

A PUBLICATION FOR THE ELEMENTARY SCHOOLS OF THE REPUBLIC OF SENEGAL
APPROVED BY THE MINISTRY OF EDUCATION



Mathematics

Supplementary Book

Grade 5 - 6

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REPUBLIC OF THE SENEGAL
MINISTRY OF THE EDUCATION

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Editor-In-Chief

Johnny L. Houston, Ph.D.

Assistant Editor-In-Chief

Abdou M. Sène, Ph.D.

Contributing Editors

Margery Coulson-Clark, Ph.D. **Sandra S. Copeland, Ed.D.**

Contributing Authors

Makesha Spivey
Cynthia Morris

Cheryl Bogue
Dorothy Johnson

Crystal Bonner
Peggy Griffin

Adaptive Authors

Birame Faye **Mangary Ka** **Mamadou Ndiaye** **Oumar Ba**

Consultants

Samba Fall **Pape M. Sow**

Translator

Abdou Maty Sène, Ph.D.

Textbooks and Learning Materials Program (TLMP)

ECSU – Senegal TLMP

Elizabeth City State University (ECSU)

Elizabeth City, North Carolina 27909 (USA)



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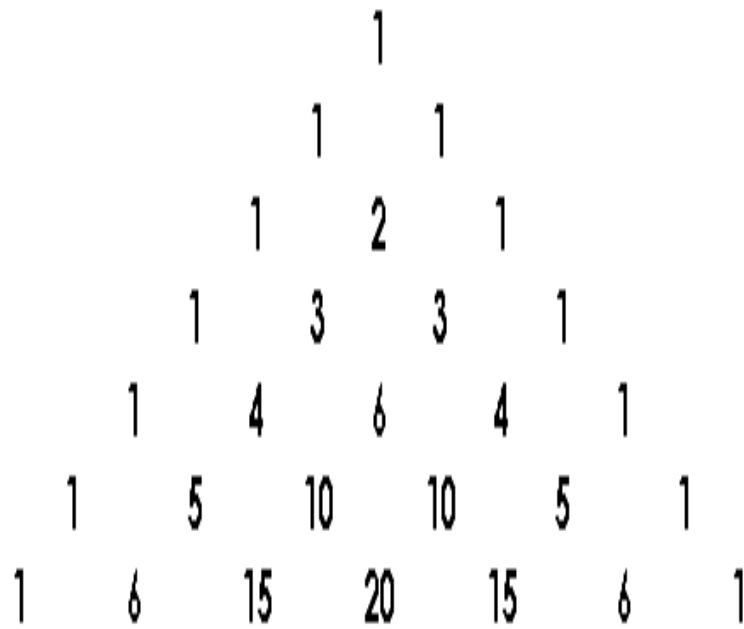
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Theme: I
Mathematical Procedures

Grades
5 - 6

*Theme I: Mathematical
Procedures*

Supplementary Lesson



*Lesson 1:
Find the Average*

Find the Average

Do You Know?



Basketball is a famous game played throughout the world. Do you know that many times when we play games we like to find out how many points we average or typically score each game? What are some games that are played where people generally find the average? Can you find the average of the number of points for each player? Use the information below.

	<u>Player 1</u>	<u>Player 2</u>	<u>Player 3</u>
Game 1:	25 points.	15 points.	25 points.
Game 2:	12 points.	17 points.	28 points.
Game 3:	22 points.	21 points.	30 points.
Game 4:	18 points.	12 points.	31 points.

Find the Average

The mean is sometimes called the average. The average is a number used to represent a set of numbers. We use the mean for many things. One way to use the mean is to “average grades”. Grades are the scores that teachers give to tell how well you did on test, class work, or homework. Higher scores usually mean you did well. Low scores usually mean you need more practice in that area.

To find the mean or average follow the steps:

Step 1: Find the sum (add up) all of the numbers.

$$75, 100, 80 = 75 + 100 + 80 = \underline{255}$$

Step 2: Divide the sum (total) by the numbers of grades.

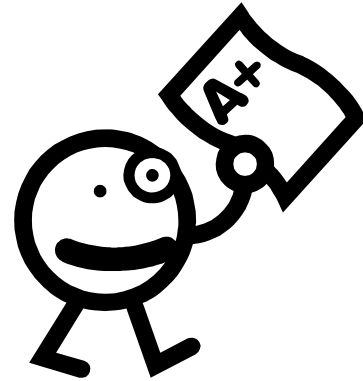
$$255 \div 3 = 85$$

The number 3 or the divisor was used because there were 3 different scores.

Find the Average

Activity 1

Report Cards



Report cards have been issued. Use the math grades of the students below to find each student's overall mean or average.

Cindy

90
92
60
86

Matthew

53
43
75
77

Gregory

75
78
93
86

Do you know which child will be least excited about his/her final grade?

Find the Average

Activity 2

Find the average of all the numbers.

8 4 7 1
3 3 4
9 2 8 5 6

Explain the steps that you did in order to solve this problem.

Find the Average

Activity 3

Find the average with the magic hat.



Look at the **magic numbers** coming from the hat. How many numbers do you see? What would be the total if you added all of the numbers together? If you can answer the two questions that were just asked then you have completed half of the steps to finding the mean. The mean is also called the average. The average is a number that is used to represent a set of numbers. Keep the first two steps in mind:

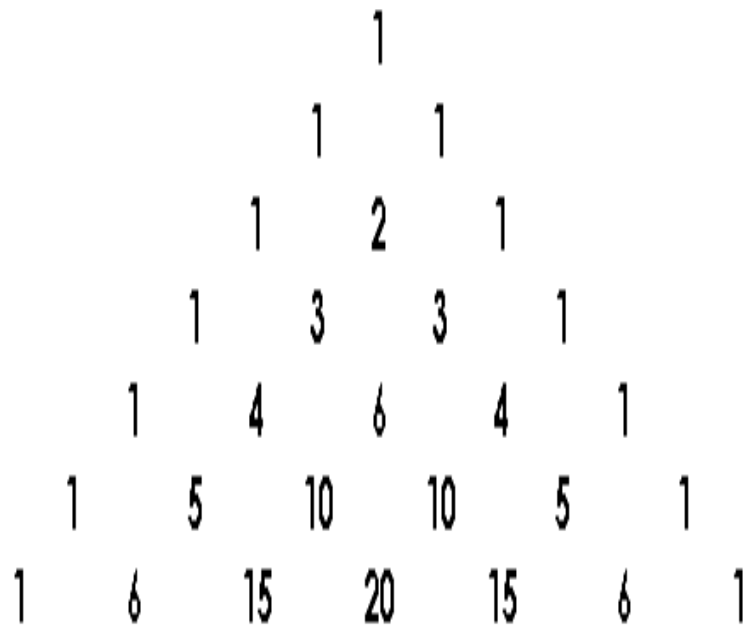
USE THE MAGIC HAT

- Step 1: How many numbers do you have? _____
- Step 2: Add up all of the numbers. _____
- Step 3: Divide the sum by the number. _____
- Step 4: What is the mean/average? = _____

Grades
5 - 6

*Theme I: Mathematical
Procedures*

Supplementary Lesson



*Lesson 2:
Find the Range*

Find the Range

Do You Know?

When we think about the range we think about the numbers that fall between two numbers. We use a single number to represent the range by finding the highest and lowest number in the number set and then subtracting to find the difference.

A score is a system of points kept to determine who wins a game. What kinds of games do you play where scores need to be kept? Look at the scores below.

Find the range using the scores in the five games below. Then, explain your answer to the teacher.

What is the range of scores for the five games?

Game 1: 20 points

Game 2: 25 points

Game 3: 16 points

Game 4: 25 points

Game 5: 25 points



Find the Range

The range is the difference between the highest and the lowest number. Many times the range is expressed using two numbers: the highest number through the lowest number. For instance the basketball player scored between 10 and 35 points per game. Another way to express the range is to do a simple subtraction problem: $35-10$ which is 25. Therefore, the range of points scored is 25.

1, 3, 2, 9

There are three very easy steps you must use to find the range. Follow the steps below.

- Step 1: Find the highest number in the number set. (9)
- Step 2: Find the lowest number in the number set. (1)
- Step 3: Subtract or find the difference between the two numbers. (8)

Find the Range

Activity 1

Reflection on the Range

Use the number sets to find the range. Remember that the range is the difference between the highest and lowest number in a set of numbers.

Find the range for each set of numbers

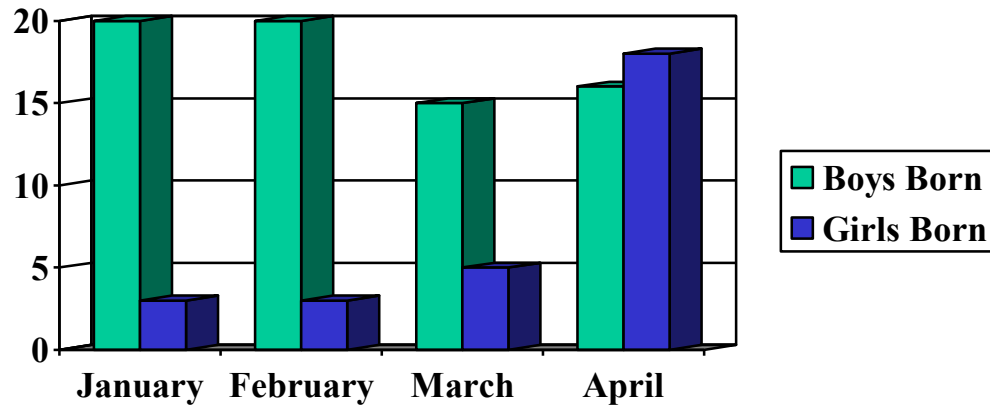
- 3,4,5,6,7,8,
- 5,9,4,3,1,2,
- 5,7,5,8,5,6,2,21
- 2,2,3,3,4,6,7,8,9,19
- 1,2,3,4,17

Find the Range

Activity 2

Finding the Range in a Bar Graph

A bar graph shows data using bars. These bars represent numbers (amounts or values).



Look at the bar graph above. It shows the number of boys and girls born in the months of January through April. Find the missing numbers using the graph.

Then find the range for the boys and the range for the girls.

Boys: Jan. Feb. March Apr.
Girls: Jan. Feb. March Apr.

Find the Range

Activity 3

What's The Range?

Mr. Manning weighed five teachers. The teachers weights varied (were different). The teachers weighed between 123 pounds and 185 pounds. This is one way to say the range of the weights.

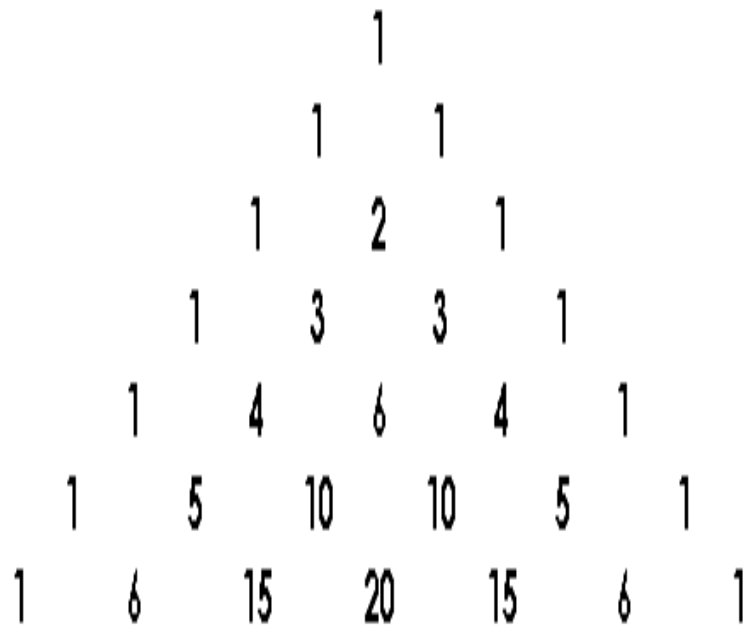
Teacher	Weight in Pounds
Mrs. Mackey	162 lbs.
Mrs. Bonner	185 lbs.
Mrs. Thorton	123 lbs.
Mr. Brite	155 lbs.
Mr. Allmay	185 lbs.

Another way to express the range of the weights is by finding the highest number (185) and the lowest number (123) and subtracting. The difference between those two numbers is called the range. Using the chart above, find the range.

**Grades
5 - 6**

*Theme I: Mathematical
Procedures*

Supplementary Lesson



*Lesson 3:
Find the Mode and the Median*

Find the Mode and the Median

Do You Know?

3	10	9	4
10	2	5	10
9	1	6	6

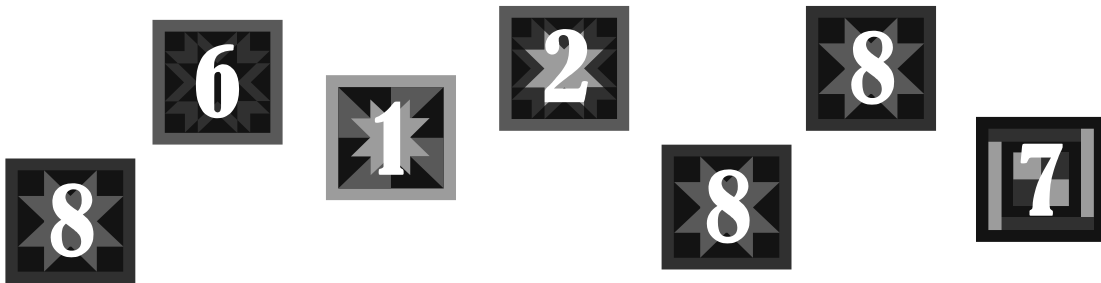
It is often helpful to find one number to represent one aspect of a set of data. Do you know that the **mode** is the number that appears the most in a set of data? The **median** is the middle number in a set of data. Look closely at the numbers above. Can you find the mode and median of these numbers?



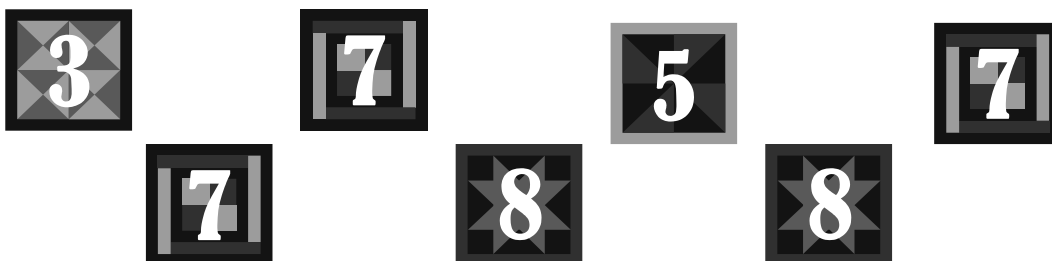
Find the Mode and the Median

Find the Mode

The mode is the number that appears the most in a set of numbers. This means that the number that appears more times in a set of numbers than any other numbers is called the mode. We often use the mode to describe data. Study the example below. The mode appears more than once in the set of numbers.



In the set of seven numbers above the number 8 (eight) appears more than any other number. Therefore, the number eight is the mode. Look at the set of numbers below. Which number is the mode?



Find the Mode and the Median

Find the Median

La médiane d'un ensemble de nombres représente le nombre au milieu de cet ensemble après avoir rangé ces nombres du plus petit au plus grand.

Exemple 1 : Les prix d'un même téléviseur dans cinq différentes boutiques sont : 490 000 F, 515 000 F, 480 000 F, 520 000 F et 500 000 F. Quelle est la médiane des prix de ce téléviseur ?

Stratégie : Utilise la définition de la médiane.

Étape 1 : Arrange les prix, du plus petit au plus grand.

480 000 F, 490 000 F, 500 000 F, 515 000 F et 520 000 F.

Étape 2 : Choisis le prix au milieu de cet arrangement.

500 000 F représente le prix au milieu de l'arrangement.

Solution : La médiane du prix de ce téléviseur est 500 000 F.

Exemple 2 : Si le nombre des prix donnés est pair, alors pour trouver le prix au milieu de cet arrangement, tu dois choisir après rangement du plus petit au plus grand, les deux prix qui se trouvent au milieu et diviser leur somme par deux.

Ainsi pour trouver la médiane des quatre montants suivants : 1270, 1450, 1250 et 1230. Tu dois :

Étape 1 : Ranger les montants, du plus petit au plus grand.

1230, 1250, 1450 et 1270.

Étape 2 : Choisir les deux montants au milieu de cet arrangement.

1250 et 1450.

Étape 3 : Faire la somme.

$1250 + 1450 = 2700$

Étape 4 : Diviser la somme trouvée par 2.

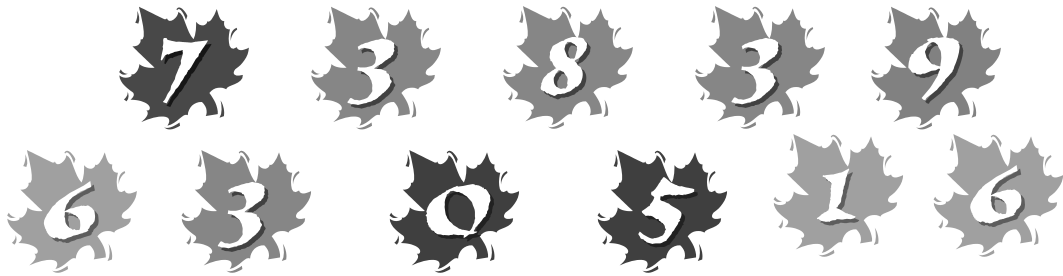
$2700 : 2 = 1350$

Solution : La médiane de ces quatre montants est 1350.

