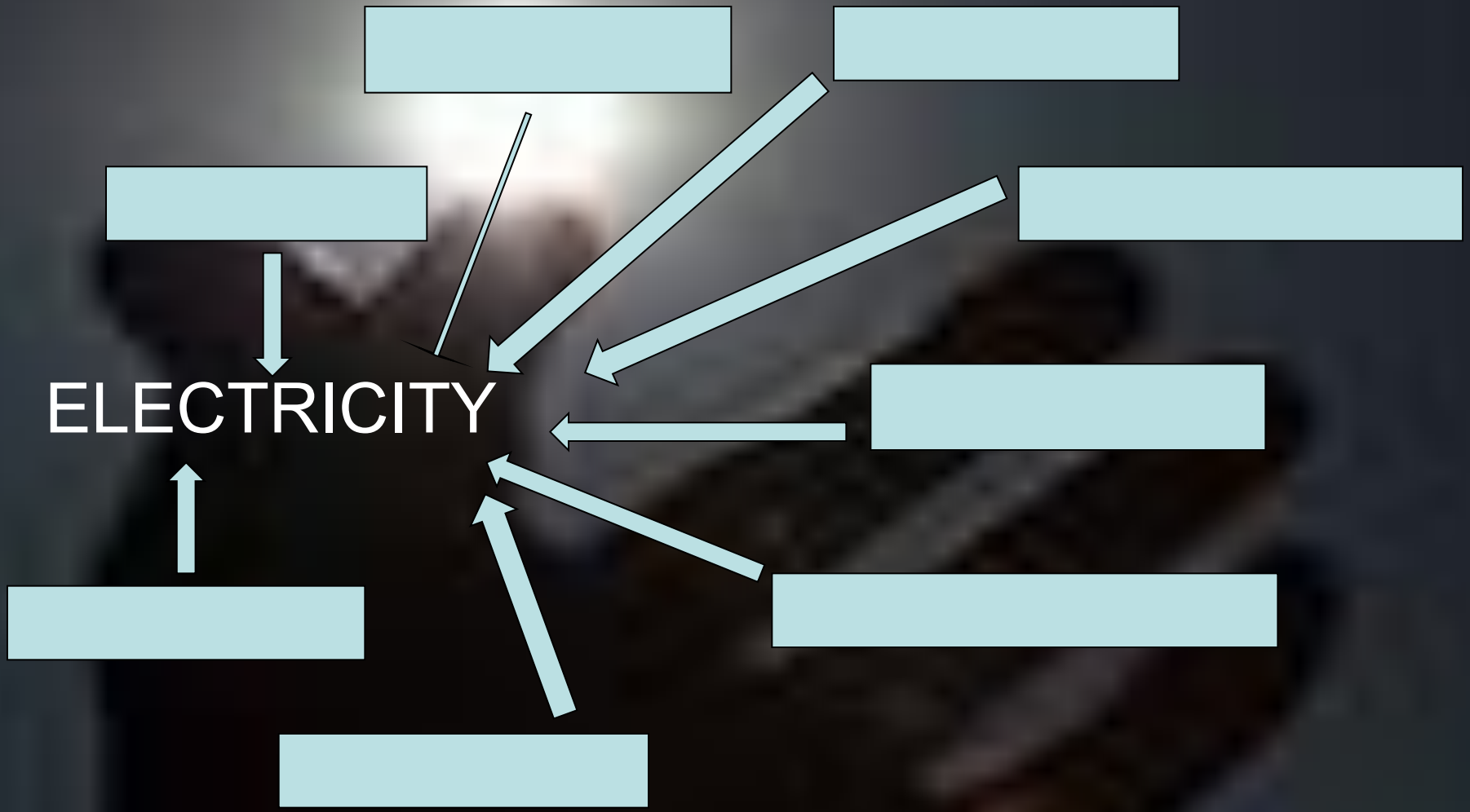
June, 8, 2010

ELECTRICITY

Ryazan College of Electronics

Think of some words which remind you about electricity.



Match the word and its definition.

