

| Subject: COMPUTING  | Date/time: 3 Sept 2015 09:00 | Lesson 1 of 7 | Class: 7GT (20 pupils) | Ability Setting: Mixed | Room: 36 |
|---|------------------------------|---------------|------------------------|------------------------|----------|
| <p><b>Topic learning aim:</b><br/>To understand the basic concepts of computer control and programming. Pupils can understand and design basic control systems. They select appropriate input and output devices and use flowcharting software to create control programs. They can identify relative advantages and disadvantages of computer controlled devices.</p>  |                              |               |                        |                        |          |
| <p><b>Learning objectives (in terms of skills, attitudes, concepts, knowledge):</b><br/><b>By the end of this lesson:</b></p> <ol style="list-style-type: none"> <li>1. Pupils can apply the terms input, process, output and feedback to describe how real-world systems work.</li> <li>2. Pupils can use the idea of a computer program to invent instructions which control a device or process. They can deduce the effect of imprecision in computer instructions.</li> <li>3. Pupils can explore the relative advantages and disadvantages offered by independent robotic devices.</li> </ol> |                              |               |                        |                        |          |
| <p><b>Previous knowledge:</b> Last lesson most pupils said they had some limited experience of using LOGO, about half have used a roamer – but only with simple, direct commands.</p>   |                              |               |                        |                        |          |
| <p><b>Key issues (based on last lesson evaluation/administrative points):</b> Reinforce seating plan as pupils enter. Reminder – Computer Club. Write WALT on the board prior to class entry.</p>   |                              |               |                        |                        |          |
| <p><b>SEN/IEP interventions for this lesson:</b><br/>S1: Learning support assistant – to support the 5 pupils identified in the register.<br/>S2 (hearing impaired): Collect and wear radio transmitter.</p>  |                              |               |                        |                        |          |
| <p><b>Differentiation strategies for this lesson: [Grouping: outcome/outputs: Tasks/worksheets: graduated tasks: Support (LSA/teacher/peer): resource]</b><br/>Support – during main phase offer specific coaching to identified individuals. Use phone-a-friend during feedback.<br/>Grouping – mixed ability groupings during programming activities.<br/>Graduated questions during feedback.</p>  |                              |               |                        |                        |          |
| <p><b>Resources required:</b><br/>Seating plan.<br/>20 dry wipe boards and pens.<br/>Y7 Control presentation.ppt.<br/>WALT &amp; WILF on the flipchart.</p> <p>Web-quest document.<br/>Sandwich stuff – tray, knife, margarine, jam, loaf of bread, tea towel [on front desk, covered with tea towel].<br/>2-part homework sheet – ‘Input, process, output’ and ‘Thinking about robots.’<br/>Lesson concept map.</p>  |                              |               |                        |                        |          |
| <p><b>Numeracy/literacy opportunities:</b></p> <ul style="list-style-type: none"> <li>• Make brief, clearly organized notes of key points for later use.</li> <li>• Define and deploy words with precision.</li> <li>• Read accurately, and use correctly, vocabulary which relates to key concepts in each subject.</li> <li>• Give clear answers, instructions or explanations that are helpfully sequenced.</li> <li>• Justify or defend a point of view using supporting evidence, example and illustration.</li> </ul>   |                              |               |                        |                        |          |
| <p><b>Cross-curricular link opportunities: English – writing for an audience; Design &amp; technology – control technology</b></p>  |                              |               |                        |                        |          |

