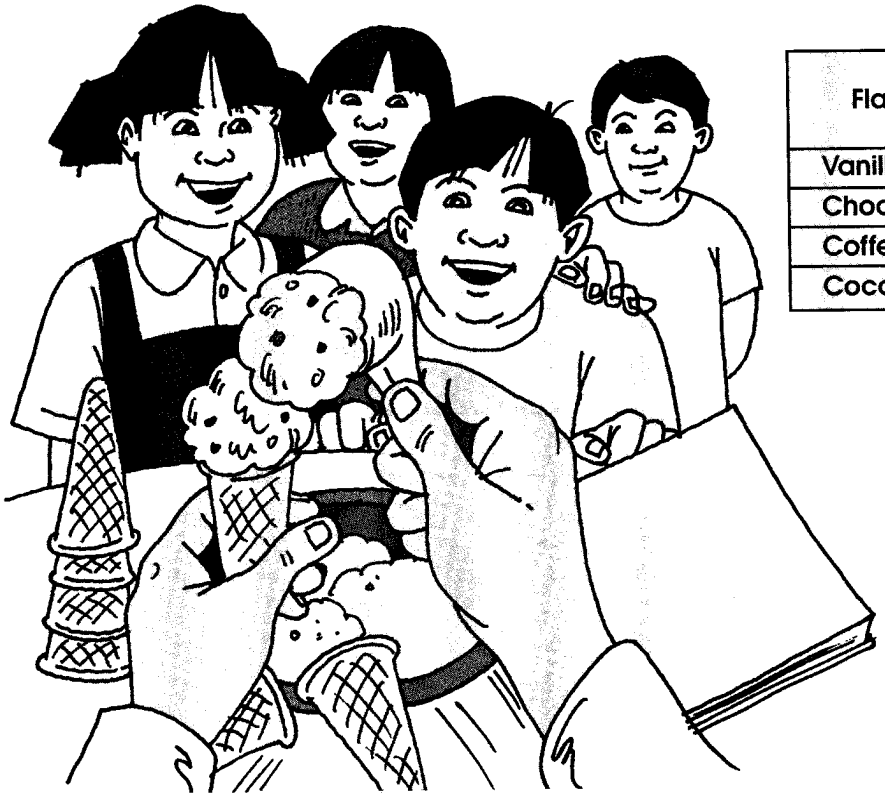
In Sudan, Africa, for instance, there may be less than 5 liters of water a day for each person.

What can you do with 5 liters of water?

How much water do you use in a day? Make an estimation.

CHAPTER 4

BAR GRAPHS



Flavor	Number of Ice-creams Sold
Vanilla	8
Chocolate	10
Coffee	6
Coconut	2

Kelvin was selling ice-cream.

According to the table...

How many coconut flavored ice-creams did he sell?

Which was the most popular flavor of ice-cream?

Which was the least popular?

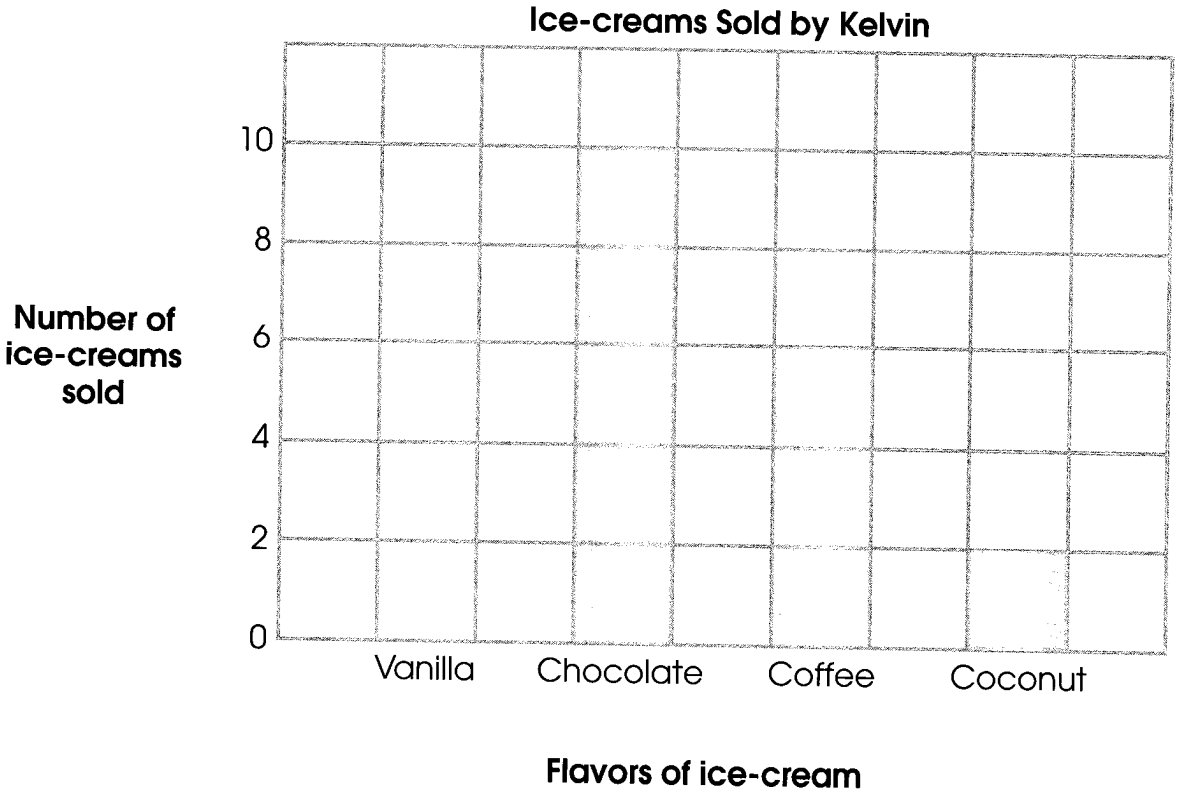
Bar Graphs

Previously we learnt about Picture Graphs with scales.

The following picture graph shows the number of different flavors of ice-creams sold by Kelvin.

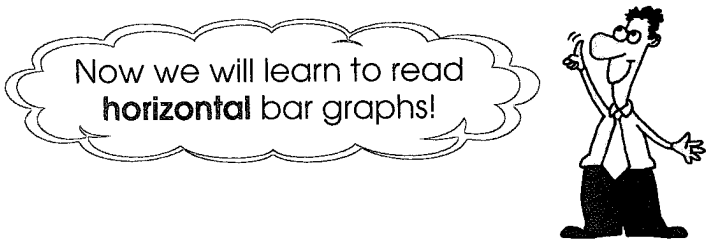
Vanilla	○ ○ ○ ○
Chocolate	○ ○ ○ ○ ○
Coffee	○ ○ ○
Coconut	○
Each ○ stands for 2 ice-creams.	

We can also use a **bar graph** to show the same information.



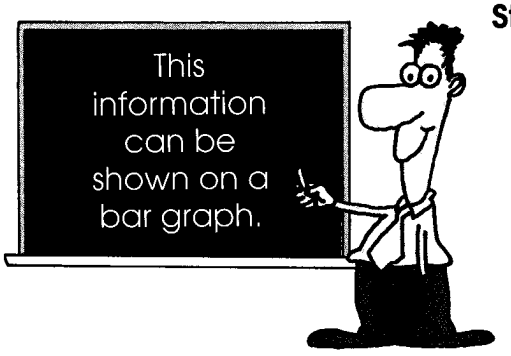
Looking at the graph, we know that **8** vanilla, **10** chocolate , **6** coffee and **2** coconut flavored ice-creams were sold.

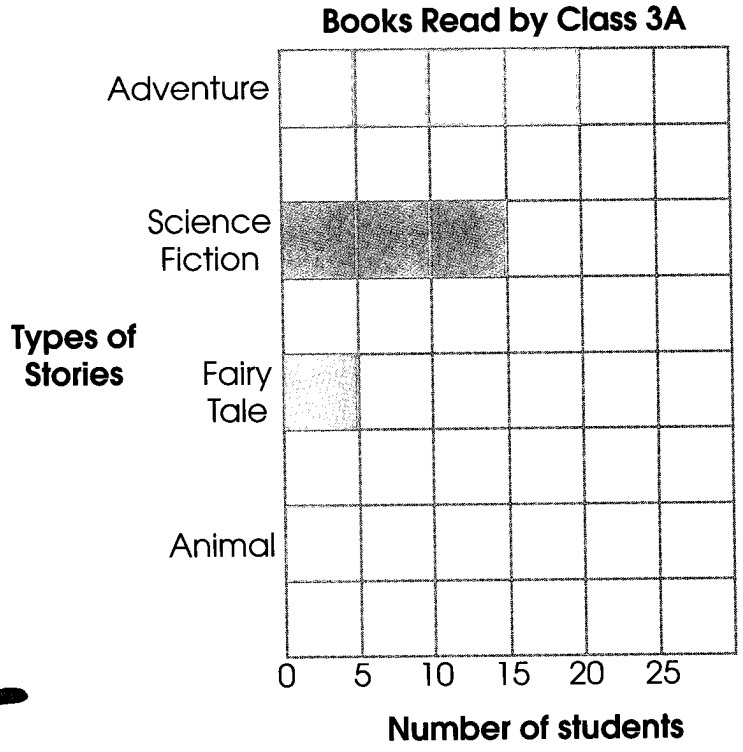
The bar graph on page 41 is a **vertical bar graph**.



The following graph shows the number of students in Class 3A in a school who like to read different types of stories.

Adventure	: 20
Science Fiction	: 15
Fairy Tale	: 5
Animal	: 5



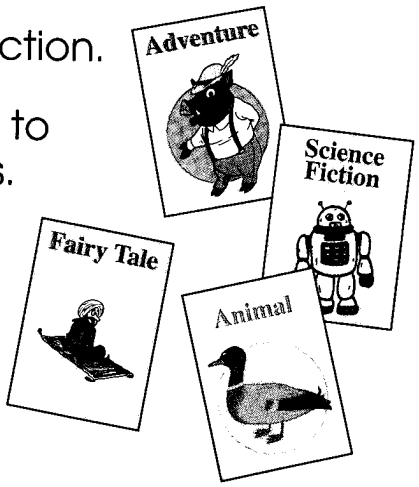


Looking at the bar graph, we know that...

(a) **15** students like to read science fiction.

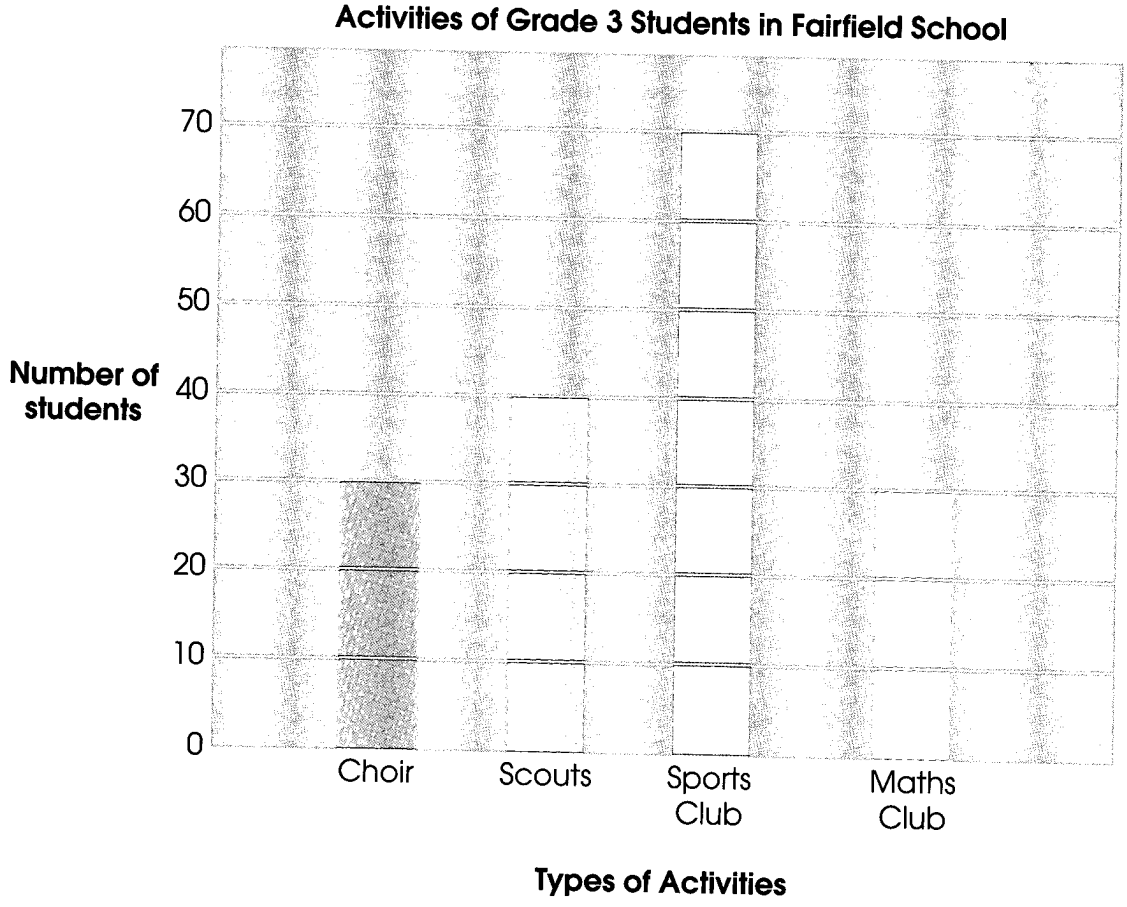
(b) The same number of students like to read **Fairy Tale** and **Animal** stories.

(c) The most popular type of book is the **Adventure** stories.



Let's Try

The following graph shows the number of students in Grade 3 of Fairfield School who joined the various types of activities.



Look at the graph carefully and write True (T) or False (F).

a) 20 students joined the Sports Club. _____

b) There are as many students who joined the choir as the Maths Club. _____

c) Most of the students joined Scouts. _____

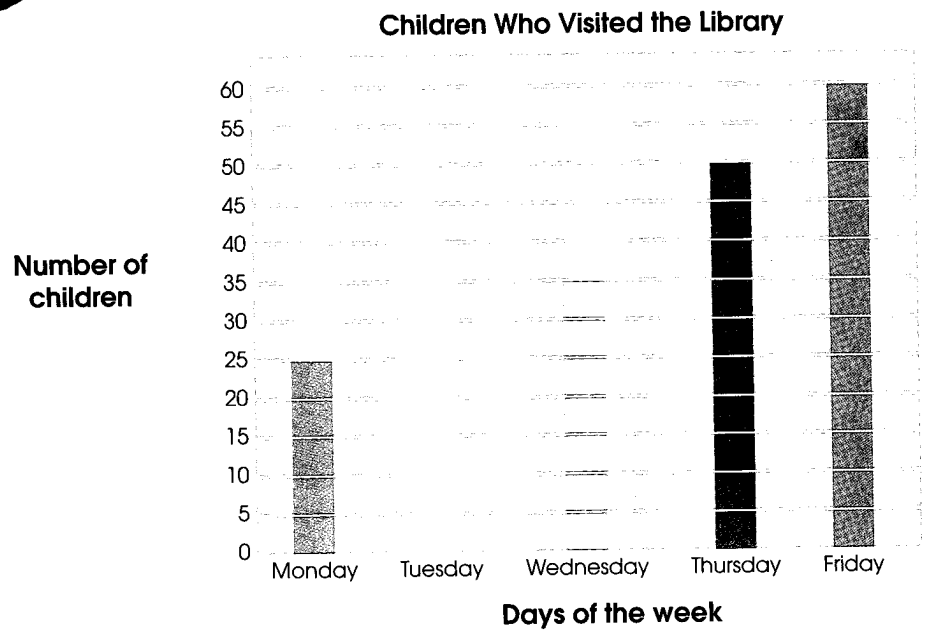
d) The least number of students joined Maths Club. _____

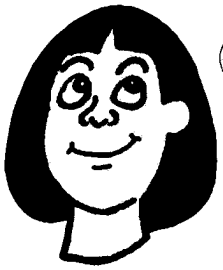
Workbook Exercise

Word Problem Involving Bar Graphs

I recorded the number of children who visited the Children's Community Library in 1 week.

Maria, the librarian used a bar graph to show this information.





Bar graphs are useful. They help us to understand a lot of information easily.

Let's get some information from the graph:

- The most number of children visited the library on Friday.
- The least number of children visited on Monday.
- 10 more children visited the library on Wednesday than on Monday.

To find the total number of children visiting the library from Monday to Friday, we add all the numbers :

$$25 + 40 + 35 + 50 + 60 = 210$$

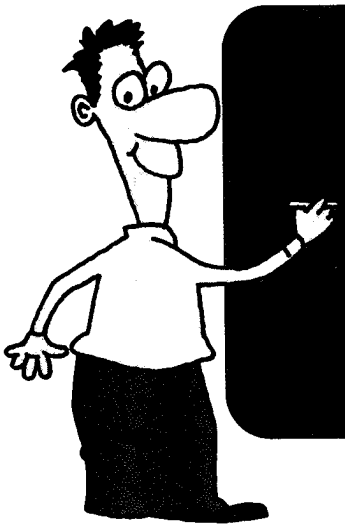
If the total number of children who visited the library this week remains the same for 3 weeks, how many children visited the library in 3 weeks?

$210 \times 3 = 630$

Write out two questions for your friend to find other information from the graph.

