

Hydropower

"Hey kids! Did you know that hydropower is not only reliable, but also completely natural?"

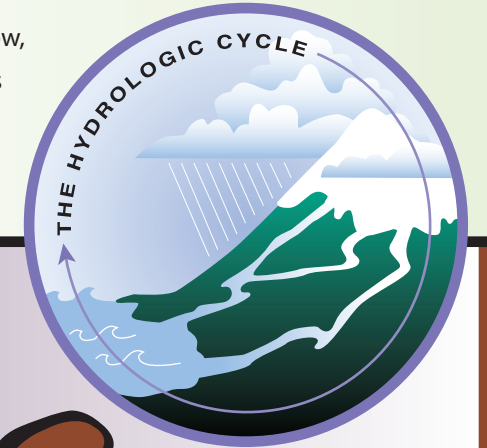


"Wait a minute. I know what you're thinking: 'What's hydropower?'"

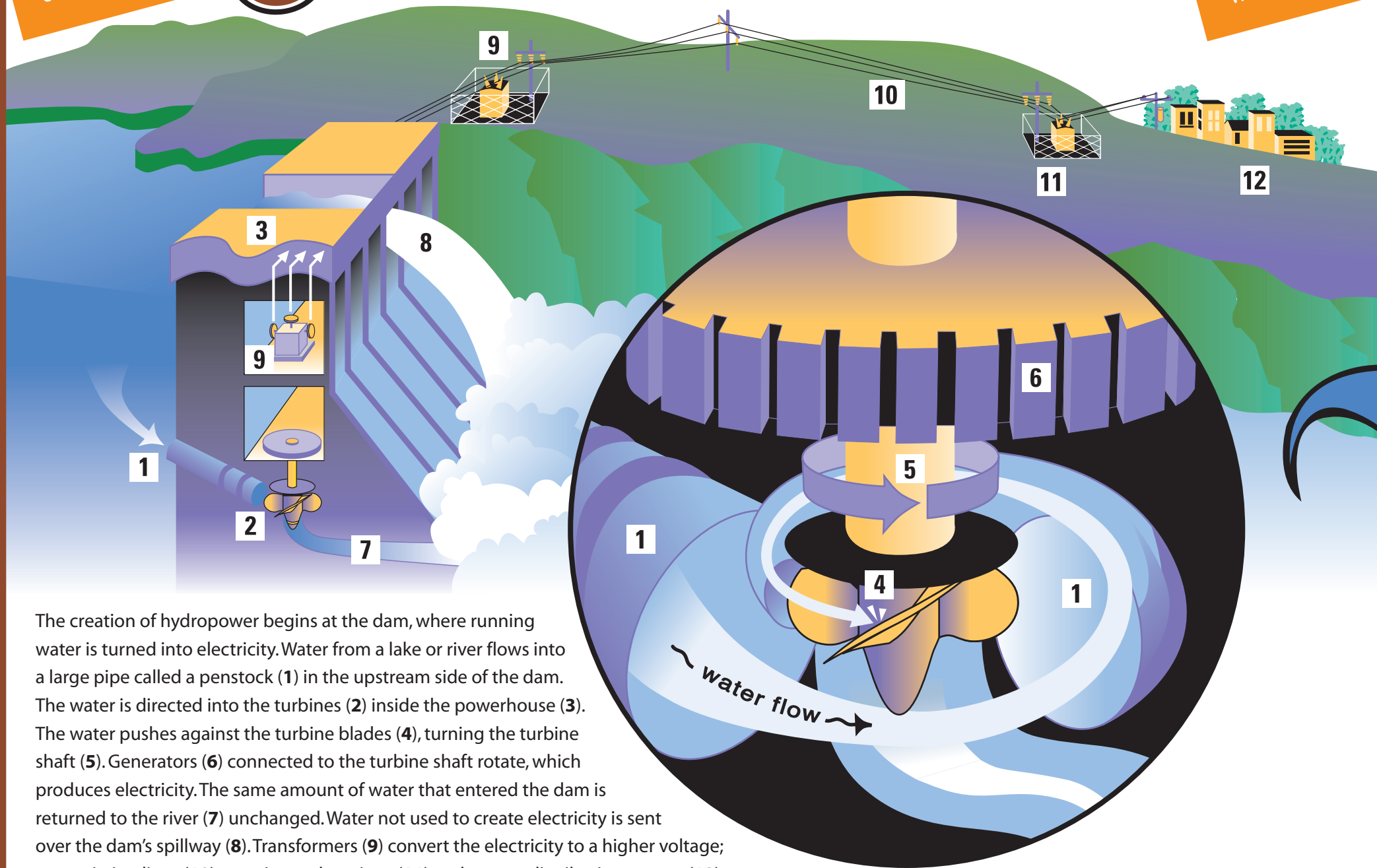


The Hydrologic Cycle Is Naturally Renewable Energy

- Snow falls in the mountains, piling up into what we call "snowpack."
- As rain falls and snowpack melts, the water fills streams, which flow into bigger rivers.
- Moving river water passes through turbines inside dams, creating electricity.
- The water returns to the river, completely unchanged.
- The sun heats oceans, lakes, and rivers, drawing moisture into the air and making clouds.
- The clouds create rain and snow, and the hydrologic cycle starts all over again.



"It all starts with the hydrologic cycle."



The creation of hydropower begins at the dam, where running water is turned into electricity. Water from a lake or river flows into a large pipe called a penstock (1) in the upstream side of the dam. The water is directed into the turbines (2) inside the powerhouse (3). The water pushes against the turbine blades (4), turning the turbine shaft (5). Generators (6) connected to the turbine shaft rotate, which produces electricity. The same amount of water that entered the dam is returned to the river (7) unchanged. Water not used to create electricity is sent over the dam's spillway (8). Transformers (9) convert the electricity to a higher voltage; transmission lines (10) carry it to substations (11) and on to a distribution system (12) where the voltage is reduced for safe use in homes and businesses.



"Working with Mother Nature means using clean and renewable energy! Let's do our part to take care of the environment by conserving the energy we use!"





