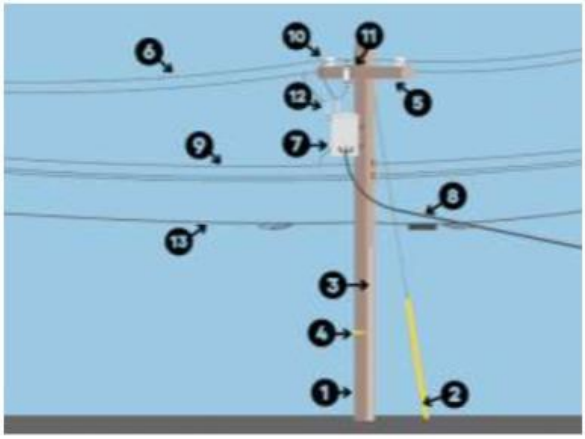
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# POWER LINES AND POLES: HOW LINES AND POLES BRING POWER TO YOUR HOME

A. Match up as many words and meanings as you can:

1. Pole
2. Guy Wires
3. Ground Wire
4. Pole Information Tags
5. Crossarm
6. Primary Wires
7. Transformer
8. Secondary Service Drop
9. Neutral Wire
10. Insulators
11. Cutouts
12. Surge Arresters
13. Lowest Wires



_____ Protect the transformer from lightning strikes.

_____ Open when there's a problem on the line, breaking the flow of electricity like a fuse to prevent further damage to the system.

_____ Range in size but are always buried underground with a depth of 10% of their length + 2 feet

_____ Holds powerlines above the ground and apart from each other.

_____ Goes back to the substation and balances out the amount of electricity on the system.

_____ Typically carry telephone, cable TV, and fiber internet signals

_____ Prevent energized wires from touching each other or the pole.

_____ Run on top of the pole, each carrying 7,200 volts of electricity from a substation.

_____ Help stabilize poles and are connected to the pole's ground wire.

_____ Runs along the pole and connects to the neutral wire. Safely directs electricity from lightning to the ground.

_____ Provide us with the exact location of the pole and attached equipment.

_____ Carries 120/240 volts of electricity into your home.

_____ Converts electricity from primary wires to a lower voltage of 120/240, getting it ready to bring into your home.

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B. Please complete the next information with the words given:

- High-voltage
- Diverts
- Source
- Wires
- Configurations
- Grid
- Transformer
- Surface
- Underground
- Hazardous



There is a lot of utility equipment around our service area, so much so that it can be confusing to look at. But every component serves an important role.

Next time you look at the power poles in your neighborhood, you will probably see a combination of the following:

1. **Primary wires:** Primary power lines carry _____ electricity from the nearby substation to the _____.
2. **Insulators:** Insulators are made of materials that do not conduct electricity and are used anywhere a live element does or could contact a non-insulated _____. This allows these tools to safely connect the _____ to the pole.
3. **Crossarm:**Not all poles have crossarms, but they are necessary in common three-phase, or three-wire, _____ like this one.
4. **Lightning arresters:** Lightning or surge arresters are designed to protect equipment from dangerous surges in electricity, most commonly caused by lightning. When a transient voltage hits this device, it _____ the electric current safely to the ground.
5. **Pole ground wire:** This copper wire provides electricity a path to the ground to prevent _____ voltages from affecting equipment.
6. **Transformer:** Transformers are used all over the electric _____ to convert electricity to different voltages. The ones that you see on the poles decrease voltage from the primary wires to the power used in your home. Transformers can also be housed in a steel box on the ground if the electric service is connected _____.
7. **Neutral line:** The neutral wire provides a return path for electric current to the _____ and is part of the grounding circuit.
8. **Secondary service drop:** These wires carry power from the transformer to the home or business where the electricity will be used.

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C. Read the text and rewrite in simple words the steps about how electricity gets to your home.

Electricity is made at a power plant using fossil fuels, such as coal and natural gas, and renewable energy, including the sun and wind. Once electricity has been generated, it is transported on extra high voltage power lines suspended on pylons. This enables electricity to be transmitted across long distances – it's like a motorway network for power!

Power lines carried on pylons feed in to large substations. Transformers in substations reduce the strength, or the voltage, of electricity. Power lines or underground cables leaving the substation carry electricity at a lower voltage. As the journey of electricity continues, the distribution network feeds towns with many smaller, lower voltage power lines carried on wooden poles, underground cables and substations - like the 'B' roads of the power network!

Electricity is distributed through a series of substations, each time reducing its voltage until it is suitable for the customer to use. Smaller substations can either be small metal boxes mounted on wooden poles in rural areas or small buildings in most communities.