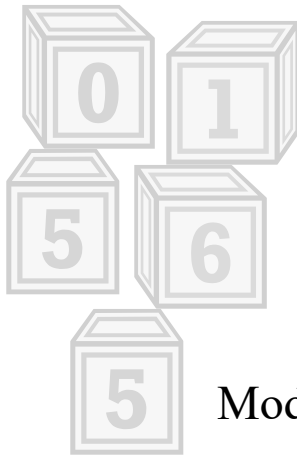
Find the Mode and the Median

Activity 1

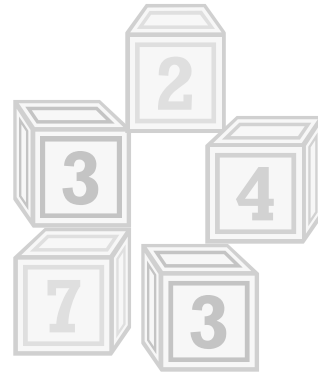
Find the Mode



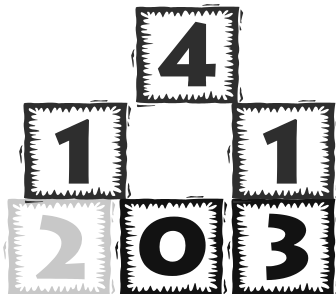
Mode : _____



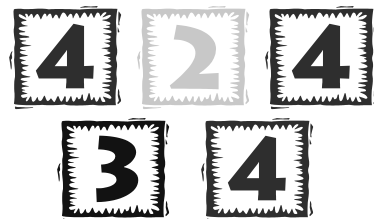
Mode : _____



Mode : _____



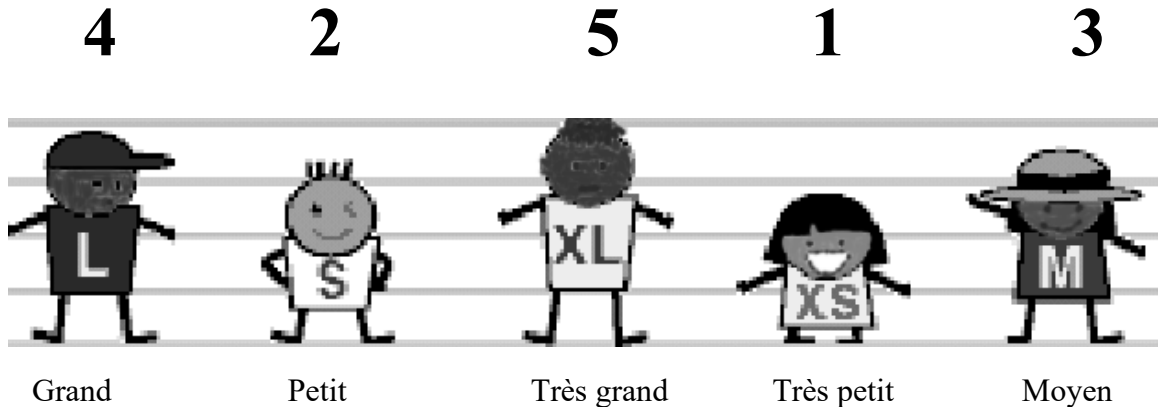
Mode : _____



Mode : _____

Find the Mode and the Median

Which person represents the median?



The word **median** means **“middle”**. We use one number, the median, to represent a set of numbers or a data. There are several important steps that must be applied in order to find the median. Review the steps below. Use the steps to find the median of the people above.

Step 1: Put the numbers in order from least to greatest.

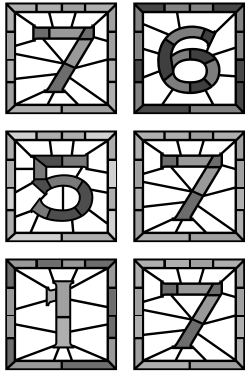
Step 2: Beginning with the ends cross out each number.
For example: 1, 2, 3, 4, 5, 6, and 7

Step 3: Circle the middle number. The middle number is called the median. The median would be four (4) because it divides the set of numbers evenly. There are three (3) numbers on each side of the number four (4).

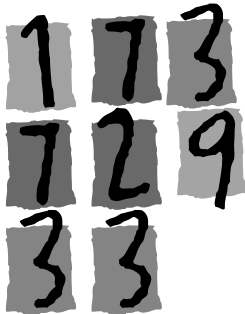
Find the Mode and the Mean

Activity 2

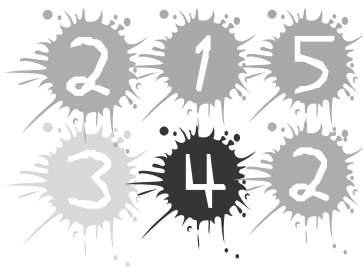
Find the Mean



Median : _____



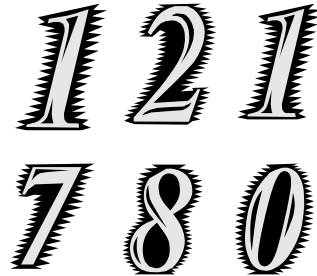
Median : _____



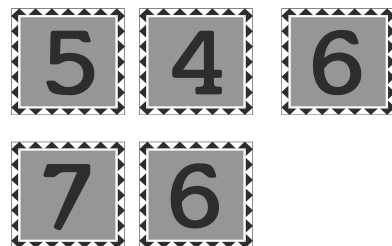
Median: _____



Median : _____



Median : _____

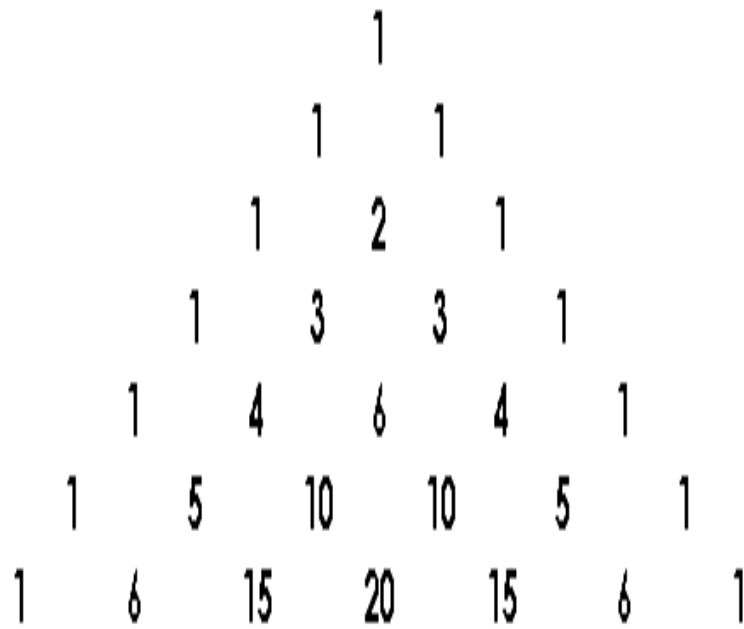


Median: _____

**Grades
5 - 6**

*Theme I: Mathematical
Procedures*

Supplementary Lesson



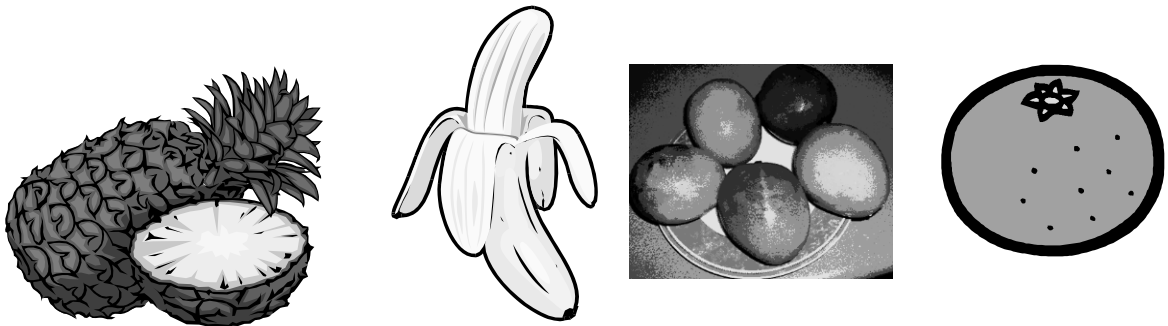
*Leçon 4:
Collect, Organize and Analyze
Data*

Collect, Organize and Analyze Data

Do You Know?

What each thought to his preferred fruit and that it says it to his table neighbor. Let us inventory the suggestions of the body of the raise class. Do you know that these important informations are called data and that we can organize them in different categories or under categories? For example, we can find that some raise like soccer and of others prefer the basketball ball or the fight, etc.

Observe figures it and the picture below and says how much students like such or such fruit.



Fruits Préférés			
Pine Apple	Banana	Mango	Orange
		++++ ++	

Collect, Organize and Analyze Data

Qu'est-ce qu'un questionnaire ou une enquête ?

A questionnaire a study drove to find information. Very often, we do questionnaires to find precise information on persons, animals or things, etc. You can investigate some classifies to collect information on the raise (for example, about their family, of their age, of their number of books, etc.).

How to investigate?

If you want to investigate in the class, you can request the class to raise their hand if a question relates itself to them.

Example: that has more than five brothers and sisters?

Below, you have examples of questions:

- Your preferred meal?
- THE AGE of the raise?
- The average of the raise?
- The cities and towns that you visited?

Collect, Organize and Analyze Data

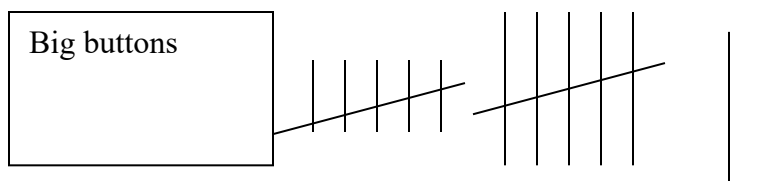
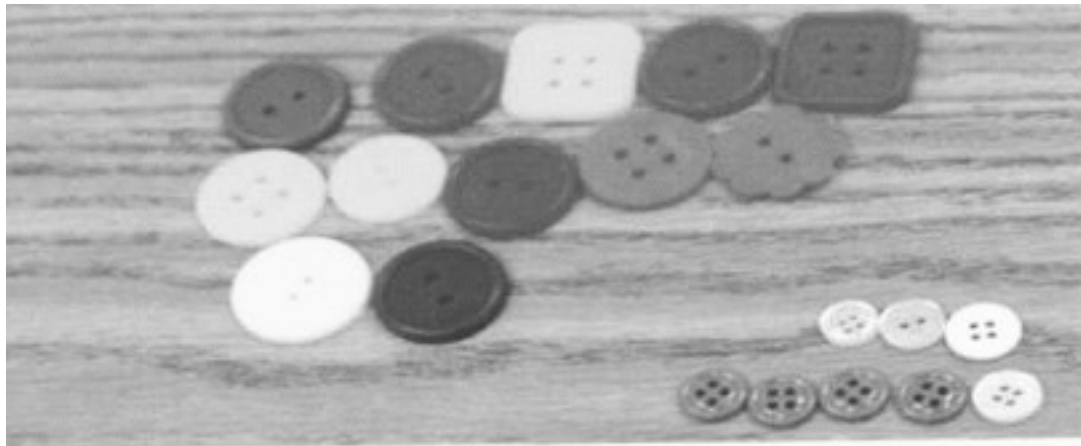
How do you Record data?

The data is information; there are several manners to record them.

First: to do a picture.

Deuxièmement: to check progressively collected information on the picture. A brand or a trait must correspond to information.

In the example below, a trait corresponds to a button.



Collect, Organize and Analyze Data

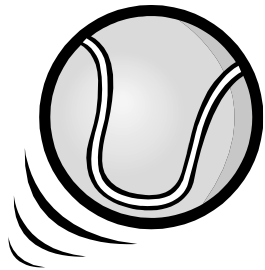
Activity 1

Class investigations

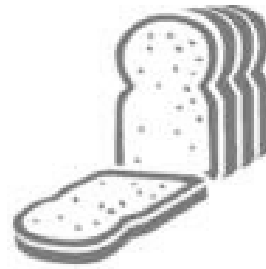
Take your clean investigation some classifies. Start with to do a graph. Graphic representation (picture, diagram, etc.) is the first step.

Inspire you of the pictures below.

Preferred sport



Preferred meal




Collect, Organize and Analyze Data

Activity 2

Collect Data

The following step is collects it data or informations. Constructs a picture of data to mark the number of games or preferred meals. Record the informations in your picture, following models it below

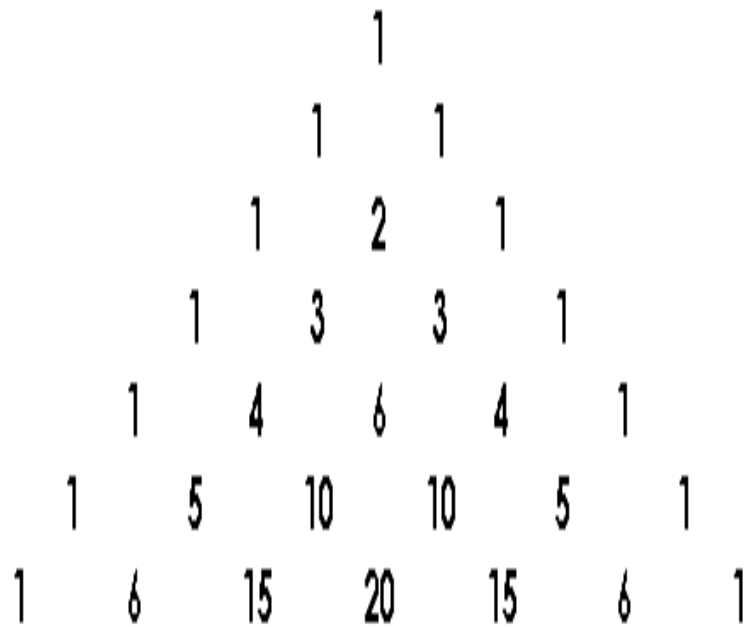
Preferred meals	Number of traits	Number of students
Fruit		3
Cake		5
Chicken		2



**Grades
5 - 6**

*Theme I: Mathematical
Procedures*

Supplementary Lesson



Lesson 5:

*How to Learn Properties about
the Whole; Using Surveys*

How to Learn Properties about the Whole; Using Surveys



Do You Know?

To learn about the whole collection or the whole group many times it is only necessary to study certain parts. We do this by identifying certain properties of the whole collection such as the average (mean) median, mode, range. We sometimes do a survey of parts of an entire collection to learn about the whole collection. Taking a survey is one way to learn.

How to Learn Properties about the Whole; Using Surveys

Data from Surveys

What is Survey?

Sidy want to know what kinds of TV shows their classmates like to see. They decide to take a **survey**. When you ask different people the same question and record their answers you are taking a **survey**.

Sidy asked his classmates,

“What is your favorite kind of TV Show?”

Here are his results in a tally chart.

Favorite Type of TV Show

Action		2
Animated		6
Comedy		6
Sports		5
Drama		1

Aminatou’s asked her classmates,

“Would you rather see a drama comedy, or action TV Show?”

Here are her results in a tally chart.

Favorite Type of TV Show

Drama		5
Comedy		7
Action		3

1. Count the tallies to find how many students like each color.

Red |||| |

Blue |||

Orange |||| |

Talk About It

1. Do you know if Aminatou’s classmates like Comedy TV Shows better than drama? Why?
2. What type of TV shows would most of Sidy’s classmates like to see?

An example as to how to take a survey?

Take a class survey to find out how many brothers and sisters your classmates have.

- a. Write survey questions.
- b. Make a tally chart to record the data.
- c. Ask your classmates the survey question and record their answers on the chart.
- d. Count the tallies.
- e. Discuss the results of your survey.

How to Learn Properties about the Whole; Using Surveys

Activity 1

Use the data in the tally chart at the right.

Favorite Places

Goree Island		
The Pink Lake		
The National parks		

- How many people in the survey like to Visit sites in Senegal?
- How many people were surveyed?
- Which location is the favorite of more People than any other?
- Number Sense** If twice as many people were surveyed, how Many do you think would say they liked the National Parks best? Explain.

Use data in the tally chart at the right.

Favorite Type of Pets

Dog	 	
Goat		
Lamb		
Cows		
Horses		

- How many people in the survey liked cats best?
- How many people were surveyed?
- According to the data, which type of pet is the favorite of more people than any other?
- Number Sense** If ten times as many people were Surveyed, how many do you think would say They liked fish best? Explain.
- Make a bar graph of the data on favorite Locations.
- Take a survey to find the favorite sport of 20 people. Write the question you ask. Give your results in a tally chart.

How to Learn Properties about the Whole; Using Surveys

Activity 2

Exercise 1:

Use them given of the picture to right to complete it and reply to the following questions.

1. How much students participated in the investigation?

A. 48 B. 45 C. 40 D. 38 E. 42

2. How much students prefer the fight?

3. Which is the favorite game of the raise?

Jeu préféré des élèves

Lutte	 	
Basketball		
Football	 	

Exercise 2:

1. Does a graph with data on the preferred places of the raise.

2. Constructs questions to put to the participants.

3. Record the responses of your investigation in a picture.

How to Learn Properties about the Whole; Using Surveys

Activity 3

1. How many students were Enrolled in 1980?

Students Enrolled in Our District

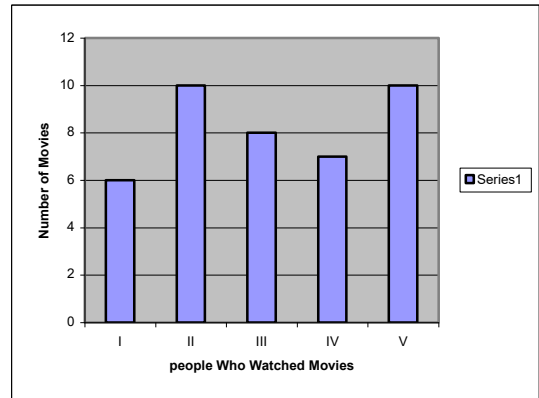
1960	⌘
1970	⌘
1980	⌘⌘
1990	⌘⌘⌘
*2000	⌘⌘⌘⌘
*Anticipated	
⌘ = 1,000 students	

- A 1,000
- B 2,000
- C 3,000
- D 4,000

2. What was the average (mean) Enrollment from 1960 to 2000?

- A 2,000
- B 2,500
- C 3,000
- D 3,500

3. Last month, Darryl saw 10 TV Shows, Bart saw 8 TV Shows, Willie saw 7 TV Shows, and Hadassah saw 6 TV Shows. In the graph below, which bar shows the number of movies Moussa saw?