- A machine for producing electricity
- Energy or force that can be used to do work
- A substance able to attract iron, either natural or by means of electric current
- A flow of electricity through something or along a wire or cable
- A supply of electric current for heating, lightning, etc
- An engine or motor whose driving-wheels turned by a current of water, steam or gas
- A closed path for an electric current

current

electricity

circuit

power

generator

magnet

turbine

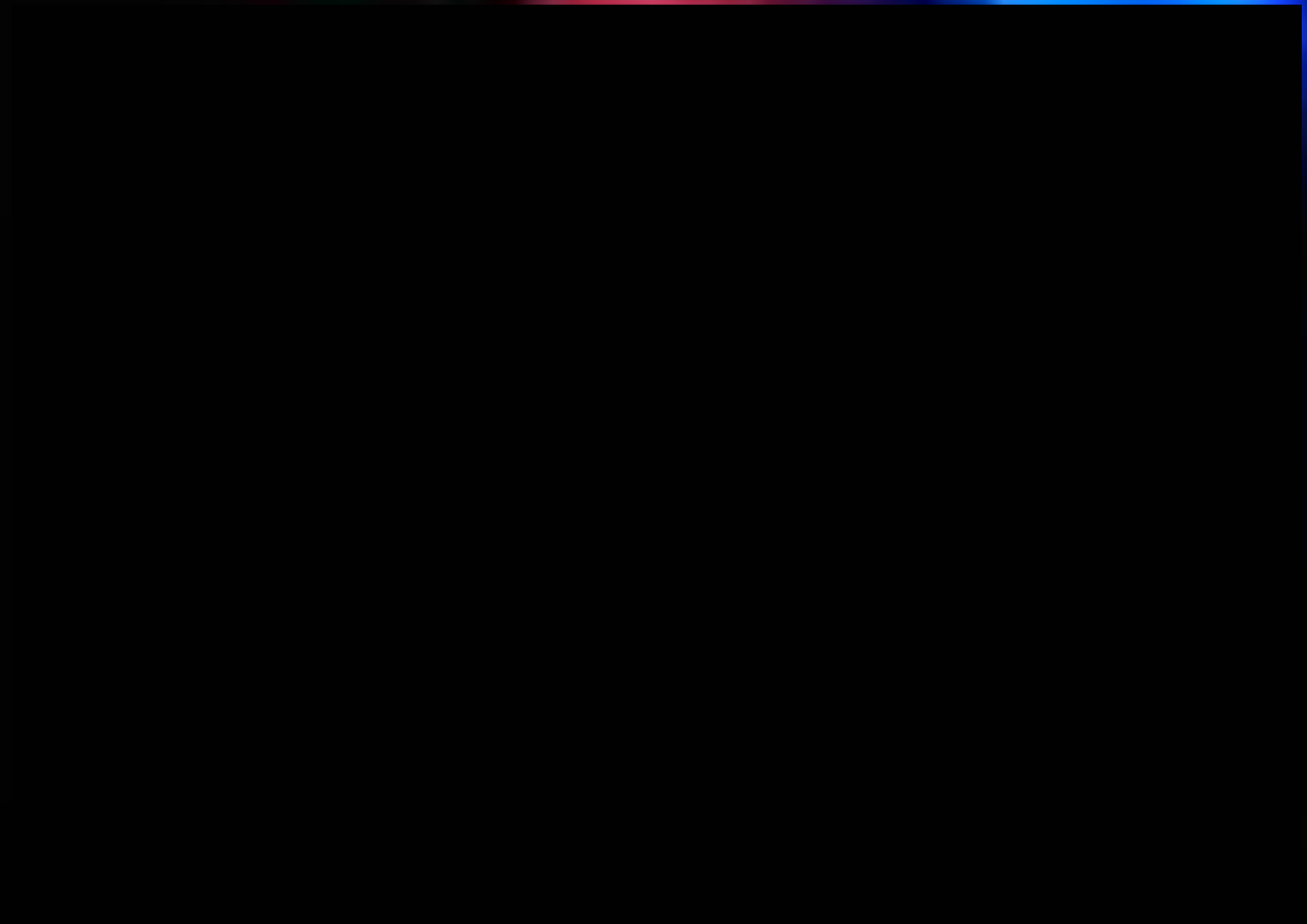
Click on any of the vocabulary words below to hear them pronounced and used in a sentence. Translate these sentences.

ELECTRICITY

ELECTROMAGNET

GENERATOR

Watch the cartoon and try to remember as many details as possible



Now read some information and compare it with the information from the cartoon. Is there something new for you?

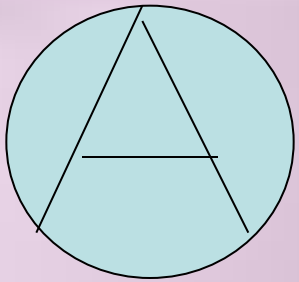
The ancient Greeks knew about static electricity back around 500 BC. They had discovered that a gold colored material called amber could be made to attract small objects, like bits of a feather, when the amber had been rubbed with a piece of fur.

Ben Franklin discovered the electricity in lightning in 1752, although nobody knows exactly how he did his experiment. Franklin was a careful scientist, and would have known that flying a kite in a thunderstorm could have deadly effects,. Both the ancient Greeks and Ben Franklin had discovered examples of naturally occurring electricity. Their discoveries were amazing in their time, but not really useful yet. One of the first practical uses of electricity occurred in England in 1858, when electricity was first used to power the lamp in a house.

