
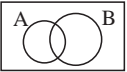


Y7	UNIT 1: <i>Logic</i> Lesson Plan 1	<i>Logic Puzzles</i>
<i>Number</i>	<i>Activity</i>	<i>Notes</i>
1	<p>Introduction</p> <p>T: Introduce Y7 course and Practice Books.</p> <p>T: How much mathematics have you remembered?</p> <p>T: The foundations of mathematics depend on logic. So we start with some simple problems.</p> <p>M 1.1 Q1 Q2 Q3 Q4</p> <p style="text-align: right;">5 mins</p>	<p>Let Ps give examples, at speed, get as many as possible to respond.</p> <p>Whole class activity, question by question; get Ps to explain answers and their method (particularly Qs 3 and 4)</p>
2	<p>Logic tables</p> <p>T: Now we will tackle more complex problems.</p> <p>OS 1.1 (or prepared on BB).</p> <p>T: We need a logic table to help solve this problem. What should the rows and columns contain? How do we mark 'true' / 'not true'?</p> <p>T: What can we fill in? What can we be sure about?</p> <p style="text-align: right;">15 mins</p>	<p>Initially keep logic table covered up. Ask Ps if they have understood problem and how to solve it.</p> <p>Ps suggest $\sqrt{\quad}$ and X. T gives hints if needed, e.g. which numbers out of the 3 are in 4 times table and which are not?</p>
3	<p>PB 1.1, Q1</p> <p>T: You have 5 minutes to solve this problem.</p> <p>T: Who would like to show their solution? Explain your answers!</p> <p>T: Check your solution, and if necessary, correct it.</p> <p style="text-align: right;">22 mins</p>	<p>Each P has copy of blank logic table, OS 1.18, to work on.</p> <p>Keep to time limit; check P's working and help individuals who are having problems starting.</p> <p>P works on OS 1.18 on OHP. Agreement/disagreement. Praising correct solution.</p>
4	<p>PB 1.2, Q2 (or Q6 if no problems with Q1)</p> <p>T: Answer this one in your Ex.B.</p> <p>T: Stop now and we will review answers.</p> <p>(Also review Q6 if stronger Ps have completed this.)</p> <p style="text-align: right;">37 mins</p>	<p>Encourage Ps to work in pairs if they need help; T monitoring work, helping slower Ps.</p> <p>Ps give answers on OHP. Class check each answer.</p> <p>Agreement/feedback/self-correction.</p> <p>Praising.</p>

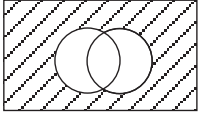
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<i>Number</i>	<i>Activity</i>	<i>Notes</i>
5	<p>PB 1.1, Q4</p> <p>T: Finally, we have a more difficult problem, where the answer is not obvious at first sight.</p> <p>T gives hints, e.g. Can Charlie be the oldest boy? So, what can we put and where? What else does Clue 1 tell us?</p> <p style="text-align: right;">45 mins</p>	<p>Whole class activity, but first Ps read Q.</p> <p>Table drawn on BB or OHP.</p> <p>Ps work in Ex.B.</p> <p>Discussion; agreement. T and Ps put \checkmark and \times in their own tables.</p>
6	Set homework PB 1.1, Q3, Q7 and Q10	