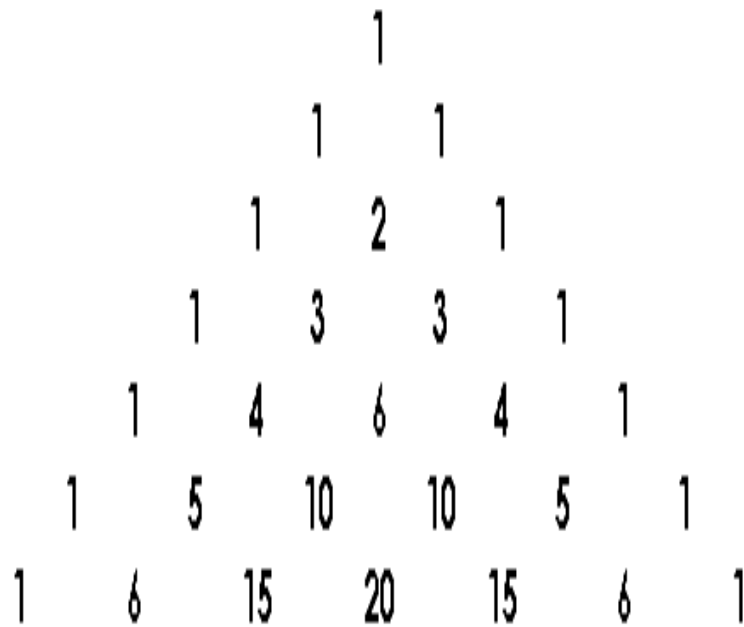


- A I
 - B II
 - C III
 - D IV
 - E V
4. What was the average (mean) number of movies viewed by all of the groups?
- A 6
 - B 7
 - C 8
 - D 9
 - E 10

**Grades
5 - 6**

*Thème II: Logique et résolution
d'un problème*

Supplementary Lesson



*Lesson 1:
Trouver la logique dans une
situation problème*

Trouver la logique dans une situation problème

Do You Know?

Do you know that patterns are found everywhere? When exploring numbers you may notice a sequence or pattern. A **sequence** is a set of numbers or items that follows a certain pattern. In the pattern below each number is increased by two. Can you determine the next number in the pattern?



Activity 1

A sequence is a set of numbers that follow a certain pattern. The numbers in a sequence are called terms. Find the pattern for each sequence. Then write the next three terms.

1. 2, 4, 8, 16

2. 35, 30, 25

3. 4, 5, 7

4. 8, 11, 14

5. 5, 8, 12, 16

Create five (5) patterns of your own.

1.

2.

3.

4.

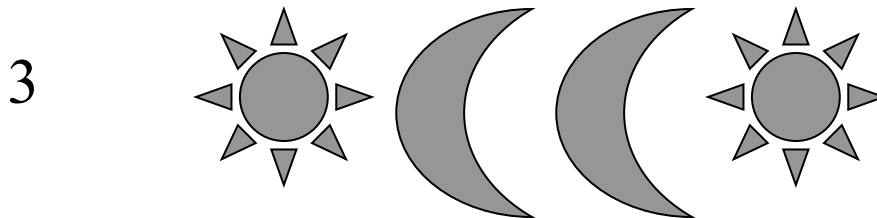
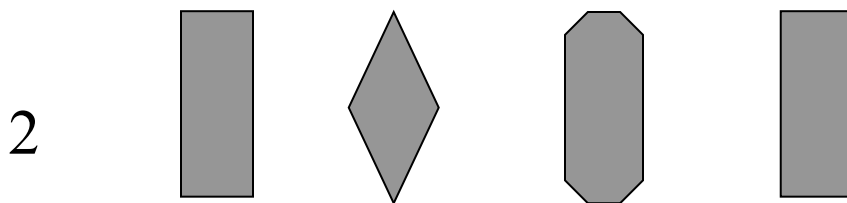
5.

Trouver la logique dans une situation problème

Activity 2

Graph Logic

You can find a pattern and use the pattern to decide what should come next in the pattern. Identify the pattern then draw the next three items to complete the pattern.



Trouver la logique dans une situation problème

Activity 3

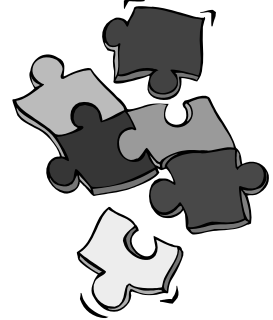
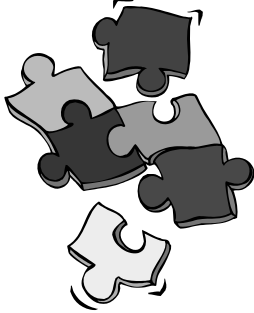
Spread the logic

Number patterns can be found in tables. Look for the pattern in Column A. Then look for the pattern in Column B. Complete the pattern.

Trouver la logique dans une situation problème

Activity 4

Case Study



Use the given Rule: $(\text{Input} \times 5) + 4 = \text{Output}$.

Example: Input = 3

$$(3 \times 5) + 4 = 19$$

Complete the table.

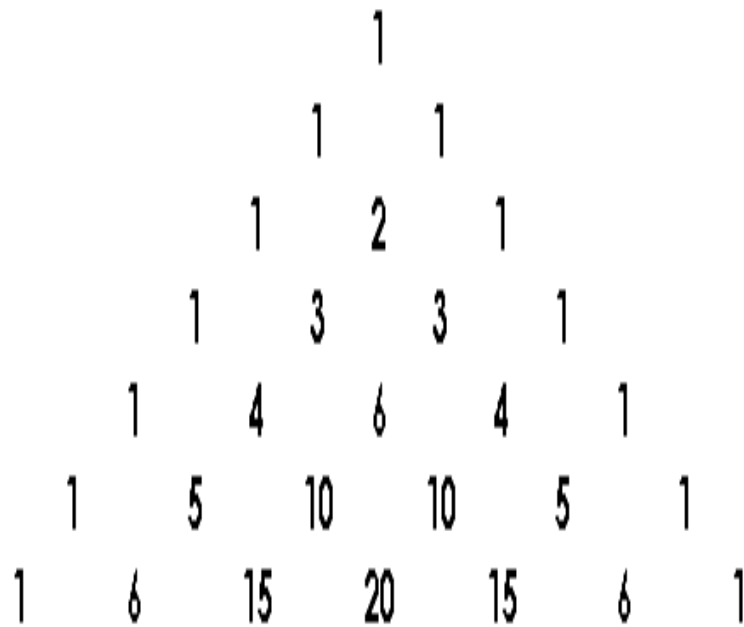
A	B
3	19
4	
5	
6	
7	



**Grades
5 - 6**

*Thème II: Logique et résolution
d'un problème*

Supplementary Lesson



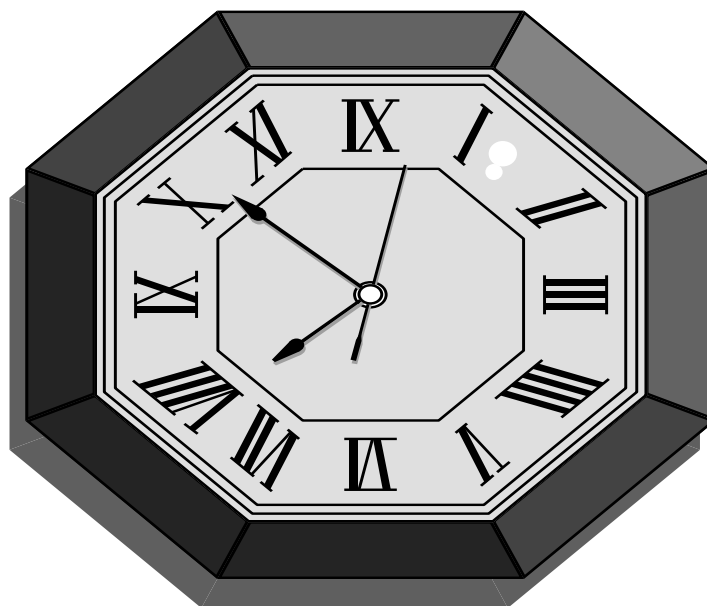
*Lesson 2:
Trouver une démarche pour
résoudre un problème*

Trouver une démarche pour résoudre un problème

Do You Know?

Did you think of this that you must do to find a solution of a problem? Do you know that there are several strategies or methods to resolve a problem? The resolution methods of problems are varied according to that it is a matter of a succession of numbers, of faces, of a list of names or of things or very of a problem more complex. Now, reflected very well to the resolution method of the following problem.

You have 50 houses, 20 cars, 10 mules or horses, and 5 bicycles or bicycles. If one a means of transportation is available for every house, how many houses would not have any means of transportation?



Trouver une démarche pour résoudre un problème

The Steps to Solving a Problem

Step 1: Exploration.

- Lire la question. Essayer de comprendre ce qui est demandé.

Step 2: Planning.

- To put Itself the following questions and look for to there to reply:
 - Which are the important words?
 - Which is the put question?
 - How do to reply to the question? (To do outline, faces or a picture, etc.).
 - Which are informations that I have to reply to the question?
 - Which are the informations that lack me?
 - How do to have them?

Step 3: Resolution.

- After to have tried your gait, verifies if your response has a direction in comparison with the described position in the problem.

Step 4: Verification.

- To Review the problem totally and look for if it n' there has not another method to arrive to this solution?

Trouser une démarche pour résoudre un problème

Methods to resolve a problem



Essays and errors:

Certain responses can be found while trying certain solutions that come to us mentally; this is probably the first one of the apprenticeship strategies. For example, in the exercise to multiple choices, we try every response to know if she is just or no. In other cases, we have to think of a possible solution and to try it. This method is called "trial and error", very often we can do this to save time.

To start with the end:

Sometimes, it is preferable to start with the end to find the solution to a problem. That wants to say that to find a solution; we must start with the principal question to climb back up next towards the data. This method obliges us often to use the inverse operation of the one that we must effectuate; this is the regressive gait. (See activity 2).

Do a drawing or an outline:

The better means to understand a problem is to do a drawing or a graph. Graphic representation or the drawing allows us to present clearly a problem. Encode the faces or simplify the positions a form proceeded to understand a problem. One also can replace names by names more familiar to seize the direction of the problem. (See activity 1).

Do graphs or pictures or organized lists:

A graph, a picture or an organized list are as much means that allow us to resolve a problem. Each of these techniques gives us another manner clearer to present the data. This facilitates the placement in relation of information and consequently allows seeing the logic that exists between the different elements of the problem.

Trouver une démarche pour résoudre un problème

Activity 1

Do a graph, an outline or a picture

Certain problems cannot be determined while doing additions, subtractions, multiplications or let us divide numbers. It is recommended in this cases kind, to do a graph or a picture while using contained information in the problem. Do a graph or a picture to resolve the problem below.

1. A for with 52 persons to the interior does 3 stops. To the first stop, 11 persons descend and 9 other persons climb. To the second stop, 30 persons descend and 25 persons climb. To the third stop, 5 persons descend and 8 persons climb. How many persons are in the for after the last stop?

Do a drawing or an outline

Do a drawing to help you to resolve the following problems:

1. The fishermen see 3 requins. They see heirs apparent representing 4 times the number of requins. How much heirs apparent did they see?
2. Leopold, Ramah, Moussa and Daba are sat the one next to the other. Ramah is sat next to Daba. Moussa is sat next to Ramah. Leopold and Daba are sat coast to coast. In which order are they sat?
3. Ngor has 3 balls, Crazy has 12 balls. How many more balls does Crazy have than Ngor?

Trouver une démarche pour résoudre un problème

Activity 2

To start with the end

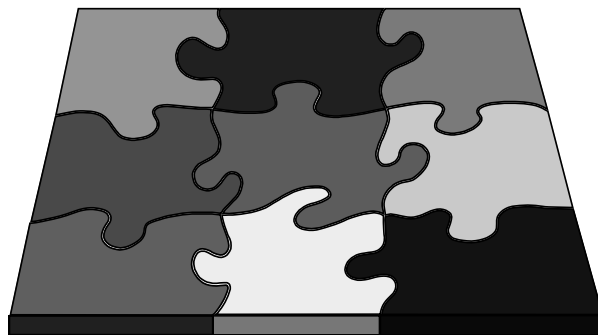
Use this method to solve this problem:

A worker receives his pay after a given work; this is all that it has as money. It spends 10 000 FCFA for its needs and gives to its apprentices 8 000 FCFA. The worker has now 18 000 FCFA. How much did it have received?

Essays and errors

Use this method to solve this problem:

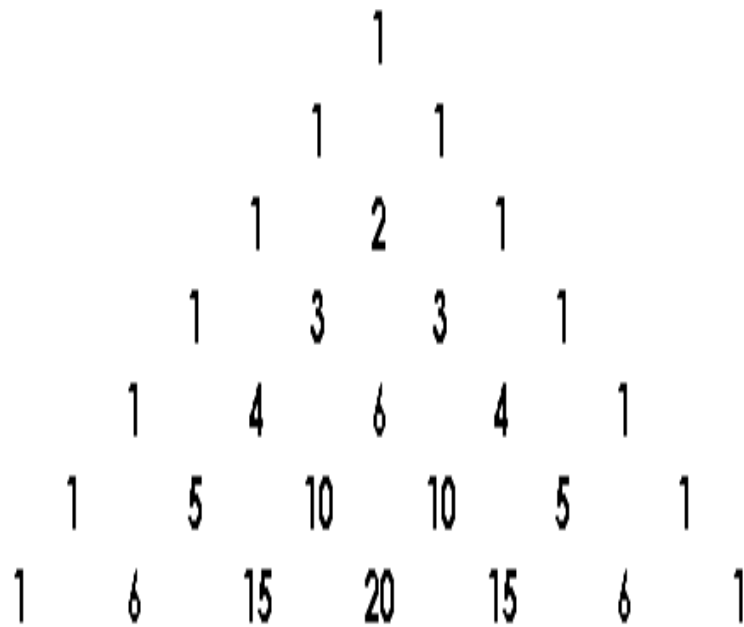
David had invited to dine with its friends. 10 of its friends came. The number of girls surpasses of 2 unities the number of boys. How many girls had replied to the invitation?



**Grades
5 - 6**

*Thème II: Logique et résolution
d'un problème*

Supplementary Lesson



*Lesson 3:
Find A Solution*

Find a Solution

Do You Know?

Do you know that an equation an equality in which one the numbers looked for are replaced by letters or symbols? This is the reason these letters or symbols are called unknown. Do you know that the recourse to the equations allows simplifying the resolution by far of problems?

Discover the mystery of the equations while learning to use them. Entertain you during this interesting adventure.



Find a Solution

Value of a Variable

Algebra is a language of symbols that are in relation, while an equation is an equality containing an unknown one called variable. Any letter can be used as variable. Resolve an equation, this is to find the number by which one it is necessary to replace the variable for that equality be true. This number is a solution of the equation.

For example equality $ax's - 4 = 5$ is not for the or true one, or false moment. She will be true or false when one will have replaced x's by a number.

Replace x's by 7

$$x - 4 = 5$$

$$7 - 4 = 5$$

$$3 = 5 \text{ (This is not true)}$$

Replace x's with 9

$$x - 4 = 5$$

$$9 - 4 = 5$$

$$5 = 5 \text{ (This is true)}$$

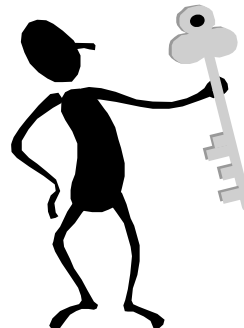
Find the solution of this equation

$5 + x = \underline{\quad} ?$, give to x's a numerical value.

When $x = 7$, then $5 + x = 5 + 7 = 12$

When $x = 10$, then $5 + x = \dots\dots ?$

When $x = 25$, then $5 + x = \dots\dots ?$



Find a Solution

Activity 1

Find the missing number.

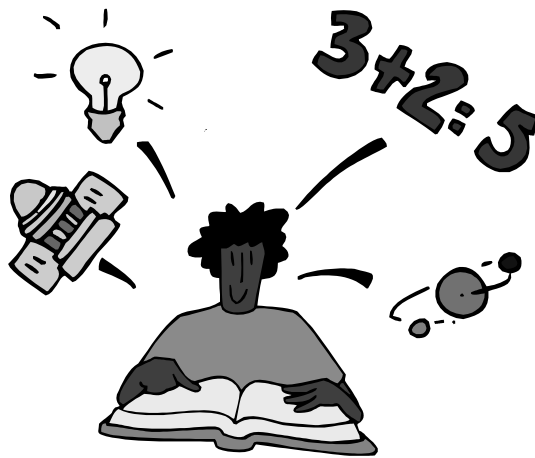
Find the value of x for each equation.

