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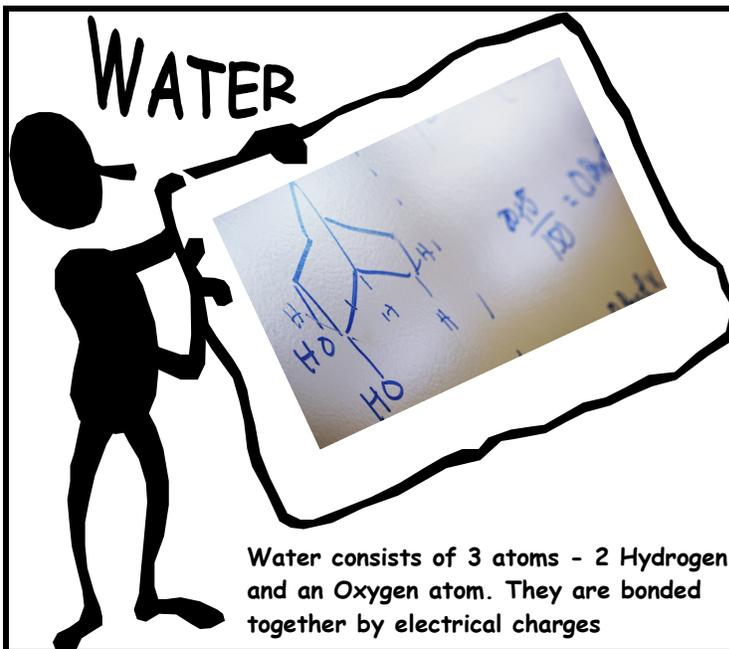


WELCOME TO YOUR SCHOOL'S WATER PACK

'WaterSpy'—Water Consumption Monitoring and Management Solution



97.5% of the earth's water is saltwater. If the world's water fitted into a bucket, only one teaspoonful would be drinkable (HDR, 2006)



Water consists of 3 atoms - 2 Hydrogen and an Oxygen atom. They are bonded together by electrical charges

WATER

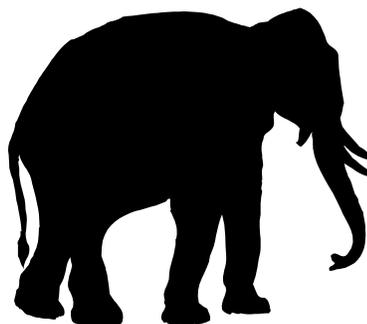


In a 100 year period, a water molecule spends 98 years in the ocean, 20 months as ice, about two weeks in lakes and rivers and less than a week in the atmosphere

WATER



Human brains are 75% water



70% of an Elephant is.... Water!

WATER



Most of the world's people must walk at least 3 hours to collect water

WATER



On average each of us use about 148 litres of water per day through baths, showers, drinking, cooking, washing clothes, cleaning the car and work on the garden.

WATER



During a 5 minute shower we can use between 95-190 litres of water



Did you know that 66% of the human body is made up of water! Water exists in all our organs.



The overall amount of water on earth has remained the same for two billion years.



On average, humans drink about 75,000 litres of water in their lifetime!

WATER





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PROJECT ONE

TOILET FLUSHING

Can you calculate the cost?

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Here's what you'll do on this exercise..

- Using your HomeRider, chart the daily average water consumption over 1 week.
- List the total number of toilets.
- Insert a 2 litre toilet dummy into each cistern.
- Now - re chart the average daily consumption over another 1 week period.
- Calculate what you can save per day and year by using toilet dummies.



How to make those calculations

1. The difference between your week 2 and week 1 reading is the total amount saved on toilet flushing by simply inserting a 2 litre toilet dummy. Multiply this figure by the number of days to see how many litres you save per school year.
2. If you multiply the number of litres that you save each year by the cost of your water figure to see how many litres you save per year.
3. If you multiply the number of litres that you save each year by the cost of your water per litre, you will see how much money you will save every year. (remember - you will be charged in m³ or metres cubed)
4. If you divide the yearly usage by the number of toilets in the school you can calculate how much your school saves per toilet per year. Then you can multiply this by the cost of your water to get the saving per toilet.

