

## In2steam Lesson Plan (Activity) Template

<b>1. Name of the lesson</b>	<b><i>BANANA DNA EXTRACTION</i></b>
<b>2. Target group</b>	9-10 years old
<b>3. Duration</b>	1 hour
<b>4. STEAM Skills/ 21<sup>st</sup> Century Skills??</b>	Tech literacy Problem Solving 
<b>5. Expected learning outcomes</b>	By the end of this unit, learners will be able to: <ul style="list-style-type: none"> <li>• Understand that all living things, bananas and people included, have the same basic material in every cell: DNA.</li> <li>• Identify the DNA structure without a high—powered microscope.</li> </ul>
<b>6. Subjects and topics covered</b>	Science & Biology: cells – DNA – genes Learning about DNA as a component of living things
<b>7. Methodologies</b>	Problem Based Learning
<b>8. Integration of the Arts</b>	Through this exercise students learn to handle different materials and discover their different properties
<b>9. Learning Environment</b>	Classroom, lab.
<b>10. Required resources</b>	<ul style="list-style-type: none"> <li>• 1 banana,</li> <li>• 1 small bowl</li> <li>• 2 cups (glass)</li> <li>• Water</li> <li>• Salt</li> <li>• Dishwashing soap or other detergents</li> <li>• Paper napkin</li> <li>• alcohol</li> </ul>
<b>11. Prior knowledge</b> a. teacher b. students	In order to deliver this lesson, the teacher will need to have the following knowledge about: cells, DNA, genes In order to be able to participate and contribute to this lesson, the students should know about: cells, DNA, genes
<b>12. Detailed description of the step-by-step sequences of the unit, incl. specific activities to support the learning experience</b>	<ul style="list-style-type: none"> <li>• Mash the BANANA in a small bowl for about a minute until all the lumps are gone and it almost looks like cream.</li> <li>• Fill a cup with the HOT WATER and SALT, then put the saltwater mix into the bowl and move the saltwater and banana mush together (1 minute).</li> <li>• Add the DISHWASHING SOAP into the bowl and gently mix the contents (no bubbles or too much foam)</li> <li>• Place the FILTER, made of paper napkin, in a clear glass cup, securing the top of the filter around the lip of the cup. Pour the mix into the</li> </ul>

	<p>filter and let it sit until all of the liquid drips down into the cup. Remove the filter.</p> <ul style="list-style-type: none"> <li>• Slowly add cold ALCOHOL down the side of the cup because the alcohol must form a layer on top of the banana mix staying separated. Make a layer of alcohol that is 2.5-5 cm thick.</li> <li>• After the alcohol layer is set up. Wait for 8-10 minutes than see some bubbles and cloudy material moving around in the alcohol. This is the DNA.</li> </ul> <p>In this activity each material plays a specific role in helping to extract the DNA from the cells. For instance, the detergent or soap helps to break down the cell's outer membrane, and the salt helps to separate the DNA from other materials in the cell. And because the DNA doesn't dissolve in alcohol, this substance helps the DNA clump together in a separate layer.</p>
<p><b>13. Gender-inclusive strategies and activities planned</b></p>	<p>Both girls and students will be engaged in the activity and they will learn all together and in a cooperative way</p>
<p><b>14. Assessment &amp; Evaluation</b></p>	<p>Personal laboratory report to be completed by each student or by the group. It will be evaluated by teachers then. Students can also show their main findings and results using videos, PPT and taking pictures</p>