



# ENVIRONMENTAL ENGINEERING WITH PROF LI LI

## TALKING POINTS

### KNOWLEDGE

1. What is a watershed?
2. What are some of the greenhouse gases responsible for climate change?
3. Can you name possible sources of water pollution?

### ANALYSIS

5. Why do you think freshwater systems are under threat?
6. Who is more likely to suffer due to water scarcity and water pollution?
7. How do you think climate change affects water quality?

### EVALUATION

8. Do you believe we can improve water quality around the world? How?

### CREATIVITY

8. What if it is too late to stop climate change? How can humans adapt to the changes?

- Along the way, over 250 smaller rivers - known as tributaries - empty into the Mississippi River. This is called the Mississippi River System and all the surrounding land forms the Mississippi River watershed. Can you identify some of the most important tributaries?
- How many states do they think are in the Mississippi River watershed? Use the internet to check if you are right!

## ACTIVITY 2. MAKE A 3D MODEL OF A WATERSHED

To study how climate change affects water quality, Li and her team develop computer models. In a similar fashion, an actual 3D model is the perfect way to understand watersheds and to assess how pollution and poor land use can affect water quality.

- This task involves building a 3D watershed model using clay. It is best to start to build the mountains at the top, then gently mark the meandering river flowing down to the ocean. It is essential to maintain a steady slope to allow water to continue flowing. For even more realism, add trees and other vegetation.
- Once your model is dry, pour a slow but steady stream of water from the top of the mountain area. Watch how the water follows the river until it reaches the ocean.
- Remove all vegetation and/or add polluted water to see how that has an impact on the water quality in the river.

## ACTIVITIES FOR HOME OR IN THE CLASSROOM

### ACTIVITY 1. MAPPING WATERSHEDS

In simple terms, a watershed includes all the land surrounding a river (and its tributaries). The shape of every watershed is influenced by the area's topography. When it rains, water flows through the watershed until it eventually reaches the ocean.

- For this activity, look at a map of the United States and locate the Mississippi River, where it begins (Minnesota) and where it ends (Louisiana). It is important to remember that the Mississippi is the longest river in the United States, covering over 3700 km from Lake Itasca to the Gulf of Mexico.

## MORE RESOURCES

Environmental science - a reliable and extensive resource for environmental science education and careers:  
<https://www.environmentalscience.org/>

American academy of environmental engineers and scientists:  
<https://www.aees.org/>