Y7	UNIT 1: <i>Logic</i>	Lesson Plan 2	Two-Way Tables																									
Number	Activity	Notes																										
1	<p>Checking homework</p> <p>T: Check your answers to Q3 and Q7.</p> <p>T: Who got them both correct? Who didn't? What was the problem?</p> <p>T: It is impossible to check all solution to Q10, but we will try one ... Who would like to give their clues?</p> <p style="text-align: right;">8 mins</p>	<p>T has prepared OS or BB with solutions to Q3 and Q7.</p> <p>Encourage Ps to discuss any problems.</p> <p>P reads out their clues, and other Ps say where to put \surd or X in logic table.</p> <p>Agreement, correction. Praising.</p>																										
2	<p>Activity 1.1</p> <p>T: Before we make our brains work, we will make our bodies work!</p> <p>T: Ps with <i>no</i> sisters or brothers, go to the front; others go to the back.</p> <p>T: Now boys go to the right; girls to the left.</p> <p><i>Similar for parts 2 and 3 of Activity.</i></p> <p>For Part 3</p> <p>T: What is the total number now? Is it equal to the total number of Ps in class? If not, why not?</p> <p style="text-align: right;">18 mins</p>	<p>You need sufficient space for this activity (you could use the four corners of the classroom).</p> <p>When in place, T puts the result on BB or OHP.</p> <p>After each formation, Ps dicuss what is in each part of the formation, and add up total number of Ps in each cell, and the total.</p> <p>Ps give ideas; establish that the categories have to be opposite to include all Ps.</p>																										
3	<p>PB 1.2, Q1</p> <p>T: Read this question carefully and answer in your Ex.B. You have 3 minutes for this!</p> <p>T: We will check answers.</p> <p style="text-align: right;">24 mins</p>	<p>T monitoring work, checking progress.</p> <p>Ps give answers in turn. T writes them on BB. Checking, feed-back, self-correction. Praising.</p>																										
4	<p>Revision</p> <p>T: It's time to see what you have remembered from your numerical work in Primary School.</p> <p>T: (for example)</p> <table><tr><td>$3 + 5$</td><td>$5 + 3$</td><td>$7 + 12$</td><td>$14 + 9$</td></tr><tr><td>$20 + 50$</td><td>$23 + 32$</td><td>$42 + 39$</td><td>$39 + 42$</td></tr><tr><td>$8 - 3$</td><td>$15 - 8$</td><td>$3 - 2$</td><td>$2 - 3$</td></tr><tr><td>$26 - 7$</td><td>$50 - 20$</td><td>$42 - 23$</td><td>$82 - 38$</td></tr><tr><td>3×2</td><td>...</td><td></td><td></td></tr></table> <p>T: Now in Ex.Bs – try to find a quick method:</p> <table><tr><td>$36 + 48 + 64$</td><td>$43 + 132 + 56$</td><td>$237 - 189$</td></tr><tr><td>3×2</td><td>...</td><td></td></tr></table> <p>T: (after 2 minutes): We will review answers.</p> <p style="text-align: right;">33 mins</p>	$3 + 5$	$5 + 3$	$7 + 12$	$14 + 9$	$20 + 50$	$23 + 32$	$42 + 39$	$39 + 42$	$8 - 3$	$15 - 8$	$3 - 2$	$2 - 3$	$26 - 7$	$50 - 20$	$42 - 23$	$82 - 38$	3×2	...			$36 + 48 + 64$	$43 + 132 + 56$	$237 - 189$	3×2	...		<p>At speed, around class by name (encourage strugglers with easier tasks).</p> <p>For review of answers, encourage Ps to work on BB or OHP. Discuss methods such as</p> $36 + 48 + 64 = (36 + 64) + 48$ $= 100 + 48$ $= 148$ $237 - 189 = 37 + (200 - 189)$ $= 37 + 11 = 48$
$3 + 5$	$5 + 3$	$7 + 12$	$14 + 9$																									
$20 + 50$	$23 + 32$	$42 + 39$	$39 + 42$																									
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Y7	UNIT 1: <i>Logic</i> Lesson Plan 2	<i>Two-Way Tables</i>
<i>Number</i>	<i>Activity</i>	<i>Notes</i>
5	<p>Incomplete tables</p> <p>T: Now we will see how to complete tables that are incomplete.</p> <p>PB 1.2, Q5</p> <p>T: Read the first part of the question.</p> <p>What data do we know apart from that in the table?</p> <p>Does every P have a place in this table?</p> <p>Why?</p> <p>How do we complete the table?</p> <p>What is the total? (436)</p> <p>What do we do now?</p> <p>T: Fine; but how can we answer part (a)? ((b), (c))</p> <p style="text-align: right;">39 mins</p>	<p>Whole class activity.</p> <p>Ps count in PB and record answer in Ex.B.</p> <p>Let Ps answer in chorus.</p> <p>Ps offer reasons.</p> <p>Ps give numbers to be added; T on BB.</p> <p>P demonstrates on BB</p> <p style="text-align: right;">$(484 - 436 = 48)$</p> <p>Class helps with subtraction; Ps put calculation in Ex.B.</p> <p>Discussion; praising.</p> <p>Ps volunteer answers; agreement. Praising.</p>
6	<p>Filling in logic table</p> <p>T: Now we can try to fill in a complete table.</p> <p>PB 1.2, Q6</p> <p>T: Who can fill in one of the boxes?</p> <p>T: What information do we start with? Why?</p> <p style="text-align: right;">45 mins</p>	<p>Whole class activity.</p> <p>Put empty table on BB or OHP.</p> <p>Ps volunteer and fill in table, giving reasons.</p> <p>Agreement, discussion.</p> <p>Ps copy table into Ex.B.</p> <p>Praising.</p>
7	<p>Set homework</p> <p>PB 1.2, Q4 and Q7 (and Q9 for stronger Ps)</p> <p>Also, find out some facts about John Venn, e.g. who he was, when and where he lived, why he is famous.</p>	<p>Encourage use of library and/or internet for information.</p>