A. $5 + x = 12$

B. $5 + x = 15$

C. $5 + x = 30$

D. $5 + x = 81$



Rechercher une solution

Activity 2

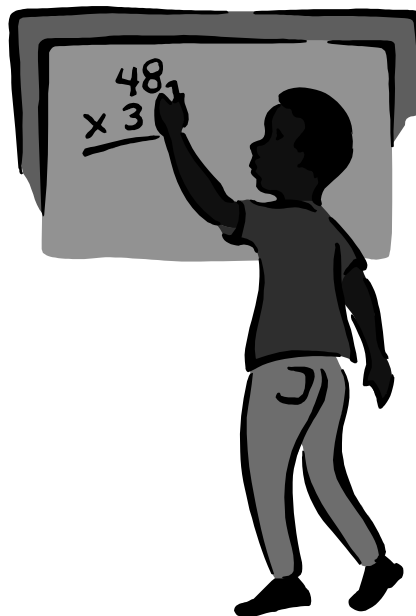
Find the unknown's of an equation

Complete the table below:

$$9 \times n = \dots\dots ?$$

n	Solution
2	18
3	
4	
5	
6	

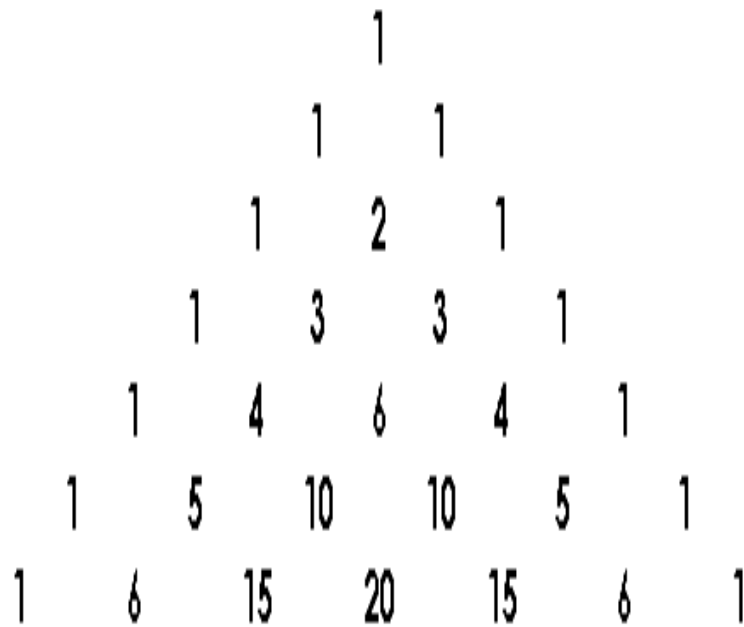
Explain your gait and justifies the response found.



**Grades
5 - 6**

*Thème II: Logique et résolution
d'un problème*

Supplementary Lesson



*Lesson 4:
Choose Between Several
Solutions*

Choisir entre plusieurs solutions

Do You Know?

Problem solving is exciting! Some problems are easy and some are not easy. Sometimes you have too much information and other times you do not have enough information.

A few simple steps listed below will help you master the world of problem solving.

- Step 1: **Think:** What is the question?
What are the facts?
What information (if any) is missing?
- Step 2: **Plan:** What mathematical operation should be used to answer the question?
- Step 3: **Solve:** Do the work and find the answer
- Step 4: **Ask:** Is the math correct? Does my answer make sense?



Choisir entre plusieurs solutions

Is There Enough Information?

Sometimes there is enough information to solve each problem. If there is, solve the problem. If not, tell what information is missing. Look at the questions below. Is enough information given to solve the problems? Discuss your answer.

1. George spelled 20 words correctly in the school's spelling contest. Jill spelled 20 correctly and Wanda spelled 18 correctly. How many more words did George spell correctly than Joe did?
 - Do we have enough information to solve the problem? No, there is not enough information to solve this problem because George spelled 20 words correctly, Jill spelled 20 words correctly, and Wanda spelled 18 words correctly. No information was given about how many words Joe spelled. Therefore, it cannot be determined how many more words George spelled correctly than Joe.
2. Jerry ate breakfast. Then he ran 2 miles to Jon's house. He and Jon walked 3 miles to school. How many miles did Jerry travel from his house to school?

Do we have enough information to solve the problem? Yes there is enough information to solve this problem because Jerry ran 2 miles to Jon's house after he ate breakfast. Then, he and Jon walked 3 miles to school. Therefore, Jerry



3. Sharon bought a piece of fruit at the market. Linda bought a piece of fruit at the market. How much fruit did both girls buy at the market?
 - Is there enough information to solve the problem? Yes, there is enough information to solve this problem because while at the market, Sharon bought a piece of fruit and Linda bought a piece of fruit. Therefore, the girls bought a total of 2 pieces of fruit.

Choisir entre plusieurs solutions

Activity 1

Using a Chart to Solve Problems

Decide if there is enough information to solve each problem. If there is, then solve the problem. If not, tell what information is missing.

Use the chart to solve the problems.

Number of Lunches Served at our School	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
= 50 Lunches	

1. On which day did more of the students in the school eat lunch?
2. How many more boys than girls ate a lunch at school on Wednesday?
3. How many lunches were served during the entire week?
4. How many lunches were served on Monday, Wednesday, and Friday?
5. How much money was collected for lunch on Wednesday?

***The chart gave enough information to answer questions numbers 1, 3, and 4. However, there was no information related to the number of boys and girls who ate lunch at school on Wednesday. Also, no information was given about collecting lunch money on Wednesday.**

Choisir entre plusieurs solutions

Activity 2

Is There Extra Information?

Sometimes a problem has extra information not needed to solve the problem. Look at each problem. Cross out the extra information. Then solve the problem.

1. The local fishing pond is very large. Harold loves to go fishing. He caught 1 fish at the pond on Tuesday. He caught 2 fish at the pond on Wednesday and 3 fish on Thursday. If this pattern continues, how many fish will they catch on Friday?



2. Harold goes fishing after school each day. He wears a green shirt and blue pants. He catches 3 fish each day for 5 days. How many fish does he have at the end of the week?

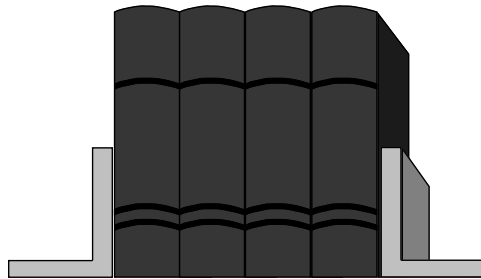
Choisir entre plusieurs solutions

Activity 3

Can these Problems be solved using the information given? Yes or No?

Decide if there is enough information to solve each problem. If there is, solve the problem. If not, tell what information is missing.

1. Harry had 10 books in a room. He received 5 more books for his birthday. Some of his books are about fishing and some are about cars. How many of his books are about fishing?

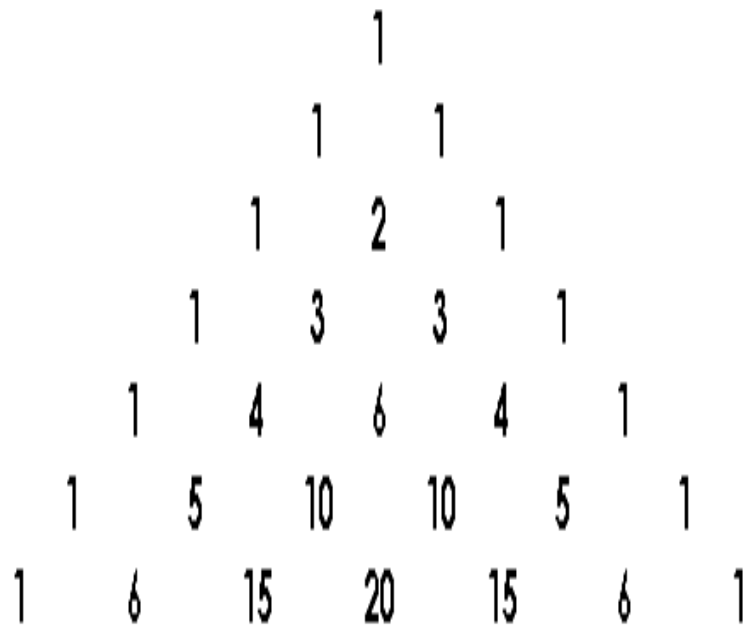


2. Mr. Johnson made 75 bells. He gave one to every student in Mrs. Johnson's class. How many does he have left?

**Grades
5 - 6**

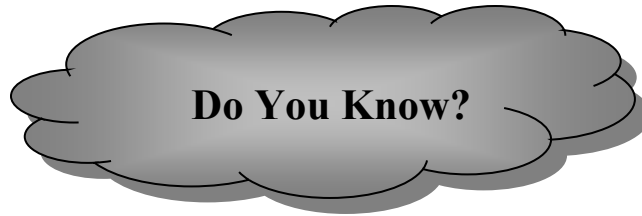
*Thème II: Logique et résolution
d'un problème*

Supplementary Lesson



*Lesson 5:
Using Patterns to do Logical
Reasoning*

Using Patterns to do Logical Reasoning



Patterns exist everywhere in nature, among numbers and in pictures. In this lesson, we use patterns to do logical reasoning and to solve problems.

Using Patterns to do Logical Reasoning

Detecting Patterns in Numbers

EXAMPLE

What is the next number in this pattern?

20, 17, 14, 11, _____, 5, 2

STRATEGY: Follow these steps.

STEP 1: Ask: Do the numbers get larger or smaller?
In this list, the numbers get smaller.

STEP 2: Ask: What numbers do you subtract from each number to get the next number in the pattern?

$$20 - 17 = 3$$

$$17 - 14 = 3$$

$$14 - 11 = 3$$

You subtract 3 from each number to get the next number.

STEP 3: Subtract 3 from 11 to find the missing number.

$$11 - 3 = 8$$

What is the next number of the pattern?

1, 2, 3, 5, 8, 13, 21, _____

STRATEGY: Look for an unusual pattern.

(In this pattern, the numbers get larger. But you can't add the same number each time to get the next number! You'll have to try something different.)

STEP 1: Try adding the first two numbers: $1 + 2 = 3$
You get the third number, 3.

STEP 2: Try adding the second and third numbers: $2 + 3 = 5$.
You get the fourth number, 5.

STEP 3: And so on.
The pattern is: add two numbers to get the next number.

STEP 4: To get the eighth number, add the sixth and seventh numbers.

$$13 + 21 = 34$$

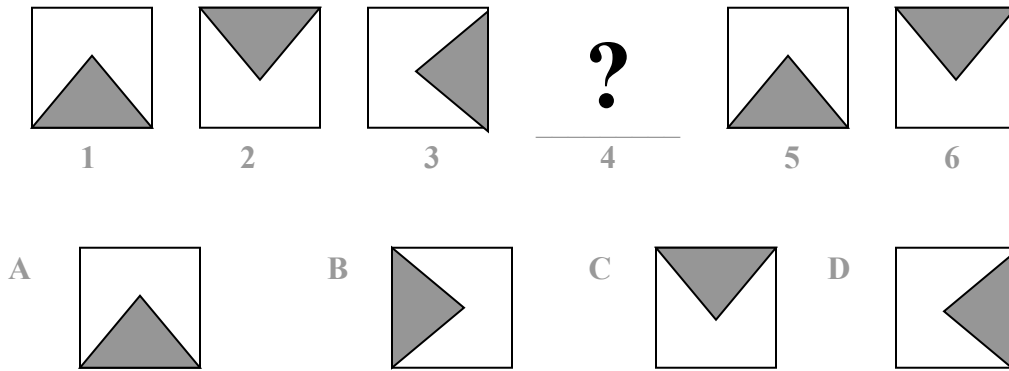
SOLUTION: The missing number is 34.

Using Patterns to do Logical Reasoning

Detecting Patterns in Graphics

EXAMPLE

What figure would replace the question mark in this pattern?



STRATEGY: Find the rule that describes the pattern. Then apply the rule to Figure 4.

- STEP 1:** Ask: How would you describe Figures 1 and 2?
In Figures 1 and 2, the shaded triangles are opposite each other.
- STEP 2:** How would you describe Figures 5 and 6?
The shaded triangles are opposite each other.
- STEP 3:** Describe the rule.
In each pair, the shaded triangles are opposite each other.
- STEP 4:** Apply the rule to Figure 4.
Look for a shaded triangle opposite the triangle in Figure 3.

SOLUTION: B goes in Figure 4, because its shaded triangle is opposite the shaded triangle in Figure 3.

Using Patterns to do Logical Reasoning

ACTIVITY 1

1. What is the missing number in the number pattern?

6, 14, 22, 30, 38, ____, 54, 62

- A 42
- B 46
- C 48
- D 50

2. Which two numbers would be next in the pattern?

6, 11, 16, 21, ____, ____

- A 25, 30
- B 26, 31
- C 27, 32
- D 28, 33

3. What is the missing number in this pattern?

160, 80, 40, 20 ____, 5

- A 15
- B 12
- C 10
- D 8

4. What number comes next in this pattern?

0, 1, 1, 2, 3, 5, 8, ____

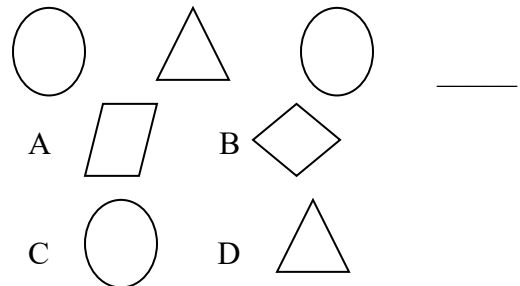
- A 11
- B 12
- C 13
- D 14

5. What number comes next in this pattern?

10, 11, 10, 12, 10, 13, 10, ____

- A 14
- B 13
- C 12
- D 10

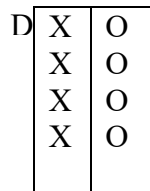
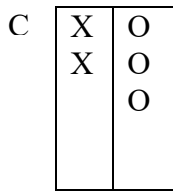
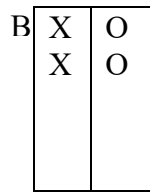
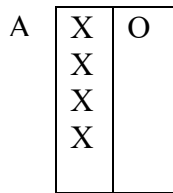
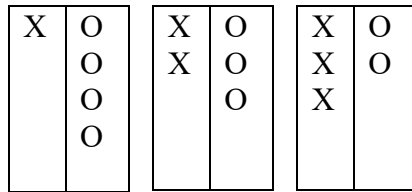
6. Which is the next picture in this pattern?



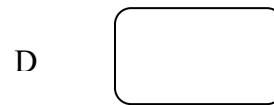
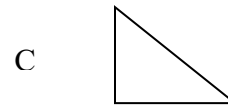
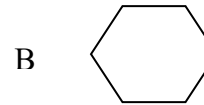
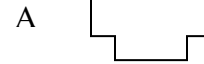
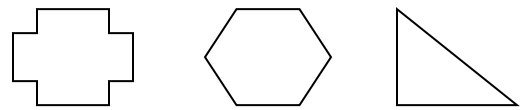
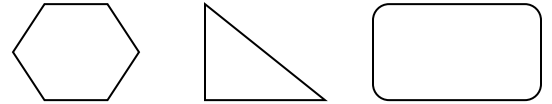
Using Patterns to do Logical Reasoning

ACTIVITY 2

1. Which of the following comes next in the pattern?



2. Which is the next figure in the pattern?



3. What number come next in this pattern?

20, 21, 19, 20, 18, 19, 17, __

A 17

B 18

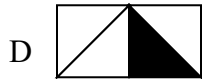
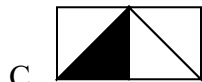
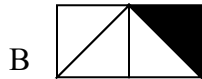
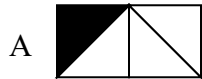
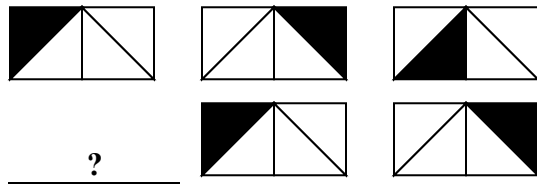
C 19

D 20

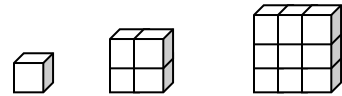
Using Patterns to do Logical Reasoning

ACTIVITY 3

1. What would replace the question mark in this pattern?

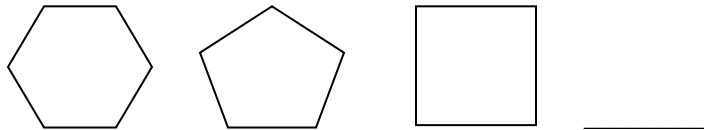


2. How many cubes will be needed to build Step 4?



- A. 12
- B. 15
- C. 16
- D. 25

3. What shape comes next in this pattern?



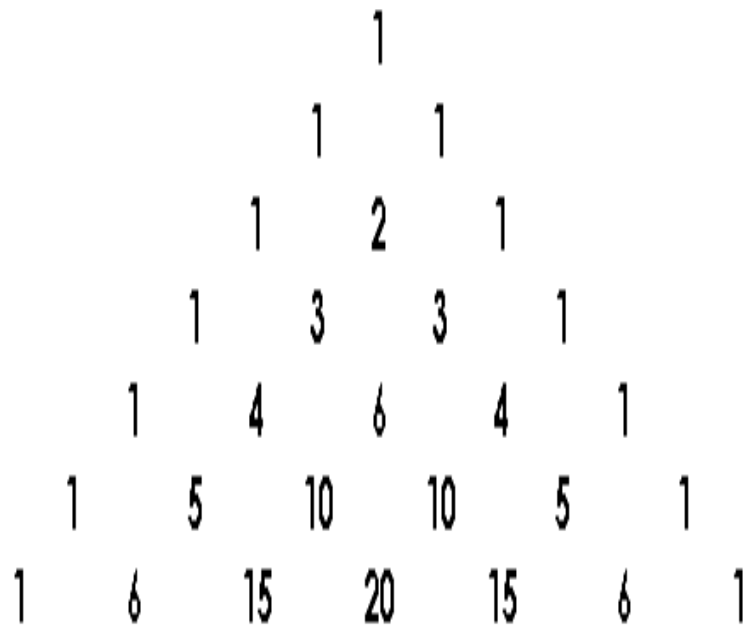


*Theme III:
Number Operations*

Grades
5 - 6

Theme III: Number Operations

Supplementary Lesson



Lesson 1:

Find the Order of Operations

Find the Order of Operations



Do You Know?

When more than one operation is used in a problem, -which operation to perform first must be known so that everyone gets the same result.