| Time | Pupil Activity  | Teacher Activity  | Learning Outcomes / Assessment |
|------|---|---|--------------------------------|
| 9:00 | <p>Lesson entry – collect dry wipe board at the door.</p> <p>Record answer to question on dry wipe board and hold up.</p> <p>Answer questions.</p>  | <ul style="list-style-type: none"> <li>• Welcome class.</li> <li>• Slide 1 – ‘What do these devices have in common?’</li> <li>• Probe answers – reveal ‘They are all controlled by a computer microchip.’</li> <li>• Show WALT and WILF on flipchart.</li> <li>• Questions to ask [HANDS UP with WAIT TIME]:</li> </ul> <ol style="list-style-type: none"> <li>1. <b>What do we need to know in order to do number 1?</b></li> <li>2. <b>Has anyone here written a computer program?</b></li> <li>3. <b>What does ‘justify’ mean in point 3?</b></li> </ol>   |                                |
| 9:10 | <p>Record answer to question on dry wipe board and hold up.</p> <p>Answer questions.</p> <p>Work in pairs to solve each example, be prepared to feedback.</p> <p>Record homework in planners.</p> | <ul style="list-style-type: none"> <li>• Slide 2 Input/output.</li> <li>• Washing machine: ‘30 seconds – On your wipe boards write down the inputs and outputs for this device’. <b>Start on-screen timer.</b></li> <li>• Pupils hold up their boards. Probe – <b>capture</b> key answers on the board – mixture of whole system and computer control responses.</li> <li>• Thought experiment – ‘Remember the things we are interested in are those that the computer inside the washing machine “knows” about – INPUTS – and the things it can directly control – OUTPUTS. Close your eyes. Imagine you are the computer that “lives” in the washing machine – your job is to get the clothes clean. Think about what senses or sensors you have that tell you what’s going on in the washing machine and what devices you can control in order to wash the clothes.’</li> <li>• Feedback from class – volunteer updates list on the board so we are only left with computer-controlled inputs and outputs. Save the slide.</li> <li>• Slide 3 – Think–Pair–Share for remaining examples, collate feedback on slides 4–6 and save updated slides.</li> <li>• Ask a pupil to distribute the next activity sheet and the homework sheet – describe. Ask a pupil to explain back to the class what the task is.</li> </ul> | LO1 – and homework             |
| 9:20 | <p>Log-on.</p> <p>Complete web-quest individually.</p>  | <p>Show picture of robot glider – introduce robots web-quest.</p> <p>Check understanding of task.</p> <p>Transition to main phase.</p> <p>Support – coach Kieran and Suzanne to be able to say answers during the feedback.</p>   | LO3 – and homework             |

| Time | Pupil Activity  | Teacher Activity   | Learning Outcomes / Assessment |
|------|---|--|--------------------------------|
| 9:35 | <p>Feedback answers.<br/>Participate in discussions.</p>  | <p>Monitors-off [CHECK – especially Kieran’s at the back].<br/>‘NO hands-up – I expect everyone to have an answer – Phone-a-friend is active.’</p> <ul style="list-style-type: none"> <li>• What do you think this is? [Robot glider]</li> <li>• Now you know the job it does, what kinds of sensors do you think it has?</li> <li>• Display robots vs humans table. <ul style="list-style-type: none"> <li>○ ‘Robots are better than humans at ... because ...’</li> <li>○ [Prompts: dangerous environments, strength, long hours, repetition]</li> <li>○ ‘Humans are better than robots at ... because ...’</li> </ul> </li> <li>• [Prompts: making complex decisions, using judgement, flexible thinking, interacting with people, solving problems]</li> <li>• How do these robots make decisions?</li> <li>• Who writes the instructions for computers and microchips?</li> <li>• What is a computer program? [compose a definition on flipchart].</li> </ul> | <p>LO3 and homework</p>        |
| 9:45 | <p>Writing a list of instructions.<br/>Testing instructions.<br/>Thinking about why the activity is so difficult.</p> | <p>So now we know a little about computer programs I want you to have a go at being computer programmers!<br/>Sandwich-making task.</p> <ul style="list-style-type: none"> <li>• Display slide showing photograph of the sandwich tray and a description of the task rules.</li> <li>• Check understanding.</li> </ul> <p>Set on-screen timer – 3 minutes.</p> <p>‘While we do the task I want you to think about why each group is successful (or not):<br/>Feedback from each group.</p>   | <p>LO2</p>                     |
| 9:55 | <p>Discuss and complete the concept map for the lesson.</p>   | <p>Refer to the learning objectives.<br/>Complete the broken concept map.<br/>Homework reminder.</p>   | <p>LQ1, 2 and 3</p>            |

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| <b>Lesson evaluation</b>   |   |
|--|---|
| <p><b>What went well?</b></p> <p>Most of the class enjoyed the topic and worked throughout. They had got the point after the first input, process, output example – so didn't use the last 2.</p> <p>On the whole they met the learning objectives, their individual understanding will be more apparent during the next activity.</p> | <p><b>What could be improved?</b></p> <p>Perhaps too many transitions – could these be reduced?</p> <p>Smoother handing out of material – have it on the desks ready next time – TA could help.</p> <p>Balance of teaching and learning time – still lots of me talking, how can I get them doing more of the work?</p> <p>Swap the sandwich-making and feedback activities?</p> <p>Timings were very tight, will need to finish off the concept map at the beginning of next lesson.</p> <p>Forgot to ask them to record the homework in their planner.</p> <p>DH and CP were absent – will need catch-up activity next week.</p> <p>The extension task was too vague – need to give them something more structured next time.</p> |