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| <b>Class:7</b> | <b>Subject: Science</b> | <b>Topic: Water</b> |
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| SUMMARY SHEET                                                                                                                  |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                          |
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|                                                                                                                                |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                          |
| Learner Previous Knowledge                                                                                                     | Water cycle; Water and Air as natural resources; Anything found in the nature which is useful for living such as air and water are natural resources.                                                                                     |                                                                                                                                                                                                                                          |
| Target Knowledge for this Topic                                                                                                | Water- Water cycle, Sources of water, ground water conservation of ground water; factors responsible for depletion of ground water, water management and water wise habits                                                                |                                                                                                                                                                                                                                          |
| Learning Goals                                                                                                                 |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                          |
| More Complex Learning Goal- Students will be able to predict what would happen if water wise habits are not incorporated by us |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                          |
| Target Learning Goal- Students will be able to explain water cycle, ground water and rainwater harvesting                      |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                          |
| Simpler Learning Goal- Students will be able to show the water cycle and state ways to conserve water.                         |                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                          |
| Period No.                                                                                                                     | Lesson Objectives                                                                                                                                                                                                                         | Teaching Learning Materials Required                                                                                                                                                                                                     |
| 1                                                                                                                              | <ul style="list-style-type: none"><li>Estimate the amount of water required by each person</li><li>Infer importance of conservation of water as a resource.</li></ul>                                                                     | <ul style="list-style-type: none"><li>Board and markers</li><li>Worksheet 1</li></ul>                                                                                                                                                    |
| 2 and 3                                                                                                                        | <ul style="list-style-type: none"><li>Demonstrate the working of water cycle.</li></ul>                                                                                                                                                   | <ul style="list-style-type: none"><li>Board and markers</li><li>Reference sheet 1</li><li>Chart paper and colours for each group</li><li>A large clear glass bowl, a small bowl, cling film, water and a weight (or a pebble).</li></ul> |
| 4                                                                                                                              | <ul style="list-style-type: none"><li>Understand groundwater as a major source of water for us.</li><li>Define different terms related to underground water</li><li>Understand how the human activities are responsible for the</li></ul> | <ul style="list-style-type: none"><li>Board and markers</li></ul>                                                                                                                                                                        |

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| <b>Class:7</b> | <b>Subject: Science</b> | <b>Topic: Water</b> |
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|   | <p>depletion of the water table</p> <ul style="list-style-type: none"> <li>• Explain the different ways to conserve water at home, school or any public place</li> </ul>                                                                           |                                                                       |
| 5 | <ul style="list-style-type: none"> <li>• Understand uneven distribution of water in India.</li> <li>• Appreciate the old age ways of conserving water such as '<i>bawris</i>'.</li> <li>• Understand the importance of drip irrigation.</li> </ul> | <ul style="list-style-type: none"> <li>• Board and markers</li> </ul> |

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|----------------|-------------------------|---------------------|
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## Period 1

### Lesson Objectives

At the end of this lesson students will be able to:

- Estimate the amount of water required by each person
- Infer importance of conservation of water as a resource.

### Teaching Learning Materials required

- Board and markers
- Worksheet 1

### Details of Teaching Learning Experience

**Seating Arrangement:** - In groups of 4 or 5

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| <b>Lesson Beginning</b><br><br><u>Time:</u> 5 min<br><br><u>Purpose:</u> <ul style="list-style-type: none"> <li>• Introduction of the topic</li> </ul>       | <u>Whole Class Discussion</u> <ul style="list-style-type: none"> <li>• Introduce the topic by asking students, what is a natural resource? Ask a couple of students to define the term and write the definition on the board.</li> <li>• Then ask the students if water too can be considered as a resource? Gather responses and arrive at a common answer.</li> <li>• Distribute worksheet 1 to the students.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Lesson Middle</b><br><br><u>Time:</u> 25 min.<br><br><u>Purpose:</u> <ul style="list-style-type: none"> <li>• Develop conceptual understanding</li> </ul> | <u>Worksheet</u> <ul style="list-style-type: none"> <li>• Ask the students to concentrate only on part A and attempt it in groups.</li> <li>• Let them discuss the answers in groups.</li> <li>• After 10 minutes, let there be a whole class discussion in which the answers can be exchanged and a generic idea on the average amount of water used by a person can be arrived at. Write that figure on the board.</li> <li>• Now ask the groups to concentrate on Part B of the worksheet.</li> <li>• Let them consider the available water per person on this Earth.</li> <li>• Let them discuss now in light on this information, why it is important to conserve water.</li> <li>• Gather their response and write it on board.</li> <li>• Now ask them that every district/state has some source of water, which provides for the surrounding places. How does the water reach your tap at home? Gather responses form students and arrive at a common consensus.</li> </ul> |

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| <b>Class:7</b> | <b>Subject: Science</b> | <b>Topic: Water</b> |
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| <b>Lesson End</b><br><br><u>Time:</u> 5 min<br><br><u>Purpose:</u><br><br><ul style="list-style-type: none"> <li>Finish up</li> </ul> | <u>Finish Up</u><br><br><ul style="list-style-type: none"> <li>Clear doubts of the students.</li> </ul> |
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### **Worksheet 1**