Mathematicians have come up with rules called the order of operations to help solve problems when multiple steps are used? Three students are trying to find what n equals in the following problem. Each has found a different answer. What is the correct answer?

$$6 + 2 - (2 \times 3) - 6 \times 1 = n$$

Can you solve this problem?

$$14 \div 7 + 12 \times 3 - 9 = ?$$

PEMDAS

Parenthesis (P)

Exponents (E)

Multiplication/Division (MD)

Addition/Subtractions (AS)

Find the Order of Operations

Order of Operations

When more than one operation is used, know which one to perform first so that all get the same value. Order of operations is the rules to follow when more than one operation is used in a problem. To solve these problems, first do what is in parenthesis. Then, simplify all exponents' powers. Next, you must do all multiplication and division in order from left to right. Finally, do all addition and subtraction in the problem in order from left to right.

Here's a sentence that can help you remember the steps when solving order of operation problems:

Please Excuse My Dear Aunt Sarafenia.

- P** (Parenthesis)
- E** (Exponents)
- M** (Multiplication)
- D** (Division)
- A** (Addition)
- S** (Subtraction)



Solve:

1. $6 + 3 \times 2 =$
2. $6 - 3 \times 2 =$
3. $(4 + 9) \times 5 =$

Find the result while using the order of the operations:

4. $6 + 3 \times 2 =$
5. $6 - 3 \times 2 =$
6. $(4 + 9) \times 5 =$



Find the Order of Operations

Activity 1

Problem Solving:

There are six cars with four persons in each car and two vans with eight people in each van. Write a number sentence that tells the total number of people in the cars and vans.



Find the Order of Operations

Activity 2



To follow the order of operations follow these steps:

Do operations in parentheses from left to right.

Multiply and divide from left to right.

Add and subtract from left to right.

Tell which step should be done first.

$$(3 \times 4) = \underline{\hspace{2cm}}$$

$$(12 - 3) \times 4 = \underline{\hspace{2cm}}$$

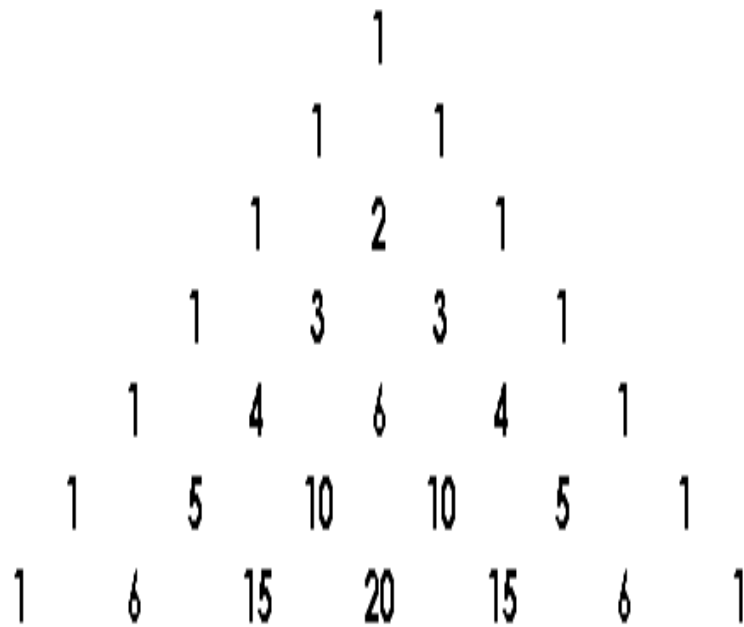
$$12 - 3 \times (4 : 2) = \underline{\hspace{2cm}}$$

$$(12 - 3) \times (4 : 2) = \underline{\hspace{2cm}}$$

Grades
5 - 6

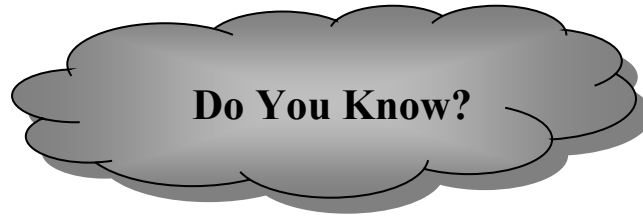
Theme III: Number operations

Supplementary Lesson



Lesson 2:
Finding prime numbers and
composite numbers

Finding prime numbers and composite numbers



Factors are number that are multiplied together to form a product. Do you know that you can classify numbers as prime or composite? A prime number is a number with exactly 2 factors, itself and 1. A composite number is a number that has more than two (2) factors. The numbers 0 and 1 are neither prime nor composite because they have no factors other than it.

Use the chart below to identify the prime numbers between 21 and 50.

21	22	23	24	25	26	27	28	28	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

What strategy did you use to discover the prime and composite numbers?

What pattern do you notice?

Finding prime numbers and composite numbers

Definition: A positive entire number (n) is called a first number if this number n and 1 are its only divisors. A number composite more than two divisors.

Examples:

- A. 37 possess two divisors only 1 and 37; thus 37 is a first number.
- B. 38 Possess more than two divisors.
 $38 = 1 \times 38$
 $38 = 2 \times 19$ or 19×2
 $38 = 38 \times 1$
- C. 39 possess more than two divisors.
 $39 = 1 \times 39$
 $39 = 3 \times 13$
The factors of 39 are 1, 3, 13, and 39 (four factors); thus, 39 is a composite number.
- D. 40 possess more than two divisors.
 $40 = 1 \times 40$; $40 = 2 \times 20$
 $40 = 4 \times 10$; $40 = 5 \times 8$
The factors of 40 are 1; 2; 4; 5; 8; 10; 20 and 40.

Definition: A factor of an entire number (n) is any number that can divide exactly n with an equal remainder to zero.

In the example D: 1, 2, 4, 5, 8, 10, 20 and 40 are factors of 40.

Definition: To first factor is a factor that is a first number. 2 and 5 are first factors of 40.

The property of the positive entire numbers:

Here some interesting property concerning the entire numbers, the first numbers and the numbers composed.

- P1.** 1 is the smallest positive entire number no any, it is not or a first number, or a number composed.
- P2.** All entire superior positive number to 1 east be a first number or a number composed.
- P3.** 2 is the smallest first number

$$2 = 1 \times 2 \text{ or } 2 \times 1, 1 \text{ and } 2 \text{ are its only factors.}$$

Finding prime numbers and composite numbers

P4. All positive whole numbers (n) greater or equal to 2 can be expressed in a product of prime factors.

Example: $37 = 37$, $38 = 2 \times 19$, $39 = 3 \times 13$, $40 = 2 \times 2 \times 2 \times 5$

P5. All the entire superior even numbers or equal to four (4) are composite numbers.

Definition: Even whole numbers have 2 common factors; $e = 2 \times h$, with (e) and (h) whole numbers.

Example: $40 = 2 \times 20$; $64 = 2 \times 32$; $200 = 2 \times 100$

P6. The odd whole numbers can be first numbers or composite numbers.

Finding prime numbers and composite numbers

Activity 1

Discovering Prime and Composite Numbers

Factors are numbers that are multiplied together to form a product.

A **prime number** is a number with exactly 2 factors, itself and 1. Thirteen (13) is a prime number because the only factors that 13 has is 1 and itself.

A **composite number** is a number that has more than two (2) factors. Twelve (12) is a composite number because the factors of 12 are 1, 2,3,4,6, and 12 and are numbers that are multiplied together to form a product.

Some examples are:

Factors of 1
 $1 \times 1 = 1$

Factors of 2
 $1 \times 2 = 2$

Factors of 3
 $1 \times 3 = 3$

Factors of 4
 $1 \times 4 = 4$
 $2 \times 2 = 4$

Factors of 6
 $1 \times 6 = 6$
 $2 \times 3 = 6$

Look at the chart below. Which numbers have exactly two factors? Circle each number that has only two factors. Two, three, and five should be circled in the first row.

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

- Use the chart to list the prime numbers between 1-20.
2, 3, 5, __, __, __, __, __
- Use the chart to list the composite numbers between 1-20.
4, 6, __, __, __,

Finding prime numbers and composite numbers

Activity 2

Prime and Composite Numbers

Factors are number that are multiplied together to form a product.

A **prime number** is a number with exactly 2 factors, itself and 1.

A **composite number** is a number with more than two (2) factors.

Use the chart below to identify the prime and composite numbers between 51 and 100.

51	52	53	54	55	56	57	58	58	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

What strategy was used to discover the prime numbers and composite numbers?

What pattern was noticed?

Finding numbers and number combinations

Activity 3

Prime, Composite, or Neither

Determine whether each number is prime, composite, or neither. Explain why.

A. 1

B. 15

C. 23

D. 37

E. 41

F. 52

G. 66

H. 71

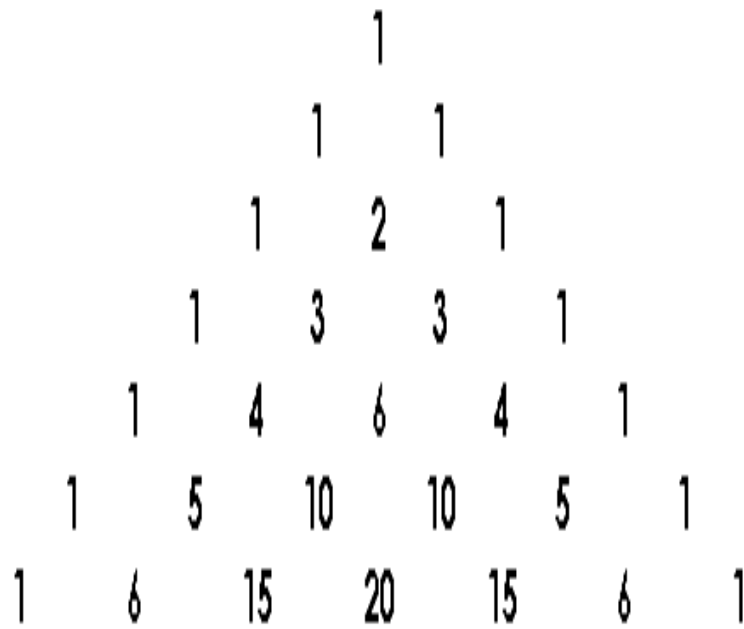
I. 82

J. 98

Grades
5 - 6

Theme III: Number Operations

Supplementary Lesson



Lesson 3:
Decompose Whole Numbers

Decompose Whole Numbers



Do You Know?

Numbers are made up of digits like words are made of letters. Do you know the location of the digit affects its value?

For example:

3 is a single digit number, 3 or 3 ones

75 is a two digit number, 75 or 7 tens and 5 ones

897 is a three digit number, 8 hundreds, 9 tens, 7 ones

6347 is a four digit number, 6 thousands, 3 hundreds, 4 tens, 7 ones

98,175 is a five digit number, 9 ten thousands, 8 thousands, 1 hundred, 7 tens, 5 ones

178,345 is a six digit number, 1 hundred thousands, 7 ten thousands, 8 thousands, 3 hundreds, 4 tens, 5 ones

Knowing how to count with large numbers allows you to gain and share new knowledge with others.

About how many people are in your class or in your school?

About how many people are in your village or your country?

Decompose Whole Numbers

Place of the amount: How to indicate the value of a number

We name a number by identifying the place value of each digit. You can find the place value of a digit by looking at its place in the number. You can write any whole number using the digits 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, and place value. Standard form is the form in which numbers are written. Expanded form is a way to write numbers that shows the place value of each digit.

The chart below shows the place values for the digits in 5, 698.

	Thousands	Hundreds	Tens	Ones
Standard Form	5	6	9	8
Expanded Form	5000	+ 600	+ 90	+ 8

You read 5,698 as: Five thousand, six hundred, and ninety-eight

5 6 3 7 8 4

You read 563,784 as: five hundred sixty-three thousand, seven hundred eighty four.

When we add the values, we find the sum in standard form.

5 hundred thousands	500,000
6 ten thousands	60,000
3 thousands	3,000
7 hundreds	700
8 tens	80
4 ones	4

Number in standard form 563, 8784



Decompose Whole Numbers

Activity 1

TRY IT OUT...EXPLORE!

- Write and read a 5-digit number with 3 in the ten thousands place and 4 in the thousands place.

- Write and read a 6-digit number with 7 in the hundred thousands place and 2 in the hundreds place.

- Write these numbers in standard form.

a) four hundred, thirty-five _____

b) seven thousand, eight-one _____

c) eighty-five _____

d) five hundred eighty thousand, nine hundred, seventy- six _____

- Write this number in expanded form.

879, 429 _____

Decompose Whole Numbers

Activity 2

Place Value

Write the number in standard form.

- A 3-digit number with 4 in the tens place and 1 in the hundreds place. _____
 - A 6-digit number with 2 in the ten-thousands place and 0 in the ones place. _____
 - Seven hundred twenty-one _____
 - Five thousand, ninety _____
 - Using the number chart below, match the digit 4 to its place value.
425,708 _____ 5,854 _____
139,645 _____ 243,106 _____
56,423 _____ 4,690 _____
- a) 40,000 d) 4,000
b) 400 e) 4
c) 40 f) 400,000

Problem Solving:

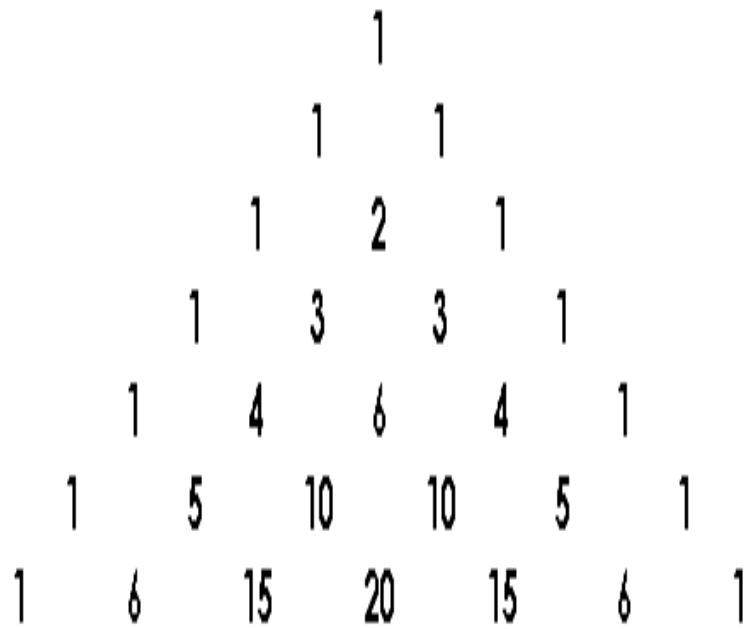
Use the digits 1, 5, 8, and 2 to solve the problems. A digit may be used only once in a problem.

- a) What is the largest 3-digit number you can write?
- b) What is the smallest 4-digit number you can write?
- c) How many 4-digit numbers can you write that are greater than

**Grades
5 - 6**

Theme III: Number Operations

Supplementary Lesson



*Lesson 4:
Multiplication and Division*

Multiplication and Division



Do You Know?

Multiplication and division are related. Use multiplication to find quotients. A quotient is the answer to a division problem.

For example, $28 \div 4 = 7$. In this example 7 is the quotient.

Once multiplication facts are learned, division is as easy as 1, 2, 3!

$$45 \div 9 = ?$$

1. What is the missing factor in $45 \div 9 = ?$
2. What number multiplied by 9 = 45?
3. $9 \times 5 = 45$, therefore the answer is
 $45 \div 9 = 5$ or $45 \div 5 = 9$

Multiplication and Division

Similarities between multiplication and division

Definition: Positioned objects in equal rows can form a body.

Example:

This body can be expressed in addition problem or of multiplication.

A. Addition : $6 + 6 + 6 + 6 = 24$

B. Multiplication : $4 \times 6 = 24$

Definition: In B, 4 and 6 are called factors; 24 is called the product.

C. $24 : 4 = 6$ or $24 / 4 = 6$

Definition: In C, 24 is called dividend; 4 is called divisor and 6 is called the quotient.

Multiplication and Division

Properties of multiplication and division

P1. Any number multiplied by zero, give zero ($N \times 0 = 0$)

$$\text{Example: } 475 \times 0 = 0$$

P2. The identity property of the multiplication: any number multiplied by a (1) is equal to the number ($N \times 1 = N$)

$$\text{Example: } 625 \times 1 = 625$$

P3. The cumulative property of multiplication.

$$\text{Example: } 75 \times 10 = 10 \times 75$$

P4. The distributive property.

$$\begin{aligned} \text{Example: } 5 \times (6 + 2) &= 5 \times 6 + 5 \times 2 \\ 5 \times 8 &= 30 + 10 \\ 40 &= 40 \end{aligned}$$

P5. Some multiplying more than two factors, it is important to proceed by step 'is-to-to say to multiply.

$$\begin{aligned} \text{Example: A. } 65 \times 5 \times 4 &= 65 \times 20 \\ &= 1\,300 \end{aligned}$$

P6. Multiplication and division are inverse operations

$$\begin{array}{ll} \text{Example: } 7 \times 5 = 35 & 35 : 7 = 5 \\ 5 \times 7 = 35 & 35 : 5 = 7 \end{array}$$

P7. Zero divided by any number gives zero.

$$\text{Example: } 0 : 75 = 0 \quad \text{or} \quad 0 : 75\,578 = 0$$

P8. One cannot divide a number by zero (0).

$$\text{Example: } 75 : 0 = n \text{ has no solution.}$$

Multiplication and Division

Activity 1

Follow the rule to find each missing number. The first one has been done.

Rule: Divide by 7. Input \div 7 = Output	
Input	Output
7	1
28	
42	
56	

The multiplication facts for 3 and 6 help you divide by 3 and 6. Each year groups of students have competed in a local fishing contest. Use the chart to tell how many students were in each group.



Fishing Contest			
Year	Number of Groups	Number In Each Group	Number of Students
1	4	?	12
2	8	?	24
3	9	?	27
4	7	?	42
5	9	?	54

Related Multiplication and Division Facts:
The Number 4 as a Factor

Multiplication and Division

Activity 2

The four facts: $4 \times 8 = 32$, $8 \times 4 = 32$, $32 \div 4 = 8$, $32 \div 8 = 4$. They are in the same fact family.