Y7	UNIT 1: <i>Logic</i> Lesson Plan 3	<i>Sets and Venn Diagrams</i>
Number	Activity	Notes
1	<p>Checking homework PB 1.2, Q4</p> <p>T: Who was successful? Who was not? What was your mistake?</p> <p>Similar for PB 1.2, Q7, PB 1.2, Q9 (stronger pupils) T: Who tried this question?</p> <p>T: We will discuss the information about John Venn later in the lesson.</p> <p style="text-align: center;">8 mins</p>	<p>T points to Ps to give answers (and reasons). Praise.</p> <p>Agreement, feedback, self-correction. Praise.</p> <p>P volunteer gives solutions on BB or OHP. Class follows; agreement, feedback, self-correction. Praise.</p>
2	<p>Illustrating sets T: This is another aspect of logic. First, though, we must make a large space for everyone to stand in (or all move to the hall!).</p> <p>T: On BB Set A = {pupils with brown eyes}</p> <p>T: All Ps in set A come into the circle.</p> <p>T: Who are in the circle? (Ps with brown eyes.)</p> <p>T: Who are outside the circle? (Ps whose eyes are not brown.)</p> <p>New example: T: On BB Set B = {boys}</p> <p>T: Ps in set B move into the circle.</p> <p>T: Who is in the circle? (boys)</p> <p>T: Who is on the outside? (not boys)</p> <p>Another example: Set A = {pupils with brown eyes} Set B = {pupils wearing glasses}</p> <p>T: Who are inside A but not inside B? (Ps with brown eyes but no glasses)</p> <p>T: Who are inside B but not inside A? (Ps with glasses but not brown eyes)</p> <p>T: Who are in both sets? (Ps with brown eyes and glasses)</p> <p>T: Now move to your places.</p>	<p>This is based on Activity 1.3, but here we use it for introducing sets and Venn diagrams.</p> <p>T draws circle around the group (or use rope, etc.).</p> <p>Volunteer P draws similar shape on BB.</p> <p>P puts answer inside circle on BB.</p> <p>Some Ps might say "blue eyes" or "green eyes", but "not brown eyes" is required.</p> <p>P puts answer outside circle on BB and completes with another circle or rectangle, e.g. </p> <p>Volunteer P draws circle and rectangle on BB and writes in answers.</p> <p>This time T arranges two overlapping circles and outside, e.g. </p> <p>on floor (and P on BB).</p> <p>Ps move in appropriate position and T checks that they are correct!</p>

