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| <b>Date</b>  | <b>Class level</b><br>Fifth and Sixth Class   | <b>Subject</b><br>Mathematics |
| <b>Strand</b><br>Measures  | <b>Strand Unit</b><br>Time and Temperature  |                               |
| <b>Title</b><br>Recording the Temperature of the Aquarium and Classroom  |   |                               |
| <b>Objective(s)</b><br>The aim of this study is for the children to record the temperature of the classroom and aquarium water over a set period of time. The children will compare their findings and evaluate if the classroom temperature influences the aquarium's water temperature.  |   |                               |
| <b>Skills Required</b><br>The children will develop skills in applying and problem solving, communicating and expressing, integrating and connecting, reasoning, implementing as well as show their understanding and recalling.   |   |                               |
| <p><b>Learning objectives</b></p> <p>The Children will become familiar with using thermometers and will explore and develop concepts using mathematical skills.</p> <p>The children will be enabled to:</p> <ul style="list-style-type: none"> <li>• Write a description of how the carried out the temperature study.</li> <li>• Report on the findings</li> <li>• Display the data using graphs and charts.</li> </ul> | <p><b>Learning activities</b></p> <p>*If the aquarium has a chill unit attached, this may be removed for the course of a week – see notes on Explorers Aquarium Best Practice Guidelines. Alternatively use a container of saltwater (minimum size 500 mls) to simulate the Aquarium.</p> <p><b>Guided Discussion:</b><br/>Discuss with the class the following:<br/>What is a hypothesis?<br/>What is calibration?<br/>Why would you need to test/calibrate the thermometers before beginning the study?</p> <p><b>Ask students to check that both thermometers give the same reading of the class room temperature and the water temperature before you begin your study. This is to test/calibrate the thermometers to make sure they record the same temperature and are both working properly.</b></p> <p>Ask the students to form their own hypothesis about whether the temperature of the classroom will influence the temperature of the water or not? Students should note their hypothesis in the Temperature study worksheet.</p> |                               |

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|  | <p><b>Active and Group Learning:</b><br/>                 Divide the students into groups and ask each group to take turns reading the temperature of the classroom and the water samples to check that all students can accurately read the thermometers. (When taking the temperature readings where possible leave the liquid thermometer in the water samples and read from outside the containers. If using digital thermometers leave the probes in the containers. In the case of a digital strip thermometer leave it stuck to the outside of the containers).</p> <p>Compare the temperatures of the room and the aquarium and note variations, if any. Collect temperature data for a set period (e.g. one week) and record on the worksheet. You may wish to set up a rota in the classroom so that each group gets a turn to collect data on a daily basis.</p> <p>Ask students to also record the water level in each sample each day on the worksheet. This can be carried out by measuring the height of water in the containers each day using the ruler.</p> <p>Using the worksheet, ask students to give a written description of:</p> <ul style="list-style-type: none"> <li>• How did they carry out their data collection?</li> <li>• Were there any changes in the temperatures of the classroom and the water samples during the test?</li> <li>• Were there any variations in the temperature on a daily/week long basis?</li> <li>• What do they think caused the variations?</li> <li>• Did evaporation reduce the quantities (lower the level) in the water samples over the study period?</li> </ul> <p>Ask students to present the daily/weekly recordings using a selection of graphs and charts.</p> |
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|  | <p>*If possible students can use excel or another computer programme to generate this output.</p> <p>A paragraph should also be written explaining the results on the graph.</p> <hr/> <p><b>Resources</b></p> <ul style="list-style-type: none"> <li>• Worksheet for each student/group</li> <li>• Two liquid alcohol or digital thermometers (one for the classroom and one for the salt water aquarium water samples)</li> <li>• Saltwater aquarium or a container of saltwater (minimum size 500 mls) to simulate the Aquarium.</li> <li>• Pencil</li> <li>• Ruler</li> <li>• Computers for students to generate graphs</li> </ul> |
| <p><b>Differentiation</b><br/>Differentiate group activities and roles to take account of individual needs.</p>  |  |
| <p><b>Assessment</b><br/>Question and answer, Oral feedback from children, teacher observation, teacher check, pupil work samples, Complete Worksheet.</p>   |  |
| <p><b>Linkage and Integration</b><br/>Science: Ask students research creatures that live at different levels in the ocean and discuss the temperatures of the ocean – compare to sea animals and corals that live in warmer climates, growth rates etc.<br/>Geography: Research Ocean Depths and temperatures – learn the names of the different depths of the ocean – see Geography lesson plans.</p> |  |



**TITLE: Temperature Study Worksheet**

**Exercise:**

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| School Name   |  |
| Student Name  |  |
| Start Date  |  |
| End Date  |  |
| Describe how temperature data was collected:  |  |
|   |  |
| Give a written description of how classroom and aquarium temperatures changed over the sampling period: |  |
|   |  |

**Data Recording Sheet**

| CLASSROOM TEMPERATURES- SCHOOL NAME |             |     |      |     |      |     |
|-------------------------------------|-------------|-----|------|-----|------|-----|
| TIMES                               | Actual Time | MON | TUES | WED | THUR | FRI |
| Earliest class time                 |             |     |      |     |      |     |
| Before morning break                |             |     |      |     |      |     |
| Before lunch break                  |             |     |      |     |      |     |
| After lunch break                   |             |     |      |     |      |     |
| Before home departure               |             |     |      |     |      |     |



| AQUARIUM TEMPERATURES |             |     |      |     |      |     |
|-----------------------|-------------|-----|------|-----|------|-----|
| TIMES                 | Actual Time | MON | TUES | WED | THUR | FRI |
| Earliest class time   |             |     |      |     |      |     |
| Before morning break  |             |     |      |     |      |     |
| Before lunch break    |             |     |      |     |      |     |
| After lunch break     |             |     |      |     |      |     |
| Before home departure |             |     |      |     |      |     |

Study Conclusions:

Create a graph and written information to represent the data collected.