1UKgallon=4.5litres
1USAgallon=3.8litres



Weeklytotalsaving	X52	=	Totalyearlysavinginlitres
Yearlysavinginm ³	Xcostofwater	=	TotalyearlysavinginEuro
Yearlysaving	÷ nroftoilets	=	Savinginlitresforeachtoilet
Savingpertoletinm ³	X costof water	=	SavinginEuroforeachtoilet

1000ltrs
=1m³





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PROJECT TWO

Teeth Poll

Time to get you thinking

'WaterSpy'—WaterConsumptionMonitoringandManagementSolution



Firstly take a poll of your class to see how many people leave the tap running when they brush their teeth.

Chart your answers in yes - no - don't know.



Now break up into groups and read the story on the next page. It's called "Water Troubles" and was written in 2004.



Time now to break into pairs and do the worksheet called "The gift of water"

Share your results with the group and see if together you can understand why its important to turn off water while you brush your teeth

Are there any other good ideas that you can think of for saving water?



While the world's water resources has grown six-fold. Within the next fifty years, the world population will increase by another 40 to 50%.

This population growth - coupled with industrialization and urbanization - will result in an increasing demand for water and will have serious consequences on the environment.



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PROJECT TWO
A WORLD REPORT TO READ
Time to get you thinking..

'WaterSpy'—WaterConsumptionMonitoringandManagementSolution

Water Troubles

--By Kathryn Satterfield

Last year, Cormelia Gogu and other students in her small town in Romania didn't have any clean water at their school. Old, rundown pipes made it dangerous for kids to drink the water or even to wash their hands. The dirty water made many kids sick.

These days, things are improving at Cormelia's school. A Romanian aid group, working with the U.S.-based Earth Day Network, is rebuilding the school's pipes and bathrooms. "Now we can drink water during our breaks," Cormelia, 12, told TFK. "We can wash our hands."

Cormelia knows that water is a precious gift. But many people in the United States and other wealthy nations don't. A simple turn of the faucet gives us gallons of clean freshwater. It's easy to believe that the supply will never run dry.

GOING DOWN THE DRAIN?

Eighty of the world's 193 countries suffer from serious water shortages. Problems are the greatest in the developing nations of Africa, Asia and Latin America. But water woes spill over into other countries too.

In recent years, the United Nations, the World Health Organization and other international groups have pumped up their efforts to protect the world's water and to deliver it to those who need it most. As a result, many of the world's poorest communities now have access to updated, more efficient water systems. Still, 1.1 billion people lack access to safe drinking water. Aid groups hope to cut that number in half by 2015.

The earth is about 75% water. But only 2.5% of that is freshwater. Most of the freshwater is frozen in ice caps, leaving just 1% for human use. Sadly, we're draining our planet's limited supply at an alarming rate, and we're choking our waterways with chemicals and pollutants.

Water use is swelling to unmanageable levels. It increased at twice the rate that the world's population grew during the past century. In parts of China, India, Pakistan, African countries and even the United States, wells that bring people groundwater for drinking and crop irrigation are drained faster than they can refill.

Expanding desert regions and unpredictable rainfall levels are parching some places on earth. Countries in the Middle East, parts of Asia, and east and southern Africa are suffering from years of drought. In recent years, because of a drought, even some U.S. states have had to cut back on water use during the summers.

REFRESHING NEWS

The planet's water woes are "absolutely solvable," says Mansoor Ali, UNICEF's senior adviser of water, the environment and sanitation. But it won't be easy to quench the world's thirst. "It's going to take some major changes in how we think about water," he told TFK, "and how we value, manage and use water."

Aid groups are making steady gains, educating kids and adults on how to conserve and protect water. In Romania, Cormelia and her neighbors are soaking up all the knowledge they can. Says Tatiana Done, the director of the water project there: "The people really understand that something can be done."

THINK!

