

TOM AND LUCIE LEARN ABOUT HYDRO POWER Come and join them!

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# FROM WATER TO ELECTRICAL POWER

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### What do rain and clouds do?

When the weather is very warm, water evaporates into the air and water vapour is formed. Higher up where the air is cooler, condensation causes clouds to form. Air movement causes water droplets to coalesce into large drops which fall in the form of rain or snow.

EDF has built dams on some watercourses. This forms a reservoir that is artificially fed by rainwater and snow melt.

Water impounded by the dam will be used to generate electricity!

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# WATER, A SHARED NATURAL RESOURCE

### Dams, useful structures

In addition to generating electrical power, EDF reservoirs are used for numerous purposes:

- they supply towns and cities with drinking water,
- they are used for the irrigation of crops, even in times of drought,
- they support and improve river navigation,
- they are used for water sports as well as providing a pleasant environment for fishermen and tourists.
   The volume of water impounded in EDF

reservoirs accounts for 75% of surface water storage in France.



# HYDRO POWER: THE LEADING RENEWABLE ENERGY SOURCE

# The working principle of a hydro power plant is very simple

The water accumulated by dams provides a continuous source of energy to spin a turbine (wheel).

When it spins, this turbine drives a generator which converts hydro power into electrical current. The water accumulated by dams is used to generate power whenever it is needed.

More than 10% of France's electricity is generated by this clean and constantly renewable source of energy.

EDF, the European Union's leading hydro power producer, operates nearly 450 hydro power plants and 600 dams in France.

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- 1 Reservoir
- 2 Dam
- 3 Penstock
- 4 Turbine

- 5 Generator
- 6 Transformer
- 7 High-voltage power lines



# STAY ON YOUR GUARD IF YOU'RE STANDING NEAR A RESERVOIR

Steep banks and deep water make swimming and water sports dangerous.

If you are sailing or swimming in a lake, abide by the signs and stay outside the buoy lines near the dam.

Swimming and water sports are prohibited in the area between the buoys and the dam.

### **DANGER, BEWARE**

#### **IT IS DANGEROUS**

to venture into the bed of this watercourse or onto the islands or sandbanks. Water levels may rise due to the operation of hydro plants and dams.

#### DANGER! EDF RESERVOIR

Steep, unstable banks and deep water make swimming and boating dangerous. These activities are strictly forbidden within 300 metres of dams and gates. DAMS AND HYDRO PLANTS: WATER LEVELS MAY SUDDENLY RISE, EVEN IN FINE WEATHER EFAHR! STAUDĂMME UNE KRAFTWERKE : RASCH ANSTEIGNEDES HOCHWASSER MÖGLISCH SOGAR BEI SCHÖNEN WETTER

#### **DANGER!** BARRAGES ET CENTRALES

RISQUES DE MONTEE SOUDAINE DES EAUX, MÊME PAR BEAU TEMPS



# STAY ON YOUR GUARD NEAR THE RIVER EDGE

### Be careful:

Never venture into the middle of a watercourse where there are hydroelectric facilities.

When electrical power is generated, large amounts of water are released. This causes river levels to rise very quickly, even in fine weather.

You could be carried away by the current, sucked in by a whirlpool and drowned, even if you're a good swimmer.

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### **DANGER, BEWARE**

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RISQUES DE MONTEE SOUDAINE DES EAUX, MÊME PAR BEAU TEMPS



# STAY ON YOUR GUARD IF YOU'RE STANDING NEAR A CANAL

In certain areas, EDF has built canals that carry water to the plant. It is dangerous to go near a canal, even if there are roads that are reserved for EDF to perform maintenance. Walking along the edge of a canal is dangerous and fishing on the edge of a canal is PROHIBITED. Signs have been posted for your safety. It is important that you abide by them. When hydro plants are running, water in the canal may rise quickly, creating strong and dangerous currents.

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ÉLECTRICITÉ DE FRANCE

**DANGER!** 

**NO ENTRY** 

**DANGER** !



## DON'T BE CAUGHT OUT BY THE SIGNS

Match the correct hazard signs with the scenes shown below.





A - Risk of drowning



B - Risk of being carried away by the current



C - Risk of falling

## **EVEN BOATS CAN GET INTO TROUBLE!**

#### Try to identify the silhouettes of careless boaters.



- 1/ When water is released downstream of a hydro plant, river levels rise:
  - A In a few minutes
  - B In a few hours
  - C In a few days

# **MINI QUIZ**

#### 2/ Am I safe if I'm in a boat downstream of a hydro plant?

- A Yes, always
- B Yes, but only if I'm on a surfboard
- C No, never. I'm no safer than a walker or a swimmer

## QUIZ: HELP TOM TO FIND THE RIGHT ANSWERS TO QUESTIONS ABOUT DAMS!

Place a cross next to the right answer(s).

### 1/ The first dam builders

were beavers

A - True B - False

#### 2/ How many dams are there in the world that measure more than 15 metres in height?

- A Fewer than 5 000
- B About 10 000
- C Nearly 50 000

#### 3/ What is a dam used for?

- A To irrigate farmland
- B To impound water
- C To supply drinking water

#### 4/ What equipment does a hydro plant use to generate electricity?

- A A transformer
- B A generator
- C A transistor
- D An alternator

### 5/ What determines the capacity of a hydro plant?

- A The amount of water flowing through it
- B The hydraulic head
- C Water quality

#### 6/ What period of history saw the invention of water mills using hydro power?

- A Antiquity
- B The Middle Ages
- C The Renaissance

### 7/ What instrument is used to measure water velocity?

- A Current meter
- B Piezometer
- C Aquameter

#### 8/ When is it safe to swim or fish downstream of a hydro plant?

- A Always, but especially after an afternoon nap and before tea time
- B From 2 p.m. to 4 p.m. only
- C Never, water may be released at any time

### 9/ When water is released, you could:

- A Be carried away by the current
- B Fall, hit a rock, be injured or be knocked unconscious
- C Drown, even if you are a good swimmer



Answers: 1-A; 2-C; 3-B; 4-D; 5 - A and B; C A; 7-A; 8-C; 9 - A, B and C

# WATER RELEASES, WELL I NEVER!

### **BEFORE THE WATER RISES...**

1 - Spot the 7 differences between the two pictures!





### AFTER THE WATER HAS RISEN...

Between pictures 1 and 3, the water level has risen suddenly and the current has become very strong.

2 - Each graduation is equal to 5 cm. By how many centimetres has the water risen downstream of the dam?

A - By about 10 cm
B - By about 50 cm
C - By about 80 cm
D - By about 1.5 m





## DECIPHER LUCIE'S MESSAGE AND WRITE IT IN THE SPEECH BUBBLE!

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### ADOPT THE RIGHT BEHAVIOURS





# STILL WATERS, RUN DEEP!

#### **DANGER, BEWARE**

IT IS DANGEROUS to venture into the bed of this watercourse or onto the islands or sandbanks. Water levels may rise due to the operation of hydro plants and dams.



### Be careful

Never venture beyond the buoys on the edge of a dam.

### **Be careful**

If you're standing near a river bank, the water may rise at any moment, even in fine weather. Abide by the signs. Beware of drowning hazards.



IT IS DANGEROUS to venture beyond this point as the gate may open automatically.



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#### DANGER ! EDF RESERVOIR

Steep, unstable banks and deep water make swimming and boating dangerous. These activities are strictly forbidden within 300 metres of dams and gates.

## Be careful

You are not allowed to walk near canal banks. You could fall in and drown. DANGER!

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www.edf.fr/calme-apparent-risque-present