Low Cost



Renewable



Habitat

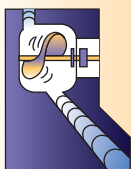


Recreation

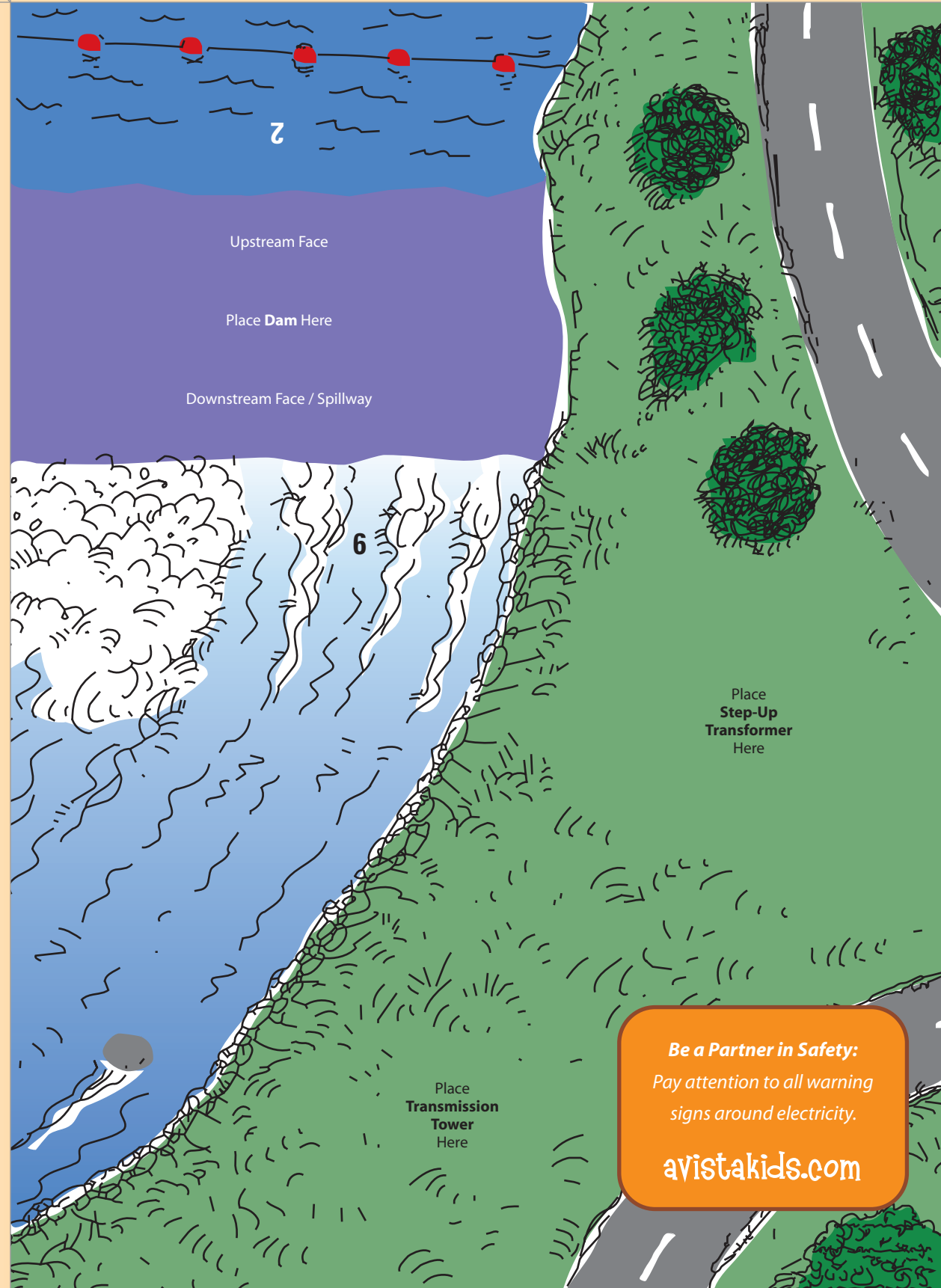


Clean and Non-Polluting

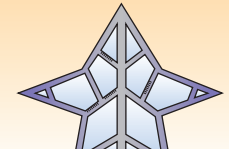
Benefits of Hydro



Dam – Water behind a dam (1) is called a reservoir (2). As it flows through a penstock (3) to a turbine (4), it turns a generator (5), which creates electricity. The water returns to the river (6) on the other side of the dam, continuing on its journey. The electricity created by the generator is sent to a transformer – the first stop on the way to your home.



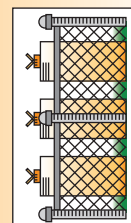
Be a Partner in Safety:
Pay attention to all warning signs around electricity.
avistakids.com



Transmission Towers – Electricity travels from place to place on high-voltage power lines, which are held by large metal structures called transmission towers.



Step-Up Transformer – A step-up transformer increases the voltage that comes from the dam, helping electricity reach its destination. At the end of its trip, substations reduce the voltage so that the electricity can be used safely in your home.



Build Your Own Hydroelectric Project – To assemble these models of a dam, transformer, and transmission tower, cut out the pieces along the dotted lines (- - - -), fold along the solid lines (—), and use clear tape to hold the flaps together. Cut slots at the top of each piece where they're marked in red, then tape the models to the map. Slip three black threads in the slots on the dam, run them through the step-up transformer and to the transmission tower. Take a look at the drawing above to see how it should look when you're all done. **Have fun and play it safe!**