Are you good at electricity? Match the objects with their symbols.

Cell, 6V battery, wire, bulb, switch, ammeter, voltmeter, ohmmeter

a



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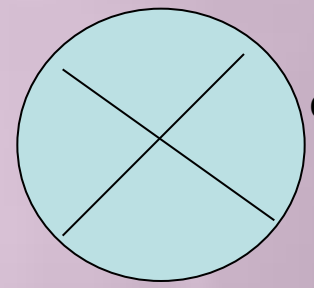

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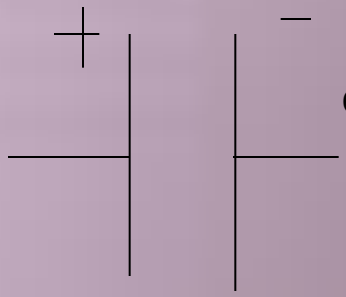

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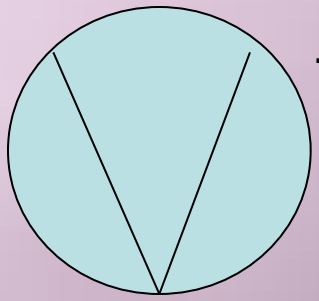

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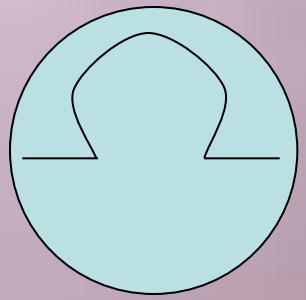

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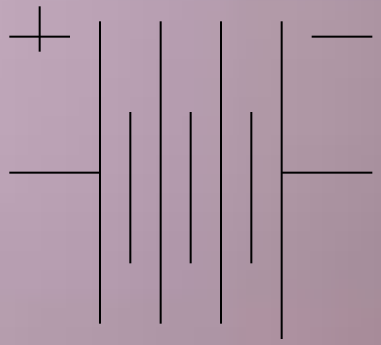