20 mins

Y7	UNIT 1: <i>Logic</i> Lesson Plan 3	<i>Sets and Venn Diagrams</i>
Number	Activity	Notes
3	James Venn T: What have you found out about James Venn? _____ 26 mins _____	Ps write information on BB. Discussion. Praising.
4	Using Venn diagrams: OS 1.7 (on OHP or drawn on BB) T: Where can we put any of the numbers? <i>(T could introduce names, i.e. intersection, union, complement)</i> _____ 32 mins _____	Whole class activity. Ps come to OHP/BB to put a number in the appropriate place. Discussion (other numbers?) Praising.
5	Intersection and union: OS 1.10 T: What are the members of set Y and set X ? Describe the sets X (and Y) in words. T: Now we will complete the sheet. Put (a)? etc. _____ 37 mins _____	Whole class activity. Each P has copy of OS 1.10 to work on. P gives answers to class. Ps give answers and complete worksheets. T writes answers on OHP. Agreement. Praising.
6	PB 1.3, Q2 T: Read the question carefully and answer in your Ex.B. T: Set A ? Set B ? Part (b) T: Also, what is the intersection of A and B? (2, 8) T: What is the complement of the union of A and B? (7, 9) _____ 45 mins _____	Individual work; monitored; help given. After a few minutes, start checking. P writes on BB. Checking. Praising. P offer answers; agreement. Praising. Help Ps with the meaning of this, e.g.  Agreement. Praising.
7	Set homework PB 1.3, Q3, and Q5 with added questions for stronger Ps: (e) What is the intersection of S and E ? (f) What is the complement of E ? (g) What is the complement of the union of S and E ?	

Y7	UNIT 1: <i>Logic</i> Lesson Plan 4	<i>Sets and Venn Diagrams: Notation</i>
<i>Number</i>	<i>Activity</i>	<i>Notes</i>
1	<p>Checking homework PB 1.3, Q3</p> <p>T: What have you noticed here? (every element in B is also in A) T: Could we use the Venn diagram in PB 1.3, Q2 for this task? What is the intersection of A and B? {4, 8, 12} What is the union? {4, 8, 12, 2, 6, 10} Hence? (you can use the usual notation)</p> <p>PB 1.3, Q5 (a) $E = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$ (b) $S = \{1, 4, 9, 16\}$ (c) $E = \{\text{even numbers}\}$ and $S = \{\text{square numbers}\}$ (d) Union of E and S = {1, 2, 4, 6, 8, 9, 10, 12, 14, 16, 18, 20} (e) Intersection of E and S = {4, 16} (f) Complement of E = {1, 3, 5, 7, 9, 11, 13, 15, 17, 19} (g) Complement of the union of E and S = {3, 5, 7, 11, 13, 15, 17, 19}</p> <p style="text-align: right;">8 mins</p>	<p>T asks, Ps give answers. Agreement, feedback, self-correction. Praising.</p> <p>T discusses this special case with Ps.</p> <p>T introduces the concept of subset.</p> <p>T prepares OS with solution or on BB, as shown opposite. Feedback, self-correction. Praising.</p>
2	<p>Simplifying notation</p> <p>T: Gosh; writing out all these names is exhausting! We need a shorter method. Can anyone suggest what we could do?</p> <p>OS 1.12 (<i>big sigh from T!</i>)</p> <p>T: We will use the notation here to revise my solutions to PB 1.3, Q5.</p> <p>T: What is the empty set? T: Name something that does not exist. T: How about "the pink dogs sitting under my table"?</p> <p style="text-align: right;">18 mins</p>	<p>Try to lead Ps to the concept of notation for intersection, union and complement.</p> <p>Ps help to rewrite solutions on BB (with OS 1.12 on OHP).</p> <p>Discussion, brainstorming (work in pairs to name things that do not exist).</p>
3	<p>Using set notation OS 1.13</p> <p>T: Look at this problem. We will answer parts (a) to (e).</p> <p style="text-align: right;">23 mins</p>	<p>Whole class activity. P volunteers to put answers on OHP (and state reasons). Agreement. Praising.</p>