### **Skill: Drawing Inferences**

#### **Part A**

**Estimate the amount of water that you use on a daily basis.**

*Note: One bottle of water is approximately 1 liter and one average sized bucket of water holds approximately 15 liters of water. (The capacity depends on the size of the bucket.)*

| <b>Activity</b>         | <b>Amount of Water Used<br/>(in liters)</b> |
|-------------------------|---------------------------------------------|
| Drinking                |                                             |
| Brushing                |                                             |
| Bathing                 |                                             |
| Toilet                  |                                             |
| Washing clothes         |                                             |
| Cleaning floor          |                                             |
| Any other               |                                             |
| <b>Total Water Used</b> |                                             |

#### **Part B:**

#### **Information:**

- Over 70% of our Earth's surface is covered with water.
- 97.5% of all water on Earth is salt water, leaving only 2.5% as fresh water

- Nearly 70% of that fresh water is frozen in the icecaps of Antarctica and Greenland; most of the remaining water is present as soil moisture, or lies in deep underground aquifers as groundwater not accessible to human use.
- Only ~1% of the world's fresh water is accessible for direct human uses. This is the water found in lakes, rivers, reservoirs and those underground sources that are shallow enough to be tapped at an affordable cost. Only this amount is regularly renewed by rain and snowfall, and is therefore available on a sustainable basis.
- **$3.5 \times 1000000000000000000$  liters is available for human use. The world population is 7 billion. Therefore, the available water for one person in his/her lifetime is \_\_\_\_\_.** Try to find the answer. Seek help of your teacher, parents or elder siblings if required.

Compare the available water with the amount of water used on daily basis by you. What do you conclude?

I conclude that the water used by humans is \_\_\_\_\_ as compared to its availability.

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| <b>Class:7</b> | <b>Subject: Science</b> | <b>Topic: Water</b> |
|----------------|-------------------------|---------------------|

## Period 2 and 3

### Lesson Objectives

At the end of this lesson students will be able to:

- Demonstrate the working of water cycle.

### Teaching Learning Materials required

- Board and markers
- Reference sheet 1
- Chart paper and colours for each group
- A large clear glass bowl, a small bowl, cling film, water and a weight (or a pebble).

### Details of Teaching Learning Experience

#### Seating Arrangement: In groups of 4-5 each

- **Note for facilitator-** Assemble the following material for activity as shown in the figure given in reference sheet 1.

A large clear glass bowl, a small bowl, cling film, water and a weight (or a pebble).

Keep the setup under the sun once you reach the school.

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| <b>Lesson Beginning</b><br><br><u>Time:</u> 15 min<br><br><u>Purpose:</u> <ul style="list-style-type: none"> <li>• Generate interest.</li> </ul> | <u>Chart Me!</u> <ul style="list-style-type: none"> <li>• Announce in the class that they are aware of the meaning of water cycle, which they have done it in previous classes.</li> <li>• Inform the students that they should now demonstrate their learning and knowledge of it on a chart paper. They can illustrate it, draw a flow chart, or write about it.</li> <li>• Distribute the chart papers and ask the groups to work together. They must complete their task in 8-10 minutes. Insist on clarity.</li> </ul> |
| <b>Lesson Middle</b><br><br><u>Time:</u> 45 min.<br><br><u>Purpose:</u>                                                                          | <u>Demonstration of Water cycle with an Activity</u> <ul style="list-style-type: none"> <li>• First, let each group show their chart to the rest of the class and explain it briefly. Ask the other groups if the cycle shown is accurate or does it misses some vital points.</li> <li>• Ensure that the entire class is on the same page.</li> </ul>                                                                                                                                                                      |

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|----------------|-------------------------|---------------------|
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|----------------|-------------------------|---------------------|



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| <ul style="list-style-type: none"> <li>Develop conceptual understanding</li> </ul>                                                     | <ul style="list-style-type: none"> <li>Ask the students to observe the experimental setup that you have done as per reference sheet 1.</li> <li>Ask the groups the questions given in the reference sheet.</li> <li>Let the groups attempt the questions.</li> <li>Let the groups now share their answers.</li> <li>Make sure the class is in consensus.</li> </ul> |
| <b>Lesson End</b><br><br><u>Time:</u> 10 min<br><br><u>Purpose:</u><br><br><ul style="list-style-type: none"> <li>Finish Up</li> </ul> | <u>Finish Up</u><br><br><ul style="list-style-type: none"> <li>Clear doubts if the students have.</li> </ul>                                                                                                                                                                                                                                                        |

### Reference Sheet 1

### Skill: Observation and Investigation

### Activity on Water Cycle

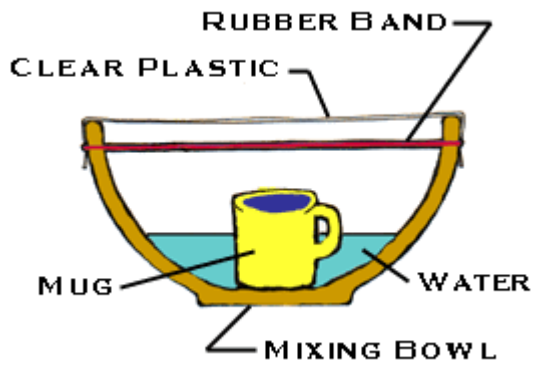
**Aim:** To observe what happens in water cycle