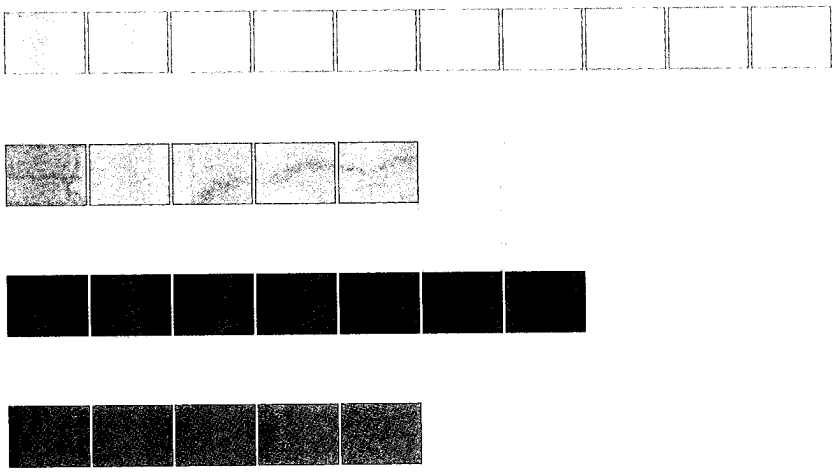
IN-CLASS ACTIVITY

Work in groups of four. Read the given information carefully. Study the incomplete graph below. Discuss and fill in the boxes on the graph with the correct words to show the given information.



Siti's family drank 25 cups of tea in a certain week. Susan's family drank twice as many cups of tea as Siti's family in the same week. Lina's family drank 10 more cups of tea than Siti's family and Rani's family drank the same number of cups of tea as Siti's family.

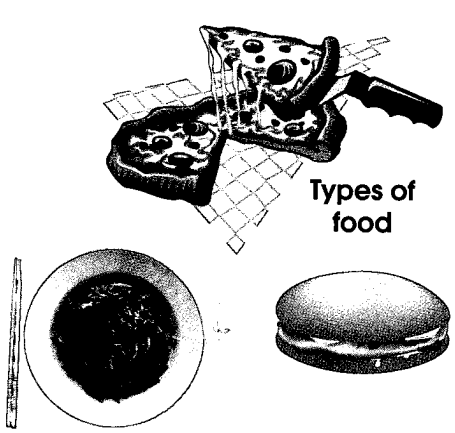
Title: _____

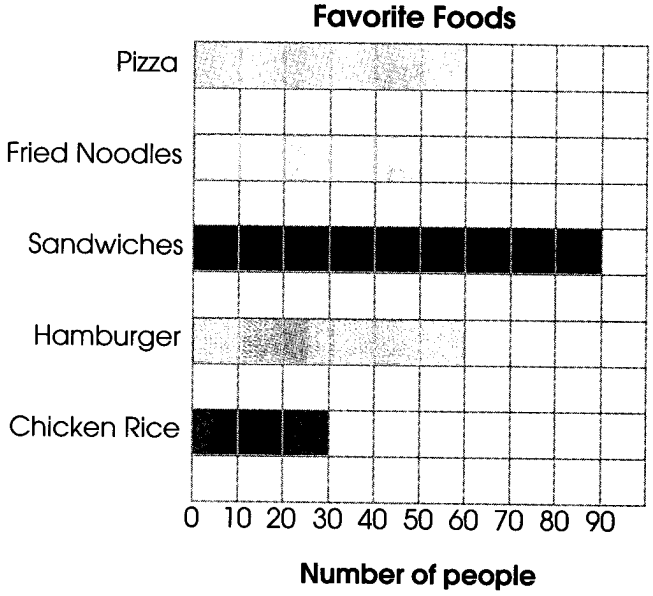


Let's Try

During a survey, a group of people were asked to name their favorite food. Here is the bar graph that shows the results:

Let's read the results of the survey...





Fill in the results according to the bar graph.

a) Most popular food: _____

b) Least popular food: _____

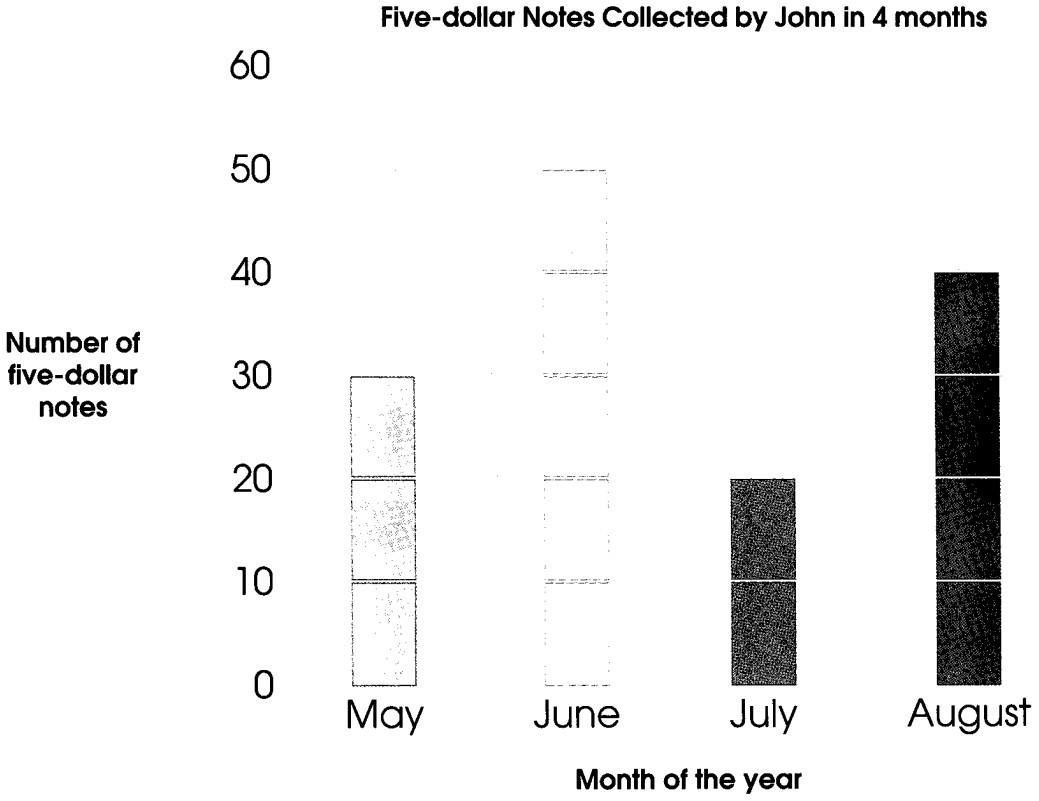
c) Number of people who liked Fried Noodles the most: _____

d) The same number of people liked these foods the most: _____

e) Number of people who prefer Pizza to Chicken Rice: _____

Practice 4A

1. The following bar graph shows the number of five-dollar notes that John collected in 4 months.



Use the graph to answer the following questions.

a) In which month did John collect the most five-dollar notes?

b) How many five-dollar notes did John collect in May?

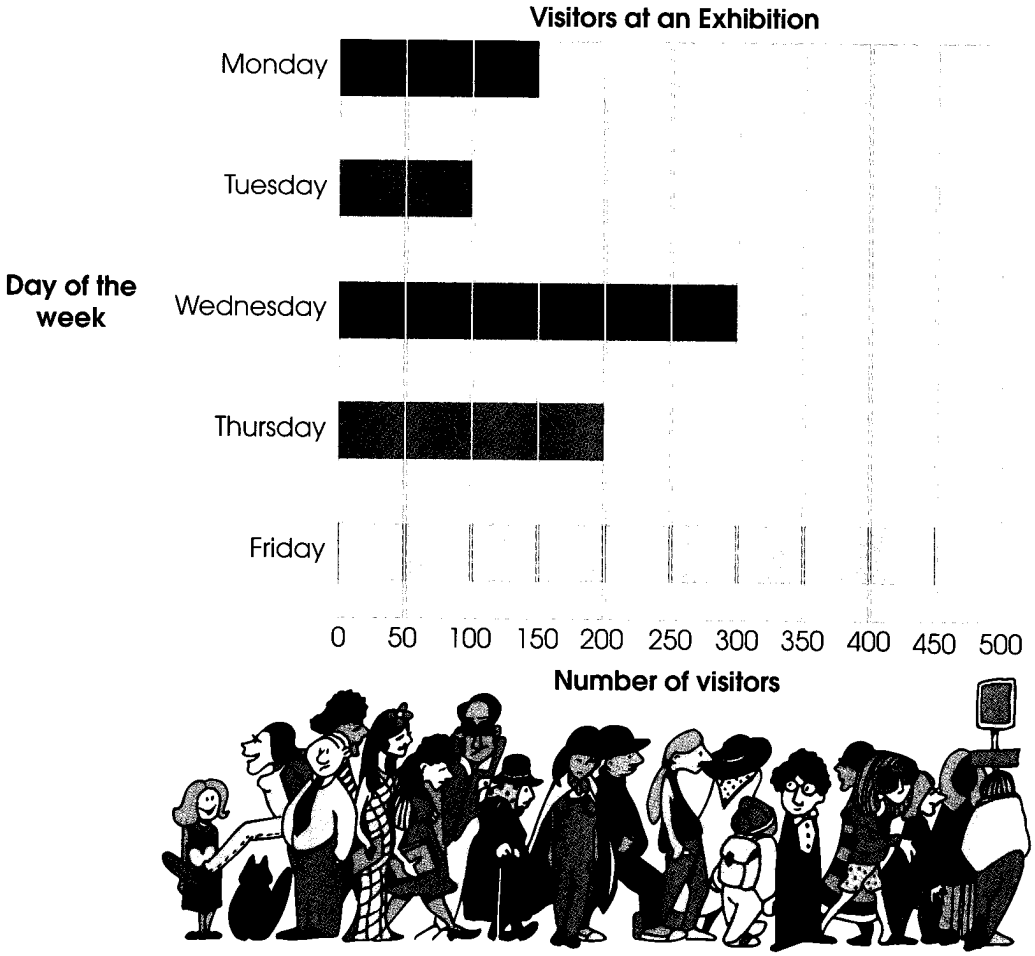
c) How many more five-dollar notes did he collect in June than in May?

d) In which month did he collect 20 five-dollar notes?

e) In which month did he collect twice as many five-dollar notes as in July?

f) How much money did he collect altogether in the 4 months?

2. The graph shows the number of visitors at an exhibition.



Study the graph and answer the following questions.

a) How many visitors were there at the exhibition on Wednesday?

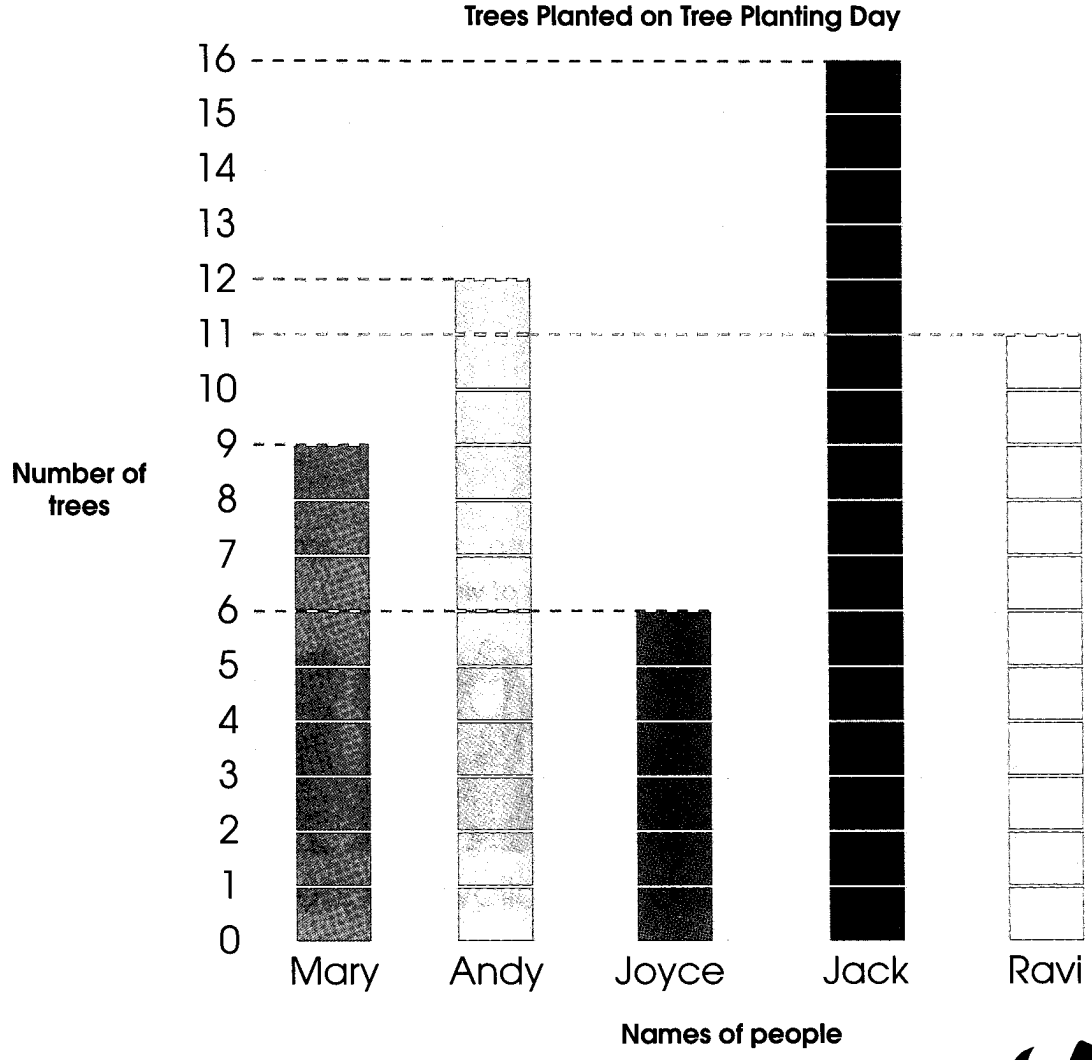
b) How many fewer people visited the exhibition on Thursday than on Wednesday?

c) On which day was the number of visitors the least?

d) If twice as many visitors went to the exhibition on Saturday as on Friday, how many visitors were there on Saturday?

e) If there were 175 adult visitors at the exhibition on Friday, how many visitors were children?

3. The following graph shows the number of trees planted by 5 people on Tree Planting Day. Look at the graph. Answer the following questions.

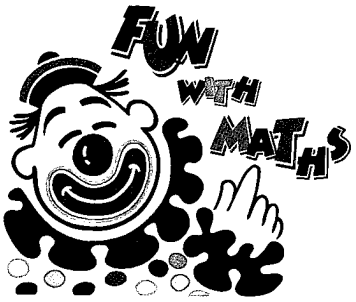


a) Who planted the least number of trees?

b) Who planted the most number of trees?

c) Who planted 4 trees less than Jack?

d) Who planted twice as many trees as Joyce?



How many glasses of water does your family drink each week?
Estimate the number of glasses and make a record:

Example: The Smith Family

Monday : 20 glasses

Tuesday : 25 glasses

Wednesday : 15 glasses

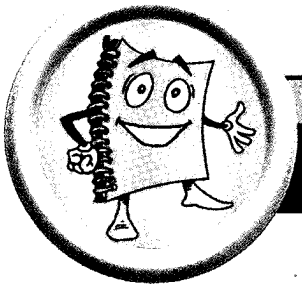
Thursday : 20 glasses

Friday : 25 glasses

Saturday : 30 glasses

Sunday : 30 glasses

Show this information by drawing a bar graph.
Can you draw this bar graph using the computer?



REVISION 1

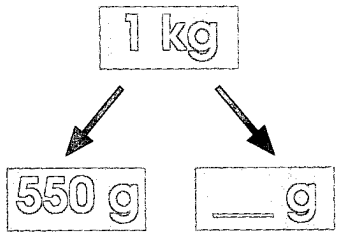
Exercise 1

1. Write in centimeters.

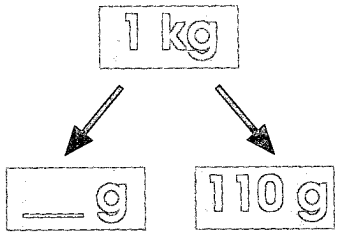
a) 1 m 4 cm: _____ **b)** 4 m 55 cm: _____

2. What is the missing number? Complete the blanks.

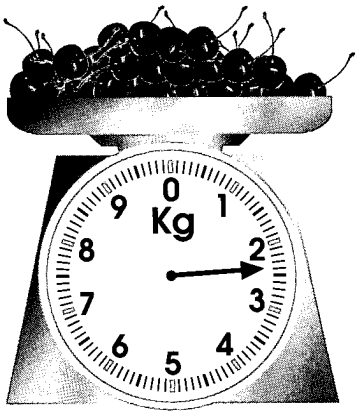
a)



b)



3. The mass of the cherries is _____ kg _____ g.



4. Complete the following.

a) 208 cm = _____ m _____ cm **b)** 3067 yd = _____ mi _____ yd

c) 1102 g = _____ kg _____ g **d)** 3001 lb = _____ ton _____ lb

e) 5050 ml = _____ *l* _____ ml **f)** 2800 ml = _____ *l* _____ ml

Exercise 2

1. 4 children take part in a game at a fun fair. The child who throws a bean bag the furthest distance wins a prize. Look at the results.

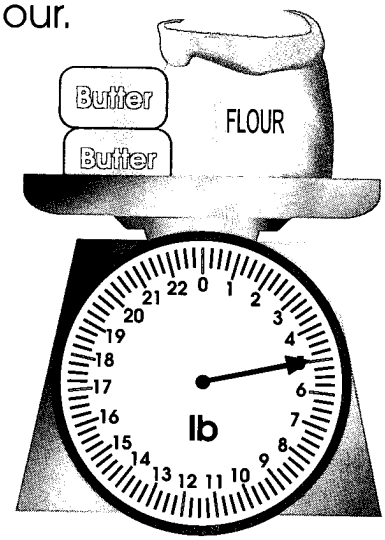
Ali	:	1 m 78 cm
John	:	99 cm
Andy	:	1 m 91 cm
Siti	:	2 m 5 cm

a) Who wins the prize? _____

b) Arrange the distances in order beginning with the shortest.

