

Timeless Lifeskills Foundation

Water Testing & Conservation Challenge



Rationale for TLS Challenges

Timeless Lifeskills (TLS) Foundation runs intra and inter-school challenges for the rural schools it works with, so that the students get an opportunity to do hands-on, project-based learning where they can apply their knowledge and come up with innovative solutions for real-world problems. In doing so, the students not only deepen their understanding of the topics of study associated with the challenge but also learn critical life skills.

What will students learn by taking part in this challenge?

- The topic of this challenge, water, is part of the prescribed science syllabus in most places.
- For example, in Tamil Nadu State Board, water is a topic of study from class 5 to class 11 and includes - sources of water, water depletion, water management, pollutants, potability and water purification.
- Scarcity of clean drinking water is becoming a crisis. In India, many cities are nearing Day Zero - when drinking water runs dry. Hence, understanding Water Conservation is extremely important in today's context.

In addition to the above, the students will also learn:

- How to conduct an empirical research (i.e. research based on experiments and observations and the scientific method of investigation).
- How to collect data, how to represent data visually, how to do research (find reliable sources of information), and how to write a research-based report.
- Design thinking and coming up with DIY (do-it-yourself) solutions.
- How to become a self-directed learner.
- Planning, team-work, time-management, coordination and other critical life skills.

WATER TESTING & WATER CONSERVATION CHALLENGE

Challenge-1: Water Testing Research Report



- Using the Tara Water Testing kit you need to conduct experiments and write a Research Report.
- Your Research Report should be about the water quality in a few villages around your school. For example, you could collect data from the same 10 villages in different seasons and test the water for seasonal variance. Or, you could collect samples from bore wells that are at different depths – 30 feet, 50 feet, 100 feet and test for variance in water quality based on depth of water. We encourage you to come up with your own interesting and relevant ideas and hypothesis for your Research Report.
- You will need to collect water samples based on the tests you have decided to conduct for your Research Report. For sample collection, you could request students or teachers living in different villages to collect the water sample for your project but remember to explain to them the proper way to

collect samples to ensure they do not add any contaminants while collecting the sample.

- Run all 14 tests on the samples and record the data.



- Tabulate the data using a spreadsheet like Excel and present it in visually interesting ways, like charts, in your Research Report (search online for ideas on 'visual data representation').
- The most important aspect of the challenge is your ability to draw inference from the data you have collected. For example, if fluoride is high in one sample what does it mean, or if nitrate is high what impact can that have on the health of people in that village. Some of this information, like the impact of a particular element, say fluoride or nitrate, is given in the manual that has come with the kit but we encourage you to do online research to get more information.
- In doing this project, keep in mind the correct way to do a scientific investigation - right way to collect the sample, right way to conduct the tests, repeating the tests to ensure accuracy and so forth.
- Any enhancements you can bring to your Research Report, especially what inference you draw from the experimental data, will get you bonus points.

Challenge-2: Make a Home-Made Water Filter



- Using materials easily available, make a low-cost, easy-to-carry water filter.
- Take dirty/contaminated water and using a sample from this water, test it (run the Tara Water Testing kit experiments).
- Put the remaining dirty/contaminated water through the water filter you have made.
- Take a sample from this purified water and test it again.
- Give before & after data (before the contaminated water passed through your filter and after it passed through your filter) and give your inference on how effective your water filter is for different types of contaminants.
- Is the water filtered through the Water Filter you have made potable? How can you be sure?

Challenge-3: Water Conservation Research Report

Conduct research and answer the following questions. In your Research Report, you have to indicate the sources you refer to (ensure that your sources are reliable).

1. How did earth get water? Explain the different theories.

2. How much water is there on earth? How much of it is drinkable?
3. What is embodied water?
4. What is Virtual Water Footprint?
5. What is biological water purification?
6. How serious is the water crisis in India? Quote from studies.
7. What solutions are experts suggesting to deal with this crisis?
8. Suggest some ways of water conservation. Try to come up with innovative ideas for conserving water in your school, in your village, and at home.

Response Process

Stage-1: Intra-School Competition

- Schools that have not received the Water Testing Kit can still take part in Challenge 3.
- Students should create teams of up to 5 students per team. They can give their team a name which is original and creative.
- Each team can choose one of the three challenges.
- For Challenge 1 and 3, the students have to submit a Research Report. For Challenge 2, students have to make the filter, test it and answer the questions.
- Each school should hold the intra-school competition by November 20th in their school.

Stage-2: Inter-School Competition

- Schools should submit the top entry for each of the three challenges for the inter-school competition by Nov 25th.
- That is, each school will submit the best Water Testing Research Report, the best Home-made Water Filter and the best Water Conservation Research Report to TLS by Nov 25th.
- Those schools that don't have the Water Testing Kit can still run the competition for Challenge 3 and submit the best entry.
- For Challenges 1 and 3, schools need to submit a soft copy of the Research Report over email to TLS. This can be a scanned copy.

- For Challenge 2, schools should submit a photograph of the water filter and a short video of the water filter in action along with the before and after test report and answers to the questions posed.

Evaluation Criteria

Challenge-1

- What aspect did you decide to test (your hypothesis).
- Did you run all the 14 tests and collect the data accurately (tabulation of data).
- Visual representation of the data - charts etc.
- The inferences you draw from your research.

Challenge-2

- Effectiveness of the water filter based on before & after tests
- Is it easy to carry.
- Answers to the questions posed.

Challenge-3

- Quality of research
- Reliability of sources
- Innovative ideas for water conservation in your school, home, and village.

Rules

- This competition is open to students from classes 8 to 12.
- The **intra-school competition** should be held in your school by **20 Nov 2019**.
- The last date for submitting the entries for the **inter-school competition** to TLS is **25 Nov 2019**.