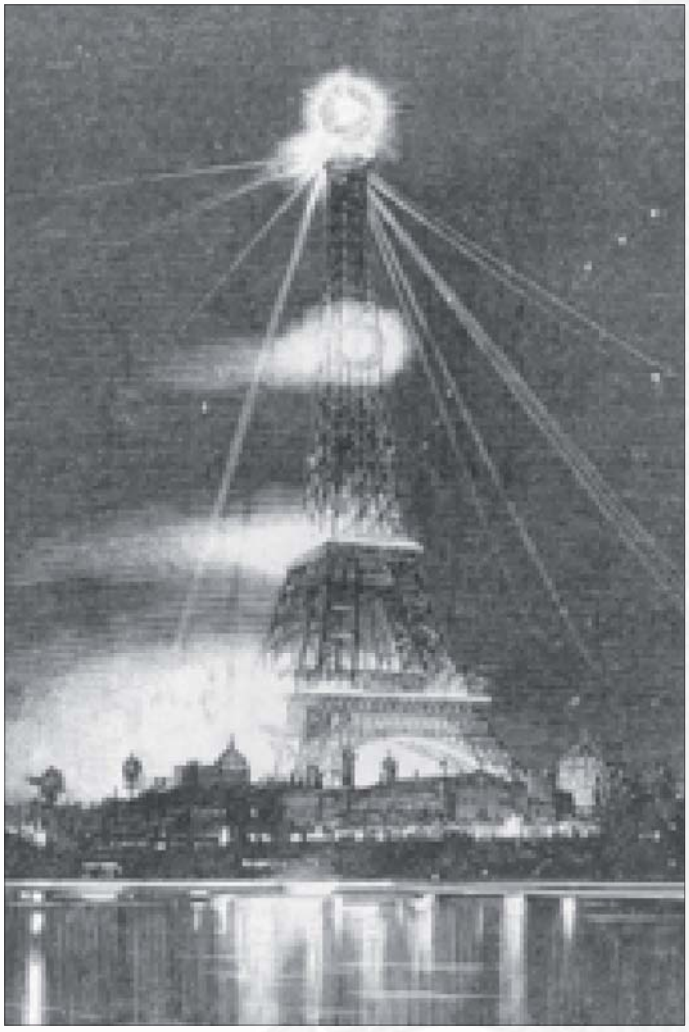
11 The Tower and its lights

Lights

Since its construction, the lighting system of the Tower has often changed. It was first lit by gas burners (10,000) while a light placed at the very top lit the surroundings of the monument.



Lights 1889

In 1900, as a result of technical developments, the Tower was lit by a set of 5,000 electric bulbs. This was in fact the main theme of the universal Exhibition held that year.

Lights 1900

In 1925, André Citroën brought colours and lights on three sides of the Tower and in 1933, he added a clock whose hands were represented by light beams that successively went on to indicate the hours.
This advertisement stayed on the Tower during a period of 10 years and in 1937, André Granet decorated the Tower with light lace on the occasion of the international Arts and techniques exhibition.

Citroën lights 1925 - 1936

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From 1958 onwards, 1,290 lights lit the Iron Lady.
In 1985, a new golden lighting system was installed. It was designed by a light expert engineer, Mr. Pierre Bideau and it consisted of 336 orange coloured yellow high pressure sodium projectors. The beams of the lamps were oriented from the bottom upwards in order to light the Tower from the inside of its structure.
Check the site, there is a new sentence in this regard.
On December 31, 1999, the Eiffel Tower was transformed into a lighthouse by means of two light beams of a 80 km range and four motor driven projectors controlled by a computer that synchronized the beaming movements so as to draw a double cross shaped beam in the sky. This "lighthouse"complies with Gustave Eiffel's wish who wanted his Tower to be a universal and symbolic landmark.
To complete its « costume » a sparkling effect was superimposed over the golden lighting.

lights year 2000

The sparkling (which had been designed to be temporary) used in the year 2000 was changed in June 2003 and replaced by a permanent device.
This new installation required the work of 25 alpinists over a period of 5 months, the installation of 20,000 flashing lights, 40 kilometers of fairy lights and power supply cables, 60 tons of iron fittings and metal parts.
The Eiffel Tower follows and covers political and sports events and in 2004 it displayed for a few days the colours of China to celebrate the Chinese New Year on the occasion of China's Minister of Culture's trip to Paris.
On May 9, 2006, it displayed blue lighting to commemorate the twentieth anniversary of the « Journée de l'Europe ».
In 2007, on the occasion of the rugby world cup, the bottom part of the Tower was lit green to represent the lawn while light beams drew the goals and a giant ball hung under the second floor.
In 2008, the Tower celebrates France's Presidency of the European Union, displaying blue lights and the twelve yellow stars of the European flag. The lights will go on every evening from June 30 to December 31.

Consumption of electricity

All of these lights are fed by Électricité de France and the monument consumes 7,500,000 kWh per year, 25% of which is consumed by the lighting system. 19 transformers are used.
In case of power cut, three generator sets will automatically take over. The lighting system consists of more than 100 different types of lamps, representing a total of 10, 000 bulbs and 80 km of electric wires in order to light and illuminate the Tower.
Since 2007, on the occasion of the « Journée de l'Énergie » (Save Energy Day), the Tower has been switched off for 5 minutes every month of February to commemorate the anniversary of the Kyoto Protocole.
The Tower also contributes to the sustainable development movement. 100% of its energy comes from renewable energy sources and the Tower has reduced its electricity consumption by 30% using new bulbs. Solar energy devices are being examined.