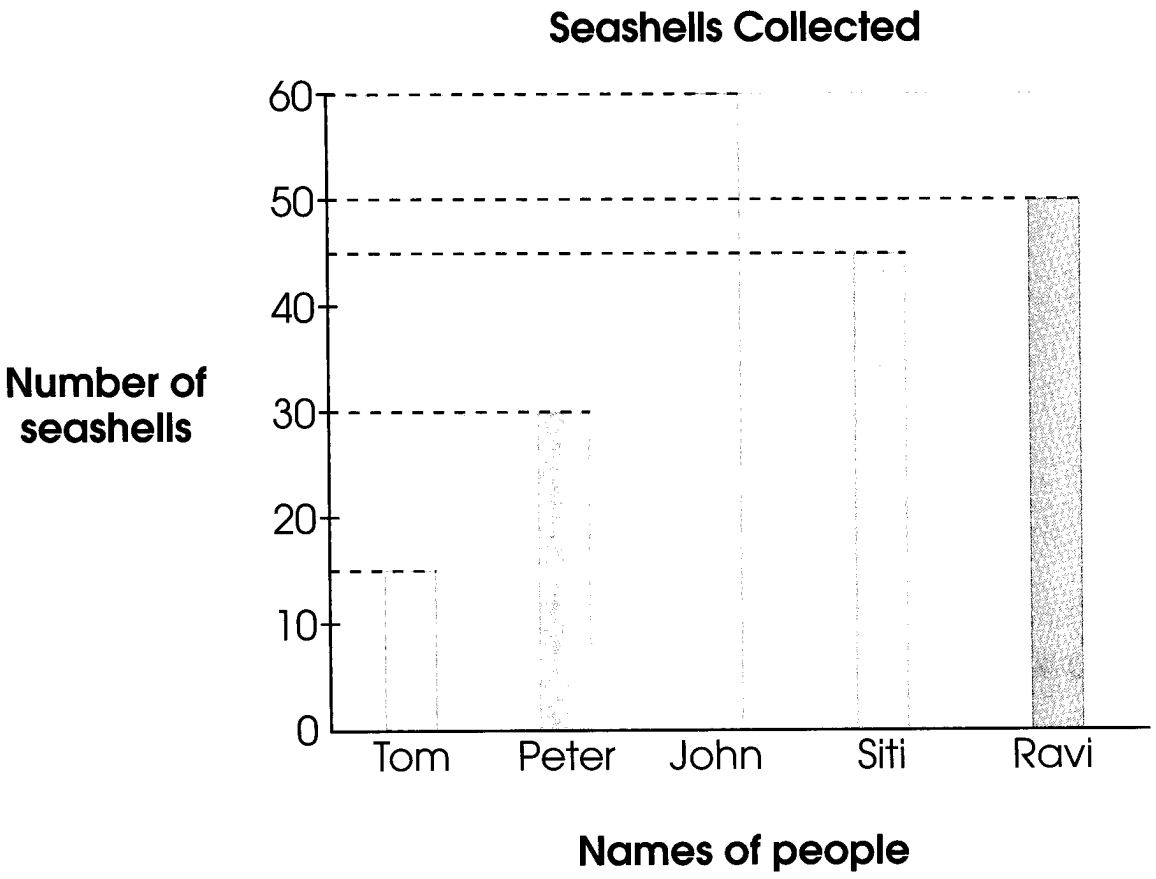
_____, _____, _____, _____.

2. In the figure shown, the total mass of blocks of butter and flour is 5 lb. If each block of butter has a mass of 8 oz, find the mass of the packet of flour.



The mass of the packet of flour is _____ oz.

3. Study the graph and answer the questions that follow.



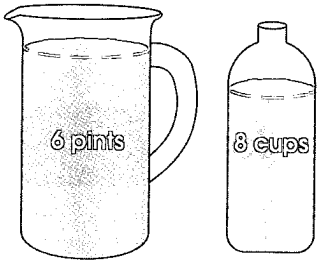
a) How many seashells did John collect?
_____ seashells

b) Who collected 4 times as many seashells as Tom?
_____

c) How many seashells must Ravi give to Peter so that they will have an equal number of seashells?
_____ seashells

Exercise 3

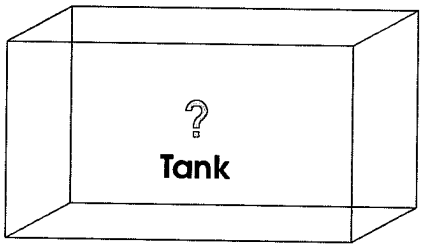
1. A jug contains 6 pints of orange juice. Sue pours 8 cups of the orange juice into a bottle.

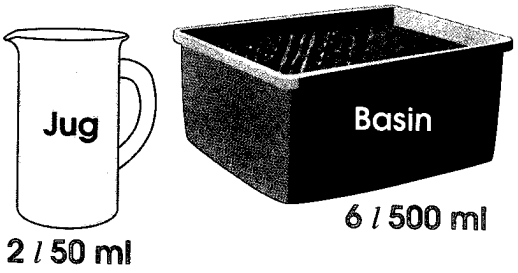


___pt of orange juice is left in the jug.

2. A cyclist has to complete a distance of 10 mi 250 yd. He takes a rest after cycling 6 mi 800 yd. How far more must he cycle to complete his journey?

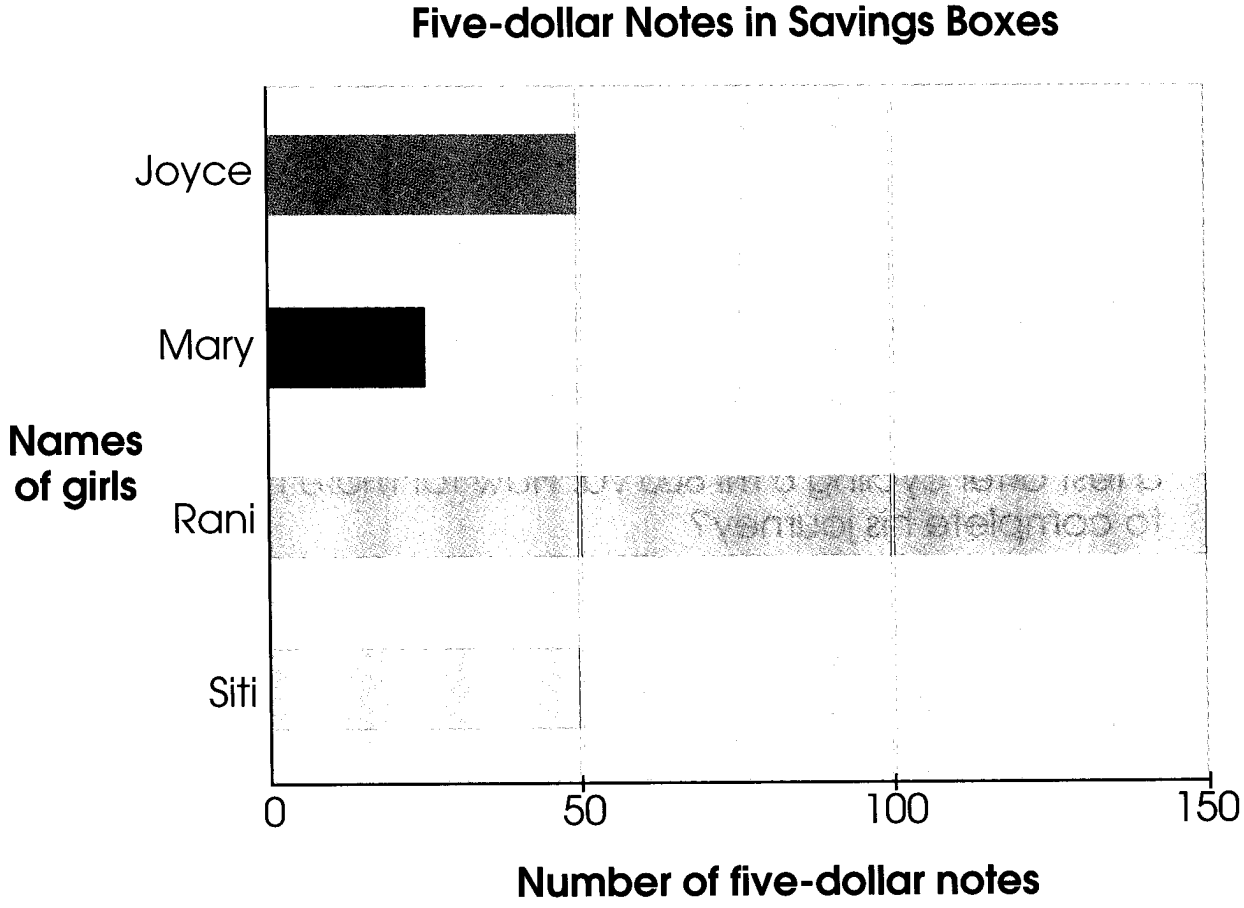
3. Peter needs two jugs and a basin to fill up the tank completely. What is the capacity of the tank?





4. The total mass of 5 bananas and some apples is 3 kg 300 g. If each banana has a mass of 150 g, what is the mass of the apples?

5. The graph below shows the number of five-dollar notes that 4 girls have in their savings boxes.



a) How many five-dollar notes does Mary have?

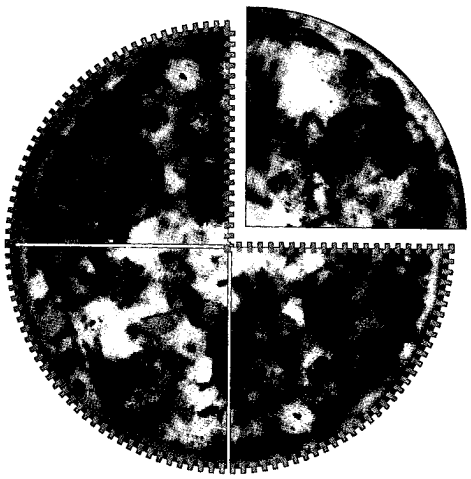
b) Who has 3 times the number of five-dollar notes as Siti?

c) How many five-dollar notes do the four girls have altogether?

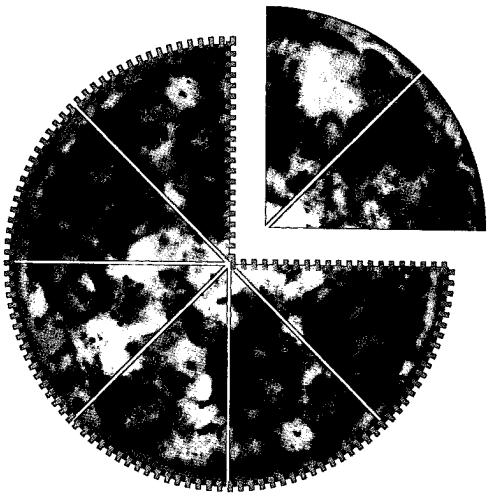
d) How much money does Mary have?

CHAPTER 5

FRACTIONS



A



B

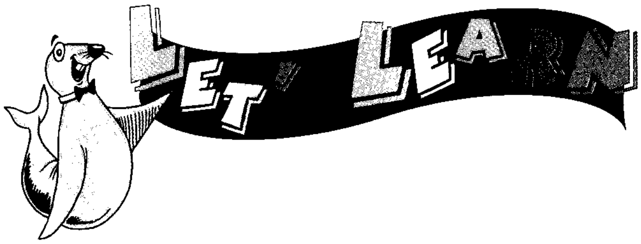
The green dotted lines show the number of pieces of pizza eaten.

DO YOU KNOW??

What fraction of Pizza A was eaten?

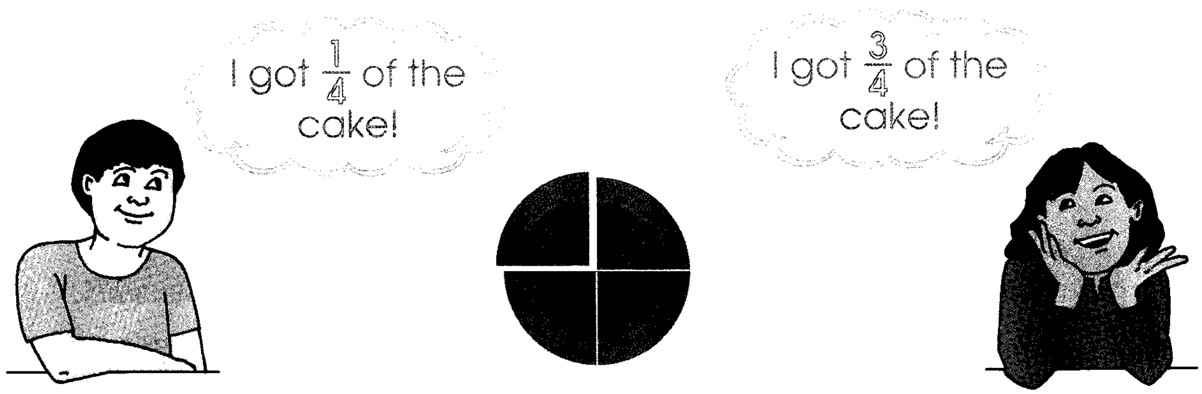
What fraction of Pizza B was eaten?

Are both portions eaten of the same size?

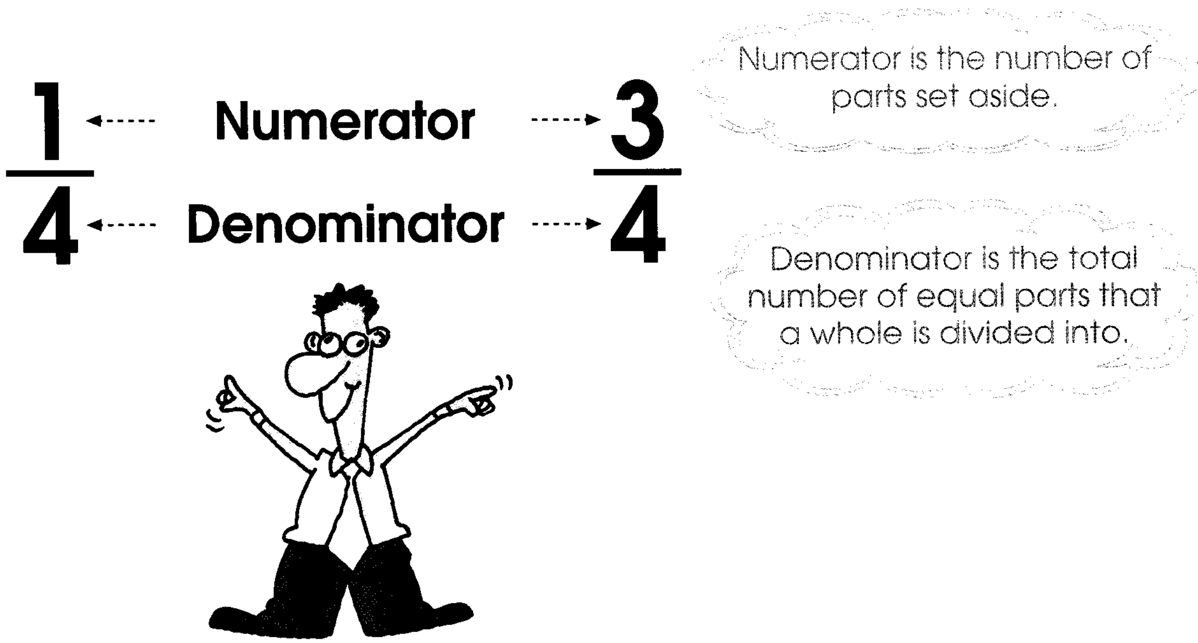


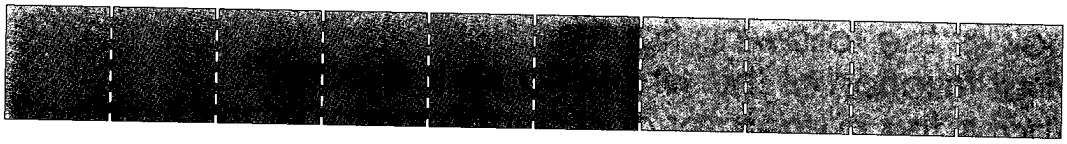
Numerators and Denominators

Siti and Peter are getting different parts of each cake.

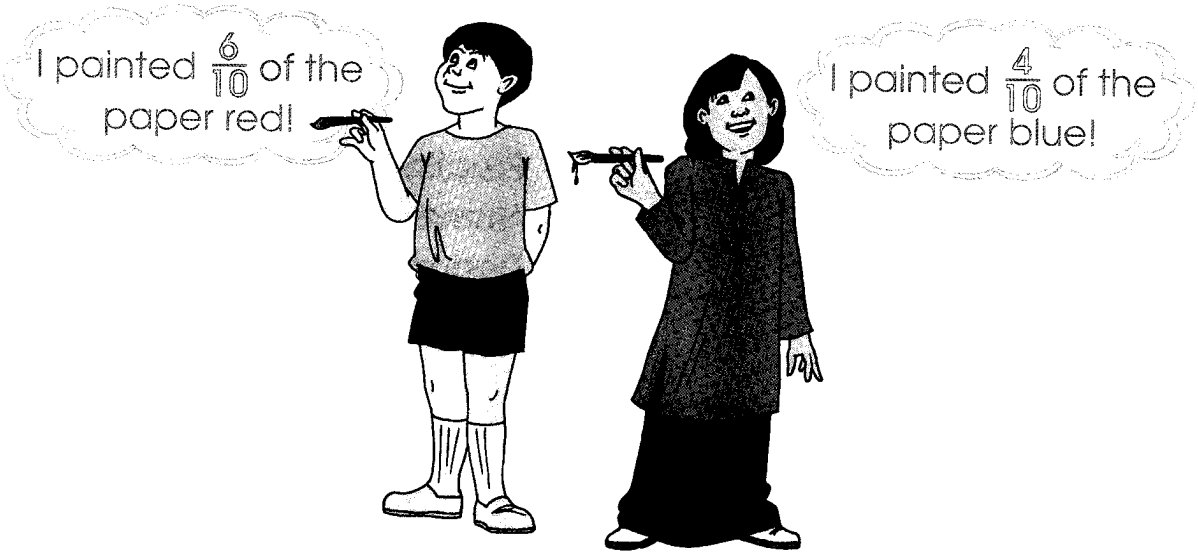


Let's look at the fractions more closely:





Siti and Peter paint a strip of paper.