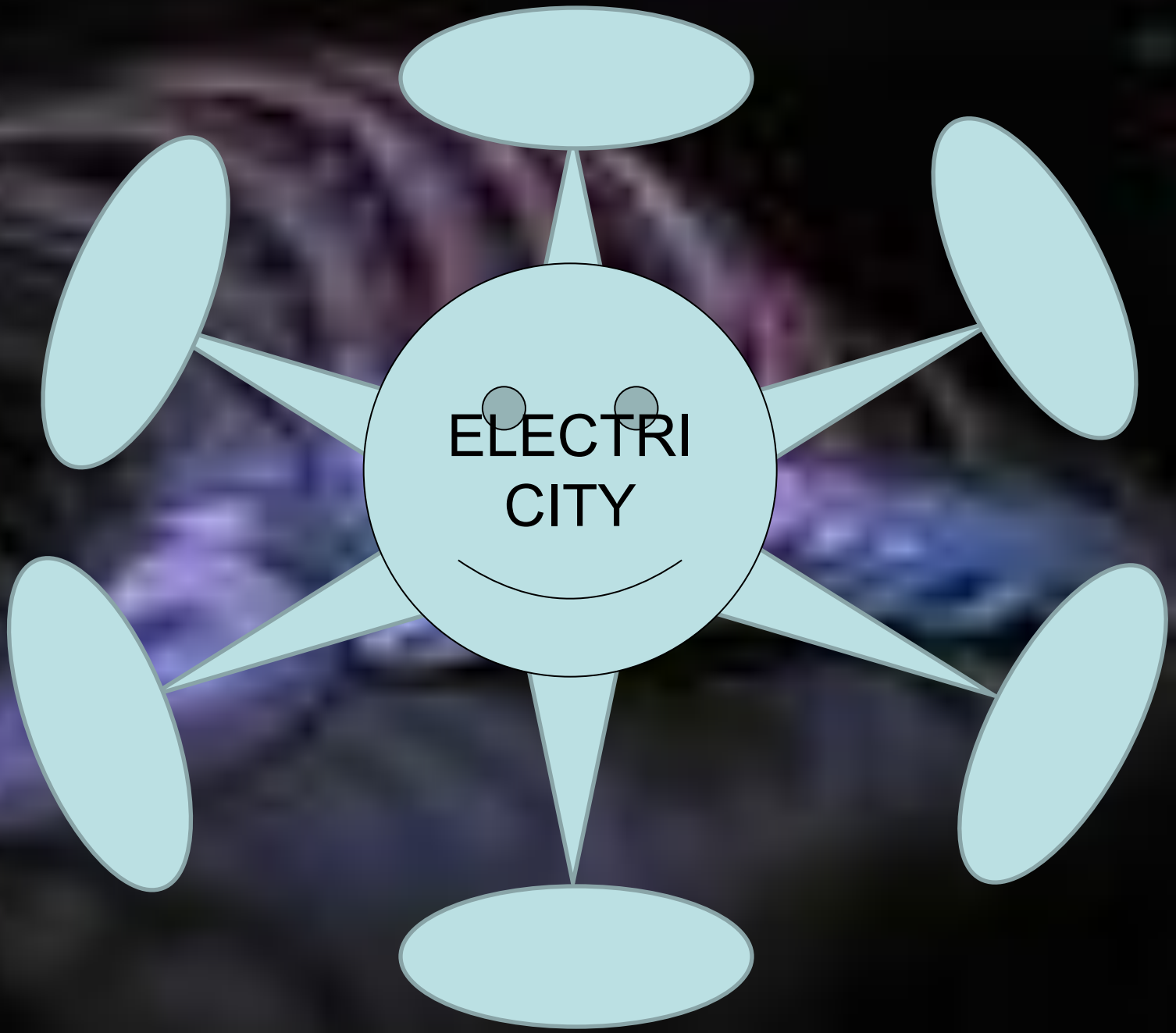
h

Read some more information and complete the following diagram.

Electricity is used in homes, and also to power industry, and to provide communication and transportation. Home uses of electricity include heat and light, as well as power to run appliances and games. Factories use electricity to power the machines used to produce all kinds of goods. Communication systems that depend on electricity include telephone service, television and radio, and the Internet. There are streetcars and subways powered by electricity. Other types of transportation, such as planes and ships, depend on electricity for navigation equipment.

ELECTRICITY

APPLICATION



Electricity occurs in 2 different forms

Static
Is stationary
E.g. Brush your hair

Current
Flows around circuit
E.g. turn on light

Match the words with the opposite meaning

To turn into (on)
Insulator
To decrease
Direct
Initial
Opened
Step-up
Advantage
Series
Positive
Resistance
Constant

to increase
to turn out (of)
closed
step-down
alternating
final
conductor
conduction
variable
disadvantage
parallel
negative

Static Electricity

- Occurs with materials which are insulators
- Rubbing adds or removes electrons
- Object becomes charged
- Like objects repel, unlike attract

Current Electricity

Electrons flow through a conductor

Negative to positive

Circuit = continuous path for electrons to flow

Needs energy supply

Energy user

Find the English equivalents in B to the Russian words in A.

A	B		
Выпрямитель	Condenser	Rectifier	Capacitor
Обмотка	Voltage	Winding	Insulator
Первичный	Primary	Secondary	Early
Передавать	To keep	To store	To transmit
Нить накала	Filament	Gap	Coil
Частота	Resistance	Frequency	Alternation
Переменный	Direct	Alternating	Different
Сопротивление	Function	Resistance	Trouble
Емкость	Value	Main	Capacity
Измерительный прибор	Meter	Current	Insulator
Клемма	Terminal	Resistor	Battery
Заряд	Charge	Short	Line
Цепь	Circuit	Current	Voltage
Падение напряжения	Trouble	Voltage drop	Distance
Обрыв	Short	Open	Plane
Повреждение	advantage	load	trouble

Types of Current

- AC Alternating current charges continuously change direction forward and back at 60 Hz
- DC Direct current charges move in one direction

