

## How Electricity is made.

The importance of electricity.



Oh no! There **is** no \_\_\_\_\_! I **was** just about to **finish** my game. I **have to restart** it now. Uh! It **seems** like there **is** some **problem** in the **electricity** \_\_\_\_\_. Don't **worry**! It'll **be back** in a **moment**. Wow! It's **back**. We **can't do** anything without **electricity** these **days**. Yeah, but do you **know** where your **electricity** \_\_\_\_\_ from? I **think** it **comes** from that \_\_\_\_\_. Right? You are very right!

How does a generator work? How does it produce electricity? Electromagnetic induction.



Electricity **comes** to this TV from this **switch** (interruptor). But what about the \_\_\_\_\_ of all the **electricity** that **comes** to everyone's **home**. Let me **ask my friends**: Do you **know** where **electricity** \_\_\_\_\_ from? Do you **want** to **know** about the **sources** of it and how it **is** \_\_\_\_\_. Ok, ok. **Take** a look here. What **is** this?

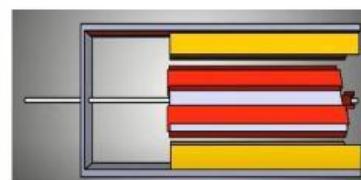
This is a \_\_\_\_\_ and \_\_\_\_\_ mounted on a **shaft** (eje). What it **is used** for? It **is used** to produce **electricity**. But how?

If we \_\_\_\_\_ a **magnet** around with-in (dentro de) a \_\_\_\_\_ electricity **is produced** in the **wire**. Oh, it is so simple! All we **need** to **have** is a **coil of wire** and a **magnet** to **make** **electricity**. And just **spin** the **magnet** with-in the **coil**. This process **is known** as **electromagnetic** \_\_\_\_\_.

Can I **spin** this **magnet**? Oh yes! But let me first **attach** (unir) a small **electric** \_\_\_\_\_ with the **wires**. Now you **can spin** the **magnet** with the help of the **handle** (mango). Wow, the \_\_\_\_\_ **is** on! So **guys** now you **know** the basics of \_\_\_\_\_ **electricity**! Now something to **remember**! The **machine having** a **magnet** and **coil of wire**, in this way, **is known** as \_\_\_\_\_. So we **need** a \_\_\_\_\_ like this to **produce** **electricity**? Yes, in most of the cases a **generator is required**.

Wow! Now I **can produce** **electricity** for my entire **home** with this **generator**. But see, this is too small! This **can light up** (iluminar) only a **small bulb**. You **need** a \_\_\_\_\_ **generator** for **getting** more **electricity**. Let me **show** you!

‘Big’ generators. Let’s change the scale! Giant generators



Oh, It does not **look** like the earlier **generator**! Let's **peep** inside! (Miremos dentro) Oh yes, it also **has** a **big** \_\_\_\_\_ **linked** with a **shaft** (eje) and \_\_\_\_\_ all around it.

Remember, every \_\_\_\_\_ **has** this kind of **arrangement** (montaje) inside it. Hmmm, if I **spin** this **generator shaft** I can **light up** (iluminar) my entire **home**!

Hmmm, now **try** to **move** it. Ah! Ah! I can't \_\_\_\_\_ it. It **is** very \_\_\_\_\_ to **move**. Now **have** a look at these **giant generators**!

Oh, wow! That's so huge. Yeah, these **big generators** are used to \_\_\_\_\_ electricity for a whole city. But how do they **spin** the **magnet** inside these **big generators**? I **can't** even **move** the **smaller** one! To **move** the **magnet** inside the **big generator** a **big** \_\_\_\_\_ is attached to this **shaft**. A **big fan**? Yeah, look here.

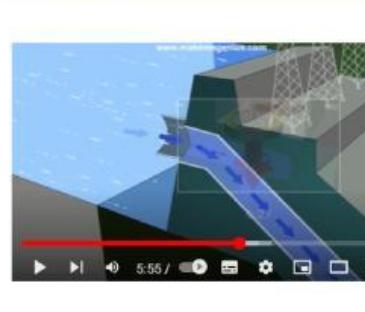


These big fans are called **\_\_\_\_\_**. Turbines? Yeah, **\_\_\_\_\_**.



Friends! Hope you **remember** generator, the machine to **make** electricity! Now **remember** \_\_\_\_\_ that **is** the second most important \_\_\_\_\_. A \_\_\_\_\_ helps the **generator** to **work** so that it **can** **produce** electricity. But how **does** this \_\_\_\_\_, I mean **turbine**, help in **turning** the **generator**? **Look** here!

### Conventional Power Plants: Hydroelectric Power Plants.



In some cases, lot of **water is dropped** on this. The **water makes it turn**. When the \_\_\_\_\_ **moves**, shaft of the **generator** also **moves**. Wow! So **water helps in running** the \_\_\_\_\_! You **got** it right! The **electricity is generated** with the help of the **water**. This kind of **electricity is known** as **\_\_\_\_\_**. The word **hydro means** related to **water**. But to \_\_\_\_\_ a **big generator**, we **may need** a lot of **water**. Where all this **water** will **come** from? For that, we **need** to go to a \_\_\_\_\_. **Dam**? What **is** a **dam**? Let's **go** and **see**!

Wow! There **is** a lot of **water** here! **Seems** like **water is being stopped** here! Yes, it is a kind of a **barrier** to **stop** **river water**. Lot of **water is \_\_\_\_\_** here. But why? Well **Jimmy**, this stored **water is used** for **water supplies** or for \_\_\_\_\_ **electricity**. Oh! That **is** why **there are** a lot of \_\_\_\_\_ and \_\_\_\_\_ nearby! This **is called** **\_\_\_\_\_ plant**. Water from higher level **flows** into a **pipe** (tubería) that **carries** it down to a **turbine**. As **water moves** down, it **gains** a lot of **pressure**. This flowing **water drives** the **turbine** that is \_\_\_\_\_ to the **generator**.