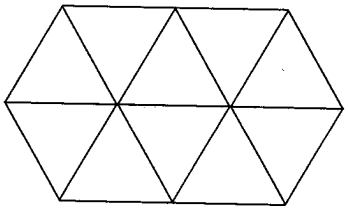


Do you know which are the numerators and denominators?

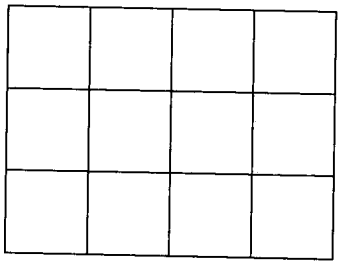
Let's Try

1. What fraction of the figure is shaded?

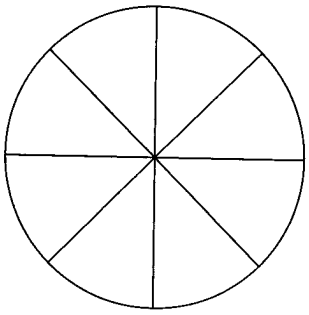
a)



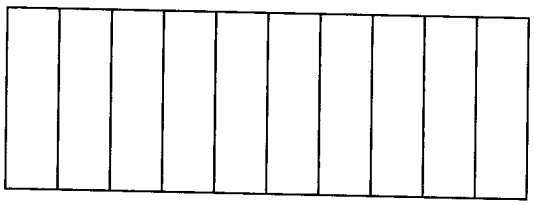
b)



c)

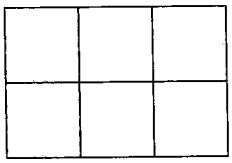


d)



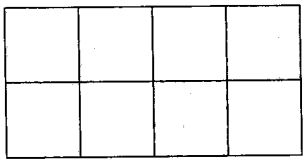
2. Look at the following figures.
What fraction of the whole figure is shaded?
What is the numerator and denominator of this fraction?

a)



Fraction shaded : ☐
Numerator : ☐
Denominator : ☐

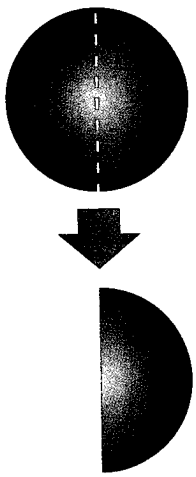
b)



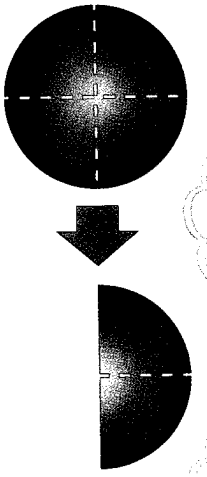
Fraction shaded : ☐
Numerator : ☐
Denominator : ☐

Equivalent Fractions

A baker bakes 2 chocolate cakes and cuts them in different numbers of equal parts.



This is $\frac{1}{2}$ half the cake!

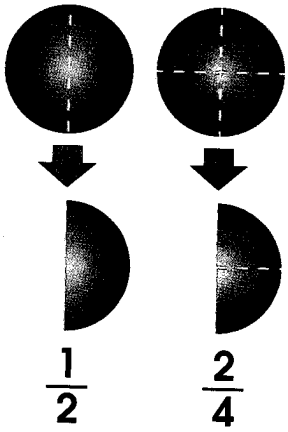


The first cake has been cut once.

The second cake has been cut twice.

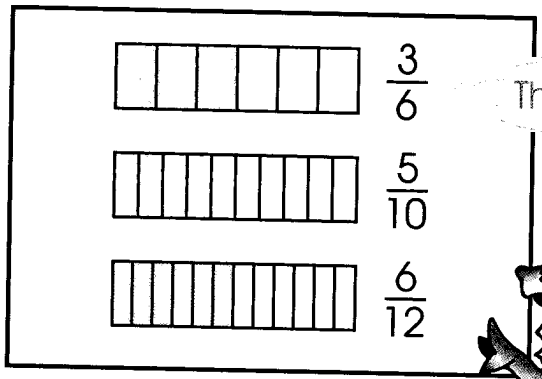
Look at the parts of the chocolate cake.
Are they of the same size?

$\frac{1}{2}$ and $\frac{2}{4}$ refer to the same amount of cake.

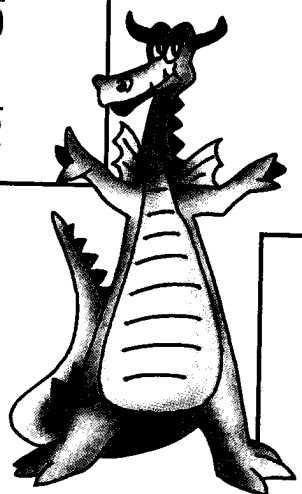


The fractions of the cakes, $\frac{1}{2}$ and $\frac{2}{4}$, are equal in value.

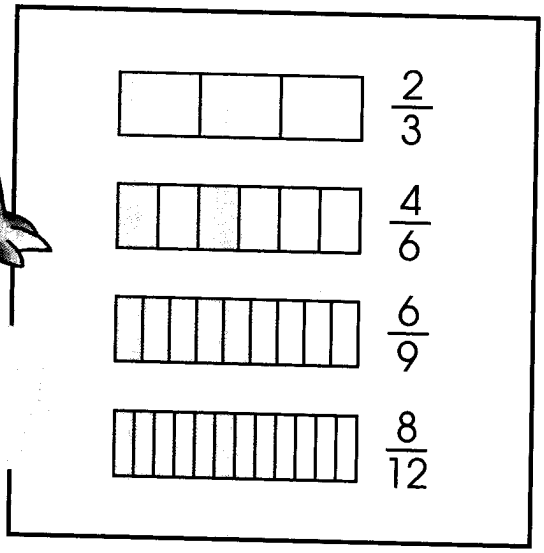
These fractions are **equivalent** fractions.

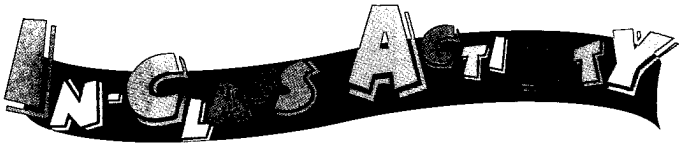


These fractions are of the same size.



The wholes of these fractions are of the same size.

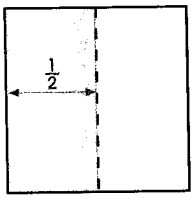




Equivalent Fractions

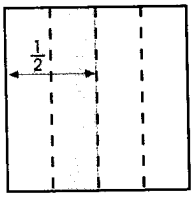
Bring to class a sheet of paper.

1. Fold the piece of paper into 2 equal parts.
Shade $\frac{1}{2}$ of the paper with your favorite color.



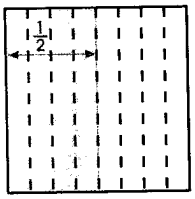
$\frac{1}{2}$ of the paper is shaded.

2. Now fold the piece of paper again into 4 equal parts.



$\frac{2}{4}$ of the paper is shaded.

3. Fold the piece of paper a third time, into 8 equal parts.



$\frac{4}{8}$ of the paper is shaded.

4. Mark the equivalent fractions on your piece of paper as shown.

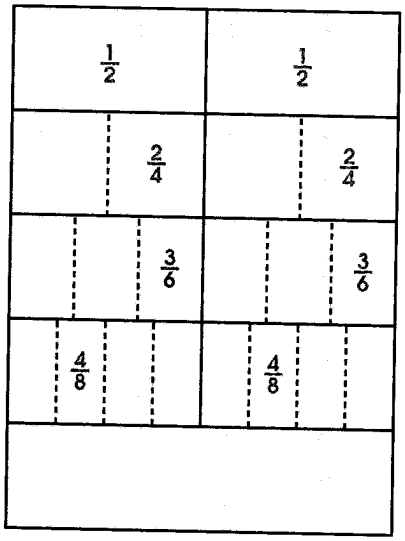
5. $\frac{1}{2}$, $\frac{2}{4}$ and $\frac{4}{8}$ are equivalent fractions. What patterns do you observe in the numerators and denominators?

$\frac{1}{2}$ ---→ $\frac{2}{4}$ ---→ $\frac{4}{8}$

Equivalent Fractions

How can we find the equivalent fractions for a given fraction?

1. Multiply the numerator and denominator by the same number.



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

Multiply by 2.

$$\frac{1}{2} \xrightarrow{\times 3} \frac{3}{6}$$

Multiply by 3.

$$\frac{1}{2} \xrightarrow{\times 4} \frac{4}{8}$$

Multiply by 4.

2. Divide the numerator and denominator by the same number.

$$\frac{9}{12} \xrightarrow{\div 3} \frac{3}{4}$$

Divide by 3.

$$\frac{4}{8} \xrightarrow{\div 4} \frac{1}{2}$$

Divide by 4.

Simplest Form of a Fraction

Let's look at the fraction, $\frac{4}{8}$.

Is $\frac{4}{8}$ the simplest form of a fraction?

$$\frac{4}{8} \xrightarrow{\div 2} \frac{2}{4}$$

No. Its numerator and denominator can be divided by the same number.

Is $\frac{2}{4}$ the simplest form of a fraction?

$$\frac{2}{4} \xrightarrow{\div 2} \frac{1}{2}$$

No. Its numerator and denominator can also be divided by the same number.

$\frac{1}{2}$ is the simplest form of $\frac{4}{8}$ because its numerator and denominat or CANNOT be divided further by the same number.

What is the simplest form of $\frac{9}{12}$?

$$\frac{9}{12} \xrightarrow{\div 3} \frac{3}{4}$$

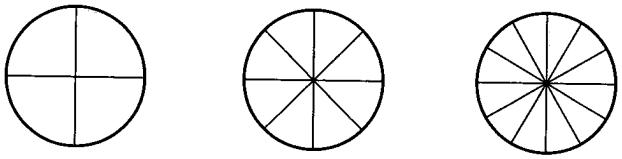
$\frac{3}{4}$ is equivalent to $\frac{9}{12}$.

The simplest form of $\frac{9}{12}$ is $\frac{3}{4}$.

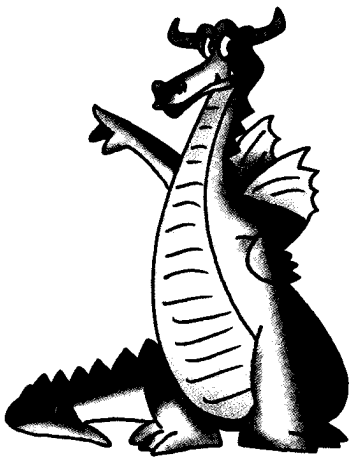
Let's Try

1. Fill in the missing numerators and denominators.

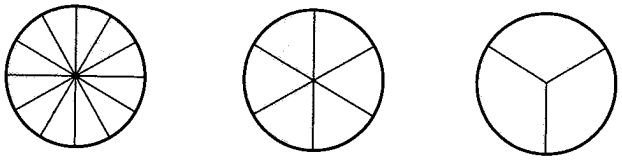
a)



$\frac{1}{4} = \frac{2}{\square} = \frac{\square}{12}$



b)



$\frac{8}{\square} = \frac{\square}{6} = \frac{2}{\square}$

2. Express each fraction in its simplest form.

a) $\frac{6}{10} = \frac{\square}{\square}$

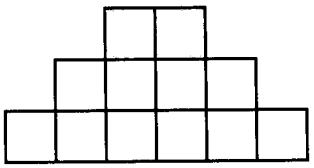
b) $\frac{10}{12} = \frac{\square}{\square}$

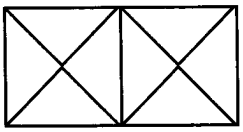
3. Is $\frac{4}{8}$ the simplest form of $\frac{8}{16}$? Explain.

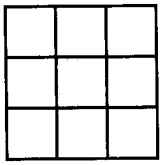
Practice 5A

1. Look at the following figures. Write the fractions in their simplest form to show the colored parts.

a) 

b) 

c) 

d) 

2. Complete the following.

a) $\frac{8}{10} = \frac{\square}{5}$

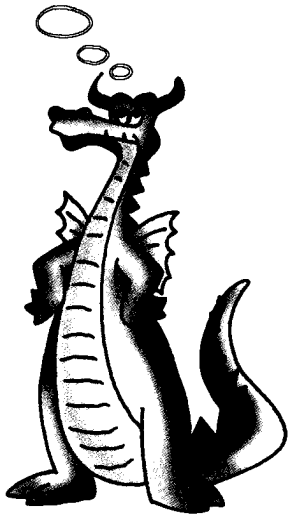
b) $\frac{4}{8} = \frac{1}{\square}$

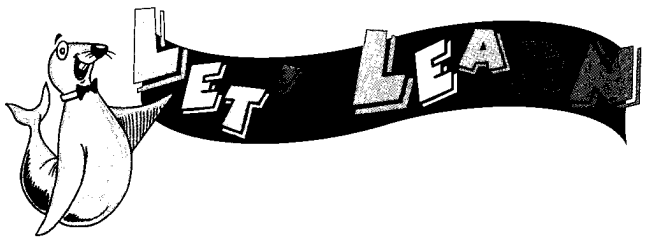
c) $\frac{10}{12} = \frac{\square}{6}$

d) $\frac{6}{9} = \frac{2}{\square}$

e) $\frac{1}{4} = \frac{\square}{12}$

f) $\frac{3}{5} = \frac{6}{\square}$

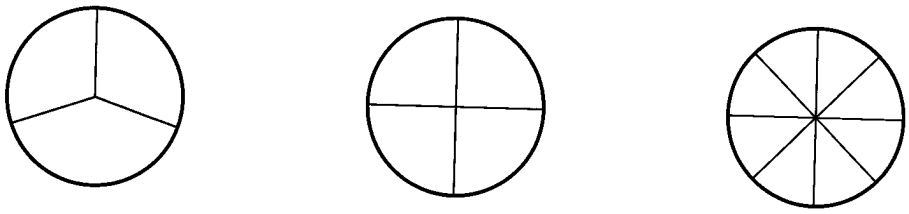




Comparing Fractions

The following fractions have the same numerators:

$\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{8}$

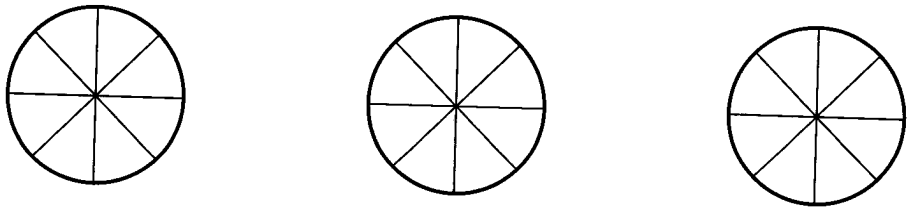


$\frac{1}{3}$ is larger than $\frac{1}{4}$. $\frac{1}{4}$ is larger than $\frac{1}{8}$.

The following fractions have the same denominators:

$\frac{2}{8}$ $\frac{4}{8}$ $\frac{5}{8}$

The whole is also the same.



Let's look at the numerators.
'2' is the smallest numerator and '5' is the largest numerator.

In $\frac{2}{8}$, there are 2 parts out of 8 parts.

In $\frac{5}{8}$, there are 5 parts out of 8 parts.

Therefore $\frac{2}{8}$ is the smallest fraction and $\frac{5}{8}$ is the largest fraction.

Now let's look at these fractions:

$\frac{3}{4}$ $\frac{7}{8}$

It is easier to compare these fractions if they have the same denominator!

Which fraction is larger, $\frac{3}{4}$ or $\frac{7}{8}$?

$\frac{3}{4}$ is an equivalent fraction of $\frac{6}{8}$:

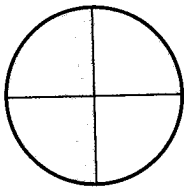
$$\frac{3}{4} \xrightarrow{\times 2} \frac{6}{8}$$

Multiply by 2.

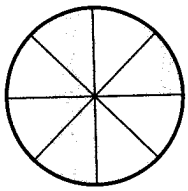
Therefore we compare $\frac{7}{8}$ and $\frac{6}{8}$.

$\frac{7}{8}$ is larger than $\frac{6}{8}$.

Therefore $\frac{7}{8}$ is larger than $\frac{3}{4}$.



$\frac{3}{4}$



$\frac{7}{8}$

Which fraction is larger, $\frac{1}{2}$ or $\frac{2}{3}$?

When we compare fractions, we change them into fractions with the same denominator.