Let's have fun.
Click on the address to solve a quiz

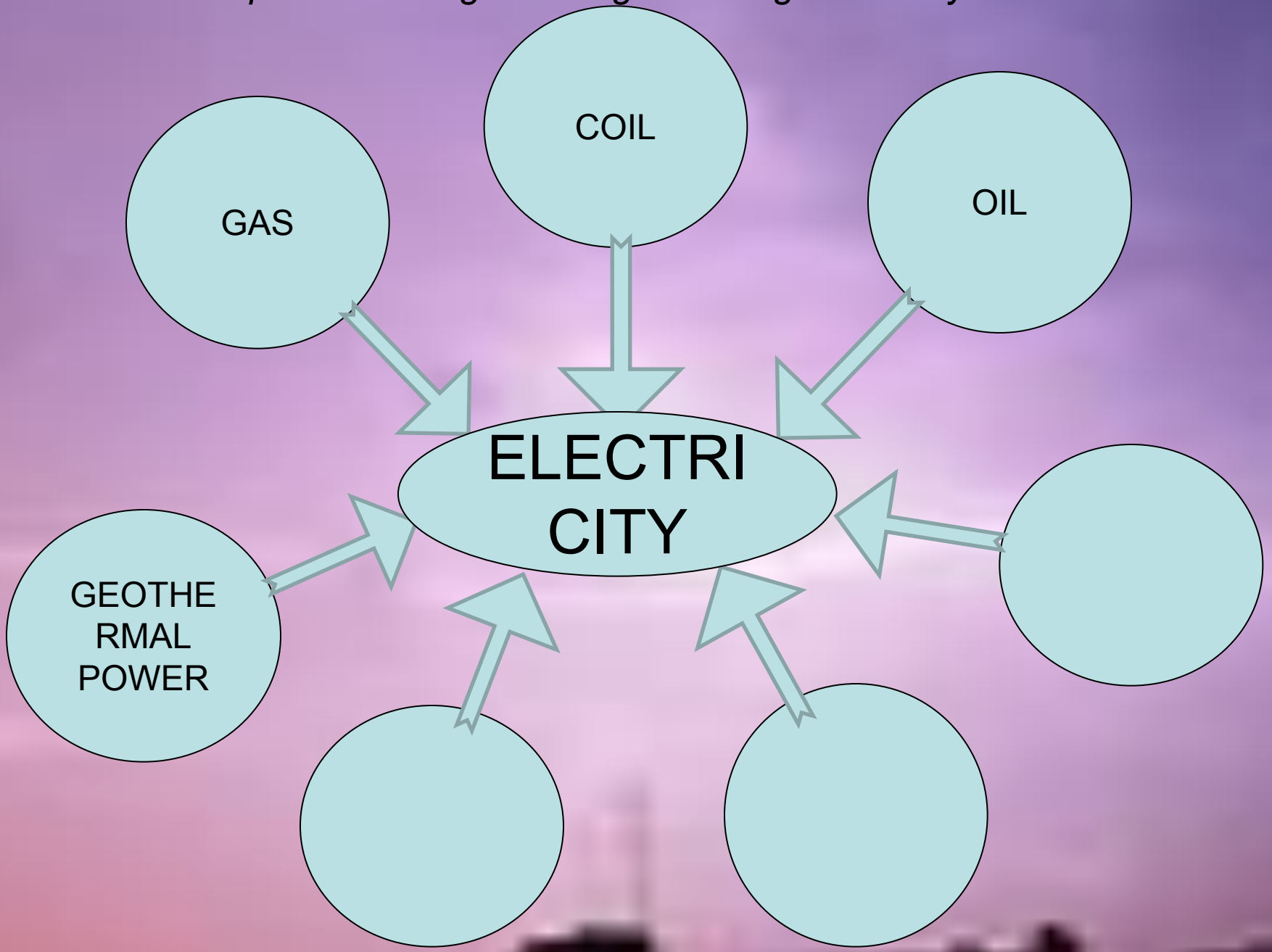
http://www.neok12.com/quiz/ELECTR01

http://www.neok12.com/quiz/ELECTR04

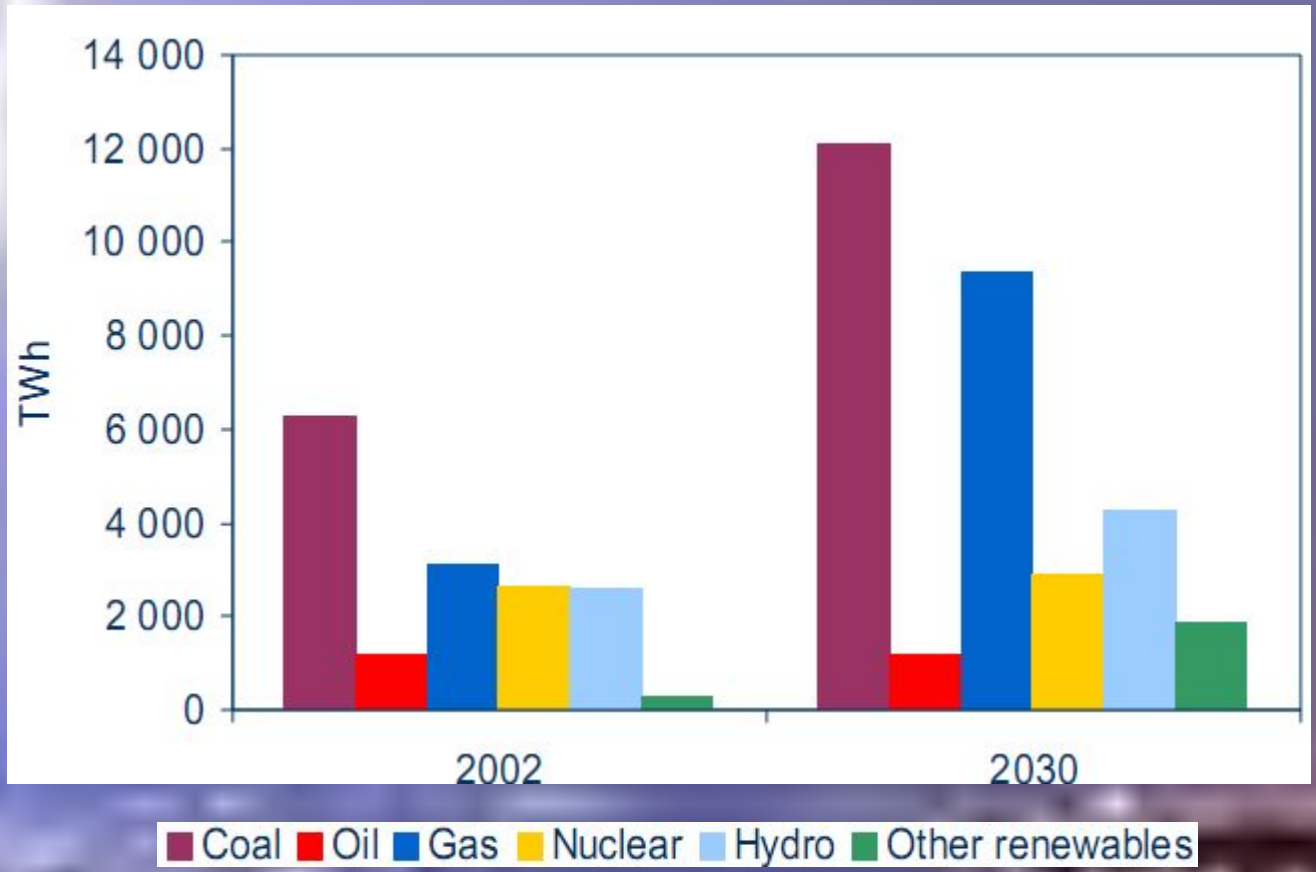
http://www.neok12.com/quiz/ELECTR02