Y7	UNIT 1: Logic Lesson Plan 4	<i>Sets and Venn Diagrams: Notation</i>
Number	Activity	Notes
4	<p>Practising 1</p> <p>T: Look at PB 1.3, Q4 and add</p> <p>(c) $P \cup Q$</p> <p>(d) Q'</p> <p>T: Who would like to draw Venn diagram on the BB?</p> <p>T: Who can answer the questions?</p> <p style="text-align: right;">29 mins</p>	<p>Whole class activity.</p> <p>P read tasks from PB.</p> <p>P draws Venn diagram (if P does not use best possible figure, still use it, unless other Ps suggest changing it, but comment on it at the end).</p> <p>Ps give answers and T writes on BB.</p> <p>Agreement. Praising.</p>
5	<p>Practising 2</p> <p>T: PB 1.3, Q7, but rewritten as</p> <p>(a) the same</p> <p>(b) $R \cap Q = ?$</p> <p>(c) $R \cup Q = ?$</p> <p>(d) $Q' = ?$</p> <p>(e) $(R \cup Q)' = ?$</p> <p>(f) $Q' \cap R = ?$</p> <p>T: We will check answers. Draw Q to I in Venn diagram on BB.</p> <p style="text-align: right;">39 mins</p>	<p>Individual work.</p> <p>Use prepared BB or OH slides or on sheet of paper.</p> <p>Ps answer in Ex.B.</p> <p>Ps draw one shape each in Venn diagram on BB or OHP.</p> <p>Parts (b) to (d) should be OK, but stronger pupils to do parts (e) and (f) and explain answers.</p> <p>Agreement, feedback, self-correction. Praising.</p>
6	<p>Logic problems OS 1.16</p> <p>T: Here is a more difficult problem.</p> <p>T: Can we start by writing 13 and 19 into H and F? (no)</p> <p>Why not?</p> <p>What <i>can</i> we start with?</p> <p style="text-align: right;">45 mins</p>	<p>Whole class activity.</p> <p>Interactive discussion along the lines of the solution given on p19/20 in PB 7A.</p> <p>T leads Ps to find out how many more is $7 + 13 + 19$ than the total.</p> <p>Praising.</p>
7	<p>Set homework PB 1.4, Q2 (a) to (e) and PB 1.5, Q6</p>	

Y7	UNIT 1: <i>Logic</i> Lesson Plan 5	<i>Solving Logic Problems with Venn Diagrams</i>
Number	Activity	Notes
1	<p>Check homework</p> <p>PB 1.4, Q2 (a) to (e)</p> <p>T: Do you agree with the answers?</p> <p>PB 1.5, Q6</p> <p>T: What is the final answer? (3)</p> <p>T: Who was successful?</p> <p style="text-align: right;">6 mins</p>	<p>(Note that if you have missed out Lesson Plan 5, you need to refer to the start of Lesson Plan 5 for correct review.)</p> <p>T has already asked P to write up answers as soon as P arrives.</p> <p>Checking, discussion.</p> <p>Agreement, feedback, self-correction. Praising.</p> <p>T asks P who was not successful to draw Venn diagram on BB and explain their solution.</p> <p>Other Ps help to correct solution.</p> <p>Self-correction. Praising.</p>
2	<p>Practice</p> <p>Tasks (given out by T):</p> <ol style="list-style-type: none"> 1. MT 1.2, Q1 2. Extra Exercises 1.1, Q3 3. MT 1.2, Q2 4. MT 1.2 Q3 with <ol style="list-style-type: none"> (c) what is the intersection of B and complement of A ? (d) use set notation to describe these regions of the Venn diagram. 5. PB 1.5, Q4 6. PB 1.4, Q4 (b), (e) and (f) <p style="text-align: right;">36 mins</p>	<p>Individual work for the remainder of the lesson.</p> <p>T to complete worksheet as shown opposite.</p> <p>Ps work in Ex.B at their own pace. If they finish one task, they move on to the next one.</p> <p>T monitors progress and helps when needed.</p>
3	<p>Checking answers</p> <p>T: Who can list set A? ($A = \{ 2, 4, 6, 8, 10 \}$)</p> <p>T: Is that correct? Who agrees?</p> <p>T: What is the intersection of A and B ? (6)</p> <p>T: How can we mark this region on the Venn diagram?</p> <p style="text-align: right;">45 mins</p>	<p>T has OH slides prepared with answers and used when needed, e.g. M 1.2, Q3</p> <p>Interactively, particularly tasks 5 and 6, which some Ps will not have reached.</p> <p>T uncovers solutions on OHP as they are dealt with.</p>
4	<p>Set homework</p> <p>PB 1.1, Q5</p> <p>PB 1.2, Q10</p> <p>PB 1.3, Q6 and list sets</p> <p style="text-align: center;">$O, M, O \cap M, M', (O \cup M)', O' \cap M$</p>	

