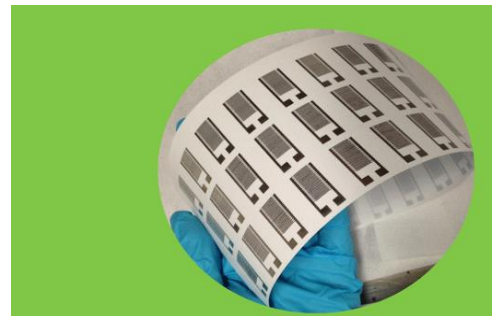












## Summary

# Printed Meteorological Station - printed sensors on paper



	<p><b>Target age</b> Age 15 and over</p> <p><b>Level of difficulty</b></p> <p><input type="checkbox"/> Easy    <input checked="" type="checkbox"/> Medium    <input type="checkbox"/> High</p>	
	<p><b>Key words:</b> <i>Sensor, temperature, humidity, UV, printed, cellulose</i></p>	
	<p><b>Abstract:</b></p> <p>This is a laboratory activity where the students make their own printed sensors and perform a calibration curve so they can be used in a real context. It will give an idea of how sensors can be made and how generally a physical variation of temperature, relative humidity or UV can be indirectly determined by measuring the electrical resistance or current variation. Depending on the number of students, the “class” can be divided in several groups of three students or it can be performed in small groups of two-to-five so everyone can be able to print at least one of the layers required in this activity.</p>	
	<p><b>Learning Goals</b></p> <ul style="list-style-type: none"> <li>• Understand the advantages of the use of small printed sensors;</li> <li>• Understand the principle of transduction and how to use it to measure;</li> <li>• Comprehend how functional inks work and the advantages of their usage.</li> </ul>	

## Summary

	<p><b>Specific Abilities</b> - <i>At the end of the activity the student will be able to:</i></p> <ul style="list-style-type: none"> <li>• Learn some basic principles about conversion from a physical property into an electrical signal</li> <li>• Characterize different type of sensors</li> </ul>
	<p><b>Cross-curricula Links:</b></p> <ul style="list-style-type: none"> <li>• Chemistry</li> <li>• Electronics</li> <li>• Physics</li> <li>• Technology</li> </ul>
	<p><b>Prerequisites</b> - <i>Knowledge and skills necessary for carrying out the activity</i></p> <ul style="list-style-type: none"> <li>• Basic understanding about electrical conduction</li> <li>• Basic knowledge on electronics/electrical characterization equipment</li> </ul>
	<p><b>Time requirement</b> <i>plus eventually other boundary conditions (i.e. Instruments)</i></p> <p><input type="checkbox"/> 2 h                      <input type="checkbox"/> ..... min</p>
	<p><b>Learning and Teaching Support Materials - What you can find in the toolkit</b></p> <ol style="list-style-type: none"> <li>1. Lab Procedure</li> <li>2. Student's Cards</li> <li>3. Teacher's Card</li> <li>4. Printed sensors of temperature, humidity and UV</li> <li>5. Multimeter</li> </ol>
<div style="background-color: #0070C0; color: white; padding: 10px; text-align: center;"> <p><b>RM Ambassadors</b></p> </div>	<p><b>Authors</b></p> <p><i>Cristina Gaspar, CENIMAT, <a href="mailto:chg12706@fct.unl.pt">chg12706@fct.unl.pt</a></i>  <i>Raquel Barras, CENIMAT, <a href="mailto:r.barras@campus.fct.unl.pt">r.barras@campus.fct.unl.pt</a></i>  <i>Luís Pereira, CENIMAT, <a href="mailto:lmnp@fct.unl.pt">lmnp@fct.unl.pt</a></i></p>