



# Mixed Up Dots

## Take a Trip down Logicland

Believe it or not, we make thousands of choices every day, from our outfits to the sports we play! Get ready to explore logical operators with Lex to learn how they are important when making decisions.



## What are Logical Operators?

A **logical operator** compares either one or two expressions to produce a true or false value. Three types of logical operators are **and**, **or**, and **not**.

### The **and** operator

The **and** operator compares **two** expressions to produce a true or false value.

		A and B
A	B	✓ True
A	B	✗ False
A	B	✗ False
A	B	✗ False

A and B equals **true** only when both statement A and statement B are true

A and B equals **false** when one or more statements are false

Black = true Gray = false



Statement A and statement B each represent true or false expressions. For example, these expressions can be anything from  $1 < 2$  to today is Monday.



## The or operator

The or operator compares **two** expressions to produce a true or false value.

	A and B	
A B	✓ True	A or B equals <b>true</b> only when at least one statement is true
A B	✓ True	
A B	✓ True	
A B	✗ False	A or B equals <b>false</b> only when both statements are false

## The not operator

The and operator evaluates **one** expression to produce a true or false value.

	not A	
A	✗ False	not A equals <b>false</b> when statement A is true
A	✓ True	not A equals <b>true</b> when statement A is false

## No More Rainy Dilemmas

Surprisingly, we use logical operators on a daily basis! Logical operators allow us to make decisions from a set of conditions. Check out Lex's favorite way to use logical operators.



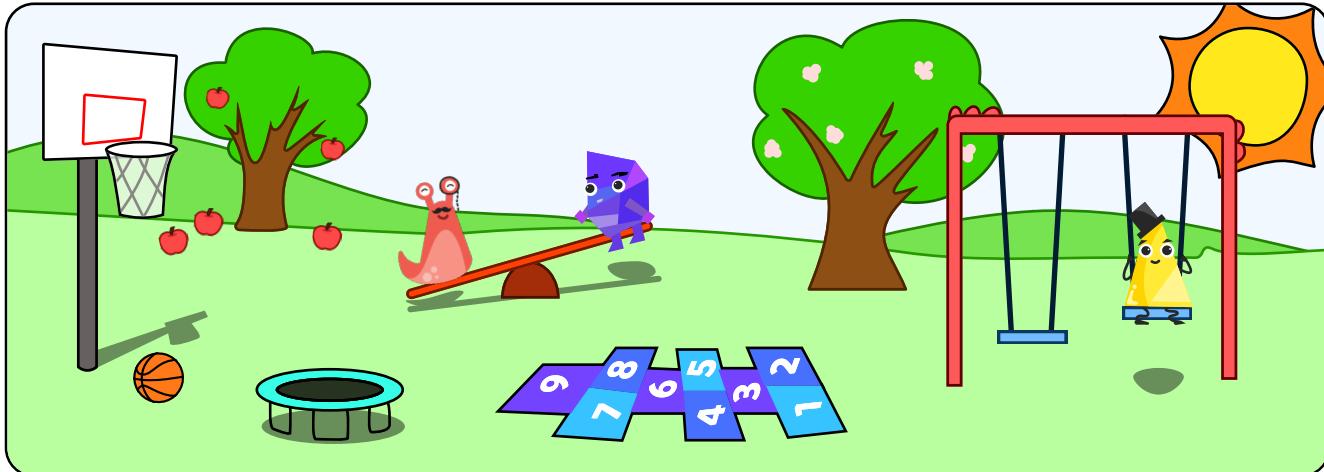
At Logicland, Lex hates getting drenched by rain! For this reason, he keeps this logical operator handy:

If it's raining **and** Lex needs to go outside, Lex brings an umbrella and wears boots.



## Mixed-Up Mysteries

On one windy day, the wind blew Lex's numbered puzzle all over Logicland Playground! Now, the numbers are all mixed up and out of order. Using your knowledge of logical operators, use the following image to solve the mixed dot-to-dot puzzle!



### Clue Bank

1. If there is a trampoline **and** there is a bicycle connect 9 and 43
2. If there is an apple tree **or** there is a banana tree, connect 32 and 10
3. If there are five trees **or** there are two trampolines, connect 32 and 28
4. If there are two trees **and** no one is on the trampoline, connect 37 and 2
5. If one swing is being used **or** it is raining, connect 12 and 24
6. If there is a tennis court **or** there is a baseball field, connect 2 and 28
7. If the swings are **not** to the left of the hopscotch, connect 24 and 37
8. If the seesaw is **not** in being used, connect 77 and 9
9. If it's sunny **and** no one is playing basketball, connect 28 and 10
10. If it is snowing **and** it is nighttime, connect 37 and 12
11. If the seesaw is being used **and** if there is a basketball, connect 9 and 2
12. If three apples did **not** fall off the tree, connect 10 and 43
13. If there is a hopscotch **or** there is a basketball, connect 77 and 43
14. If there is **not** someone playing basketball, connect 28 and 43