**Material:** a large clear glass bowl, a small bowl, cling film, water and a weight (or a pebble)

Procedure:

1. Put some water into the bottom of the large glass bowl
2. Place the small bowl carefully in the centre of the large bowl
3. Cover the top of the large bowl with cling film so there are no gaps. Don't pull it too tightly.
4. Place the bowl in direct sunlight and leave it for a few hours

*(Note: Place a weight in the centre of the cling film so the film sags in the middle)*

**Observation & Questions on the Activity on Water Cycle**

1. What do you observe on the inner side of the cling film?
2. Has the water come from outside?
3. Which part of the set up represents the water bodies of the Earth?
4. Why does the evaporated water drip back?
5. What does the cling film represent here?

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|----------------|-------------------------|---------------------|
| <b>Class:7</b> | <b>Subject: Science</b> | <b>Topic: Water</b> |
|----------------|-------------------------|---------------------|



#### Period 4

#### Lesson Objectives

At the end of this lesson students will be able to:

- Understand groundwater as a major source of water for us.
- Define different terms related to underground water
- Understand how the human activities are responsible for the depletion of the water table
- Explain the different ways to conserve water at home, school or any public place.

#### Teaching Learning Materials required

- Board and markers

#### Details of Teaching Learning Experience

**Seating Arrangement:** - In groups of 4-5

|                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| <b>Lesson Beginning</b><br><br><u>Time:</u> 5 min.<br><br><u>Purpose:</u> Recap the previous learning    | <u>Whole Class Discussion</u> <ul style="list-style-type: none"> <li>• Ask the students what happens to the rainwater.</li> <li>• Quickly gather responses and jot them briefly, on board.</li> <li>• Now ask the students from where natural lakes and wells get their water.</li> <li>• Again, gather responses and jot them on the board.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Lesson Middle</b><br><br><u>Time:</u> 25 min.<br><br><u>Purpose:</u> Develop conceptual understanding | <ul style="list-style-type: none"> <li>• Explain the terms like ‘infiltration’, ‘aquifer’ etc. with reference to fig. 16.7 given on page no. 198 of NCERT book.</li> <li>• Ask the students to share their experiences with tube well or hand pumps.</li> <li>• Ask them will the water reach underground if it falls on the cemented floor of the class. Make sure to ask justification for their answer.</li> <li>• Let the students discuss their opinions among themselves</li> <li>• Assign one sub topic of topic 16.4(Depletion of underground water) to read and prepare their notes.</li> <li>• Let them discuss their understanding with the larger group.</li> <li>• Intervene in between if required.</li> </ul> |

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| <b>Lesson End</b><br><br><u>Time:</u> 5 min<br><br><u>Purpose:</u><br><br><ul style="list-style-type: none"> <li>• Finish Up</li> </ul> | <u>Finish Up</u> <ul style="list-style-type: none"> <li>• Clear any doubts that the students may have.</li> </ul> <u>Homework</u> <ul style="list-style-type: none"> <li>• Ask students to - on an art sheet, make a mind map and show ways to conserve water at home, school and other public places.</li> </ul> |
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| <b>Class:7</b> | <b>Subject: Science</b> | <b>Topic: Water</b> |
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## Period 5

### Lesson Objectives

At the end of this lesson students will be able to:

- Understand uneven distribution of water in India.
- Appreciate the old age ways of conserving water such as '*bawris*'.
- Understand the importance of drip irrigation.

### Teaching Learning Materials required

- Board and markers

### Details of Teaching Learning Experience

**Seating Arrangement:** - Normal

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| <b>Lesson Beginning</b><br><br><u>Time:</u> 5 min.<br><br><u>Purpose:</u> Recap the previous learning                                   | <ul style="list-style-type: none"> <li>• Discuss the home assignment.</li> <li>• Let few students share their concept maps.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Lesson Middle</b><br><br><u>Time:</u> 25 min.<br><br><u>Purpose:</u> Develop conceptual understanding                                | <ul style="list-style-type: none"> <li>• Discuss the uneven distribution of water in India with the help of the map given on the page number 200 of NCERT book.</li> <li>• Explain how 'bawlis' were used in the old times for the conservation of water.</li> <li>• Give examples of the 'bawli' present in your state. You can also use other traditional methods of conserving water in your area.</li> <li>• Discuss how drip irrigation is an important method of conserving water in today's life. Also, explain how it is different from the traditional method of irrigation.</li> </ul> |
| <b>Lesson End</b><br><br><u>Time:</u> 5 min<br><br><u>Purpose:</u><br><br><ul style="list-style-type: none"> <li>• Finish Up</li> </ul> | <u>Finish Up</u> <ul style="list-style-type: none"> <li>• Clear the doubts of the students.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| <b>Class:7</b> | <b>Subject: Science</b> | <b>Topic: Water</b> |
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