1. Read data

When you read a data value, you should carefully pay attention to the source of the data, the date of the data, the place (often a country) of the data, the unit of the data. More generally, you should read everything around the data, such as the title of the document, the titles of the axis, etc.: they may provide useful information to understand the data, such as its unit.

Then, you can write a sentence about the value, with all this information, in this way :

« According to (source), in Y (place), in (date), ... »

2. Percentage

Very often we want to know how much a certain value represents in proportion to the total it belongs to. For example, you might want to know the proportion of girls in your class. If there is 30 students in you class, and 20 of them are girls, the answer to this question is :

$$Percentage\ of\ girls = \frac{Number\ of\ girls}{Number\ of\ students} \times 100$$

$$Percentage\ of\ girls = \frac{20}{30} \times 100 = 0{,}667 \times 100 = 66{,}7$$

The percentage formula is :

$$Percentage = \frac{Value}{Total} \times 100$$

Beware : sometimes you have to calculate the total, as it is not given !

Here is a table that presents the number of families by the number of children in France.

Families by number of children in France in 2006

Kind of families	Number of families (thousands)	%
Couples with children	**7758**	
Couples without child	7199	
Single Parents[1]	2358	
Total		

[1] Single parents are families in which there is only one parent (mother or father) living with her/his children.

Source :INSEE

Question 1 : Complete the percent column.
Question 2 : Make a sentence with the underlined value and its percentage.

3. Percentage change

You may want to know how much a certain value changes over time. For instance, a class that had 20 students at the beginning of the year, now has 30. You can calculate the change in the number of students : $30 - 20 = 10$.

But it is much more interesting to calculate the percentage change of students, that is the number of new students in proportion to the number of students at the beginning.

Old Value   *New value*

                                                          Time axis

To do that, you have to :

Step 1 : Calculate the change (subtract old value from the new value)
Here we need to subtract 20 to 30 : 30 – 20 = 10

Step 2 : Divide that change by the old value
Here : 10 / 20 = 0.5

Step 3 : Convert that to a percentage (by multiplying by 100 and adding a "%" sign)
Here : 0.5 x 100 = 50 %

$$Percentage\ change = \frac{(New\ Value - Old\ Value)}{Old\ Value} \times 100$$

Note 1: if the percentage change is positive, it is an increase. If the percentage change is negative, it is a decrease.
Note 2: Contrary to "normal" percentage, **there is no limit to percentage change**: it can be greater than 100%. A percentage change of 100% means that the value has doubled. If the value has more than doubled, the percentage change is greater than 100%.

Kind of families	Number of families in 1990 (thousands)	Number of families in 2006 (thousands)	Percentage change
Couples with children	7991	7758	
Couples without child	5140	7199	
Single parents	1490	2358	

Source : INSEE

Question 1 : Calculate the percentage changes.
Question 2 : Make a sentence with the percentage change of single parents.

4. (multiplier) coefficient

To express an increase, you can also calculate by how much a value has been multiplied. For instance, the number of students has been multiplied by 1.5 since the beginning of the year. 1.5 is called a multiplier.

$$multiplier = \frac{New\ Value}{Old\ Value}$$

For instance, we can express the increase of single parent families by a multiplier.

Multiplier = ----------------------- =

Between 1990 and 2011, the number of single families has been multiplied by --------------- .

SUMMARY

Percentage	Percentage change	Multiplier
$Percentage = \dfrac{Value}{Total} \times 100$	$\dfrac{\left(New\,Value - Old\,Value\right)}{Old\,Value} \times 100$	$Multiplier = \dfrac{New\,Value}{Old\,Value}$
The value represents x % of the total. *Example: girls represents 66,7 % of the students.*	The value has increased/decreased (by) x % between this date and that date. *Example: the number of single families has increased (by) 30 percents between 1990 and 2011.*	The value has been multiplied by x *Example: the number of single families has been multiplied by 1.5 between 1990 and 2011.*

SYNTHESE :

Pourcentage de proportion	Pourcentage de variation	Coefficient multiplicateur
$Pourcentage\,de\,répartition = \dfrac{Sous\,Ensemble}{Ensemble} \times 100$	$\dfrac{\left(Valeur\,d'arrivée - Valeur\,de\,départ\right)}{valeur\,de\,départ} \times 100$	$Coefficient\,multiplicateur = \dfrac{Valeur\,d'arrivée}{valeur\,de\,départ}$
La donnée représente x % de l'ensemble. *Exemple : les filles représentent 66,7 % des élèves de la classe.*	La donnée a augmenté/diminuée de x % entre telle et telle date. *Exemple : le nombre de familles mononparentale a augmenté de 30 % entre 1990 et 2006.*	La donnée a été multipliée par x *Exemple: le nombre de famille monoparentale a été multiplié par 1,3 entre 1990 et 2006.*

Keywords :

data: données (au sens de chiffres dans des statistiques)
unit: unité
data value: une donnée
value: valeur
percentage or percent: pourcentage
axis: axe
table: tableau
value: valeur
change: modification, changement, évolution
subtract: soustraire
divide: diviser
multiplier: coefficient multiplicateur