In what ways does your family or community waste water? How can you help conserve this valuable resource?



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PROJECT TWO

THE GIFT OF WATER

Question sheet

'WaterSpy'—Water Consumption Monitoring and Management Solution

How many times a day do you turn on a tap or drink from a water fountain? For many people around the world, getting clean water is not that easy. Water is a limited resource. Only 1% of the world's water can be used for drinking.

Read and answer the questions below. Show your work in the spaces.

1. In some parts of the world, people must travel miles to get clean water. How would your life be different if you had to get water from outside your home? Give two examples.

2. An average person can use up to 300 litres per day.

How many people are in your family?

How many litres of water might your family use...

in one day?

in a week?

in a year?

1 UK gallon = 4.5 litres
1 US gallon = 3.8 litres



3. A litre of water weighs about half a pound. How many pounds would you need to carry to meet the daily needs of your family?

4. In America the average household can lose 38 litres of water leaks. How many litres are wasted in 30 days? 1 year?

5. Can you suggest two ways that YOUR family might save water?

6. A family in America might use 107,000 gallons of water every year. If they paid €2 for every 1000 gallons of water, how much would a year's supply cost?



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'WaterSpy'—WaterConsumptionMonitoringandManagementSolution

How much water comes from a tap in a minute?

Water flow management.

This activity will develop topics like: volume and measurement of water flow and includes a number of simple mathematical calculations.

Form into small groups of 3 or 4 and solve the following calculations.

How much does a bucket of water, a plastic container of milk, an ice cream tub, a baby bath hold?

- Bucket of water?
- Plastic container?
- Ice cream tub?
- Baby bath?



Turn off your tap when you brush your teeth and save about 5 litres of water every time!

Make comparisons between the different measuring containers.

- How many times does it take to fill up the milk carton using the Ice cream tub?
- How many time does it take to use a milk carton to fill a bucket?
- How many times does it take to use the bucket to fill the baby bath?

Now turn on the tap and see how long it takes to fill up a bucket

Note - this will depend on how fast the water flow is. If the tap is turned on full it will take about 10 - 15 seconds to fill up a 9 litre bucket

Once your group have worked out the timing of one bucket of water, estimate how many buckets of water would come out of the tap in 1 minute, 3 minutes and 10 minutes if the tap was left running or if there was a leak.



"Knowledge is your greatest asset"



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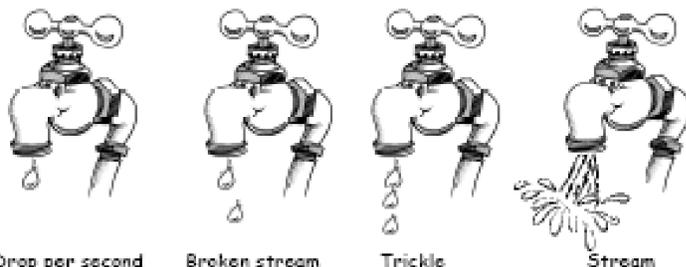
PROJECT FOUR

MONITORING LEAKY TAPS AT SCHOOL

Can you calculate the cost of a leak?

'WaterSpy'—Water Consumption Monitoring and Management Solution

For this exercise we will focus on the four major types of leaks



1 Drop per second

Broken stream

Trickle

Stream

Using one of the school taps, use a container and measure how much water can be wasted over a one minute period

Type of leak	Equals	Amount in litres
1 drop per second	=	
Broken stream	=	
A trickle	=	
A stream	=	



Only 1% of the world's water can be used for drinking water

Use the information gathered above can you now calculate how much water will be wasted by each type of leak in an hour.



Look into the future!

Can you calculate how much a leak would cost over the course of your time in primary school?

Type of leak	Equals	Amount in litres
1 drop per second	=	
Broken stream	=	
A trickle	=	
A stream	=	

"There is a water crisis today. But the crisis is not about having too little water to satisfy our needs. It is a crisis of managing water so badly that billions of people - and the environment - suffer badly."
World Water Vision Report



Based on your findings can you discuss and draw up a list of school rules regarding leaks



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PROJECT FIVE

WHERE DOES WATER COME FROM?