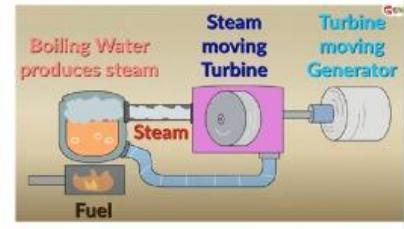
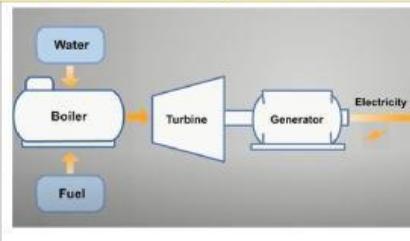
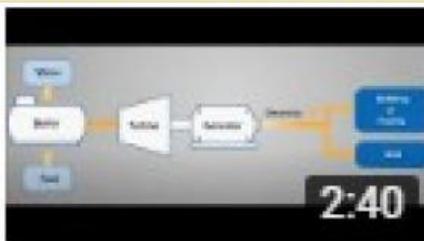
And inside the **generator**, **there is** a large \_\_\_\_\_ in the **coil** of **copper wire**. When this \_\_\_\_\_ **rotates** inside the **coil of wire** **electricity is produced**.

Then it **is sent** to our homes through **transmission lines**.

Wow! It is so **clear** to me.

Water from the **dam moves** the \_\_\_\_\_, **turbine drives** the \_\_\_\_\_. And **generator produces** the \_\_\_\_\_. Guys, **have** a closer look. This **is** how **water helps** in producing **electricity**.

## Conventional Power Plants: Thermal plants and Uranium plants.



Uhm! The visit to the dam **was** interesting but **tell me: Is there** any other way to \_\_\_\_\_ the **turbine**? Yeah! **There are** many ways. In many **cases** it **is moved** by \_\_\_\_\_. **Steam**? But how **can steam move** anything? Look at this! Can you \_\_\_\_\_ it? It **is** very simple! I have to \_\_\_\_\_ some **air** into it. Pfffff! See, it **is spinning**.

It **is** the same with \_\_\_\_\_. We **need** some **air** or **gas** to **blow** it. But you **said steam**. Yeah! **Steam is** a gaseous form of **water**. Oh yeah! **Steam is** a **gas**. It is just like...air hmmm Let me **try** to **make** this \_\_\_\_\_ **spin**.

Oh! It **did** not even move an **inch** (pulgada). It is very heavy, We **need** a lot of \_\_\_\_\_. We **need** lot of **air** to move it. But from where will we **get** that much of **air**?

In most of the **electricity** generating \_\_\_\_\_ **water is put** in **big tanks** (tanques, depósitos). Then it **is** \_\_\_\_\_ to **produce steam** and the \_\_\_\_\_ **is moved** with the **pressure** of the **steam** like my **pinwheel** (molinillo). Yep! Now let's **see** how the whole system **works**.

**Water is** \_\_\_\_\_ until it **produces steam** and the **steam moves** the **turbine** that **spins** **shaft connected** to a **magnet** inside the \_\_\_\_\_ but **can you name** the **fuel used** for **heating** the **water** to **produce** **steam**? We **can use** **electricity** to **heat** **water** like we **use** it for a 'guiso' at **home**. You **are** right but **using** **electricity** to **produce** **electricity** **can be** very costly. Think of!.

We **can use** \_\_\_\_\_ (carbón). Yeah! We **can use** \_\_\_\_\_. We **can also use** **natural gases**, **biomass** or **uranium**, etc... **Are** those \_\_\_\_\_?

So we **can use** **coal** and **natural gas** as **fuel** to \_\_\_\_\_ the **water** to **produce** **steam** to \_\_\_\_\_ the **turbine**. And as we **use** the **heat** to **produce** **electricity** this **is also called** \_\_\_\_\_ **energy**. And this **is done** in \_\_\_\_\_ **plans**. Correct! but the **plants** where we **use** **uranium** as **fuel** to **produce** **electricity** **are known as** **power plants**.

## Non conventional Power Plants: Wind mill and Photovoltaic cells or panels.



I **am** worried! Why? Well If **burning** all \_\_\_\_\_ will **get over** (vencidos). Then there would **be** no **electricity** in this **world**. Even **scientes** **are worried**. They **are finding** new ways to \_\_\_\_\_ **electricity**. Like? Some of the **electricity** **is being produced** with the help of \_\_\_\_\_ and even \_\_\_\_\_. Wow! That **is** great. Can you **tell** me more about this? This **is called** a **wind mill**. The **blades** (aspas) of **windmill** **act** as a \_\_\_\_\_. The **blades move** due to the \_\_\_\_\_. Oh! So we don't **need** **fuel**! We will **generate** the \_\_\_\_\_.

Now **tell** me about the **ways** to **get** \_\_\_\_\_ from the \_\_\_\_\_. Yeah! There it is.

See, **sunlight falls** on special **panels** called **photovoltaic cells**. These **cells produce** \_\_\_\_\_. Wow! We **can get** **electricity** for infinite period from them and \_\_\_\_\_ as they will always **be** there.

So guys. Some **homework** for you ... It is **ery easy**... Watch few **videos** on **dams** and **electromagnetic induction**. Also **click** on this **link** to **play** the **quiz** on [makemegenius.com](http://makemegenius.com).