Solve the given problem. Then name the other facts associated with the same factor.

A. $3 \times 7 = \underline{\hspace{2cm}}$

$\underline{\hspace{1cm}} \div 3 = 7$

$\underline{\hspace{1cm}} \div 7 = 3$

B. $9 \times 5 = \underline{\hspace{2cm}}$

$\underline{\hspace{1cm}} \div 5 = 9$

$\underline{\hspace{1cm}} \div \underline{\hspace{1cm}} = 5$

C. $8 \times 6 = \underline{\hspace{2cm}}$

$48 \div \underline{\hspace{1cm}} = 6$

$\underline{\hspace{1cm}} \div \underline{\hspace{1cm}} = 8$

D. $4 \times 10 = \underline{\hspace{2cm}}$

$\underline{\hspace{1cm}} \div 10 = 4$

$\underline{\hspace{1cm}} \div 4 = 10$

Multiplication and Division

Activity 3

Division is defined as an operation on two numbers that results in a quotient. A quotient is the number that is the result of the division operation. Division involves separating a number of items into same -size groups. Multiplication can be used to check division.

$$72 \div 8 = 9 \qquad \text{Check: } 9 \times 8 = 72$$

↑
quotient

Divide. Multiply to check.

A. $36 \div 4 =$

B. $54 \div 6 =$

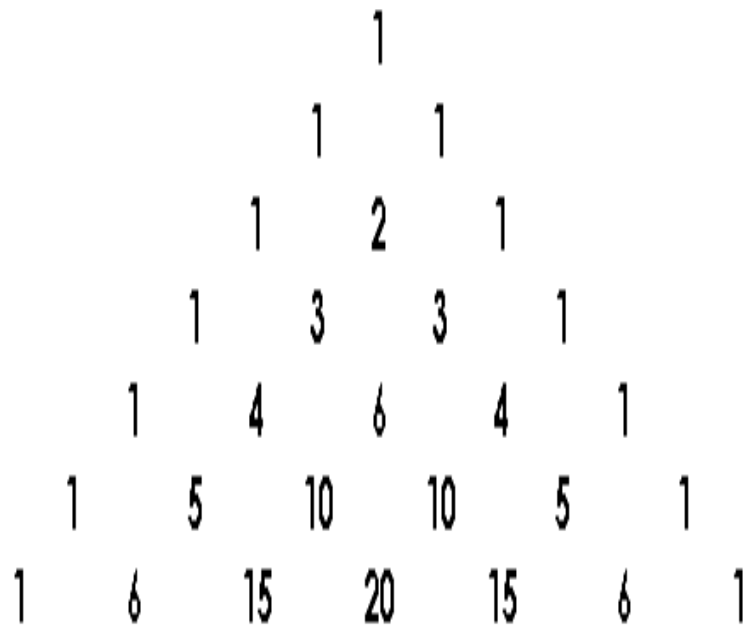
C. $48 \div 6 =$

D. $64 \div 8 =$

**Grades
5 - 6**

Theme III: Number Operations

Supplementary Lesson



*Lesson 5:
Résoudre des problèmes avec
des unités de mesure*

Résoudre des problèmes avec des unités de mesure



Do You Know?

Numbers are tools to help us solve problems. Almost everyone uses numbers to help solve problems involving the measurement of length, weight and volume (capacity). In this lesson we solve problems in each of these areas as well as some combinations of these areas.

Résoudre des problèmes avec des unités de mesure

Principle Units of Measure

Solving Problems with Units of Length, Weight and Volume (Capacity)

Customary Units of Measure

METRIC UNITS (for measuring length)

Millimeter about this long –

Centimeter about this long -----

One centimeter (cm) = 10 millimeters (mm)

Meter A meter is a little longer than 3 feet (1 yard).

1 meter (m) = 100 centimeters (cm)

Kilometer 1 kilometer (km) = 1,000 meters (m)

METRIC UNITS (for measuring weight)

Gram about the weight of a peanut

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

METRIC UNITS (for measuring volume)

Milliliter think of a drop of water

Liter 1 liter (L) = 1,000 milliliters (mL)

Résoudre des problèmes avec des unités de mesure

Activity 1

Estimate first. Then, measure each length to the nearest inch.

1. 2.

3. **Reasoning** To measure the width of your desk, which would be the better unit to use, your hand span or your height? Explain.

Estimate first. Then, measure each length to the nearest centimeter.

4. 5.

Choose the most appropriate unit to measure the length of each.

Write centimeter, meter, kilometer

6. pencil 7. tree 8. soccer field
9. book

10. front yard 11. shoe 12. room 13. river
(length then width)

14. Think about it would a meter stick be the best tool to use to measure the length of a fork?

Explain why or why not.

Résoudre des problèmes avec des unités des unités de mesure

Activity 2

1. What would be the best measure for the height of a door?
 - a. 2 centimeters
 - b. 10 centimeters
 - c. 2 meters
 - d. 5 meters
2. What measure would be the weight of a small dog?
 - a. 7 g
 - b. 70 g
 - c. 7 kg
 - d. 70 kg
3. If a liter bottle is half-filled with juice, how much more juice is needed o fill the bottle?
 - a. 200 mL
 - b. 300 mL
 - c. 400 mL
 - d. 500 mL
4. Which is the longest?
 - a. A 20 cm flashlight
 - b. A 3 km race
 - c. A 12 m sidewalk
 - d. A 300 mm wire
5. Aminatou is in the 6th grade. She weights about 30 _____.
 - a. Kilograms
 - b. Grams
 - c. Pounds
 - d. Ounces
6. ... likely being weighted?
 - a. A book
 - b. A pencil
 - c. A sandwich
 - d. A carton of milk
7. Jose's bedroom is 6 meters long. How many centimeters long is his room?

Résoudre des problèmes avec des unités des unités de mesure

Activity 3

1. Which of these is probably about 3 meters high?
 - a. A drinking fountain
 - b. A fourth grader
 - c. The distance from the floor to the ceiling
 - d. A school building

2. Which is the best unit to measure the length of a pen?
 - a. Millimeter
 - b. Centimeter
 - c. Meter
 - d. Kilometer

3. The width of a picture frame is 20 units. What unit was most likely used to measure the width?
 - a. Meters
 - b. Decimeters
 - c. Centimeters
 - d. Millimeters

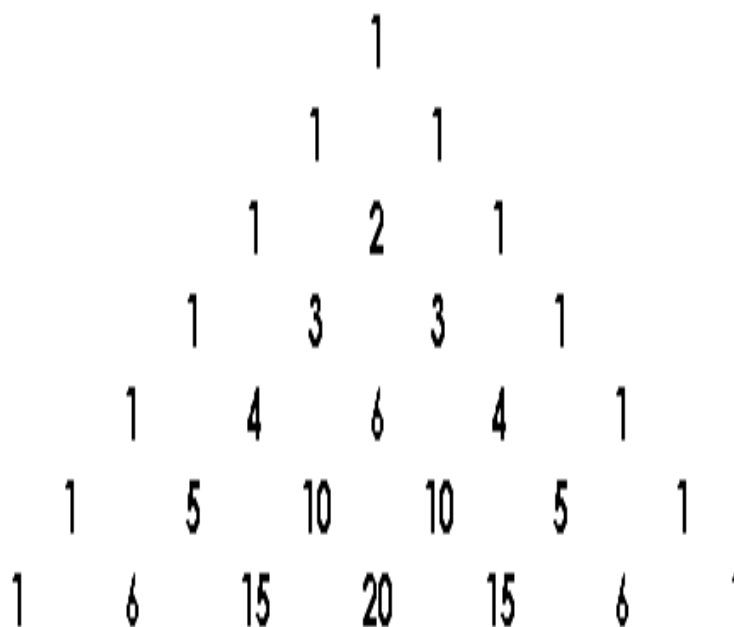
4. A foot is about equal to how many centimeters?
 - a. 1
 - b. 10
 - c. 30
 - d. 100

Theme IV:
Geometric Figures : dimensions et aires

**Gades
5 - 6**

*Theme 4: Figures géométriques :
dimensions et aires*

Supplementary Lesson



*Lesson 1:
Périmètres et aires des
quadrilatères*

Perimeters et aires des quadrilatères



Do You Know?

We call geometric figures that are flat and can be correctly drawn on a sheet of paper or a flat surface, a two-dimensional figure or plane figure. Many special two-dimensional can be drawn using line segment. Many special two dimensional geometric figures have angles. One well-known plane figure without angles is called a circle. Several of these special two dimensional figures you should know by name. In this lesson we will provide more information about these special two-dimensional figures. Special two-dimensional figures with four sides are called quadrilaterals. If a special two dimensional figures have more than four sides it is usually called a polygon. In this lesson we will discuss areas and perimeters of quadrilaterals.

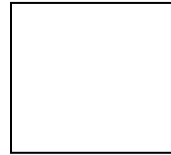
Périmètres et aires des quadrilatères

How do you classify quadrilaterals?

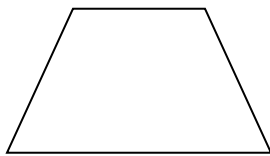
Quadrilaterals are figures with four sides and four angles. Quadrilaterals can be classified by their angles or pair of sides.



Rectangle
There are four right angles.



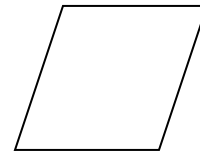
Square
There are four right angles and all sides are the same length.



Trapezoid
There is only one pair of parallel sides, and no right angles.



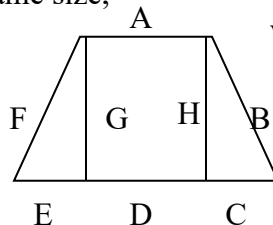
Parallelogram
Opposite sides are parallel, and no right angles.



Rhombus
Opposites sides are parallel, All sides are the same length, and there are no right angles.

- Parallel line segments or line lines are lines that never meet even though they might be extended as far as one can.
- A right angle is square corner formed by two line segments or two lines.
- Two geometric figures are said to be similar if they have the same shape but different sizes.

An isosceles trapezoid is a quadrilateral that can be viewed as a rectangle and two right triangles of the same size,



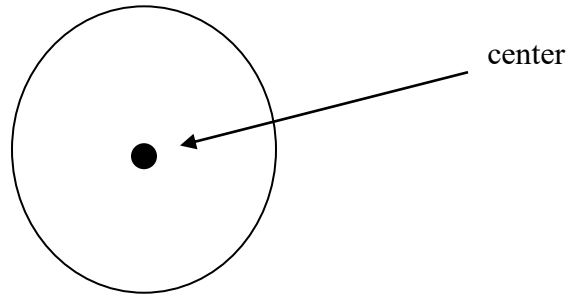
where: A and D are the same length
G and H are the same length
E and C are the same length
B and F are the same length

The area of the trapezoid (above) is the area of rectangle A, G, H, D and the area of the two triangles FGE and BHC.

The perimeter of the trapezoid (above) is the lengths of $A + B + C + D + E + F$.

Quadrilaterals, Areas and Perimeters

Circle. A round figure, like the one below. All points on a circle are the same distance from the center of the circle.

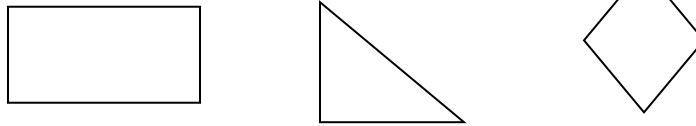


Polygon. A figure made up of straight sides. the figure is closed---there are no gaps openings in it.



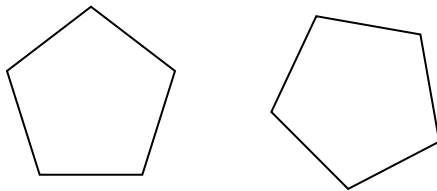
You've already seen two types of polygons.

All triangles and rectangles are polygons.

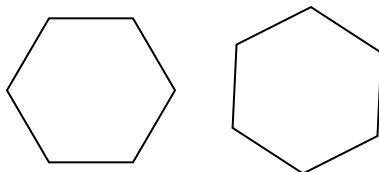


There are two other special types of polygons that you should know.

Pentagon. A figure with 5 sides and 5 angles.



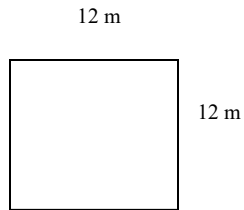
Hexagon. A figure with 6 sides and 6 angles.



Périmètres et aires des quadrilatères

Activity 1

1. What is the area of this square?

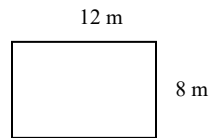


- A. 52 sq m
- B. 71 sq m
- C. 144 sq m
- D. Not given

2. What is the area of a rectangle 22 m long and 15 m wide?

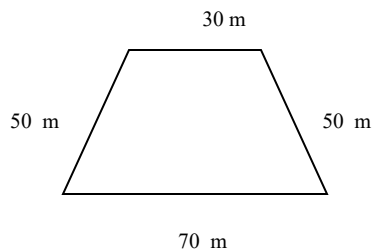
- A. 300 sq m
- B. 37 sq m
- C. 74 sq m
- D. not given

3. What is the area of this rectangle?



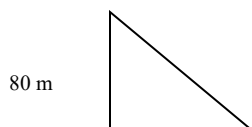
- A. 96 sq m
- B. 48 sq m
- C. 40 sq m
- D. Not given

4. What is the area of this trapezoid?



- A. 180 sq m
- B. 140 sq m
- C. 100 sq m
- D. Not given

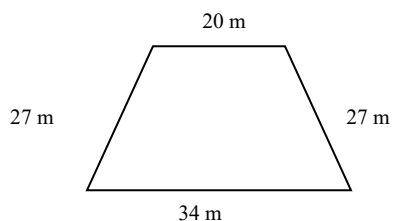
5. What is the area of this triangle?



- A. 2800 sq m
- B. 5600 sq m
- C. 75 sq m
- D. Not given

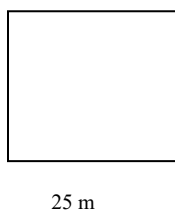
Activity 2

1. What is the perimeter of this trapezoid?



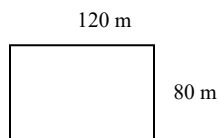
- A. 254 m
- B. 710 m
- C. 108 m
- D. Not given

2. What is the perimeter of this square?



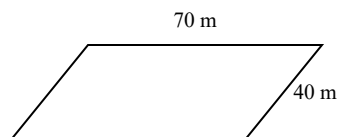
- A. 625 m
- B. 100 m
- C. 250 m
- D. Not given

3. What is the perimeter of this rectangle?



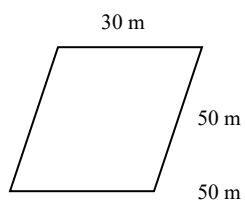
- A. 960 m
- B. 480 m
- C. 400 m
- D. Not given

4. What is the perimeter of this parallelogram?



- A. 220 m
- B. 280 m
- C. 420 m
- D. Not given

5. What is the perimeter of this rhombus?

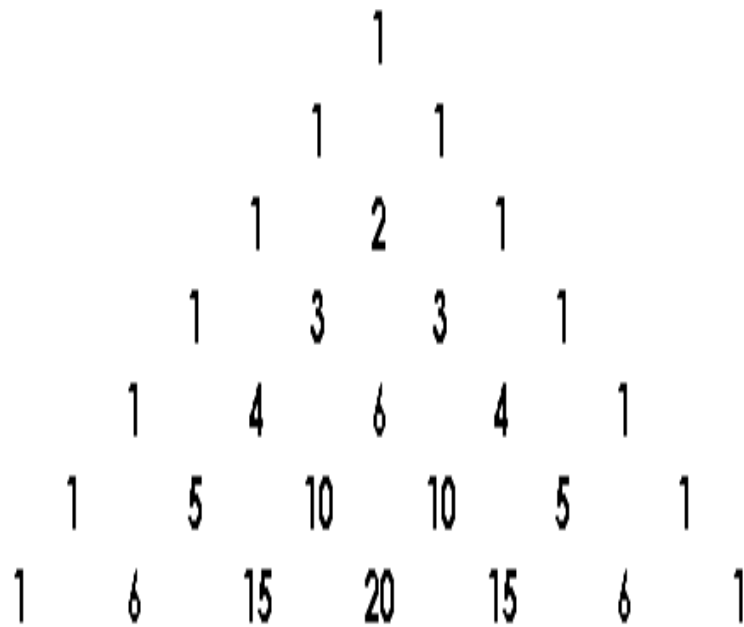


- E. 1500 m
- F. 160 m
- G. 150 m
- H. Not given

**Grades
5 - 6**

*Theme 4: Figures géométriques :
dimensions et aires*

Supplementary Lesson



*Lesson 2:
Line of Symmetry*

Line of Symmetry, Similar Figures, and Congruent Figures




Do You Know?

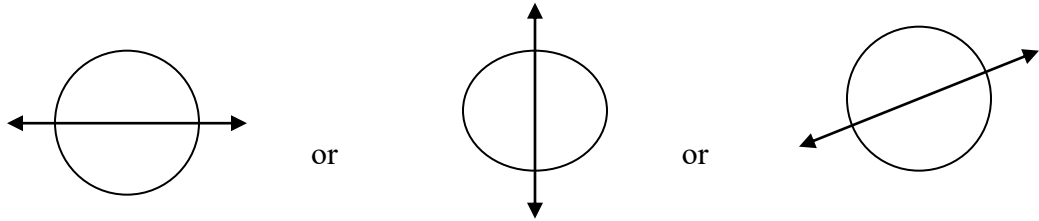
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Line of Symmetry, Similar Figures, and Congruent Figures

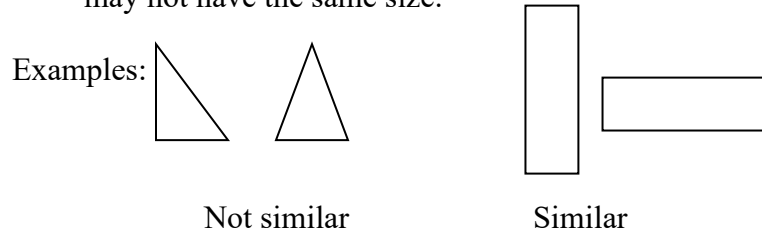
Definition: A figure is said to have a line of symmetry, l , if the line l can be drawn in a way that divides the figure into two equal geometric figures.

