



# Representing Information & Introduction to Codes



## Lesson Plan: Class 04 / IP / 02



<b>Overall goal of the lesson</b>	<b>Representing Information and Introducing Codes.</b>
<b>Prior knowledge required</b>	

**MODULE 1:**      **Module time:** 35 minutes

<b>Goal:</b>	To learn how to represent information using symbols and codes.
<b>Description:</b>	Students will learn how to represent information with symbols and codes.
<b>Material required:</b>	<p><b>Physical:</b> Printed copy of the worksheet 04-IP-02-WS for each student, pencil and eraser.</p> <p><b>Electronic:</b> Representing information &amp; Introducing Codes (04-IP-02-PPT) Power Point presentation.</p>
<b>Procedure Summary:</b>	<ol style="list-style-type: none"> <li>1. Walkthrough the presentation 04-IP-02-PPT with the students.</li> <li>2. Distribute the worksheet copy 04-IP-02-WS to the students.</li> <li>3. Ask the students to complete the worksheet exercises to determine whether they have understood the lesson.</li> </ol>
<b>Procedure Details:</b>	<ol style="list-style-type: none"> <li>1. Show the students a picture of a traffic light and ask them if they know what it is?</li> <li>2. When the students identify it as a traffic light or signal, show them the Red-light picture and ask them to identify it. Ask them what is the purpose of a red traffic light? The answer is that the red light is the universal signal for all vehicles facing the light to stop at the signal till the light remains red.</li> <li>3. Show them the yellow light and ask them the purpose. The answer is that when the light is yellow it means that the traffic light is changing from green to red and vehicles need to slow down and proceed with caution.</li> <li>4. Show them the green light and ask them the purpose. The answer is that all vehicles facing the green light can move forward or continue moving forward, till the light remains green.</li> <li>5. Ask the students what will happen if we change the red color of the traffic light to pink? Will traffic stop when the light turns pink? Answer is No. Ask the students what will happen if we change the green color of the traffic light to blue? Will the traffic go when the light turns blue? Answer is No.</li> <li>6. What we have seen is a representation of information in a way that is universally understood. The Red light means you Stop. The Yellow light means you Proceed with Caution and the Green light means you Go. If change the colors, then the traffic signal loses meaning.</li> <li>7. Ask the students if they recall the Binary representation. Binary literally means composed of or involving two things. For example, a light bulb is Binary because it has two positions: it is either OFF or it is ON. OFF is represented by the number 0 and ON is represented by the number 1. Binary is the basic building block of all digital devices. Digital devices are composed of millions of small electronic parts capable of generating ON/OFF signals i.e. 0 and 1. The binary information is then interpreted as images, sounds, and other kinds of data.</li> </ol>

	<p>8. We can use the 0 and 1 notations of binary numbers to create black and white pictures. For e.g., consider a grid of 1 row and 4 columns as below:</p>  <p>9. If we color the cell containing 1 with black and erase the zero, we get:</p>  <p>10. This is a picture representation of the binary number 0101.</p> <p>11. Each box is a picture element or “Pixel”. A pixel is the smallest single component of a digital image. It is the smallest element of a picture or image represented on a screen.</p> <p>12. A collection of pixels makes an image. For example: we can make a smiley face image by creating a grid of 6 rows and 7 columns and representing it as:</p> <pre> 0000000 0010100 0001000 0100010 0011100 0000000 </pre> <p>13. Slides 23, 24 and 25 break down how exactly we can create a smiley face using the 6x7 grid.</p>
<b>Assessment:</b>	Exercises on representing information and introducing codes.
<b>Information Broadcast:</b>	Completed lesson and exercises on representing information and introducing codes.