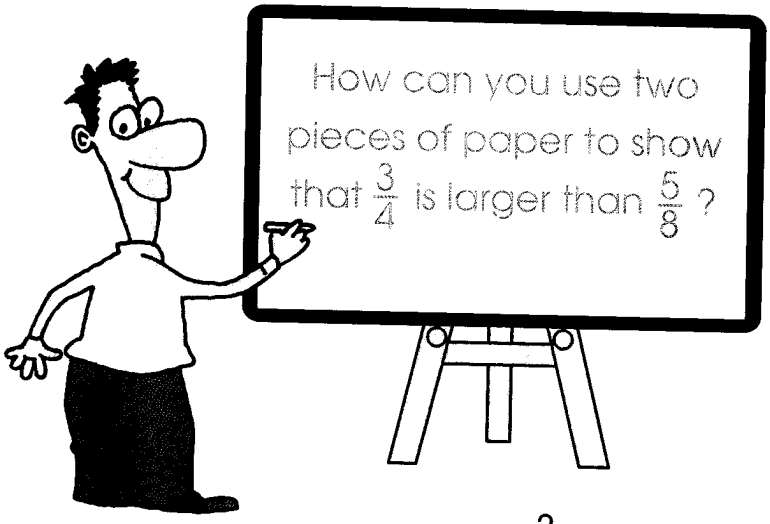
$\frac{1}{2} = \frac{2}{4} = \frac{3}{6}$

$\frac{2}{3} = \frac{4}{6}$

We compare $\frac{3}{6}$ and $\frac{4}{6}$.

Since $\frac{4}{6}$ is larger than $\frac{3}{6}$, therefore $\frac{2}{3}$ is larger than $\frac{1}{2}$.

IN-CLASS ACTIVITY



Use the same method to find out if $\frac{3}{5}$ is larger than $\frac{7}{10}$.

Let's Try

1. Arrange the fractions in order beginning with the smallest.

$$\frac{1}{2}, \frac{7}{8}, \frac{3}{4}$$

Change the fractions so that all of them have the same denominator.

$$\frac{1 \times 4}{2 \times 4} = \frac{4}{8}$$

Notice that $2 \times 4 = 8$ and $4 \times 2 = 8$

$$\frac{3 \times 2}{4 \times 2} = \frac{6}{8}$$

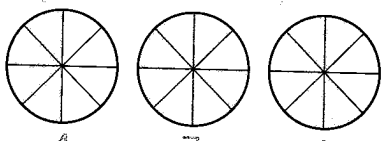
Therefore, 8 is the common denominator!

We can rewrite the fractions as,

$$\frac{4}{8}, \frac{7}{8}, \frac{6}{8}$$

Arrange the fractions from the smallest numerator to the largest:

$\square$, $\square$, $\square$



$\frac{4}{8}$ $\frac{7}{8}$ $\frac{6}{8}$

2. Circle the smaller fraction.

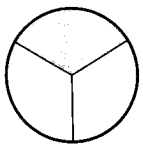
a) $\frac{1}{2}$, $\frac{2}{5}$

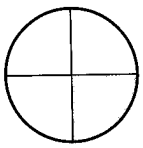
b) $\frac{2}{3}$, $\frac{1}{4}$

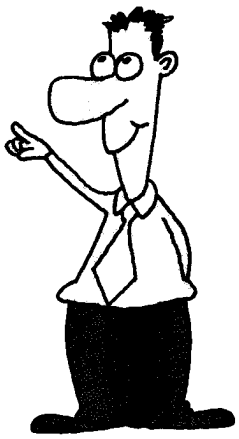
Practice 5B

1. What fraction of the figure is colored? Tick the figure with the larger fraction.

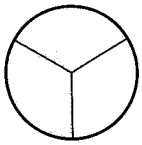
a)

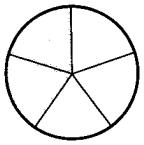






b)



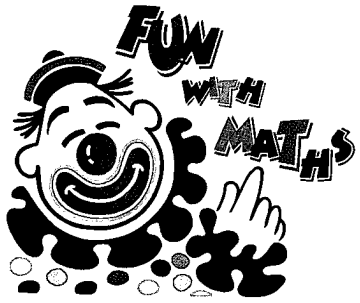


2. Arrange these fractions in order, beginning with the largest.

a) $\frac{1}{2}, \frac{1}{5}, \frac{1}{10}$: ____, ____, ____

b) $\frac{6}{12}, \frac{1}{4}, \frac{5}{6}$: ____, ____, ____

c) $\frac{1}{2}, \frac{1}{4}, \frac{2}{3}$: ____, ____, ____

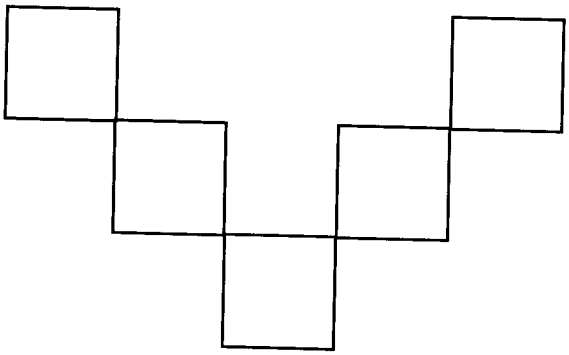


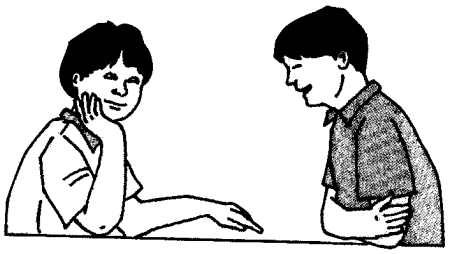
Play the following game with a friend.
Take a cardboard sheet and cut out 12 squares of equal size.
Write the following fractions on the cards:

$$\frac{2}{4}, \frac{3}{4}, \frac{1}{2}, \frac{1}{5}, \frac{7}{12}, \frac{3}{6}, \frac{1}{3}, \frac{1}{10}, \frac{3}{8}, \frac{2}{6}, \frac{4}{12}, \frac{2}{3}.$$

Shuffle these cards and place them in a deck.

Each of you make a gameboard as follows:



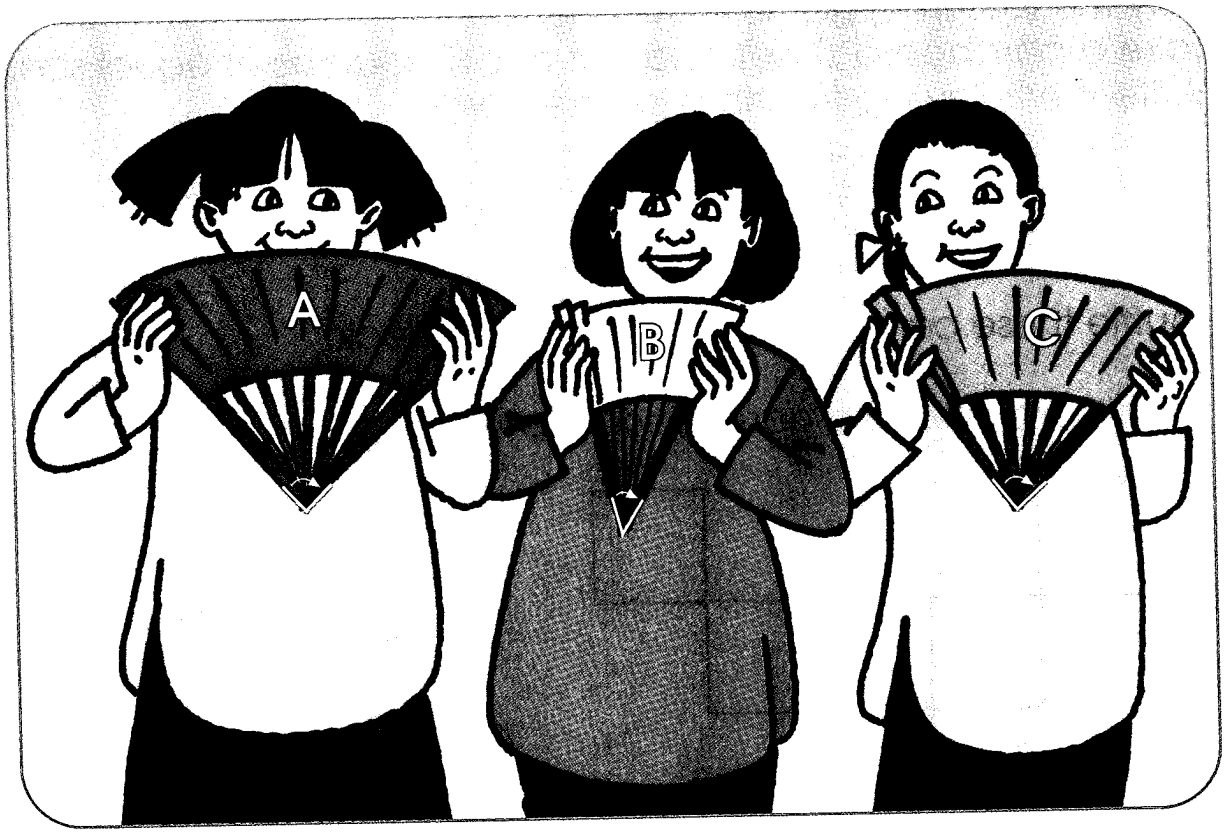


Each of you pick a card from the deck of cards. Who has the larger fraction? The one who has the larger fraction, crosses out a square on his gameboard. If the fractions are equivalent, pick another pair of cards without crossing out any squares.

Continue playing until one of you crosses out all the squares on the board. The person who crosses out all his squares wins the game!

CHAPTER 6

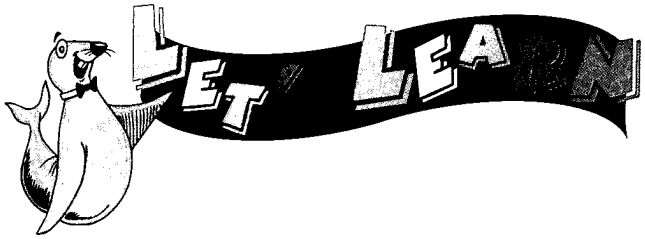
GEOMETRY



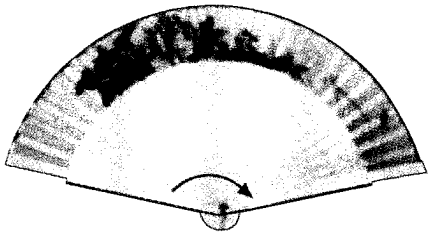
Mary, Joyce and Jane are holding fans.

DO YOU KNOW?

Which fan has been opened the widest?

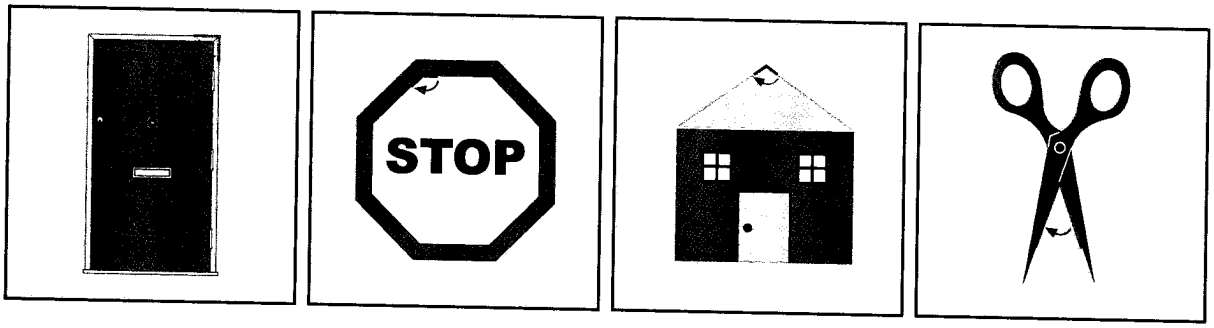


Angles



A fan forms an angle when opened.

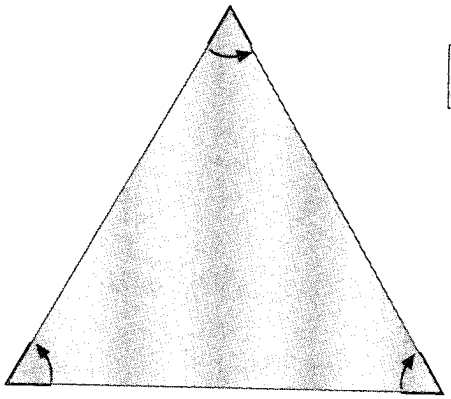
We can find many examples of angles in common things around us:



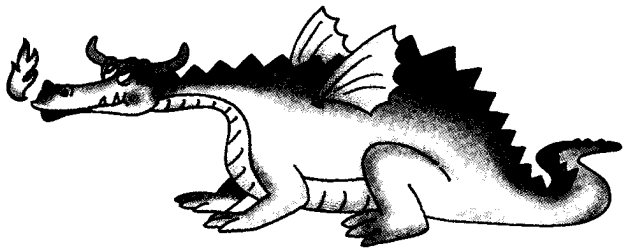
Now let's find the angles in these shapes:

An angle is formed when 2 straight lines meet at a point.

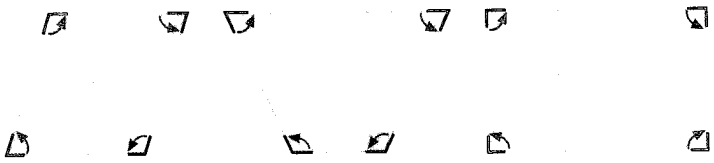
In a triangle, any two sides of the triangle make an angle.



A triangle has 3 sides and 3 angles.



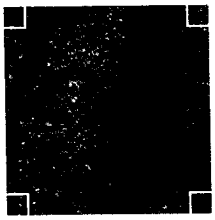
Now look at these 4-sided shapes.

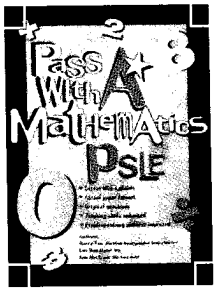


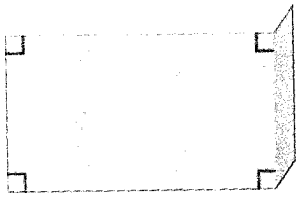
There are 4 angles in each shape!

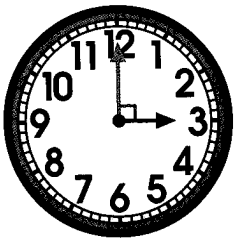
Right Angles

Look at the angles that can be found on these objects.



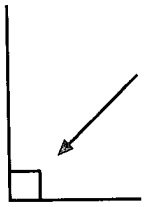






In all the figures shown above, there is a common point. All the angles shown are **right angles**.

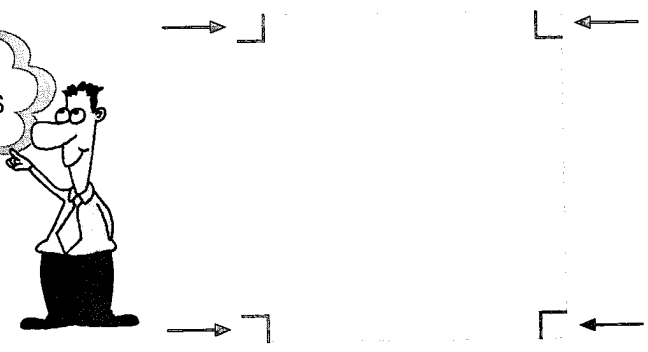
This is a right angle.



A right angle looks like a square corner.

Look at the right angles marked out in this square.

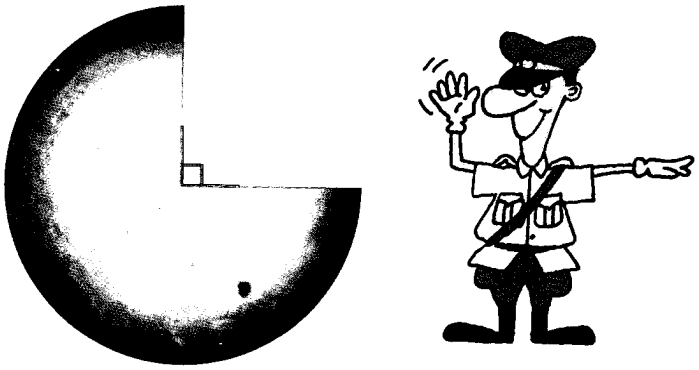
We mark out the corners of the square. The angles are right angles!



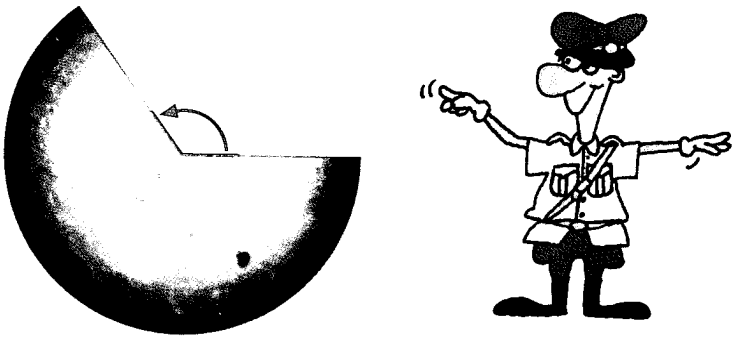
There are 4 right angles in a square.

Let's compare some angles.

