Logic

Problem Solving & Critical Thinking
Conditional Statements

- Have an “IF” … “THEN” form
  - The “IF” part of the statement is the hypothesis
  - The “THEN” part of the statement is the conclusion
- Example:
  - Everyone who lives in Wisconsin needs to have a warm coat to wear in the winter.
  - Revised to be a conditional statement, it would read as:
    - IF you live in Wisconsin, THEN you need to have a warm coat to wear in the winter.
  - As in this example, the statement isn’t necessarily a fact. It can be an opinion, and it can even be a false statement.
More Conditional Statements

- If you work hard at your sport, then you will be successful as a professional athlete.
- If you are a real Packers fan, then you would wear Green & Gold on every game day.
- If you don’t put gas in your car, then you will run out of gas sometime.
Converse Statement

- A Converse statement is formed by interchanging the hypothesis and the conclusion.

- **Original Statement:** If you don’t keep oil in your engine, then your car will fail you.

- **Converse:** If your car fails you, then you didn’t keep oil in your engine.

- A Converse statement is not necessarily true/false to match the original statement.
Create Converse Statements

- A Converse statement is formed by interchanging the hypothesis and the conclusion.

- If you’re allergic to apples, then you can’t eat applesauce.

- If you go skydiving, then you are a person who likes a thrill.

- If you don’t like math, then being an accountant is not a good career choice.
Inverse Statement

- An Inverse statement is formed by negating the hypothesis and negating the conclusion.

- **Original Statement:** If you don’t keep oil in your engine, then your car will fail you.

- **Inverse:** If you kept oil in your engine, then your car won’t fail you.

- An Inverse statement is not necessarily true/false to match the original statement.
Create Inverse Statements

- An Inverse statement is formed by negating the hypothesis and negating the conclusion.

- If you’re allergic to apples, then you can’t eat applesauce.

- If you go skydiving, then you are a person who likes a thrill.

- If you don’t like math, then being an accountant is not a good career choice.
Contrapositive Statement

- A Contrapositive statement is formed by constructing a converse (interchanging hypothesis and conclusion) and inverse (negating both the hypothesis and conclusion) in the original statement.

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Contrapositive Statement

- **Original Statement:** If you don’t keep oil in your engine, then your car will fail you.
- **Contrapositive:** If your car didn’t fail you, then you kept oil in your engine.