The Weather Cycle

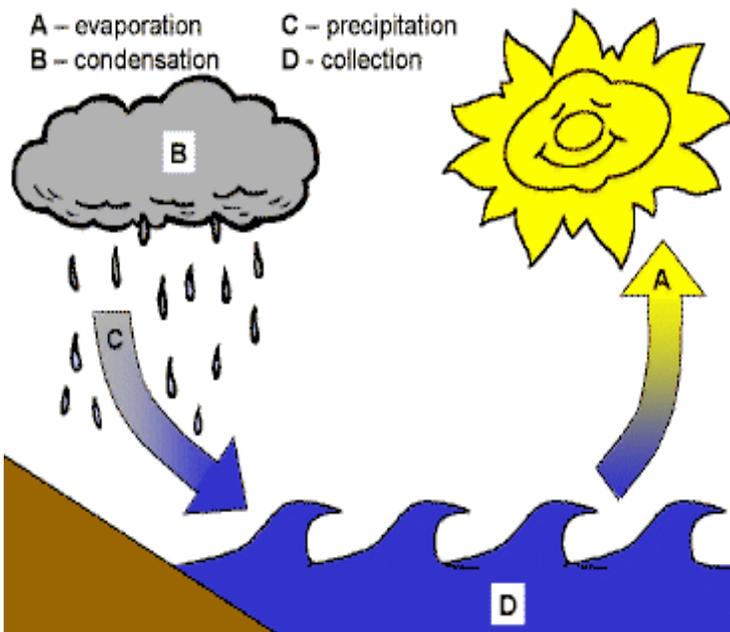
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Run and get a glass of water and put it on the table next to you. Take a good long look at the water. Now --can you guess how old it is?

The water in your glass may have fallen from the sky as rain just last week, but the water itself has been around pretty much as long as the earth has!

When the first fish crawled out of the ocean onto the land, your glass of water was part of that ocean. When the Brontosaurus walked through lakes feeding on plants, your glass of water was part of those lakes. When kings and princesses, knights and squire took a drink from their wells, your glass of water was part of those wells.

And you thought your parents were OLD



Can you put the correct letter in each box?

PRECIPITATION

Precipitation occurs when so much liquid has collected in the clouds that the air cannot hold it any longer. The rain falls back to earth in the form of rain, hail, sleet or snow.

CONDENSATION

When rising vapour hits the cold air in the sky, the vapour turns into liquid, forming clouds. This is called condensation.

EVAPORATION

The sun heats up water in rivers, lakes and oceans turning water into steam or vapour. This steam rises and goes up into the air.

COLLECTION

Water from the clouds may fall back into rivers, lakes and oceans, or fall on land where it soaks into the earth and collects under the ground. This water may seep into rivers, lakes and oceans beginning the cycle all over again.

Create



Own

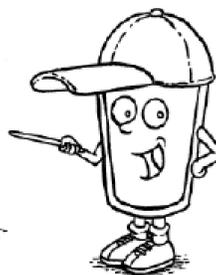
Your



Water



Cycle



You will need:

1. jar
2. plants
3. bottle cap or shell of water
4. soil
5. sand
6. small rocks

Directions:

1. Fill jar as in the picture and put the lid on.
2. Put the jar in a sunny place and see how the water cycle works.



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PROJECT SIX

THE WATER CRISIS

Some facts to ponder

'WaterSpy'—Water Consumption Monitoring and Management Solution

SOME WATER FACTS

Facts about water, water crisis, drinking water, sanitation, and water -related disease.