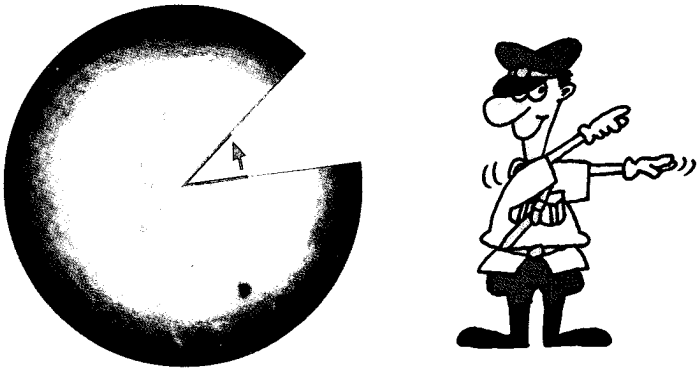
The following angle is a right angle:



The following angle is **greater** than a right angle:



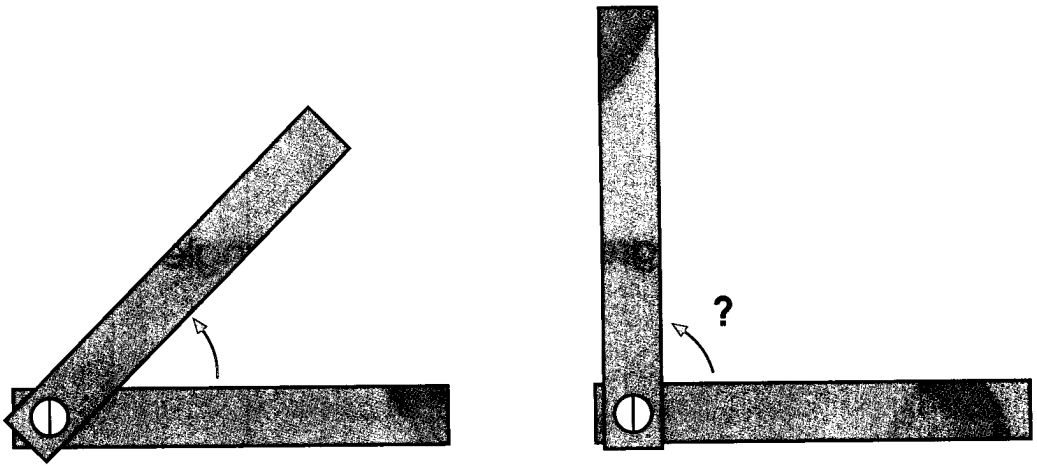
The following angle is **smaller** than a right angle:



IN-CLASS ACTIVITY

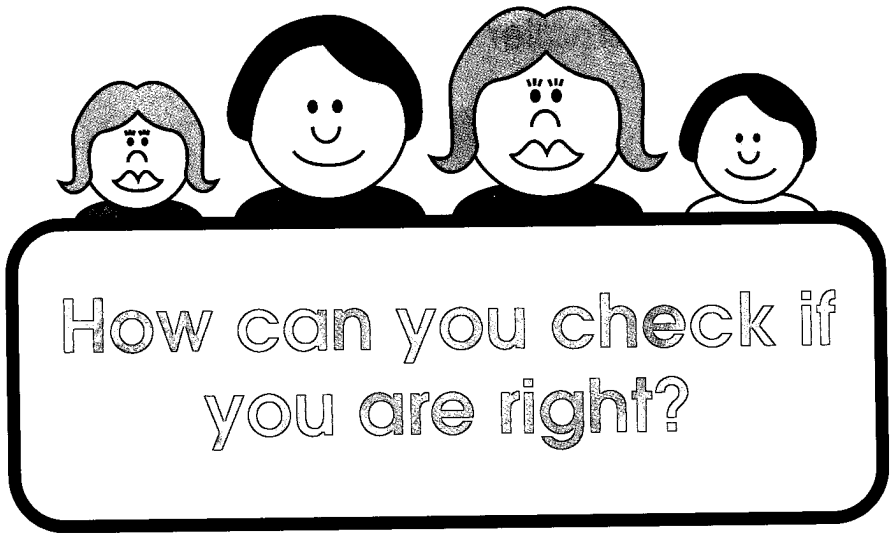
Each student brings to class two rectangular cardboard pieces and paper fasteners for this activity.

1. Use the paper fasteners to join 2 strips of cardboard.
2. Check that you can form angles like this :



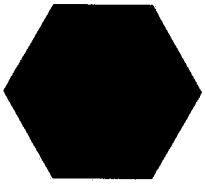
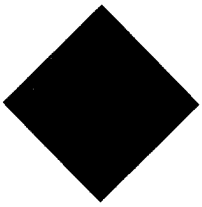
3. Use what you have made to form these angles:

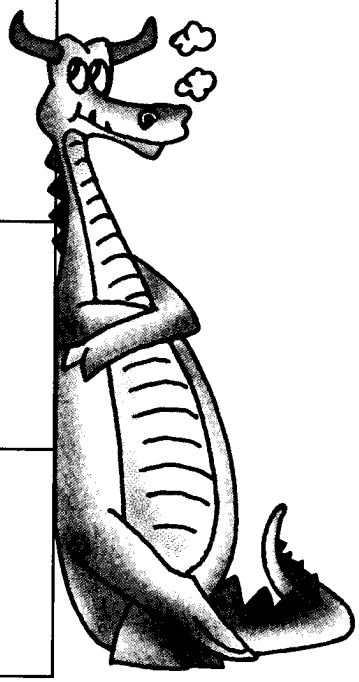
Right angle	Angle greater than right angle	Angle smaller than right angle



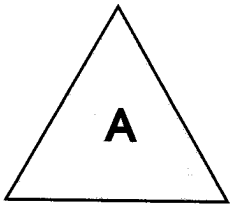
Let's Try

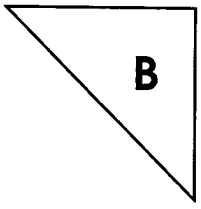
1. How many angles are there inside each figure? Complete the table.

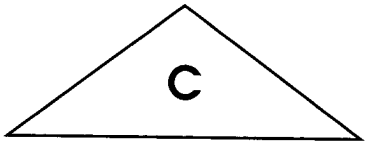
Shapes	Number of angles
	
	
	
	



2. Which triangle has an angle that is greater than a right angle?







Answer: Triangle _____.

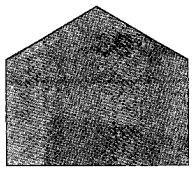
Practice 6A

1. How many angles does each figure have?
How many are right angles?

a)

Number of angles	
Number of right angles	

b)

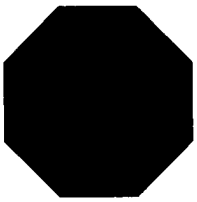


Number of angles	
Number of right angles	

c)

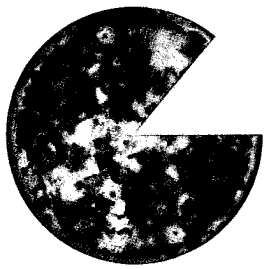
Number of angles	
Number of right angles	

d)



Number of angles	
Number of right angles	

2. Tick in the boxes for the pictures where you can find an angle that is smaller than a right angle.



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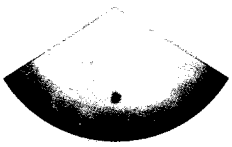

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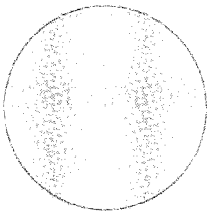

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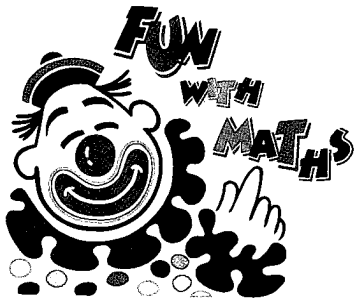
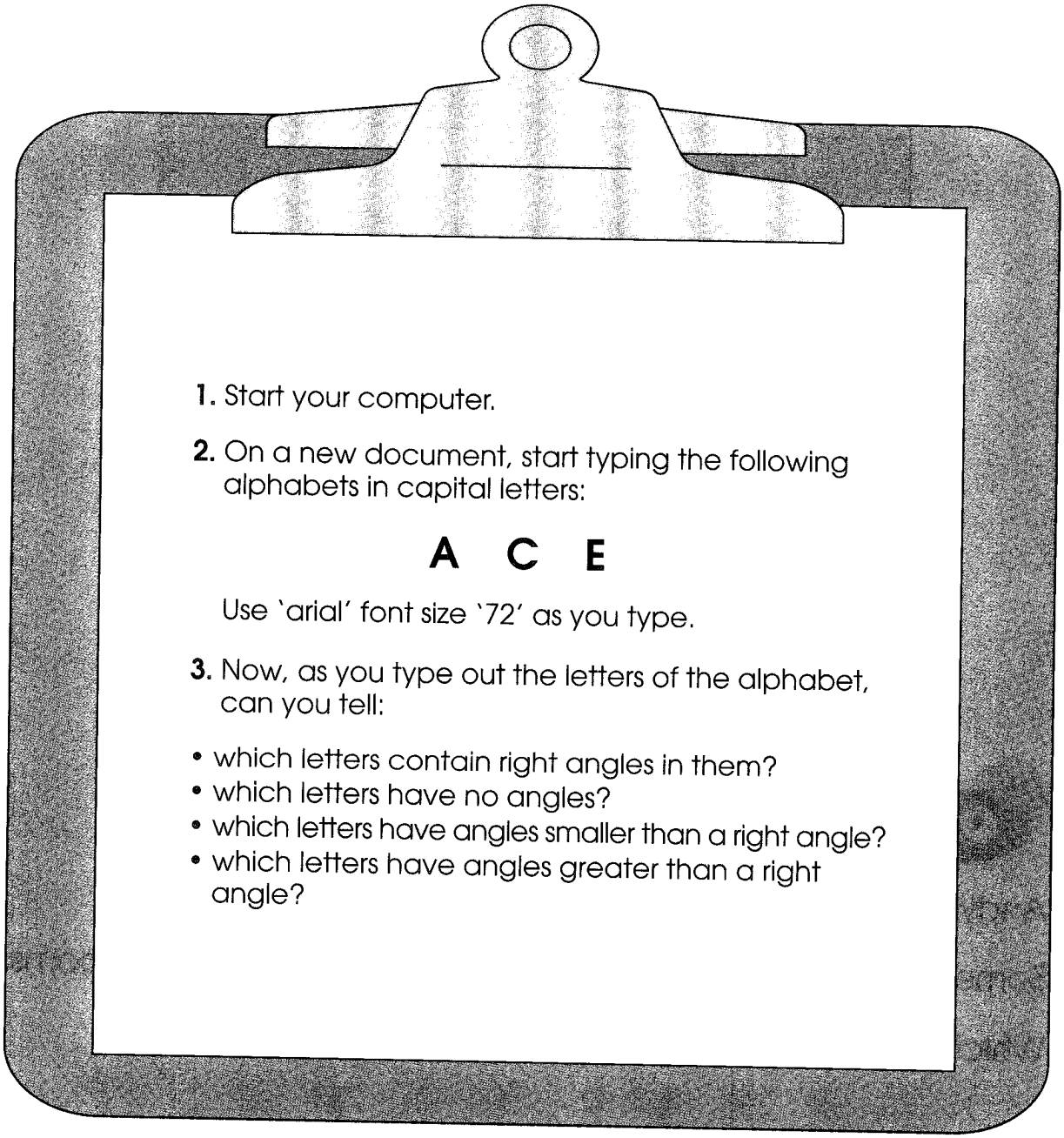


Here is one way you can use the computer to explore angles:



1. Start your computer.

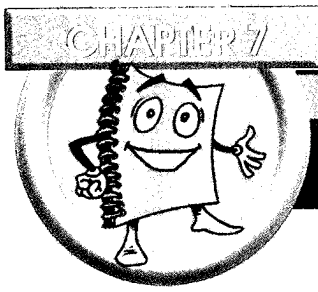
2. On a new document, start typing the following alphabets in capital letters:

A C E

Use 'arial' font size '72' as you type.

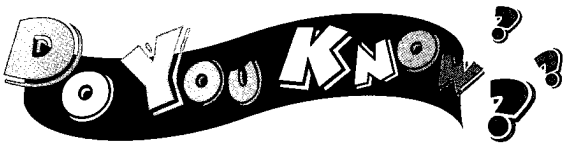
3. Now, as you type out the letters of the alphabet, can you tell:

- which letters contain right angles in them?
- which letters have no angles?
- which letters have angles smaller than a right angle?
- which letters have angles greater than a right angle?



AREA AND PERIMETER

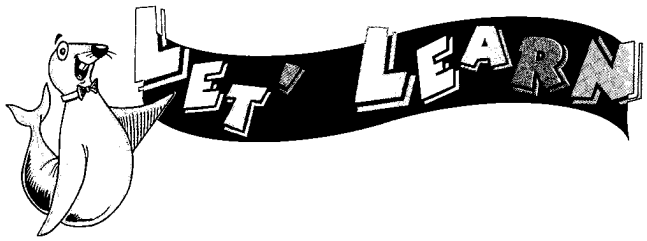
	Kitchen			Living Room	
	Dining Room				
Store Room				Bedroom 1	
	Bedroom 2				



Andy drew a rough plan of his house.

Some rooms take up more space in his house than other rooms.

Which room takes up the most floor space?



Area

Look at the plan of Andy's house again.

Both the kitchen and bedroom 1 take up space of 6 squares each. The kitchen and bedroom 1 are of the same size.

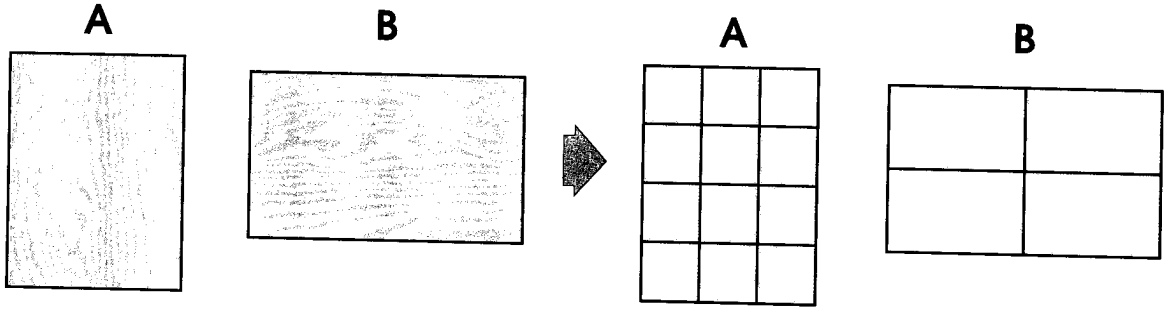
We say that they have the same **area**!

The area of a room is the floor space it takes up!

Andy found two wooden boards in the store room. He used two different cards to measure the boards.

Square card

Rectangular card

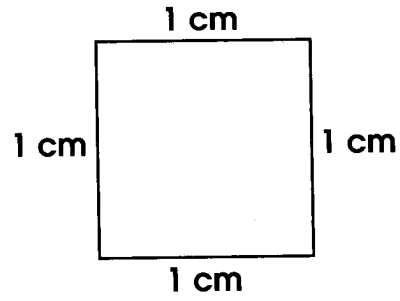


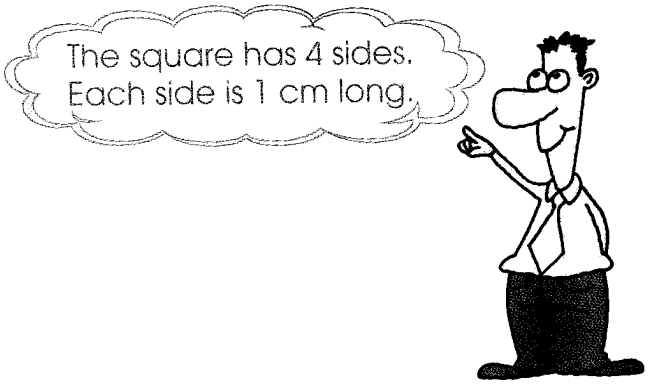
_____ square cards cover A. _____ rectangular cards cover B.

Using this information, can you tell which wooden board has a larger area? Why?

The Square Centimeter

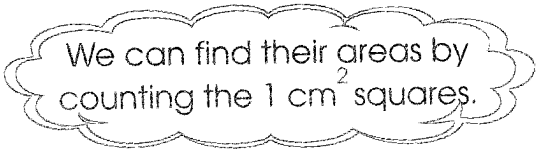
This is a 1 **cm²** square:



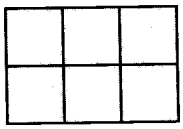


The area of the square is 1 **square centimeter** or 1 **cm²**.

Look at these cardboard figures. They are made up of many 1 **cm²** squares. What are their areas?

