Names (pair) _____ Date _____

Logical Operations

Remember

A **statement** is a sentence that is either true (1) or false (0). The **conjunction** $A \wedge B$ (AND) is true only when both statements are true. The **disjunction** $A \vee B$ (OR) is true when at least one is true. The **negation** $\neg A$ (NOT) swaps true and false.

1 IN PAIRS Is the sentence a statement? If it is, is it true (1) or false (0)?

7 **is an even number.**	**1**	/	**0**	/ **not a statement**
A week has 7 **days.**	**1**	/	**0**	/ **not a statement**
Close the window!	**1**	/	**0**	/ **not a statement**
$2 + 2 = 4$	**1**	/	**0**	/ **not a statement**
What time is it?	**1**	/	**0**	/ **not a statement**

2 IN PAIRS Let A be "It is raining." and B "It is windy." Read each row as a sentence and complete the tables.

A	B	$A \wedge B$	$A \vee B$
0	0		
0	1		
1	0		
1	1		

A	$\neg A$
0	
1	

Names (group) _____ Date _____

3 ON YOUR OWN Let $A = 1$ and $B = 0$. Work out.

$A \wedge B =$ ☐ $A \vee B =$ ☐

$\neg A =$ ☐ $\neg A \wedge B =$ ☐

$A \vee \neg B =$ ☐

4 IN A GROUP **Cinema.** The rule: "You may go in if you have a ticket, and you are at least 12 or you are with a parent." Let K: has a ticket, G: is at least 12, R: is with a parent. Write the rule as an expression and check who may go in.

Expression: ☐

	K	G	R	May go in?
Ana: has a ticket, 10 years old, with her mum	☐	☐	☐	☐
Ivan: no ticket, 14 years old	☐	☐	☐	☐
Petra: has a ticket, 13 years old, alone	☐	☐	☐	☐

5 IN A GROUP "For dessert you can have cake or ice cream." May you take both? Is this the same as the logical OR? Discuss.

The Logic Gates app · otooly.com/logic-gates

Expression mode: type $A \wedge B$ or $A \vee B$ and compare the truth table with yours.

★ ON YOUR OWN **Exit card.** $\neg(1 \wedge 0) =$ ☐