http://www.neok12.com/quiz/ELECTR05

Complete the diagram on generating electricity



World Electricity Generation



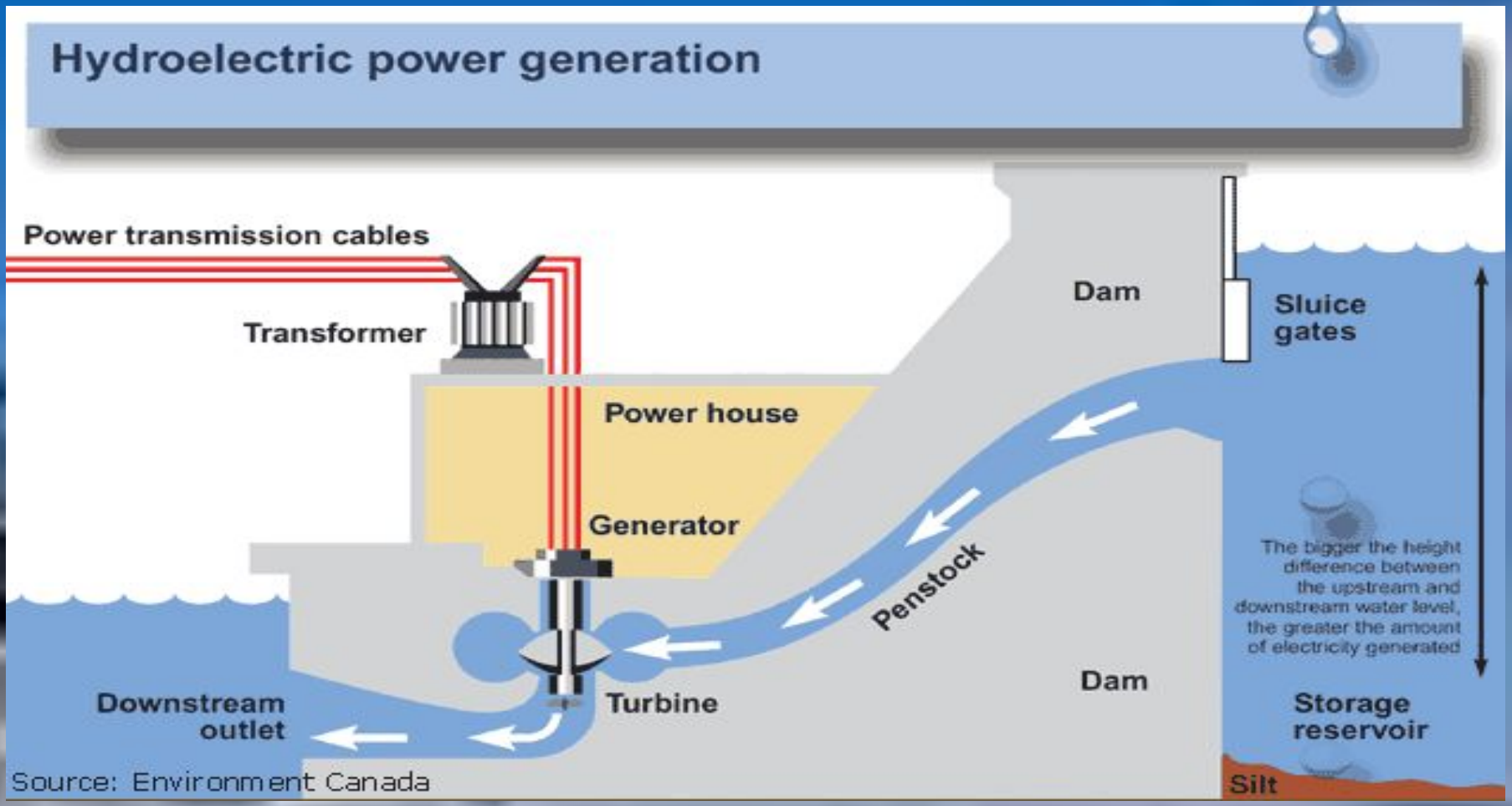
Compare the world electricity generation in 2002 and 2030 using the model:

Generation of electricity from gas in 2030 will be higher than in 2002.

Hydroelectric power plants

Hydroelectric power plants use water flowing directly through the turbines to power the generators.

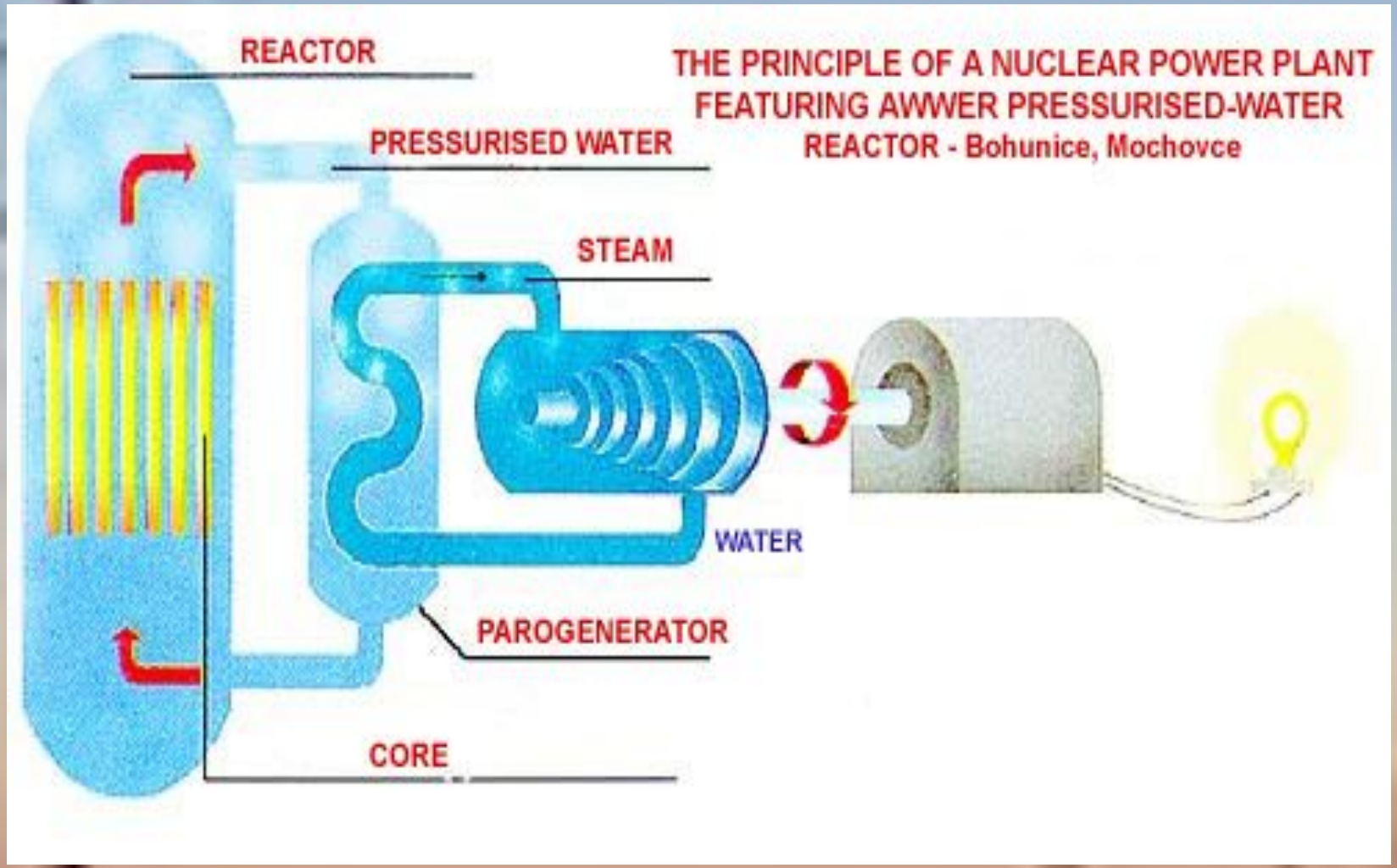
Describe the production process and this hydroelectric power plant.