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Exercises

CP - CE1

French / Reading / Grammar

EDUCATIONAL OBJECTIVE

Understanding the relationship between the verbal tenses (past, present, future) and events that have already occurred, events that are in process, and events that have not yet occurred.

En 1889, les becs de gaz éclairaient la Tour. En 1900, des ampoules électriques ont illuminé la Dame de fer. L'éclairage actuel se compose de 20 000 lampes à éclats et durera encore quelques années.

• Tell the pupils to find the verbs contained in the above sentences (éclairaient, ont illuminé, se compose, durera) and to place the events along a chronological time line.

• In CE1, have the pupils identify the four tenses of the verbs.

• Point out the words that also show the « location » along a time line: In 1889, In 1900, actuel, quelques années.

• At the end of the sentences, indicate Pa (past), Pr (present), F (future).

Aujourd'hui nous grimpons au premier étage, par les escaliers.
L'ascenseur montait très vite.
Tu m'attendras lorsque tu seras arrivé en haut !
L'année dernière les illuminations étaient superbes !
La tour a été le monument le plus haut du monde pendant quarante ans.

• Tell the pupils to write sentences using the past, present and future tenses. Clearly explain the tenses of the verbs and the words that locate the action in the past, in the present or in the future.

• For younger pupils, just give the beginning of sentences.

Ex : Avant j'allais à l'école maternelle, maintenant je suis au CP (CE1), bientôt je serai en CE2.

French / Reading/ Vocabulary

EDUCATIONAL OBJECTIVE

Recognizing the words that belong to a same family, identifying the prefix and the suffix.

La Tour Eiffel n'est sans doute jamais aussi belle qu'à la tombée de la nuit, quand elle revêt son habit de lumière...
Dès son inauguration, la Tour est illuminée, d'abord par dix mille becs de gaz, puis dès 1900 par cinq mille ampoules électriques.
De 1925 à 1936, une publicité lumineuse pour Citroën, visible à quarante kilomètres, s'installe sur trois faces de la Tour.
La Tour Eiffel aime les couleurs et c'est en bleu qu'elle entre dans le troisième millénaire, alors qu'en janvier 2004, elle se colore en rouge pour célébrer le nouvel an chinois.
Depuis 2007, elle réduit sa consommation d'électricité de 40 % et en février, à l'occasion de la journée de l'énergie, elle suspend son illumination durant cinq minutes.

• Find the words that belong to the same family as « lumière » in the above text (illuminée, lumineuse, illumination), and find other words that belong to the same family (allumer, rallumer, allumette...).

• Proceed in the same way for the word « colore », (coloris, colorier, bicolore, tricolore..., décolorer, coloration, décoloration...).

• Explain the radical, the suffix and the prefix of the words that belong to the same family as « lumière ». The prefix modifies the meaning of the word while the suffix changes the nature of the word.

• Find the radical, the prefix and the suffix of the following words: kilomètres, millénaire, consommation, suspend and words that belong to the same family as the word « couleur ».

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Exercises

CE2 - CM1 - CM2

Discover the world / Science and technology

EDUCATIONAL OBJECTIVES

Understanding how electric appliances work, doing research work, learning how to observe and ask questions, handling and experimenting.

Formulating a theory and testing it, justifying.

Testing various solutions.

Building electrical circuits fed by batteries.

• For the pupils of cycle CP-CE1, 3 sessions will be necessary to implement the total sequence, for cycle CE2-CM1-CM2, the first 2 parts may be carried out during the first session.

• Supplies - Each pupil (or group of 2) must have a bulb (flashlight type), a flat battery, a sheet of paper, a pencil and an eraser and 15 to 20 cm of conductive wire.
The pupils work in pairs and enter the results of their experiments.

• Introduction - What is electricity? (write the answers on the board grouping the ones that are closely related.
Each pupil must observe his bulb and draw it on the sheet of paper.
Put all the drawings together, compare them and mark the various parts with arrows and then give the vocabulary that should be used: glass, stud base, filament, insulating pearl.
Hand out the drawing of the bulb where the pupils have to write the words of the various parts. Ask the following question: How can we get the bulb to shine or light?

• Give the students flat batteries and suggest to them that they « light » the bulb by placing it in such a way that it touches the battery.
Listen to the pupils' theories and write them on the board.
Have the pupils give their theories before they start handling the bulb and make experiments.
Let the pupils experiment and find a way to light the bulb by themselves.
Finally, have the pupils draw up « reports » about the experiments, or drawings showing under what conditions it is possible to light the bulb and make it shine.
Expected conclusion - « In order that the bulb can be lit, the base must be in contact with one of the poles of the battery and the stud must be in contact with the other pole".

• Tell the pupils to make the bulb shine by using the wires in addition to the bulb and battery.
Ask the pupils to come up with other theories.
Draw the diagram after they have managed to switch the battery on.
It is also possible to explain the part played by the insulator and by the conductor while handling various materials.