

SWBAT determine the truth values of ANDS (conjunctions) and ORs (disjunctions).

A proposition... makes a claim  
Must be true or false (complete sentence)

AND statements... are called conjunctions  
two propositions joined by an and

ANDs are true ONLY when both propositions are true

Mr. Stanton is male and Mr. Stanton wears glasses → True  
 T T

Paris is the capital of France and Boston is the capital of the USA → False  
 T F

OR statements... DISJUNCTIONS  
Two propositions joined by an OR  
True when either (or both) are true.

Mr. Stanton is female or Mr. Stanton wears glasses. True since one is true.  
 F T

The capital of England is Paris or the capital of the USA is Boston. False since both are false.  
 F F

The OR connector can have two different meanings. However in logic, we always assume the OR means "either or both".

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An "INCLUSIVE OR" means.... *either or both*

My dog Ranger can fetch a ball or he can fetch a frisbee.

An "EXCLUSIVE OR" means... *one or the other, but not both.*

My dog Ranger has brown or black hair.

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## CM 1B.2 Conjunctions and Disjunctions-MU

Each statement connects two individual propositions with the word and. State the two individual propositions and, if possible, whether each is true or false. Then explain why the entire statement is true or false.

1. Boston is the capital of Massachusetts and Moscow is the capital of Russia.

True True  
Entire statement is true because both propositions are true.

2. Kim Kardashian is an American celebrity and Donald Trump is a Russian president.

3. Ben is married and Ben is a bachelor.

4.  $12 + 6 = 18$  and  $6 \times 4 = 24$ .

5. Cats have four legs and whales have legs.

6. Some people are tall and no people are short.

For each statement, state whether or is used in the exclusive or inclusive sense. Explain.

7. You have a choice of soup or salad.
8. The car warranty covers parts for 3 years or 36,000 miles.
9. The insurance policy covers fire or theft.
10. I will wear either boots or shoes.
11. My shorts will be made of cotton or wool.
12. Tonight I will go to the movies or play Bingo.

Each statement connects two individual propositions with the word or. State the two individual propositions and, if possible, whether each is true or false. Then explain why the entire statement is true or false.

13. The Amazon River is in South America or Beijing is in Germany.
14.  $2 \times 5 = 15$  or  $23 + 8 = 31$ .
15. The light is on or the light is off.
16. Either Beethoven or Gandhi was a professional baseball player.
17. Denver is in Colorado or Seattle is in New York.