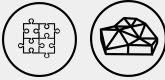



<p>Grades 1-4 (S), 5-8 (SA)</p> <p>Duration: 20 min</p> <p>Tools: one Logifaces Set / pairs</p> <p>Pair work</p> <p>Keywords: Yes / no questions, Exponents</p>	<p>203 - Twenty Questions</p>  <p>MATHS / LOGIC</p>	 <p>LOGIFACES METHODOLOGY Erasmus+</p> <p>TEACHER Logifaces</p> <p>2019-1-HU01-KA201-0612722019-1</p>
<p>DESCRIPTION</p> <p>LEVEL 1 Students play in pairs. If using the 9 pcs Set each pair gets 7 different Logifaces pieces (as there are 7 different pieces in the 9 pcs Set). If using the 16 pcs Set, each pair gets 10 different pieces (as there are 10 different pieces in the 16 pcs Set).</p> <p>Students put the pieces down on the table in front of them and one student thinks of a piece without moving it from the table. The other student needs to ask yes/no questions to find out which piece the first student is thinking of.</p> <p>LEVEL 2 What is the least amount of questions that is always enough to find the piece (even if you are not lucky)? How many questions are needed to choose from 2, 4, 10, 16, 20 different pieces?</p>		
<p>SOLUTIONS/EXAMPLES</p> <p>LEVEL 2 To find the least amount of questions, the optimal strategy is to approximately half the pieces with each question: either by finding an appropriate question, or simply dividing the pieces into two approximately equal groups, and asking if the piece is in one of them. This way, if we are unlucky, we will need 4 questions, if we are playing with 10 pieces.</p> <p>With less than 4 questions it is not possible to solve the problem (if we are unlucky), because 1 question is enough for at most 2 pieces, 2 questions are enough for at most 4 pieces, and 3 questions for at most 8.</p> <p>If we are playing with 7 different pieces, we need only 3 questions.</p> <p>So we need 1 question for 2 pieces, 2 questions for 4 pieces, 4 questions for 10 and 16 pieces, and 5 questions for 20 pieces.</p>		
<p>PRIOR KNOWLEDGE</p> <p>None</p>		
<p>RECOMMENDATIONS/COMMENTS</p> <p>LEVEL 2 This is an additional question after the LEVEL 1 exercise. If students have already learned exponents, the teacher can connect the number of questions needed to the powers of 2.</p>		