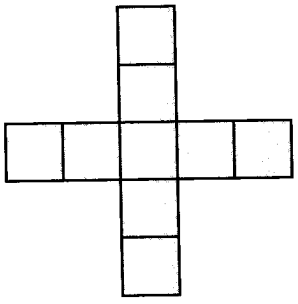


A



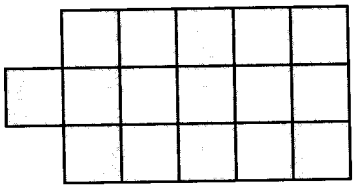
6
1 **cm²** squares

B



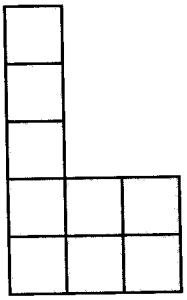
9
1 **cm²** squares

C



16
1 **cm²** squares

D



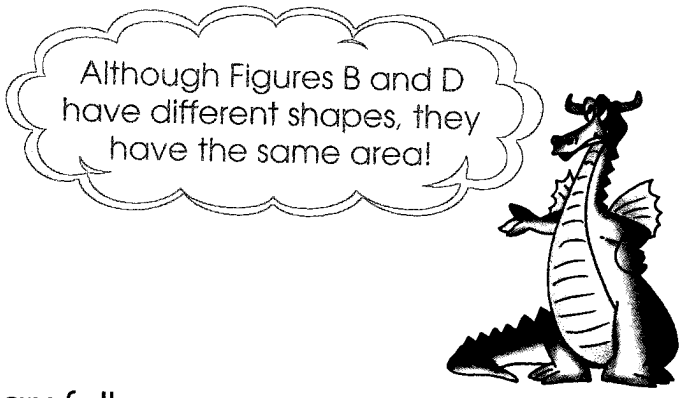
9
1 **cm²** squares

Area of Figure A : 6 cm^2

Area of Figure B : 9 cm^2

Area of Figure C : _____

Area of Figure D : 9 cm^2

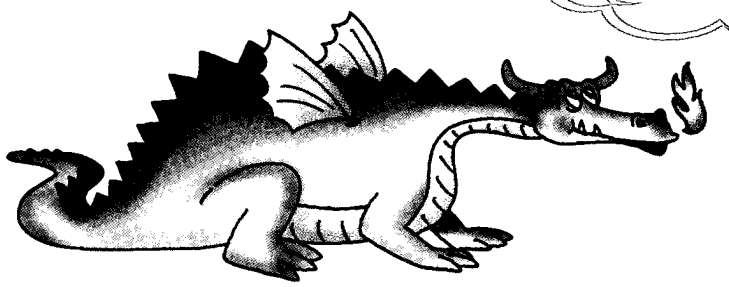


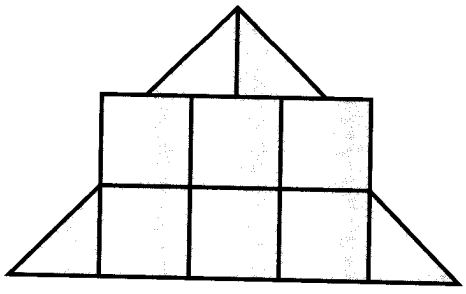
Now look at these figures carefully.

Each  is $\frac{1}{2}$ of a square.

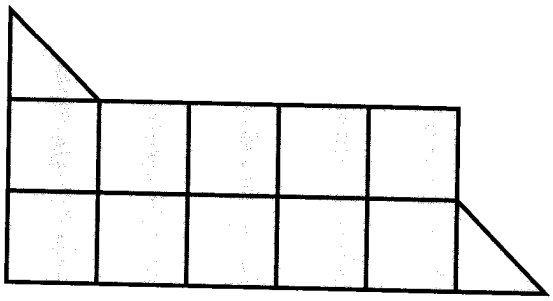
How many  are there in one square?

What is the area of each figure below?





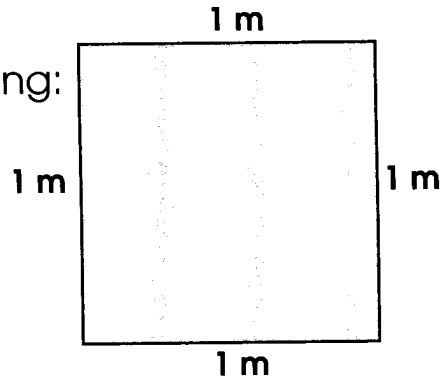
Area: 8 cm^2



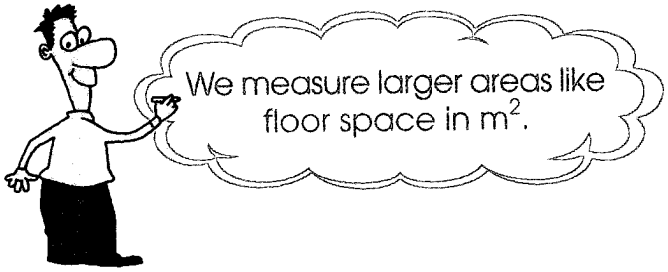
Area: _____ cm^2

The Square Meter

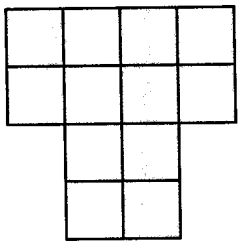
The sides of the square are each 1 m long:



The area of the square is 1 **square meter** or 1 $\mathbf{m^2}$.

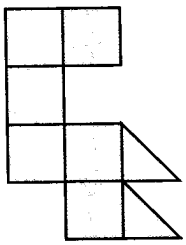


What are the areas of the following figures? (One □ shows an area of 1 m^2)



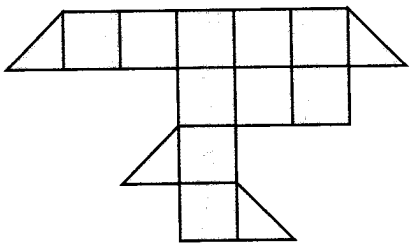
A

Area: 12 m^2



B

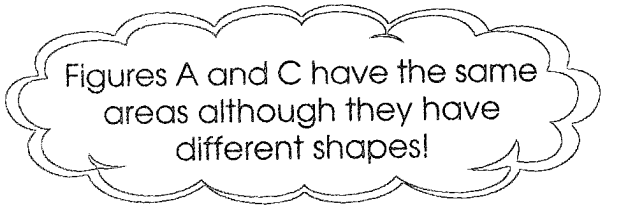
Area: 7 m^2

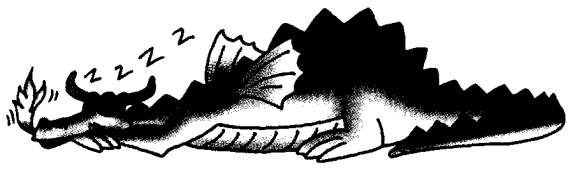


C

Area: 12 m^2

In U.S. Customary Units, the area is expressed in yd^2, ft^2 or in^2 depending upon the unit of length used.

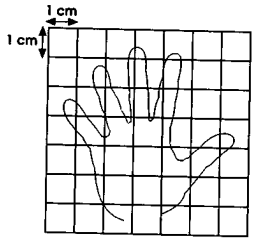




IN-CLASS ACTIVITY

Work in groups. Each student should have one centimeter grid paper.

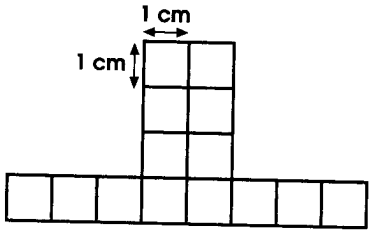
Trace the outline of the left hand onto this paper. Count the number of squares within the outline. Estimate the area of the hand of each student in the group.



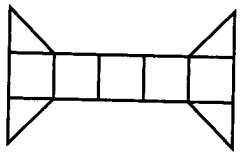
Let's Try

1. Fill in the blanks.

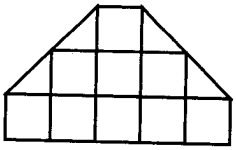
a) What is the area of each of the following figures?



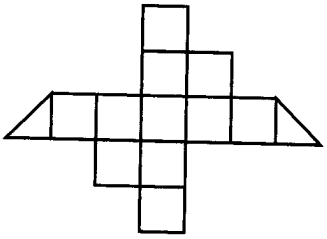
A: _____ cm^2



B: _____ cm^2



C: _____ cm^2

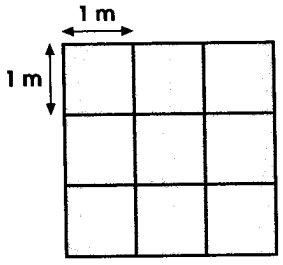


D: _____ cm^2

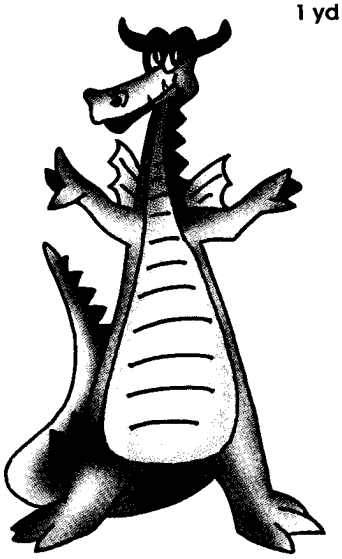
b) Which figure has the smallest area? _____

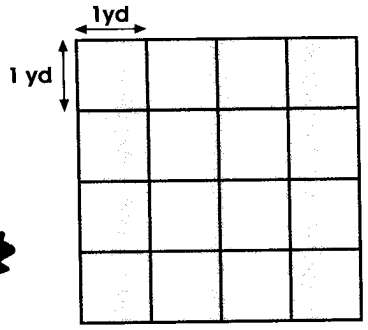
c) Place these figures in order, from the largest area to the smallest area. _____

2. Look at these squares. What are their areas?



Area: _____

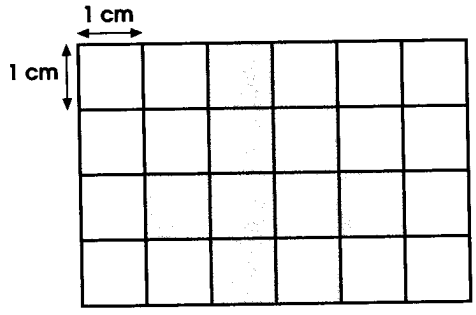


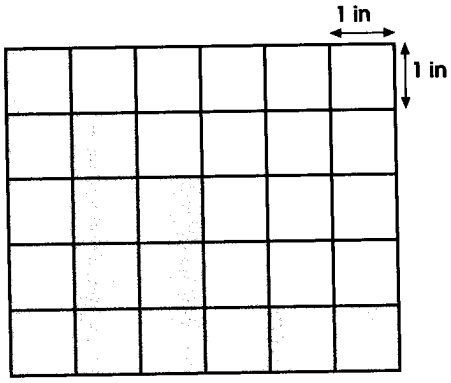


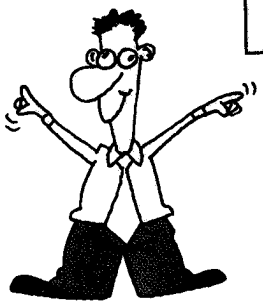
Area: _____

Practice 7A

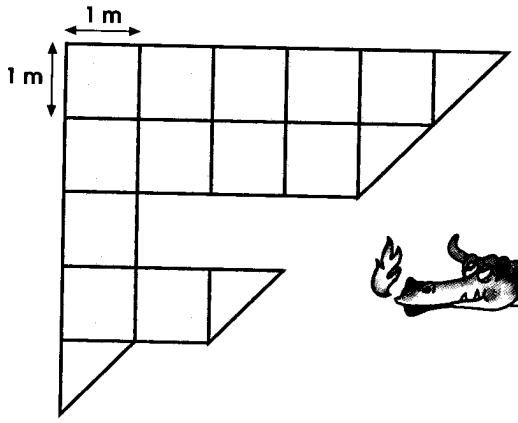
1. Find the area of the shaded parts.

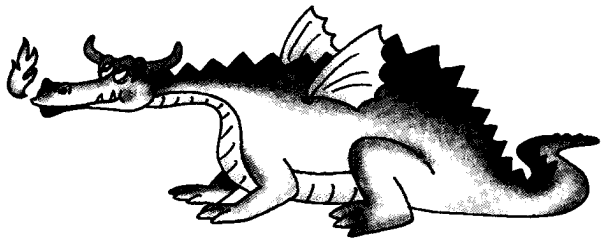






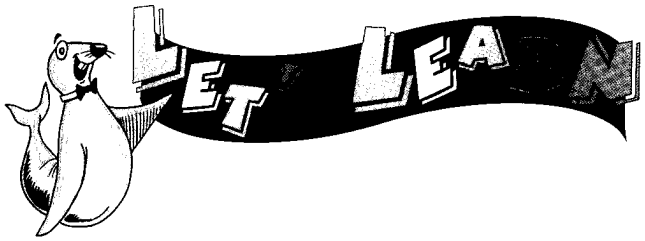
2. What is the area of the figure shown below?





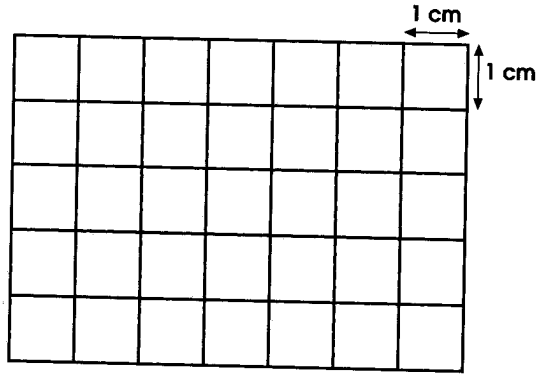
Area: _____

Workbook Exercise 1



Areas of Squares and Rectangles

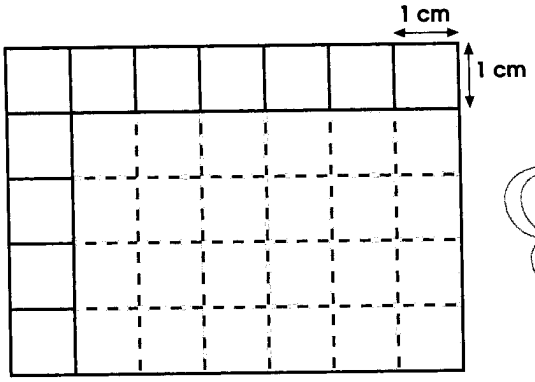
Look at this rectangle:



This rectangle is covered with 35 1 cm^2 squares.

Therefore, the area of the rectangle is 35 cm^2.

We can use a faster way to count the number of squares covering the rectangle.



Remember!

Total number of squares in rectangle = Total number of 1 cm^2 squares in rectangle

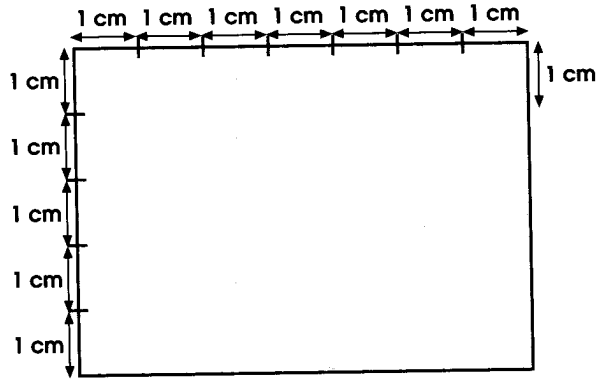
There are 5 rows of 7 squares each.

Total number of squares = 7 + 7 + 7 + 7 + 7

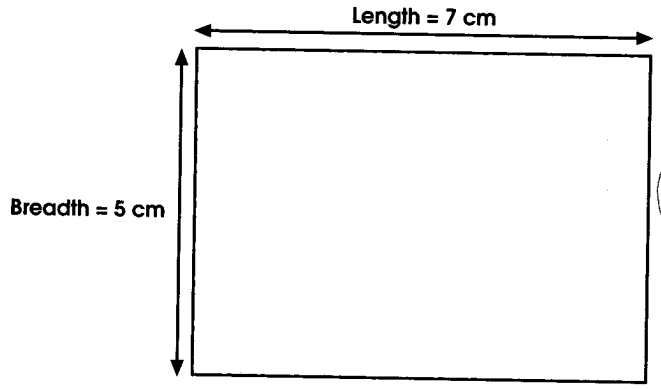
= 35

Or, 7 x 5 = 35

We can mark to show how many squares fit across and down the rectangle.



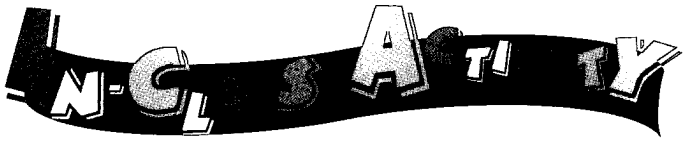
After marking, we can see that the length across is 7 cm and the breadth down is 5 cm.



Therefore, to find the total number of 1 cm^2 squares that can cover the rectangle, we multiply the length by the breadth.

Hence,

Area of rectangle = Length x Breadth

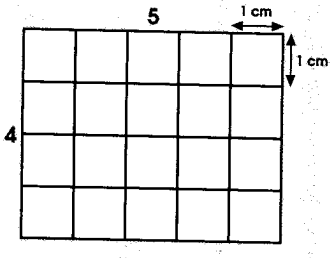


Work in pairs. Bring an A4 sized 1 cm^2 grid and a long ruler to class. Estimate the number of 1cm^2 squares needed to cover the cover of your Maths textbook completely. Then use the ruler to find the length and breadth of the textbook. What is the area of the cover of your book? Was your estimation accurate?