NUCLEAR POWER PLANT

In Russia there are now 10 active power plants. This one produces 1/7 of the overall electricity outcome of Russian nuclear power plants, so it is a big one.

In a nuclear power plant, nuclear reactions create heat to heat water, which turns into steam, which goes through a turbine, which spins...turning the copper armature inside the generator and generating an electric current



TIDAL POWER

There are a lot of energy in waves on the sea. But it is not easy to get it. A wave power station needs to be able to stand really rough weather, and yet still be able to generate power from small waves. This source of energy is renewable – the waves will cause whether we use them or not.

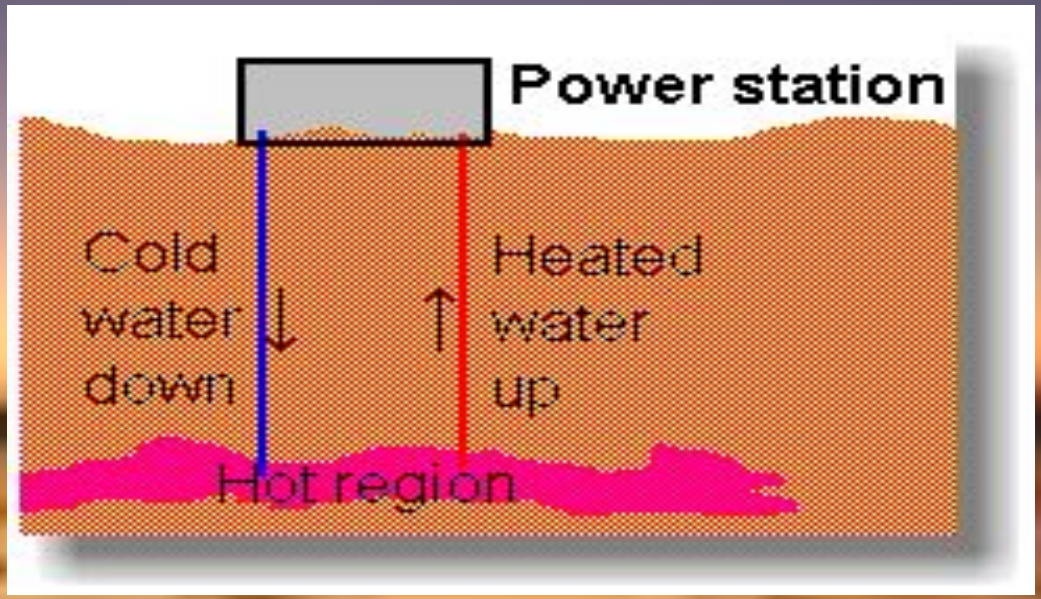
SOLAR POWER

Solar power is renewable. It is used for heating houses. Solar cells make electricity from sunlight. Solar cells are expensive. Solar power isn't much use unless you live somewhere sunny. It doesn't cause pollution and doesn't need fuel.

Wind Power

Wind generators use wind to turn turbines that are hooked up to a generator. Wind power is renewable as well. It doesn't cause pollution, doesn't need fuel. It is necessary to put generators them where winds are reliable.

GEOTHERMAL ENERGY



The first geothermal power station was built in Italy, and the second was in New Zealand. The centre of the Earth is about 6000 degrees Celsius - hot enough to melt rock. Even a few kilometres down, the temperature can be over 250 degrees Celsius. In general, the temperature rises one degree Celsius for every 36 metres you go down. In volcanic areas, molten rock can be very close to the surface.

Describe the work of such power station.

Find some advantages and disadvantages of different ways of generating electricity

ADVANTAGES	DISADVANTAGES
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-

Study the picture and describe in writing how electricity is produced and then transmitted to our homes.