The Global Water Crisis

- 3.575 million people die each year from water -related disease.
- 43% of water -related deaths are due to diarrhoea.
- 84% of water -related deaths are in children ages 0 -14.
- 98% of water -related deaths occur in the developing world.
- 884 million people lack access to safe water supplies, approximately one in eight people.
- The water and sanitation crisis claims more lives through disease than any war claim through guns.
- At any given time, half of the world's hospital beds are occupied by patients suffering from a water -related disease.
- Less than 1% of the world's fresh water (or about 0.007% of all water on earth) is readily accessible for direct human use.
- An American taking a five -minute shower uses more water than the typical person living in a developing country spends in a whole day.
- About a third of people without access to an improved water source live on less than \$1 a day. More than two thirds of people without an improved water source live on less than \$2 a day.
- Poor people living in the slums often pay 5 -10 times more per litre of water than wealthy people living in the same city.
- Without food a person can live for weeks, but without water you can expect to live only a few days.
- The daily requirement for sanitation, bathing, and cooking needs, as well as for assuring survival, is about 50 litres per person.
- Over 50 percent of all water projects fail and less than five percent of projects are revisited, and far less than one percent have any longer -term monitoring.

1 UK gallon = 4.5 litres
1 US gallon = 3.8 litres



SANITATION

- Only 62% of the world's population has access to improved sanitation -defined as a sanitation facility that ensures hygienic separation of human excreta from human contact.
- 2.5 billion people lack access to improved sanitation, including 1.2 billion people who have no facilities at all.
- The majority of the illness in the world is caused by fecal matter.
- Lack of sanitation is the world's biggest cause of infection.
- At any one time, more than half of the poor in the developing world are ill from causes related to hygiene, sanitation and water supply.
- 88% of cases of diarrhoea worldwide are attributable to unsafe water, inadequate sanitation or insufficient hygiene.
- Of the 60 million people added to the world's slums and cities every year, most occupy impoverished slums and shanty -towns with no sanitation facilities.

It is estimated that improved sanitation facilities could reduce diarrhoea -related deaths in young children by more than one -third. If hygiene promotion is added, such as teaching proper hand washing, deaths could be reduced by two thirds. It would also help accelerate economic and social development in countries where sanitation is a major cause of lost work and school days because of illness.

IMPACT ON CHILDREN

- Every 15 seconds, a child dies from a water -related disease.
- Children in poor environments often carry 1,000 parasitic worms in their bodies at any time.
- 1.4 million children die as a result of diarrhoea caused by unclean water each year.
- 90% of all deaths caused by diarrhoea diseases are children under 5 years of age, mostly in developing countries.



Our water - do we take it for granted?



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PROJECT SEVEN

WATER TREATMENT

How does it all happen

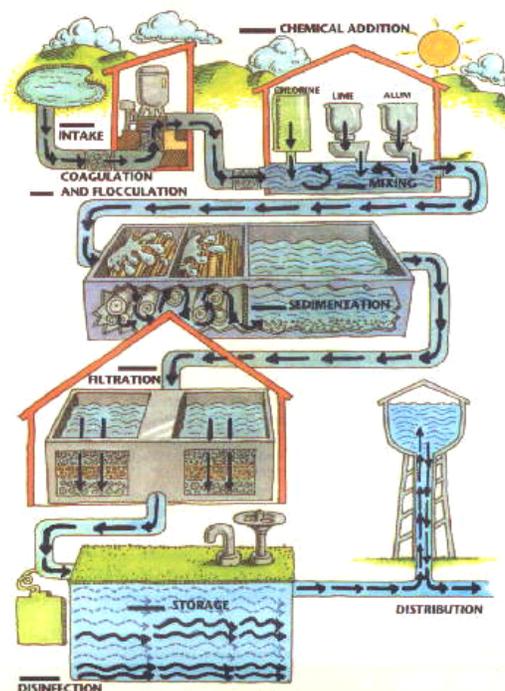
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Treating our Water

Follow a drop of water from the source through the treatment process. Water may be treated differently in different communities depending on the quality of the water which enters the plant. Groundwater is water located under ground and typically requires less treatment than water from lakes, rivers, and streams.

Stop at each treatment point to show where the water is along the treatment path.