Let's Try

What are the areas of these rectangles? Use two methods to find the area. In the first method, find the total number of 1 cm^2 squares and in the second method, use the formula for area. Do you get the same answer? Explain.

a)



Method 1

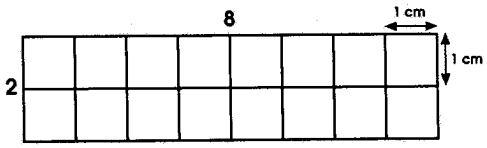
Total number of squares = _____

Total area = _____

Method 2

Total area = 5 x 4 = _____

b)



Method 1

Total number of squares = _____

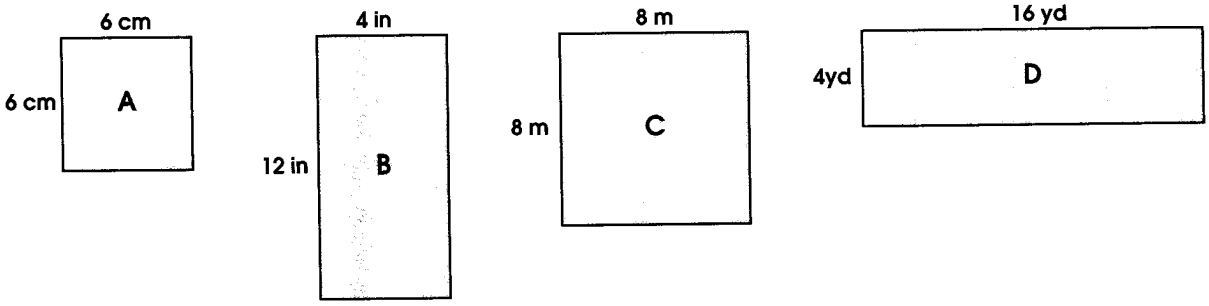
Total area = _____

Method 2

Total area = _____ x _____ = _____

Practice 7B

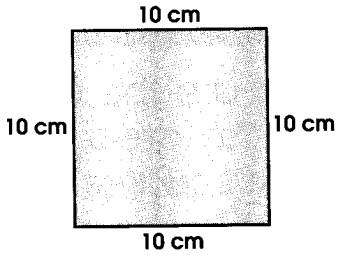
Find the area of each of these rectangles and squares.

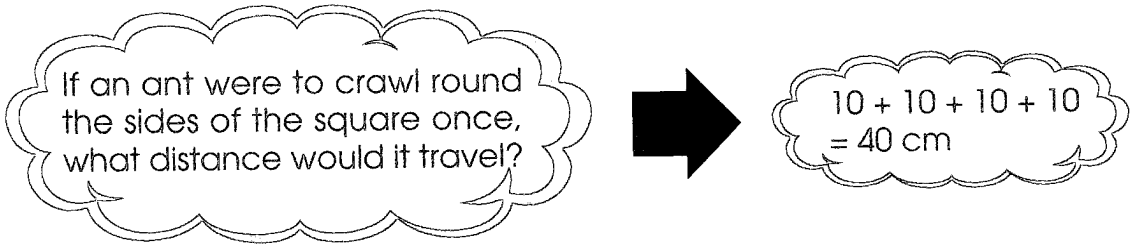


Perimeter

John draws a square.

Each side of the square is 10 cm long.





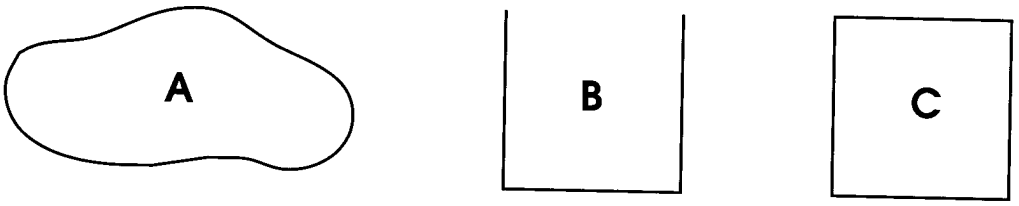
It would travel a distance of 40 cm.

We say that the perimeter of the square is 40 cm.

The perimeter of a figure is the total distance round it.

The units of perimeter are the units of length: **cm** and **m**

Which of these figures have perimeters?



Figures A and C have a perimeter. Figure B does not have a perimeter. Do you know why?

Only closed figures have perimeters

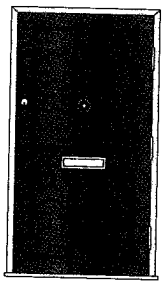
IN-CLASS ACTIVITY

Work in groups.

Measure the perimeter of the whiteboard in your class.

Then measure the perimeter of one side of the door of your classroom.

You will need to use a string and a ruler to check your measurements.

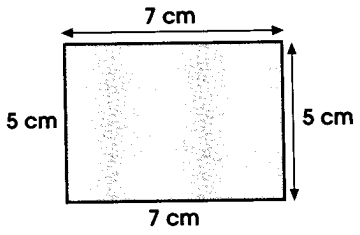


Does the door have a larger perimeter or the whiteboard?

Use a measuring tape to measure the perimeter of your waist. Write down the perimeter of your waist.

Let's Try

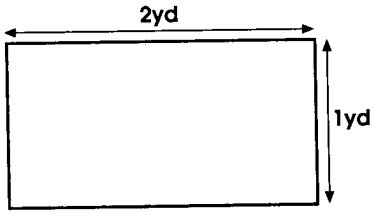
1. The rectangle has a length of 7 cm and a breadth of 5 cm. What is its perimeter?



Perimeter = 5 +7 + 5 + 7

= _____ cm

2. The length of the rectangular notice board is 2 yd. Its breadth is 1 yd. Find its perimeter.



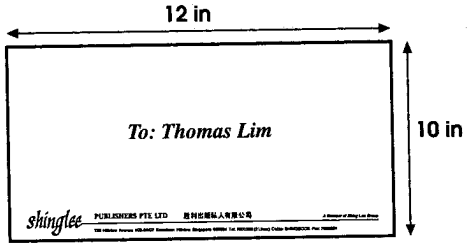
Perimeter = _____ + _____ + _____ + _____

= _____ yd

Practice 7C

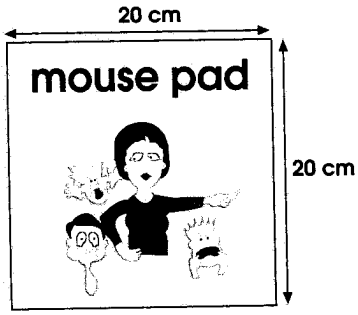
Find the perimeters.

a)



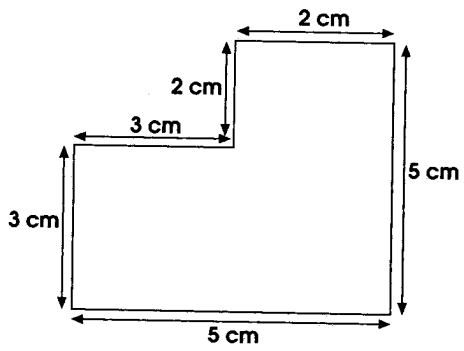
perimeter: _____

b)



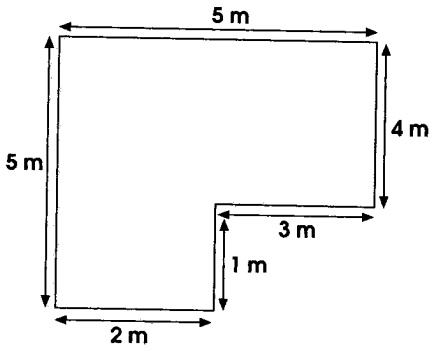
perimeter: _____

c)

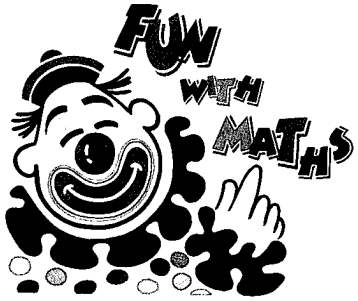


perimeter: _____

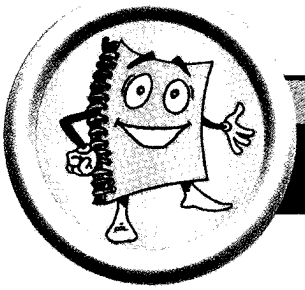
d)



perimeter: _____



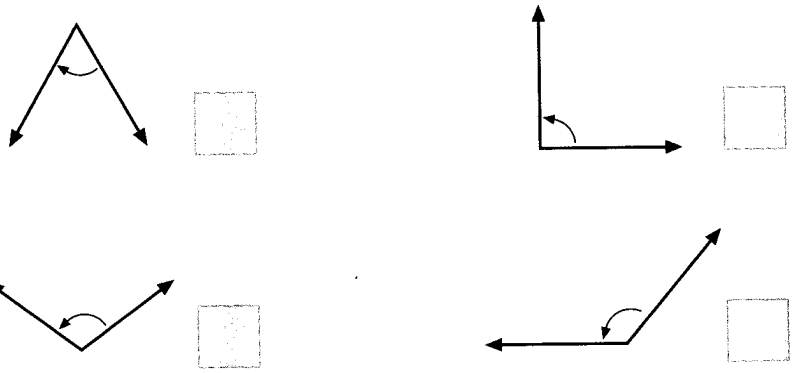
Imagine that you are an architect. Draw 2 different floor plans (with the same perimeter) for a kitchen you are designing.



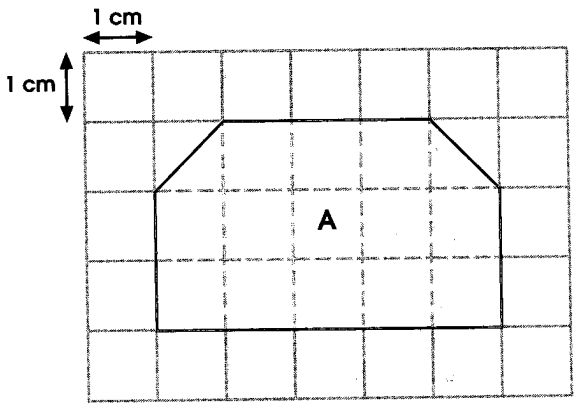
REVISION 2

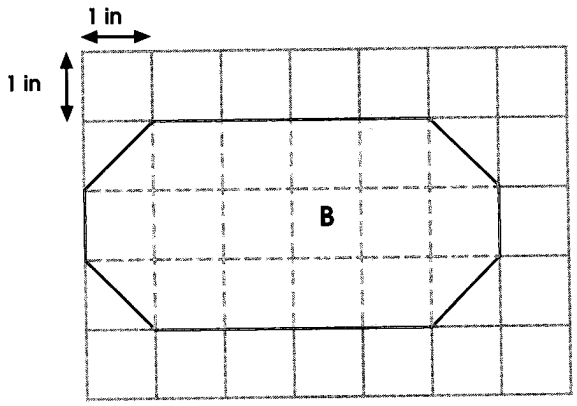
Exercise 1

1. Tick the angles that are greater than a right angle.



2. Find the areas of figure A and figure B.



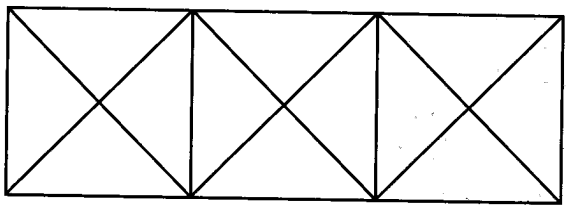


Area of figure A = ___ cm^2

Area of figure B = ___ in^2

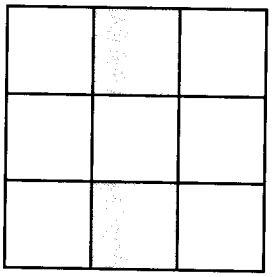
3. What fraction of each figure has been shaded? What is the numerator and denominator of each fraction?

a)



Fraction	
Numerator	
Denominator	

b)



Fraction	
Numerator	
Denominator	

Exercise 2

1. Cross-out the smaller fraction.

a) $\frac{4}{12}$ $\frac{2}{3}$

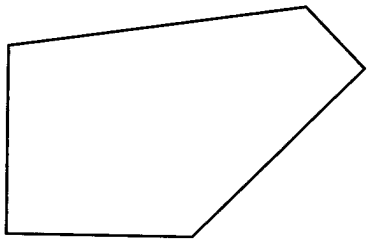
b) $\frac{4}{10}$ $\frac{1}{5}$

c) $\frac{5}{6}$ $\frac{2}{3}$

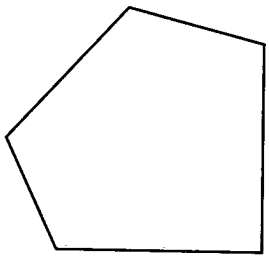
d) $\frac{4}{8}$ $\frac{3}{4}$

2. How many right angles are there in each figure?

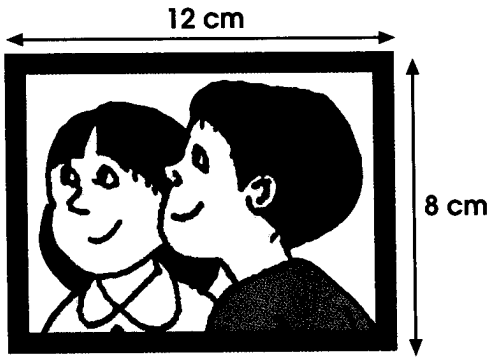
a)



b)



3. Look at this rectangular frame showing a picture.

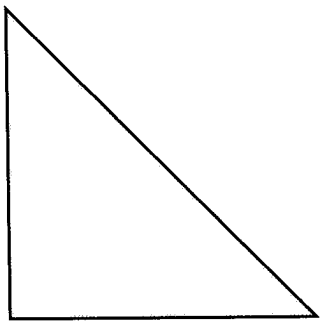


a) What area does the frame enclose? _____

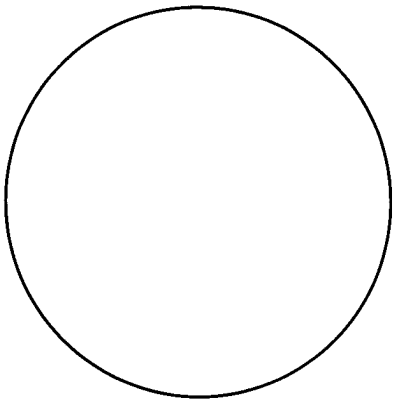
b) What is the perimeter of the frame? _____

4. Mark the right angles in the figures below. Are there any figures that have no right angle?

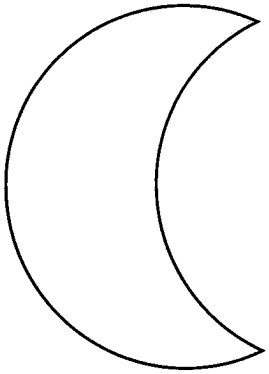
a)



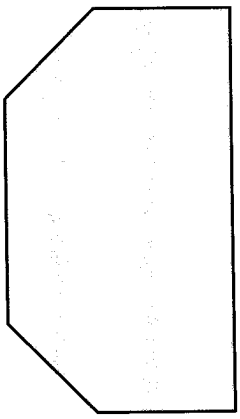
b)



c)

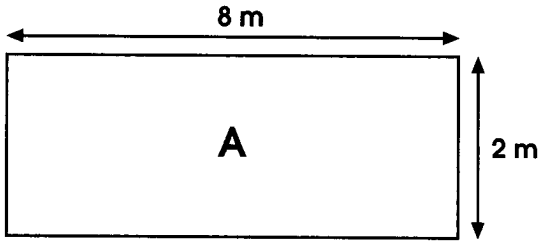


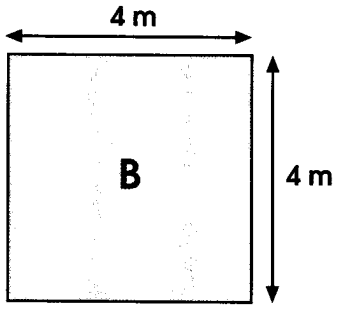
d)



Exercise 3

1. Find the areas and perimeters of the following figures.





Area: _____

Perimeter: _____

Area: _____

Perimeter: _____

Are the areas and perimeters of figure A and B the same? Explain.

2. Arrange the following fractions in order from the largest to the smallest.

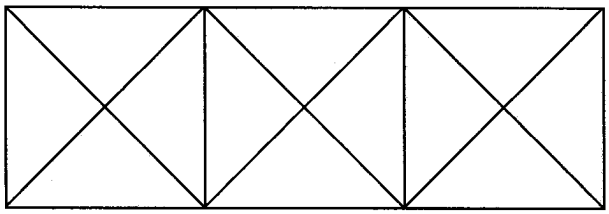
a) $\frac{3}{4}$, $\frac{7}{8}$, $\frac{1}{8}$: _____, _____, _____

b) $\frac{5}{9}$, $\frac{1}{3}$, $\frac{2}{3}$: _____, _____, _____

c) $\frac{6}{10}$, $\frac{4}{5}$, $\frac{1}{5}$: _____, _____, _____

d) $\frac{2}{7}$, $\frac{5}{7}$, $\frac{1}{7}$: _____, _____, _____

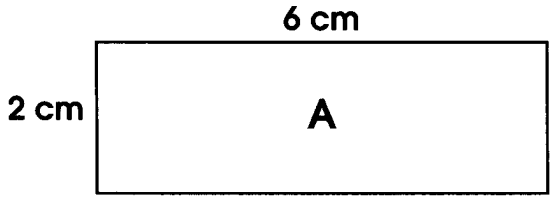
3. Look at the following figure. Answer the questions.



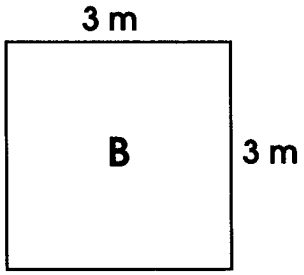
a) What fraction of the figure is shaded? _____

b) How many more triangles should be shaded so that the shaded fraction is $\frac{2}{3}$? _____

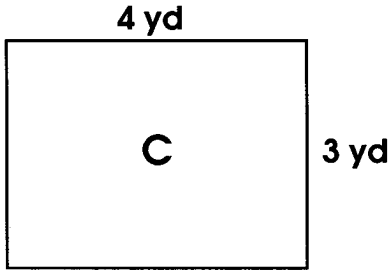
4. Look at the following figures. Find their areas.



Area : _____



Area : _____



Area : _____

If the length and breadth of Figure C were doubled, what would the area of Figure C be?