Lesson 5 . Classwork

WARM-UP

1. Mental math.

a) Tom is 4 years older than Mark. Mark is 10 years old.
How old is Tom?

b) Two children in a family are aged 10 and 12. Alan is older than Kate. How old is Alan?

c) In a swimming race, Jane finished before Kim; Pam finished before Jane.
(1) Who finished first?
(2) Who finished last?

d) Sue is 1 year older than Rachel and 2 years younger than Jane.
(1) Jane is 9 years old.
(2) How old is Sue?
(3) How old is Rachel?

e) In a class of 30 boys and girls, there are 6 pupils who are left-handed of whom are girls. There are 10 right-handed boys.

How many:

(1) boys are left-handed,
(2) boys are there in total,
(3) girls are there in total?

2. Compare without performing the calculations:

$57 + 29 \ldots 57 + 30$	$57 - 29 \ldots 57 - 30$	$58 + 30 \ldots 57 - 30$
$65 + 18 \ldots 65 + 20$	$65 + 18 \ldots 63 + 20$	$65 + 18 \ldots 64 + 20$
$47 + 18 \ldots 50 + 15$	$47 - 16 \ldots 50 - 19$	$80 - 19 \ldots 82 - 20$

REVIEW

3. If $a = 2, b = 7$, and $c = 3$, calculate

a) $6 + b$

b) $2a + b$

c) ab

d) $a(b + c)$

Function machines

Input → Function machine → output

4. Calculate the output of each of these function machines

(a) $4 \rightarrow \boxed{\times 5} \rightarrow ?$

(b) $5 \rightarrow \boxed{\times 2} \rightarrow \boxed{-1} \rightarrow ?$

(c) $-3 \rightarrow \boxed{+8} \rightarrow \boxed{\times 7} \rightarrow ?$

5. Calculate the input of each of these function machines

(a) $? \rightarrow \boxed{\times 4} \rightarrow 8$

(b) $? \rightarrow \boxed{+2} \rightarrow \boxed{\times 5} \rightarrow 25$

(c) $? \rightarrow \boxed{-5} \rightarrow \boxed{\times 3} \rightarrow 6$

Note that

Operation	*Inverse Operation*
+	–
–	+
×	÷
÷	×

6.

(a) ? → [+ 1] → [× 4] → 12

(b) ? → [+ 7] → [÷ 6] → 4

(c) ? → [× 4] → [+ 9] → 37

(d) ? → [× 9] → [– 20] → 34

(e) ? → [÷ 6] → [– 1] → 7

(f) ? → [– 6] → [÷ 7] → 9

(g) ? → [+ 8] → [× 4] → 24

(h) ? → [× 2] → [+ 7] → –3

7. a) A number is multiplied by 10, and then 6 is added to get 36.

What was the number?

a) Karen asks her teacher, Miss Sharp, how old she is. Miss Sharp replies that if you double her age, add 7 and then divide by 3, you get 21. How old is Miss Sharp?

NEW MATERIAL

Logic Puzzles

8. Rana, Toni and Millie are sisters. You need to deduce which sister is 9 years old, which one is 12 and which one is 14. You have two clues:
Clue 1: Toni's age is not in the 4-times table.

Clue 2: Millie's age can be divided exactly by the number of days in a week.