Examples, consider a circle C . 

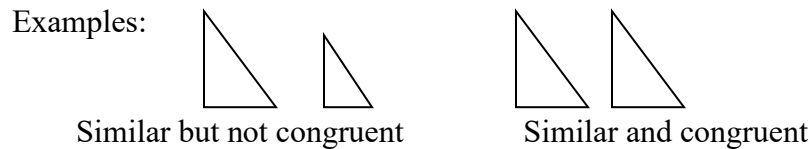
A line of symmetry is line that passes through diameter of the circle.



Definition: Two figures are said to be **similar** if they have the same shape, they may or may not have the same size.



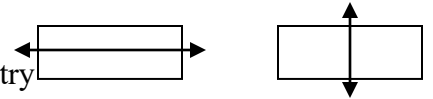
Definition: If two figures are similar and they have the same size, they are said to be **congruent**.



Properties

P1. A figure may have more than one line of symmetry.

Example: A rectangle with two different lines of symmetry



P2. A circle has only one distinct line of symmetry because a circle is view as having only one diameter.

P3. All similar figures are not congruent.

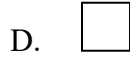
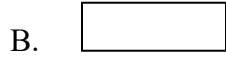
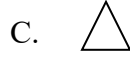
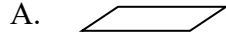
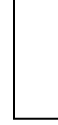
P4. All congruent figures are similar.

P5. A line of symmetry for a given figure divides that figure into different congruent figures.

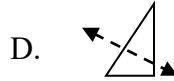
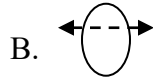
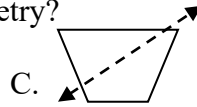
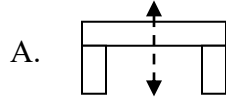
Line of Symmetry, Similar Figures, and Congruent Figures

ACTIVITY 1

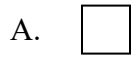
1. Which figure below is similar to this quadrilateral?



2. Which line is a line of symmetry?



3. Which figure has no lines of symmetry?

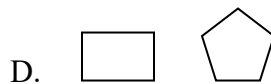
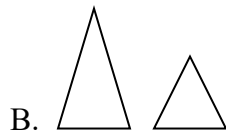
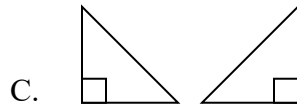
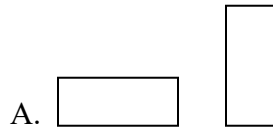


4. What would be a line of symmetry for

S

W

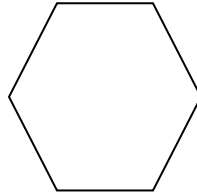
5. Which pairs of figures appear to be similar, congruent or neither?



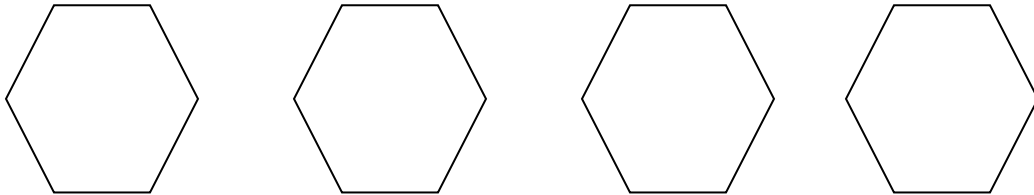
Line of Symmetry, Similar Figures, and Congruent Figures

ACTIVITY 2

1. How many different **lines of symmetry** can you draw for this figure?



2. Are these figures Symmetric? Similar? Congruent? All Three? Neither?



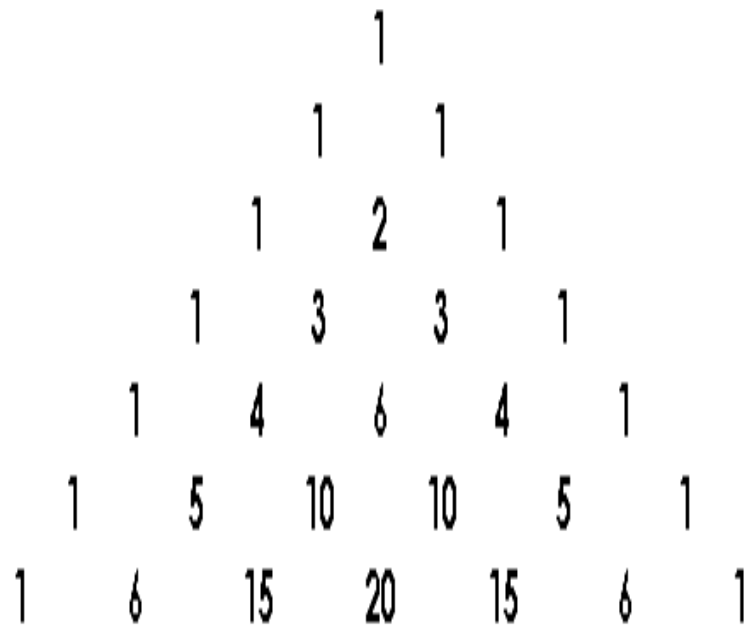
3. How many different lines of symmetry can you draw for a rectangle?
Show (by pointing your finger) what these different lines of symmetry would be for the rectangles below.



**Grades
5 - 6**

*Theme 4: Figures géométriques :
dimensions et aires*

Supplementary Lesson



Lesson 3:

*Organiser ou arranger des
nombres et des lettres pour
résoudre un problème*

Organiser ou arranger des nombres et des lettres pour résoudre un problème



Do You Know?

Many times we can illustrate clearly what we wish to communicate by the way we arrange letters and numbers. Another way we can illustrate clearly what we wish to demonstrate is by plotting ordered pairs of numbers on a grid. In this lesson we look at the kinds of comparisons we can make and the kinds of problems we can solve by arranging numbers and letters and by using ordered pairs on a grid.

Arrangements of Numbers and Letters to Solve Problems

Arrangements

A good way to find the numbers of different arrangements (various ways to put things in order) is to make a list of all possible arrangements.

Example:

Chuck, Leopold, and Sidy want to sit next to each other at a soccer game. How many different ways can they sit next to each other?

Strategy:

Step 1: Use one letter for each name
Let C represent Chuck,
L represent Leopold, and
S represents Sidy

Step 2: List all possible seating arrangements.
CLS CSL
LCS LSC
SCL SLC

Step 3: Count all the arrangements.

Solution: There are 6 different ways the boys can sit next to each other at a soccer game.

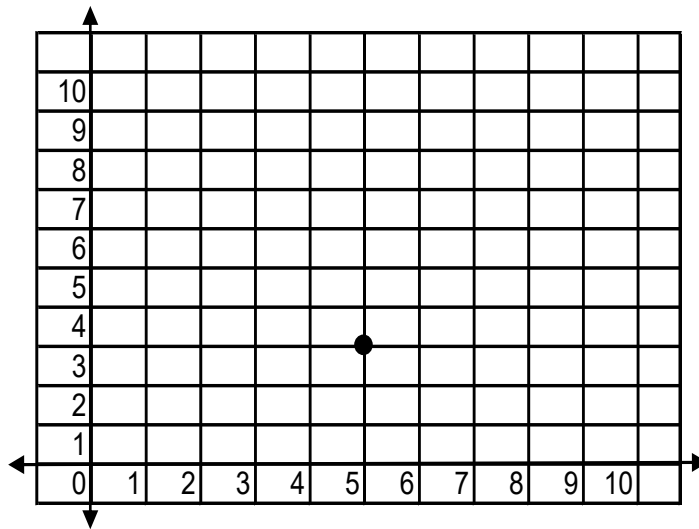
Arrangements of Numbers and Letters to Solve Problems

What is an ordered pair of numbers?

An ordered pair of numbers is a set of 2 numbers, such as $(5, 3)$.

- 5 is the first number of the ordered pair, and
- 3 is the second number of the ordered pair.

Each ordered pair can be represented by a point on grid like the one shown below:



The two lines with arrows are called axes. (One of the lines by itself is an axis.)

The left-right axis is the x-axis.

The up-down axis is called the y-axis.

The point where the two axes meet is called the origin.

Solution: The dot is at point $(5, 3)$.

Arrangements of Numbers and Letters to Solve Problems

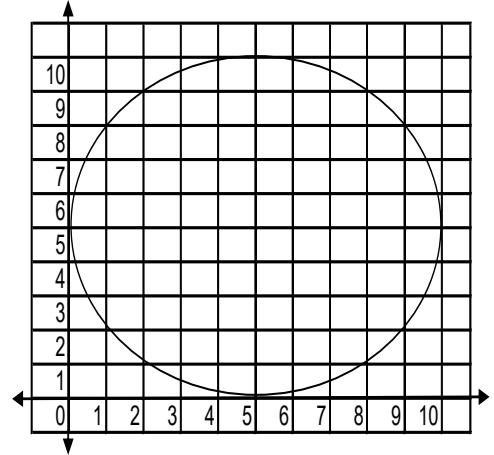
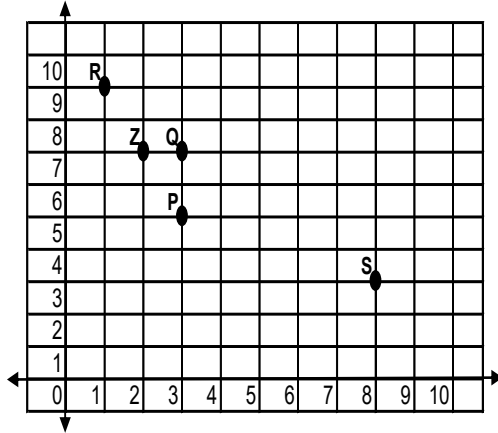
Activity 1

1. How many different outfits can be made with 3 hats, 4 skirts, and 2 blouses?
 - a. 9
 - b. 18
 - c. 24
 - d. 32
2. How many different numbers can be made that use all three of these digits: 4, 4, and 5?
 - a. 3
 - b. 4
 - c. 6
 - d. 8
3. There are 3 juices, 5 sandwiches, and 4 desserts available at Obdoul's school. How many different meals can Obdoul choose consisting of one juice, one sandwich, and one dessert?
 - a. 12
 - b. 19
 - c. 30
 - d. 60
4. How many different numbers can be made that use all three of these digits: 4, 4, and 5?
 - a. 3
 - b. 4
 - c. 6
5. How many different 4 digit numbers can be made using the digits 2, 3, 8, 7 (no digit can be repeated)
 - a. 6
 - b. 12
 - c. 18
 - d. 24

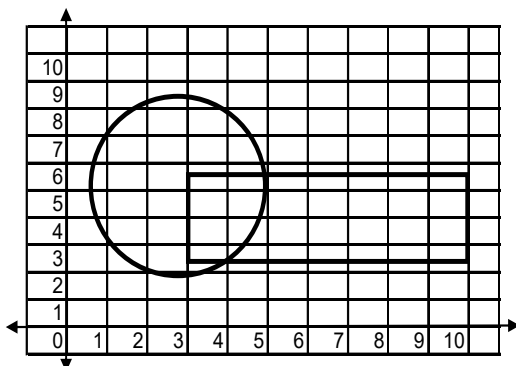
Arrangements of Numbers and Letters to Solve Problems

Activity 2

1. What are the coordinates of the point that is farthest from point Z?



- a. (3, 5)
 b. (3, 7)
 c. (1, 9)
 d. (8, 3)
2. Which ordered pair is closest to the origin? (You may refer to the grid above.)
- a. (3, 5)
 b. (3, 7)
 c. (1, 9)
 d. (8, 3)
3. What is the location for the middle of the bull's eye?
- a. (0, 5)
 b. (5, 0)
 c. (5, 5)
 d. (5, 10)
 e. (10, 5)
4. Which ordered pair is outside the circle and inside the rectangle?

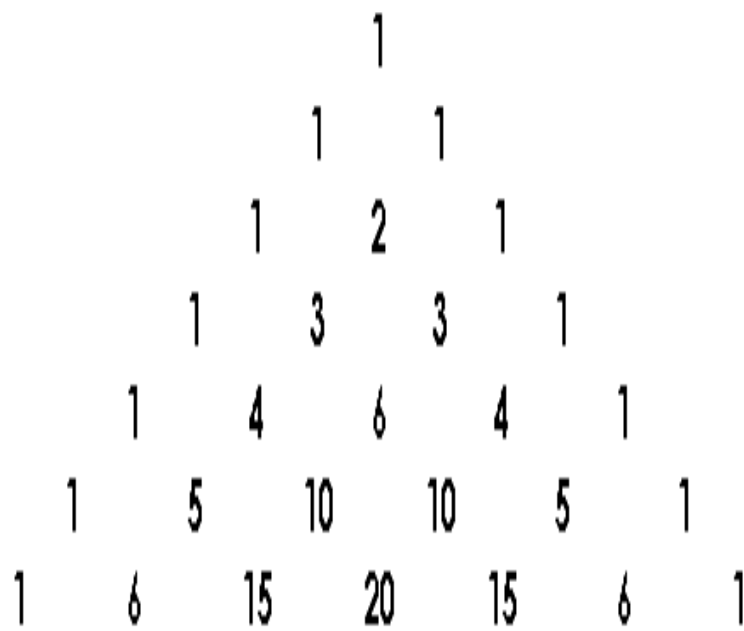


- a. (9, 4)
 b. (7, 7)
 c. (2, 5)
 d. (4, 7)

**Grades
5 - 6**

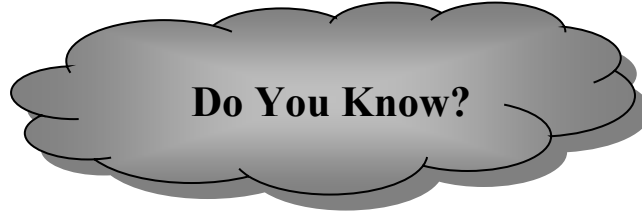
*Theme 4: Figures géométriques :
dimensions et aires*

Supplementary Lesson



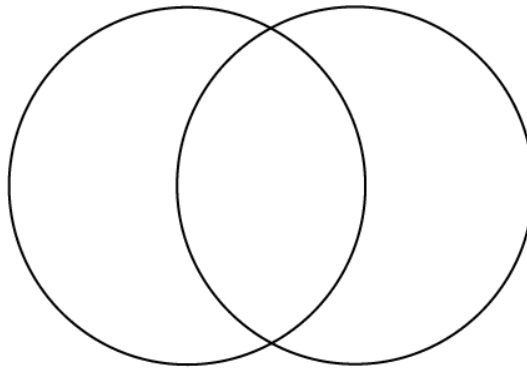
*Lesson 4:
Tracer des figures pour faire
une représentation graphique*

Tracer des figures pour faire une représentation graphique

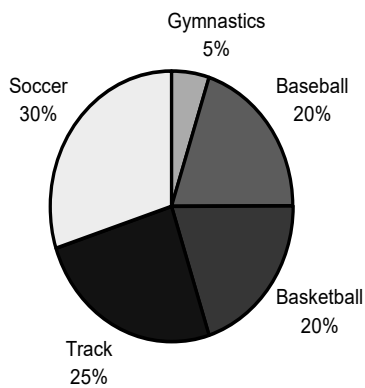


A graph is a tool used to make information or data easier to read and understand? Different types of graphs are used for different things. Below there are several types of graphs. We will talk about a circle graph, Venn diagram, and a line graph. Look at the picture of each graph.

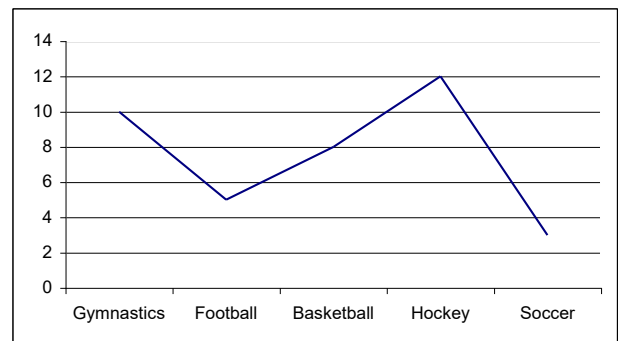
Venn Diagram



Circle Graph



Line Graph

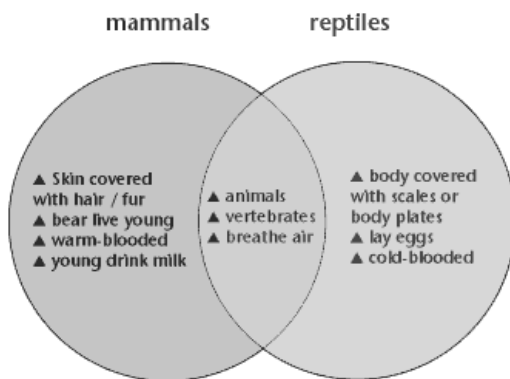


Tracer des figures pour faire une représentation graphique

What Is A Graph?

A graph is a tool used to make information or data easier to read and understand. Different types of graphs are used for different things. In this lesson, we will talk about a Circle Graph, Pictograph, Venn Diagram, and a Line Graph. Look at the picture of each graph.

