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# **All The Water On Earth**

## Activity Instructions

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**Purpose: If there is so much water on Earth, why do we need to conserve it?**

**Procedure:**

1. Make a data chart similar to the one below and record your data for each step. The first step is done for you as an example. Record the number of millimeters for each step, and use your math skills to determine the percentage of water distributed.
2. Pour 500 mL of water into the large beaker. This water represents all the water on Earth.
3. When you look at a map, you realize that most of Earth's water is stored in the oceans. Is this water drinkable as it is? The answer is no. Pour 15 mL of water into the next smaller beaker. This 15 mL of water represents all of the fresh water on Earth. What percentage of the total amount of water is this? The 485 mL of water left in the large beaker represents all the salt water on Earth.
4. Of the 15 mL of water that represents fresh water, 80% is frozen in polar ice caps and glaciers. Pour 3 mL of fresh water into the smallest beaker or graduated cylinder.
5. You now have only 3 mL of fresh water remaining. This water is found either as surface water or groundwater. Using your eyedropper, remove one drop of water from your freshwater and drop it on the plate. This one drop of water represents the clean fresh water that is available for human use.

Location of the Water	Amount of Water (mL)	Percentage of Water
All water on Earth	500 mL	100%
Total fresh water		
Total salt water		
Fresh water in polar ice caps		
Available surface/groundwater		

**Data Analysis:**

Water is a limited resource that needs to be managed carefully. You will now calculate how that drop is distributed among all the people of Earth. Look at the table below. Use your math skills to find the amount of each quantity from the percentages and place your calculations in the middle column.

Water Availability

Water Quantities	Water Availability (liters/person)	Percentage of the Total Water on Earth
All water	280 billion	100%
Only fresh water		3%
Only non-frozen fresh water		0.6%
Available fresh water (not polluted or inaccessible)		0.00003%



Based on these calculations, you might think that there is plenty of fresh water for every person on the planet. In reality, one-third of the world's population does not have access to a supply of clean water. Factors such as local landforms, vegetation, distance to large bodies of water, drought, contamination, and pollution all affect the availability of water. Just because that one drop is there, it doesn't mean that it is available to all people at all times.

**Conclusion:**

1. Make a list of all the ways that you and your family use water. Can you think of at least 5 ways you could conserve water?
2. Construct a pie graph representing the distribution of the earth's water based upon the experiment you did.
3. Do you think there is truth in the line from Coleridge's poem The Rime of the Ancient Mariner, "Water, water everywhere, Nor any drop to drink"?
4. How has this activity changed your thoughts about water?
5. Where on the globe might you find a place where people lack enough clean water to drink? Explain what circumstances may have led to this dilemma.



<http://www.earth-policy.org/Updates/Update1.htm>

### Worsening Water Shortages Threaten China's Food Security

Lester R. Brown

A little-noticed survey released in Beijing in mid-August reveals that China's water situation is far more serious than realized. The water table under the North China Plain, which produces over half of China's wheat and a third of its corn, is falling faster than thought.

Overpumping has largely depleted the shallow aquifer, reducing the amount of water that can be pumped from it to the amount of recharge from precipitation. This is forcing well drillers to go down to the region's deep aquifer, which, unfortunately, is not replenishable.

As water tables fall, springs dry up, streams cease to flow, rivers run dry, and lakes disappear. Hebei Province once had 1,052 lakes. Only 83 remain.

[http://www.adb.org/AnnualMeeting/2001/Media/water\\_shortages.html](http://www.adb.org/AnnualMeeting/2001/Media/water_shortages.html)

Peter Rogers, an environmental engineering professor at Harvard University, observed that of all the regions of the world, Asia has the lowest per capital availability of water, and by the year 2025, nearly 1 billion people in Asia will not have adequate access to water.

Distribution of resources could lead to major political, tensions and violence, according to Dr. Peter H. Gleick, director of the California-based [Pacific Institute for Studies in Development, Environment and Security](#).

[http://news.bbc.co.uk/1/hi/world/south\\_asia/318369.stm](http://news.bbc.co.uk/1/hi/world/south_asia/318369.stm)

World: South Asia

Bangladesh faces water shortages

The Bangladeshi minister for Water Resources, Abdul Razak, says India cannot guarantee the normal flow of water from the River Ganges to Bangladesh this month.

India and Bangladesh signed an agreement to share water from the Ganges more than a year ago.



Climatic consequences	Ecological / economic consequences	Health consequences
Mesoclimatic changes (increase of continentality)	Degeneration of the delta ecosystems	Increase of serious diseases (e.g. cholera, typhus, gastritis, blood cancer)
Increase of salt and dust storms	Total collapse of the fishing industry (originally 44,000 t/a)	Increase of respiratory system diseases (asthma, bronchitis)
Shortening of the vegetation period	Decrease of productivity of agricultural fields	Birth defects and high infant mortality

But parts of north-eastern India have experienced low rainfall levels during the current dry season and Mr Razak said he was told by Delhi that it may not be able to provide Bangladesh's normal water quota this month.

Bangladesh is prone to severe water shortages of its own at the height of the dry season in April, and farmers are predicting a reduced harvest this year.

*From the newsroom of the BBC World Service*

[http://www.dfd.dlr.de/app/land/aralsee/back\\_info.html](http://www.dfd.dlr.de/app/land/aralsee/back_info.html)

The Aral sea is located in Central Asia in the lowlands of Turan. Administratively the water body is divided between the Republics of Kasachstan in the north and Karakalpakistan in the south. The latter is an autonomous republic within the republic of Usbekistan. The two rivers Amu-Dar'ja and Syr-Dar'ja are heavily used for irrigation by these republics. Especially in the last 35 years irrigation has been greatly intensified. Since this period the desiccation of the Aral sea has been dramatic, with the result that the former fourth-largest lake of the world is now the world's eighth largest lake.

The image shows the desiccation of the Aral sea in the years 1995 to 1996. Within only one year the area of the lake has decreased by 3885 km<sup>2</sup> and the volume by 36 km<sup>3</sup>. The sea level has decreased by another 1 m down to 36 m over Baltic sea level. The salinity increased to 46 g/l (own measurement).