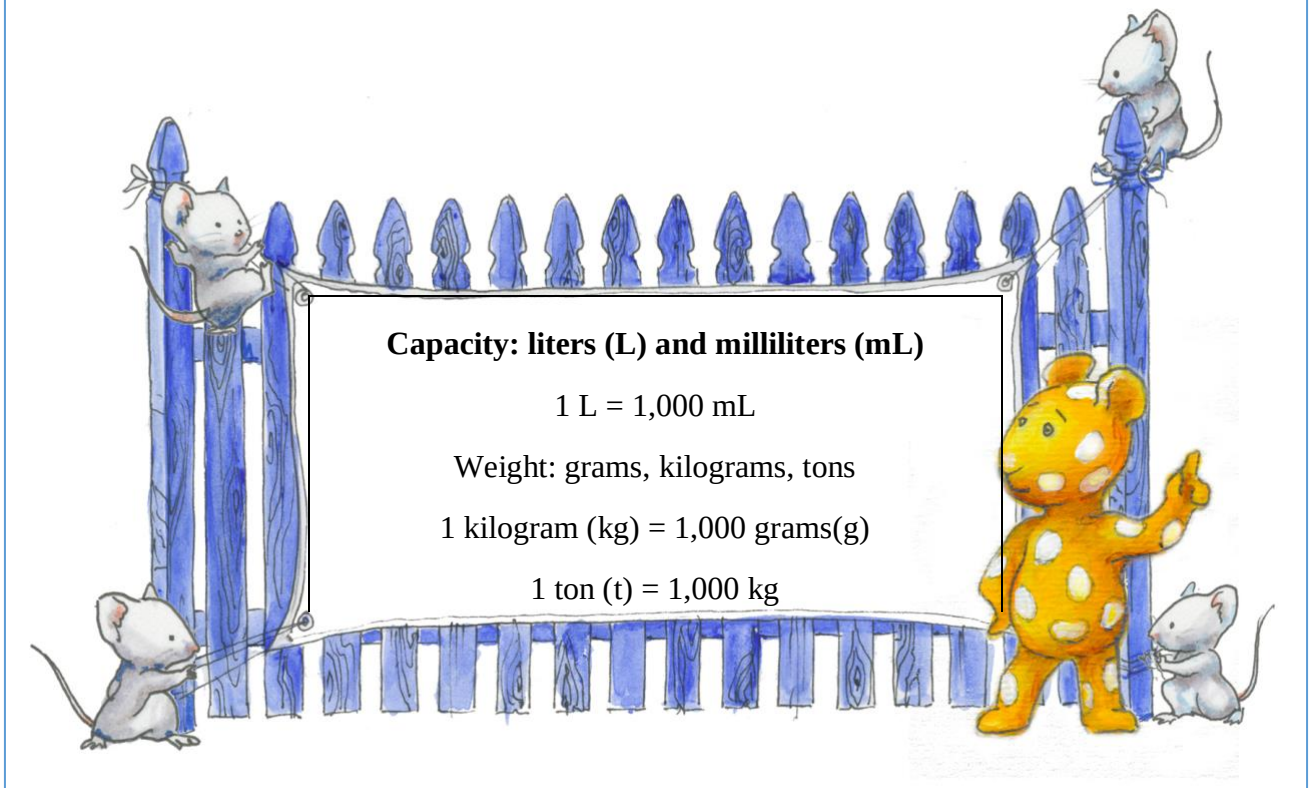
	9 yrs	*12 yrs*	*14 yrs*
Rana			
Toni			
Millie			

8. Three children are asked to name their favorite subject out of Math, PE, and Art. They each give a different answer. Decide which child names which subject.

Clue 1: Daniel likes working with numbers.

Clue 2: Sarah does not like to draw or paint.

	Maths	*PE*	*Art*
Daniel			
Sarah			
Jane			



Capacity: liters (L) and milliliters (mL)

1 L = 1,000 mL

Weight: grams, kilograms, tons

1 kilogram (kg) = 1,000 grams(g)

1 ton (t) = 1,000 kg

A bottle holds one liter of water

A milliliter is about 20 drops of water

A paperclip weighs about 1g.

A big textbook weights about 1kg

A small car weighs about 1 ton.

9. Read questions and circle the correct answer:

a) Mr. Franklin tilled a bucket with water to clean the floor. Does his bucket probably hold 9 liters or 9 milliliters of water?

b) A baker adds half of a teaspoon or vanilla to her cake recipe. Did she use 2.5 L or 2.5 mL of vanilla?

c) Chris bought a cup of hot chocolate. Does his cup probably hold 400 liters or 400 milliliters of hot chocolate?

d) Which of the following should be measured in liters. Circle your answers.