Venn Diagram



Circle Graph



Line Graph

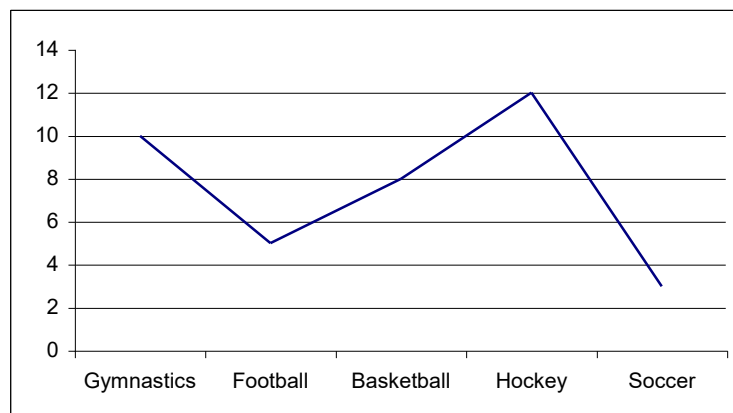


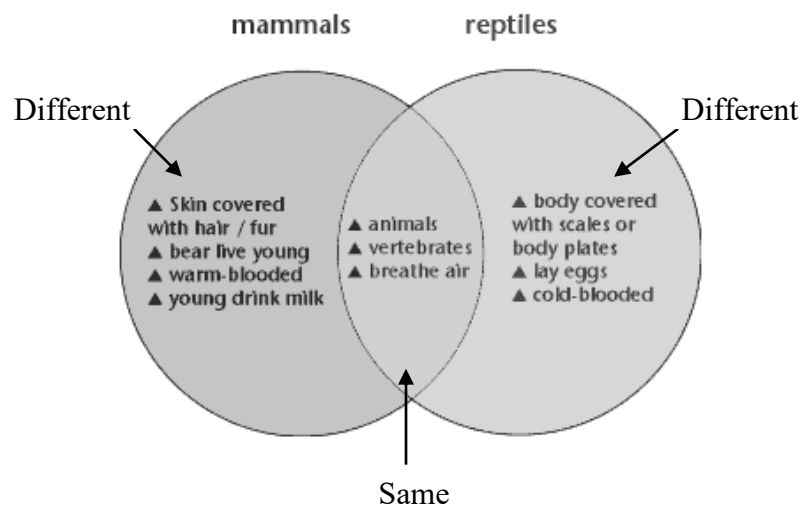
Diagramme linéaire

Tracer des figures pour faire une représentation graphique

Diagramme de Venn

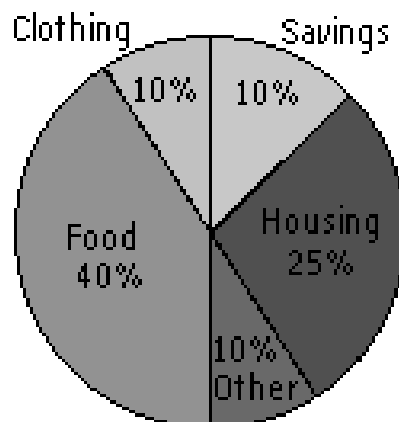
Venn Diagram

A **Venn Diagram** is used to compare and contrast two things. Comparing means to tell how a group of things are similar and contrasting is telling how they are different.



Circle Graph

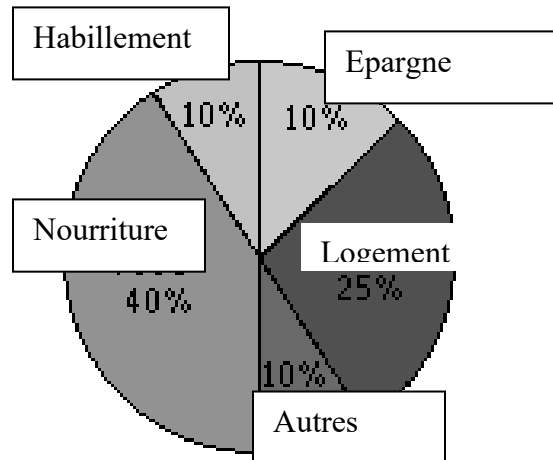
A **circle graph** is used to show parts of a whole. It can also be called a pie graph. A circle graph is broken up into sections to show amounts; usually in percentages.



Tracer des figures pour faire une représentation graphique

Diagramme circulaire

A circular diagram is used to show the portion that represents each under together. It is divided in proportional sectors (often in percentage) of the under together represented, in comparison with the body.



Tracer des figures pour faire une représentation graphique

Activity 1

Create A Circle Graph (Pictograph)

Use the directions below to create a circle graph. Then, think of other data that can be use to make your own circle graph.

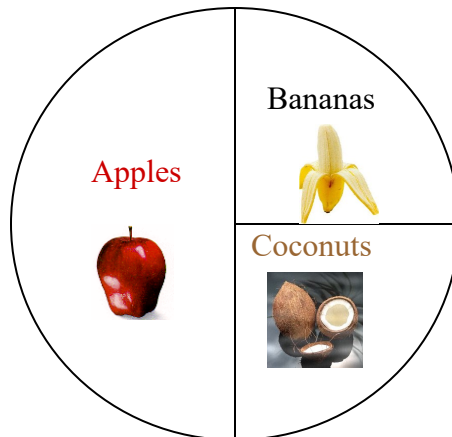
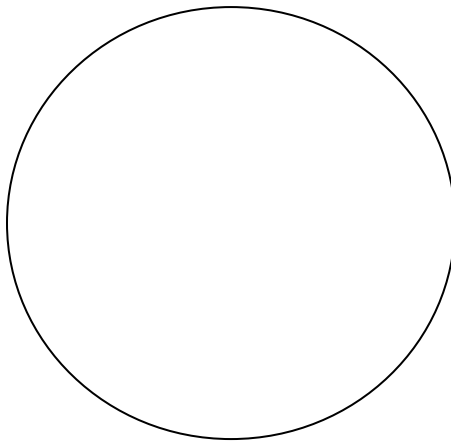
Title of graph: **Our Fruits**

Step 1: Show apples a 50 percent of the circle graph. This would be $\frac{1}{2}$.

Step 2: Show bananas as 25 percent of the circle graph. This would be $\frac{1}{4}$.

Step 3: Show coconuts as 25 percent of the circle graph. This would be $\frac{1}{4}$.

Step 4: Draw a picture of each fruit in each part that is represented **Tracer des figures pour faire une représentation graphique**



Tracer des figures pour faire une représentation graphique

Activity 2

Create a Venn Diagram

Use the directions below to create a Venn Diagram. Then, think of other data that you could use to compare and contrast.

Title of graph: **Bananas vs. Coconuts**

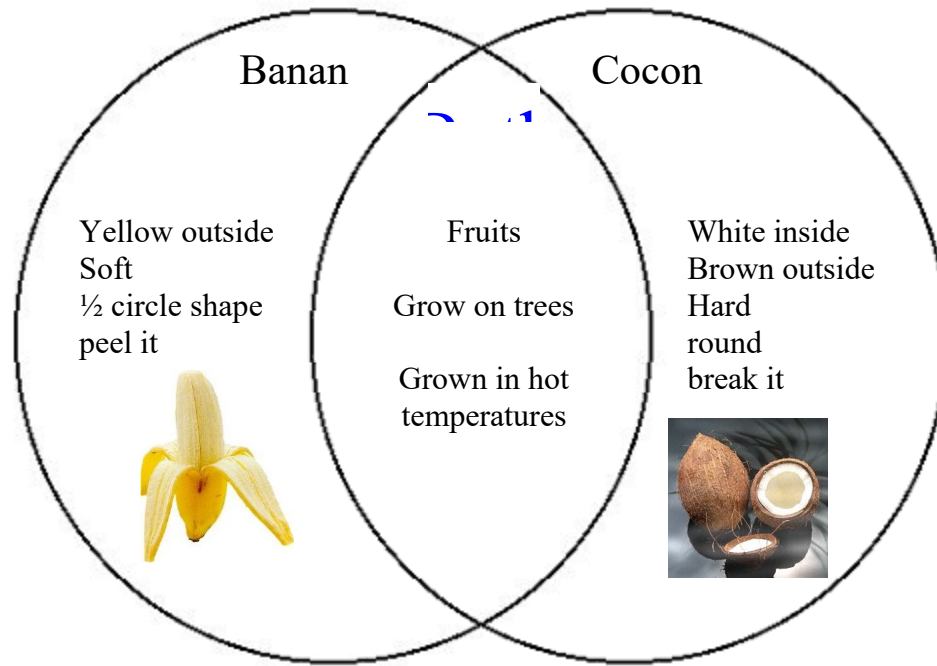
Step 1: Write banana on one side of the diagram and coconut on the other side.

Step 2: Write all the things that you can think of that are similar about bananas and coconuts in the middle of the graph.

Step 3: Write all the things that are different about bananas under the banana side.

Step 4: Write all the things that are different about coconuts under the coconut side.

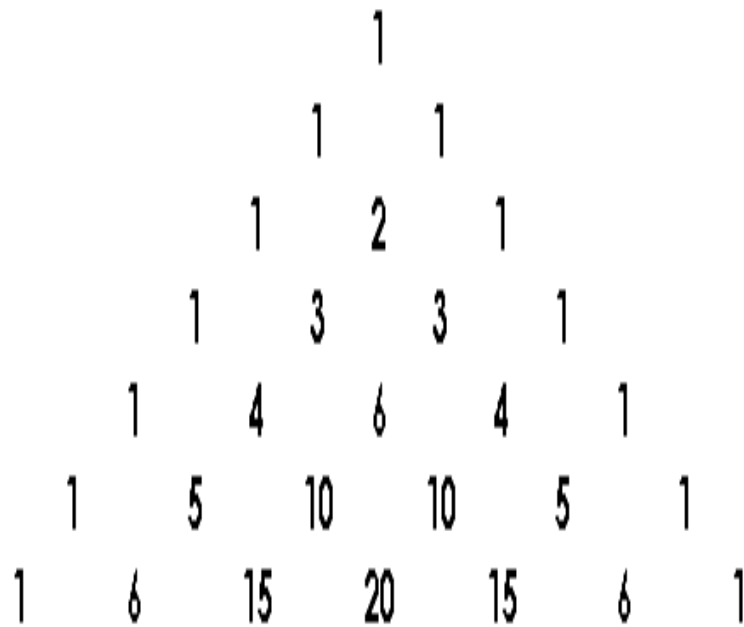
Share your Venn Diagram with your other classmates.



**Grades
5 - 6**

*Theme 4: Figures géométriques :
dimensions et aires*

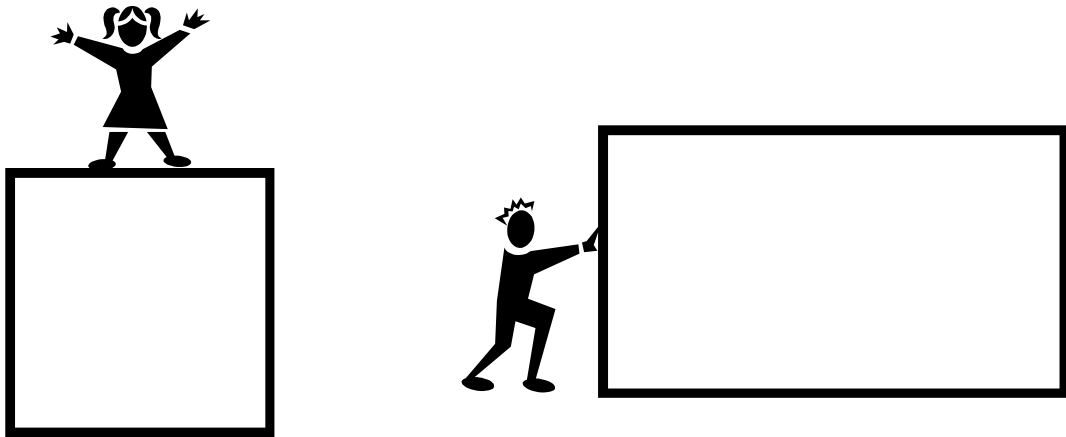
Supplementary Lesson



*Lesson 5:
Recognizing a Polygon*

Recognizing a Polygon

Do You Know?



You already saw these forms or these faces before? Do you know their names? If you say that the figure in left is a square, you have reason. If you say that the figure in right is a rectangle, it is true. All these faces are polygons. These faces also are called quadrilaterals because they have four sides.

Can you say this that these faces have in common? Can you say also this that differentiates them? In this lesson, we will learn the different types of polygons.

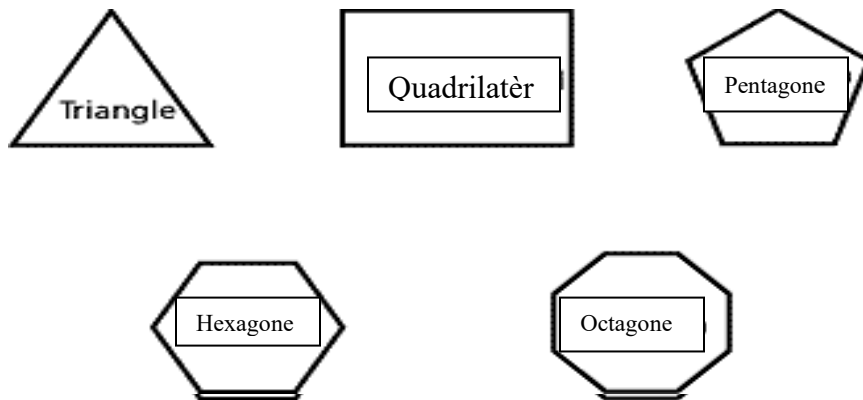
Recognizing a Polygon

Polygons

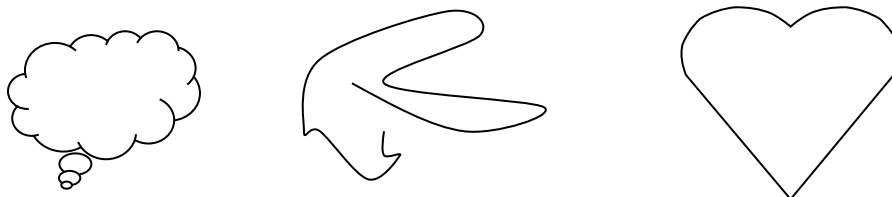
A polygon is a face that has several sides. We see geometric forms around us to every instant. Among these forms, we have the polygons that are faces glide. That means that they have flat forms. A polygon uniquely is formed upright lines; it has not any opening. We can reproduce these forms while using paper or of typical others of materials.

Observe figure them below; they are polygons. For the types that interest us in this lesson, their sides are right segments that do not touch themselves that to their extremities. These faces are closed without that their sides do not cross themselves. Can you count the number aside of each of these polygons? For every face, try to find in the class an object that has the even forms.

These figures are polygons

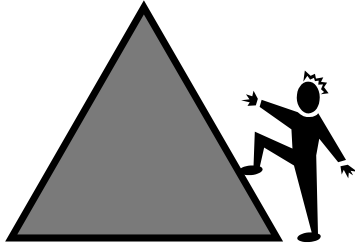


These figures are not plygons

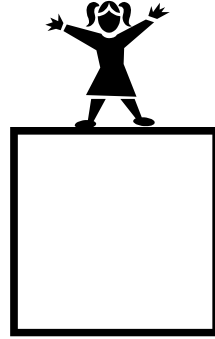


Recognizing a Polygon

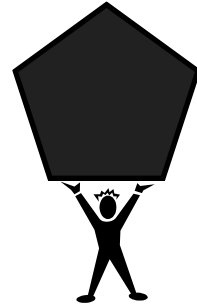
Identifying polygons



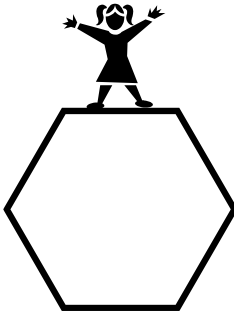
Triangle
(3 côtés)



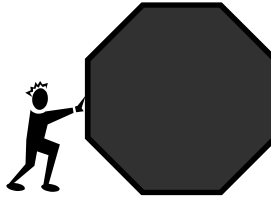
Quadrilatère
(4 côtés)



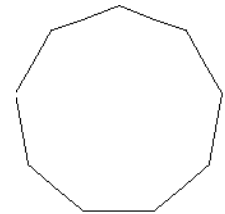
Pentagone
(5 côtés)



Hexagone
(6 côtés)



Octogone
(8 côtés)



Nonagone
(9 côtés)

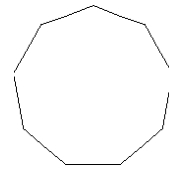
The polygons appear under different forms and with varied dimensions. They are identified by the number of sides that they possess. For example, a square and a rectangle are both of them quadrilaterals, but they have not the even forms. Do you know typical others of quadrilaterals? How many different quadrilaterals can you draw?

Recognizing a Polygon

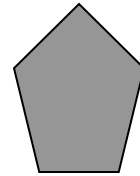
Activity 1

Link up every description of polygon to the face corresponding. Next, can you imagine an exercise of this type to propose to your friends?

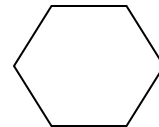
- Polygon with 4 sides



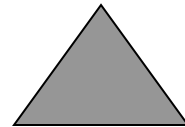
- Polygon with 3 sides



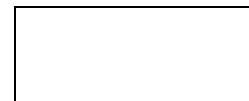
- Polygon with 6 sides



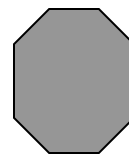
- Polygon with 5 sides



- Polygon with 8 sides



- Polygon with 9 sides

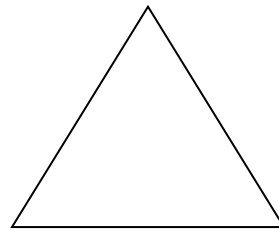
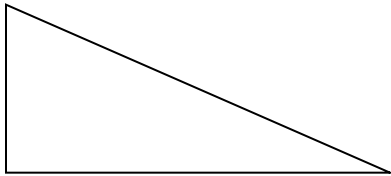


Recognizing a Polygon

Activity 2

Exploring polygons

The polygons are faces with a lot of sides. A polygon is characterized by the number of its sides. For example, the faces below are triangles. There is several types of triangles (isosceles, rectangle, equilateral, etc.), but they all the characteristics to have 3 sides.



Let's Draw Polygons:

3 sides

4 sides

5 sides

6 sides

8 sides

9 sides



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