Y7	UNIT 1: <i>Logic</i> Lesson Plan 6	<i>Recap</i>
<i>Number</i>	<i>Activity</i>	<i>Notes</i>
1	<p>Check homework</p> <p>PB 1.1, Q5</p> <p>PB 1.2, Q10</p> <p>PB 1.3, Q6</p> <p>For each task,</p> <p>T: Who was successful?</p> <p>T: Who was not?</p> <p>T: What were the problems?</p> <p style="text-align: right;">10 mins</p>	<p>T prepares OH slide with answers on it. At start, T puts slide on and Ps check answers in their Ex.Bs.</p> <p>T shows answers question by question.</p> <p>T concentrates on any misconceptions.</p>
2	<p>Test: RT 1.2 (answers given in but pupils keep a copy)</p> <p style="text-align: right;">45 mins</p>	<p>T gives out copies of RT 1.2, and Ps work on copies or in special test book.</p> <p>Stronger Ps, who finish early, can continue with extra tasks (e.g. activity 1.5).</p>
3	<p>Set homework</p> <p>Study copy of answers for RT 1.2 and try to find mistakes.</p> <p>Stronger Ps continue with extra work.</p>	

Y7	Logic Revision	Lesson Plan 7 UNIT 1
Number	Activity	Notes
1	<p>Revision</p> <p>T and Ps go over test questions. e.g.</p> <p>Question 1</p> <p>T: Who did <i>not</i> get the correct answer? Who found their mistake at home?</p> <p>T: OK, come to BB and explain where your mistake was (<i>T draws logic table on BB</i>).</p> <p>T: First clue was: "Ben's yo-yo was not green." What did you do?</p> <p>P: <i>This was clear; I put X in Ben's row in the third column (P does this on BB).</i></p> <p>T: OK! The second clue is: "Tom's yo-yo is not red or green." What did you do now?</p> <p>P: <i>I was confused. I thought it meant: "Tom's yo-yo is not red but green." and so I put a X in the first column of Tom's row and a ✓ in the third row.</i></p> <p>T: What did you do next?</p> <p>P: <i>As there was no contradiction, I completed the table, answered the question but did not notice my fault.</i></p> <p>T: And what is the correct solution?</p> <p style="text-align: right;">etc.</p>	<p>Between lessons 6 and 7, T must mark the test, and bring corrected test papers to give back to Ps.</p> <p>T chooses P who has discovered their mistake at home so that they can explain how they noticed it.</p> <p>This P writes on BB, explaining mistake and correcting it.</p> <p>If no such Ps, T asks one of the Ps who got it wrong to work at BB and, with help, correct their mistake.</p> <p>If every P was successful, T praises the class, and goes over the test quickly.</p> <p>P gives correct solution on BB.</p> <p>In this way, Ps find the solution to each question, learn from mistakes (their own and others) and revise Unit 1; covering</p> <ul style="list-style-type: none"> • how to solve logic problems • how to use 2-way tables • when to use sets • how to use sets to solve problems.