Statistical graphs	Season	01
	Episode	03
	Time frame	1 period

Objectives :
- Discover five different types of statistical graphs.
- Get information from statistical graphs.

Materials :
- *Pdf file in English : ClimateReport.pdf (from* `http://www.statistiques.equipement.gouv.fr/rubrique.php3?id_rubrique=558` *)*
- *Computers.*

1 – Discover five types of graphs

15 mins

Students work by two on computers. This activity is based on a report about climate issued by the French government. They are also given a task sheet. In the first part, they have to find in the document examples of five types of graphs.
A discussion can be about graphics that combine different types or none.

2 – Get information from statistical graphs

Remaining times

Using the document, students have to find or compute some information to answer some question from a task sheet.

Statistical graphs	Season	01
	Episode	03
	Document	Task sheet

For this activity, we will work with a report about climate issued by the French government in 2010. The file ClimateReport.pdf is stored in the folder `Partage Eleves/Seconde Euro`. Open it with Adobe Acrobat Reader.

Part 1 – Five types of statistical graphs

In this part, we introduce five important types of statistical graphs.

Definition 1

In a *frequency polygon*, the values are shown on the x-axis and the frequencies are represented by the height of a point located above the score (on the y-axis). The points are then connected to form a polygon.

Definition 2

A *histogram* is used when values are gathered into class intervals, or when the data are qualitative. The intervals are shown on the X-axis and the frequencies for each interval are represented by the areas of rectangles located above each class interval.

Definition 3

In a *scatter plot*, the data is displayed as a collection of points, each having the value of one variable determining the position on the horizontal axis and the value of the other variable determining the position on the vertical axis.

Definition 4

A *pie chart* is a circular chart divided into sectors. In a pie chart, the arc length of each sector (and consequently its central angle and area), is proportional to the quantity it represents.

Definition 5

A *bar graph* is a chart with rectangular bars with lengths proportional to the values that they represent. The bars can also be plotted horizontally.

Your task : Find in the document one or two examples of each type of graph. Give explicitly the title of the graph and the page where it can be found. *Call the teacher when you've finished this part.*

Graph	Title	Page
Frequency polygons		
Scatter plots		
Histograms		
Pie charts		
Bar graphs		

Part 2 – Get information from statistical graphs

Part A – Global GHGs by type of gas, page 12

1. What type of graph is that ?
2. Explain the acronym GHG.
3. According to the pie chart, what gas represented most of the emissions in 2004 ?
4. In the text, it is said that CO_2 emission represented the $^3/_4$ of global emissions in 2004. Is this sentence consistant with the pie chart ?
5. The global emission in 2004 reached 49 Gt CO2eq (49 Giga tons equivalent CO_2). Use this information to compute the emissions of carbon dioxyde, methane and nitrous oxyde in Gt CO2eq.

Part B – Regional Distribution of GHG Emissions per capita, page 13

1. This graph is not exactly of one of the types we've seen, but it looks a lot like one. Which one ?
2. On the x-axis is shown the cumulative population in billions.
   a. Where can the world population in 2004 be seen on this graph ?
   b. What region has the largest population ?
   c. Order the regions according to their population.
3. On the y-axis is shown the average GHG emissions per person, in tons equivalent CO_2.
   a. What region has the highest average GHG emissions per person ?
   b. Order the regions according to their GHG emission per person.
4. Explain the link between the percentage indicated for each region and the area of each rectangle.

Part C – CO_2 Emission Factors for the Principal Fossil Fuels, page 21

1. What kind of graph is that ?
2. Find in the text the information presented here. As an example, explain the value 3.1 for Kerosene.
3. According to the graph, what kind of fuel emits the most CO_2 ? What kind of fuel emits the less ?
4. Using the graph, find three fuels that emit the same amount of CO_2.
5. Answer the two previous questions with the table. What do you notice ?
6. Could you correct the graph ?

Part D – Energy-related CO2 Emissions Worldwide, page 16

For this graph, the Energy-related CO_2 emissions of 1990 have been taken as the base (index 100) for every category.

1. What type of graph is used here ?
2. How many such graphs are drawn together ?
3. According to these graphs, what country or group of countries had the greatest increase in energy-related CO_2 emissions between 1990 and 2007 ?
4. Are there some periods when the emissions have decreased in France ?
5. From this graph, can you say what country or group of countries had the greatest emissions in 2000 ?

Part E – Estimated global mean temperature, page 7

1. What type of graph is that ?
2. What information is given on each axis ?
3. According to this graph, what year was the warmest between 1850 and 1900 ? What year was the coldest ?
4. The text says that "the global average temperature has increased by approximately $+1°C$ over the last century". How can this be seen on the graph ?
5. Explain the red, purple, orange and yellow lines on the graph ?
6. What do these lines show about the global temperature ?