Substations near our homes and schools generally ensure that the electricity we are supplied in our homes and schools is at 230 volts. These substations can look very different; some are small brick buildings, some are plastic and some just have metal fences around a metal box. They are safe if they are locked and we leave them alone but only authorised personnel from the electricity distribution company can go inside them.




Electricity is supplied to our homes by underground cable or overhead power line at 230 volts. The electricity supply cable enters your home through a meter which records how much electricity you are using and a consumer unit (or fusebox) where your main switch and residual current devices (RCDs) are located.

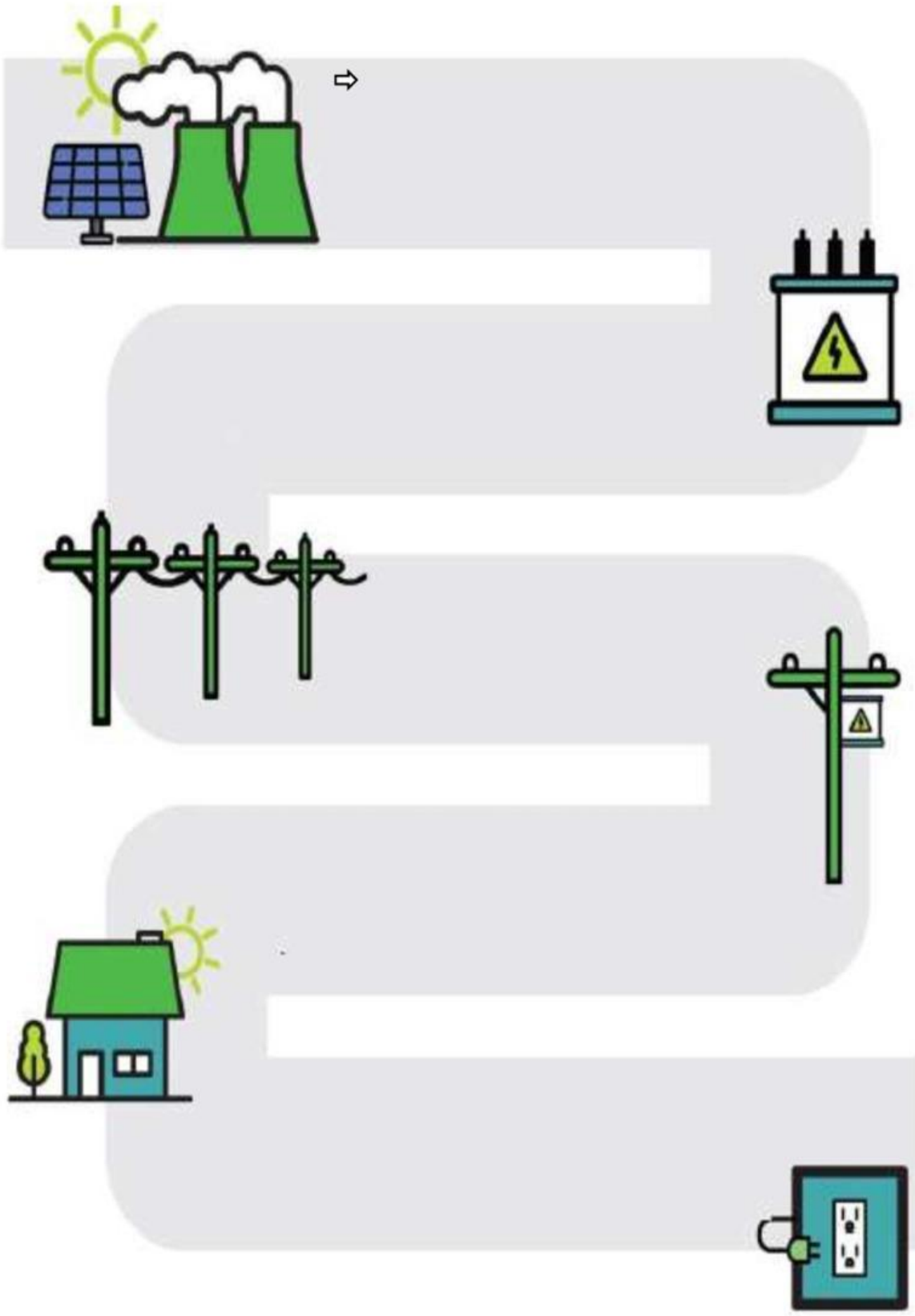


Finally, your domestic wiring distributes electricity to lights and sockets throughout your home. Many people do not recognise equipment on the electricity network, for example, a common misunderstanding is that cables on wooden poles are telephone wires but often they are electricity power lines.

Always look up and look out for overhead lines and look for the yellow and black 'Danger of Death' warning sign that is displayed on equipment on the electricity network to warn people of the danger posed by the apparatus.

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