6. Resources

Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept:

a. Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.

b. Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and know how to classify them as renewable or nonrenewable.

c. Students know the natural origin of the materials used to make common objects.

Dear Friends,

We are nearing the end of these letters I am writing to you. So far we have talked about plate tectonics and how continents are moved around and great mountain ranges thrust into the sky over millions of years.

We have talked about how water shapes valleys and even moves great quantities of earth great distances, as when the glaciers covered almost all of Canada and scooped out the Great Lakes.

We have talked about heat and how it moves from place to place through conduction, convection, and radiation.

We have talked about energy in the earth system and how the sun works to move water from the sea to the mountains, and how it makes wind, and how the wind creates great streams moving within the sea.

And we have talked about ecology and how plants and animals, worms and germs, water and air and soil are all intricately woven into a web of life.

In this letter we will look at the resources that human beings use—energy and raw materials. This is serious business. Throughout history, and even before history, countless wars have been fought over energy and raw materials. Civilizations have passed away because they ran out of energy or used up their resources. Your generation will be challenged as never before to find ways of sharing energy and resources without resorting to wars—wars more destructive than any ever seen before.

As citizens of America and citizens of the world, you will shape decisions that determine the future of our planet. You will do this by the way you choose to live, the work you choose to do, the things you choose to buy, the politicians you vote for to make the laws.

So in this letter I will suggest some activities to get your class thinking about just one

important kind of energy—electricity.

I bet that you use electricity every day. Just for fun, make a list of all the ways you have used electricity in the past couple of days. Think of lighting, heating, cooking, opening your garage door, etc., etc.

Don't forget the things that are powered by electrical batteries like watches and cell phones.

When you flip a switch and the light comes on, how was that electricity made? Can you tell?

That was a trick question. You probably cannot tell. The electricity that comes off the grid is made in many different ways. It was all fed into the grid and you can't say what the source was for the electricity that comes into your house–unless you have your own solar panels, or a generator, or your own windmill, or something like that.

Now get your class or some friends together and brainstorm to make a list of all the ways that electricity gets onto the grid. You should come up with quite a list. But why so many ways? The answer to that question is that each of the ways has both good sides and bad sides. A project for your class would be to research the advantages and drawbacks for each of the ways that electricity can be produced.

To give one example: nuclear power has the advantage of not creating air pollution and that the basic source of the energy that is converted to electricity is inexpensive. But it has the disadvantage that controlling the nuclear reactions is quite expensive, that we still haven't found an acceptable way to dispose of the nuclear waste, and that when things go wrong (as they did at Fukushima in Japan in 2011) you can have a huge disaster on your hands.

So you will discover that there is no "magic bullet" to provide our electricity in ways that we can afford and that do not do great damage to our environment. The world will no doubt be struggling with this problem for as long as you live. The more you know about it, the more you will be able to contribute to solutions along the way.

And electricity is only one of the challenges. The world is already facing serious shortages of fresh water, and of other resources. Throughout your life you will be making decisions great and small concerning these resources. Whether you know it or not. Won't it be better if you have some idea as to what you're doing?

But I must end this letter on a happy note. If you are like me, there is nothing more satisfying than facing a challenge and coming up with a good solution.

I remain forever your spirit of Curiosity,
Joseph Priestley