Bathtub, toothpaste, fish tank, cereal, swimming pool, shampoo, yogurt, cookies.

10 Compare

23 cm ☐ *5 cm*	*68 cm* ☐ *6dm and 8 cm*	*3 dm* ☐ *36 cm*
18 m ☐ *37 m*	*51 dm* ☐ *57 dm*	*7 m* ☐ *70dm*
500 mL ☐ *1L*	*9L* ☐ *950mL*	*3L* ☐ *350mL*

11. Name each object and explain what it measures?

Challenge yourself

12. There is a group of numbers. The following numbers belong to the group:

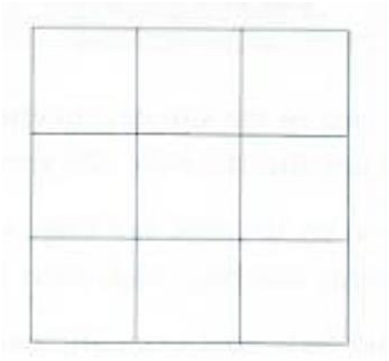
25, 40, 110, 55

These numbers do not belong to the group: 33, 71, 4, 106

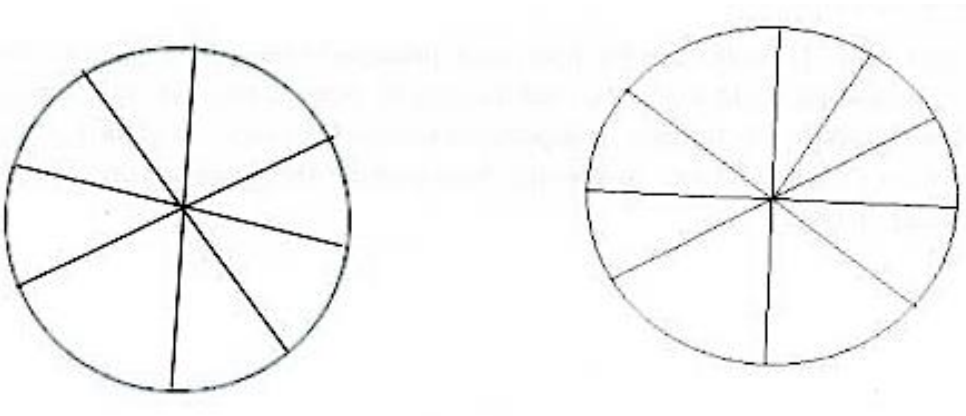
Which of these numbers belong to the group: 75, 205, 87, 43? What is the rule?

The four colors theorem.

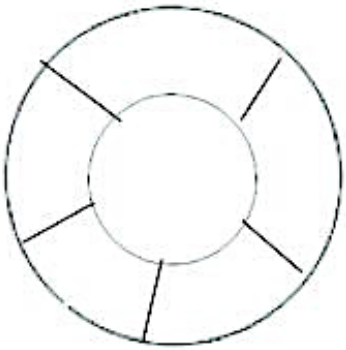
How many colors do you need to color a pattern of nine squares? Can you color it using only two colors?



How many colors do you need to color a pie split into 8 pieces? 9 pieces?



How many different colors you need to color the picture below?



Did you know?

The four-color theorem is one of the simplest mathematical problems to state and understand, still it took mathematicians over 100 ears to prove.

The theorem states that if you try to color in a map, you only need four colors to complete it so that no two areas touching each other have the same color.

A number of false proofs and false counterexamples have appeared since the first statement of the four-color theorem in 1852 .... The four color theorem was proved

in 1976 by Kenneth Appel and Wolfgang Haken. It was the tirst major theorem to be proved using a computer.

The Four-Color Theorem was the first major theorem lo be proved using a computer. Having a proof that could not be verified directly by other mathematicians. Despite some worries about this initially, independent verification soon convinced everyone that the Four-Color Theorem had finally been proved. Details or the proof appeared in two articles in 1977.