COAGULATION	Coagulation removes dirt and other particles suspended in water. Alum and other chemicals are added to water to form tiny sticky particles called "floc" which attract the dirt particles. The combined weight of the dirt and the alum (floc) become heavy enough to sink to the bottom during sedimentation.
SEDIMENTATION	The heavy particles (floc) settle to the bottom and the clear water moves to filtration.
FILTRATION	The water passes through filters some made of layers of sand gravel and charcoal that help remove even smaller particles.
DISINFECTION	A small amount of chlorine is added or some other disinfection method is used to kill any bacteria or microorganisms that may be in the water.
STORAGE	Water is placed in a closed tank or reservoir in order for disinfection to take place. The water then flows through pipe to homes and businesses in the community.
AERATION	Aeration helps to remove certain contaminants like radon.



Nature treats water in its own way through the hydrologic cycle, though we still need to treat the water before we drink it due to all the pollution and bacteria in the environment. The hydrologic cycle provides the supply of water for us to use for consumption, continuously cycling through over and over. The five basic processes that make up the hydrologic cycle are condensation, precipitation, infiltration, runoff, and evapotranspiration (evaporating from the ground and transpiration by plants)

In the water treatment plant the water comes in from the source, is aerated and the addition of chemicals to aid in coagulation and flocculation occurs in the flash mix chamber, it is then allowed to go through coagulation and flocculation, and settle out in the sedimentation basin. The water will pass through a filtration system after the sedimentation basin, removing particles that were too small to settle out. Chlorine is added as the final step and then the water is stored until it is distributed back to the consumer.



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PROJECT EIGHT

WATER IN GENERAL

Activity and facts

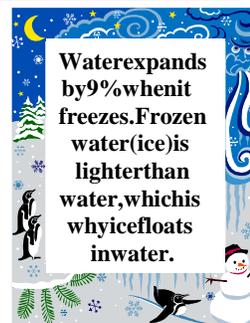
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A person can live about a month without food, but only about a week without water.



Water regulates the Earth's temperature. It also regulates the temperature of the human body, carries nutrients and oxygen to cells, cushions joints, protects organs and tissues, and removes wastes.



Water expands by 9% when it freezes. Frozen water (ice) is lighter than water, which is why ice floats in water.

PUT THE LETTERS IN THE RIGHT ORDER TO COMPLETE THE SENTENCE

All living things need _____ to live.

t a w e r

When water evaporates, it travels into the air and becomes part of a _____.

d l o c u

Less than 1% of all the water on the earth is _____ water.

s e f r h

We _____ water in the liquid form.

i k r d n

Check for leaks and save hundreds of _____ of water a day.

a l l o g n s

You'll save water by taking a quick _____.

h o w s e r

Wash bikes and cars with a _____ and sponge instead of a running hose.

k e c b u t

Ask your _____ to look for ways to save water.

m f a i y l



There is the same amount of water on Earth as there was when the Earth was formed. The water from your tap could contain molecules that dinosaurs drank.



Water is part of a deeply interconnected system. What we pour on the ground ends up in our water, and what we spit into the sky ends up in our water.



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WHAT ARE WE LEARNING?

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We need to recycle well



Then we'll save our water



Save money too



And help the world



Knowledge - your best Asset!



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THANK YOU FOR YOUR ATTENTION

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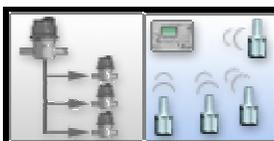
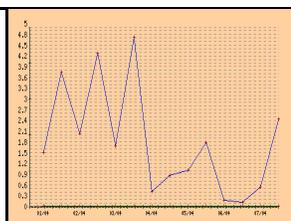
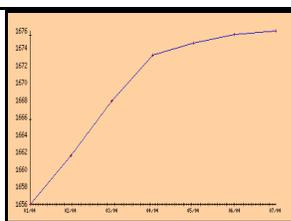
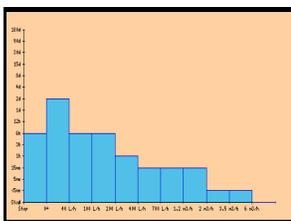


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