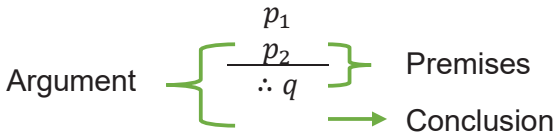
GENERAL MATHEMATICS

Name of Learner: _____ Grade Level: _____
Section:_____ Date: _____

LEARNING ACTIVITY SHEET
ESTABLISH THE VALIDITY AND FALSITY OF REAL-LIFE ARGUMENTS USING LOGICAL PROPOSITIONS, SYLLOGISMS, AND FALLACIES

Background Information for Learners

An **argument** is composed of premises and conclusion. **Premises** are the statements in an argument that will help you to draw or create a **conclusion**. You can easily identify the conclusion in an argument because of the conclusion indicators such as therefore, hence, so, thus, consequently, it is shown that and etc.



Arguments can be a valid or a fallacy. An argument is said to be **valid** if the truth of the premises logically supports the truth of the conclusion while, it is **fallacy/invalid** if the premises do not support convincing reasons for the conclusion. To test its validity, you can use the different rules of inference such as rule of simplification, rule of addition, rule of conjunction, modus ponens, modus tollens, law of syllogism, rule of disjunctive syllogism, rule of contradiction, and rule of proof cases. On the other hand, the different logical fallacies such as fallacy of the converse, fallacy of the inverse, affirming the disjunct, fallacy of the consequent, denying a conjunct, and improper transposition will help you recognize whether an argument is a fallacy or invalid.

Examples:

If there is a power interruption, the ISELCO will notify us. $p \rightarrow q$
The ISELCO did not notify us. $\sim q$
So, there was no power interruption. $\therefore \sim p$
This argument is valid through Modus Tollens

If it is winter then it is cold. $p \rightarrow q$
It is winter. p
Therefore, it is cold. $\therefore \sim q$
This argument is valid through Modus Ponens

If it is winter then it is cold. $p \rightarrow q$
It is not winter. $\sim p$
Therefore, it is not cold. $\therefore \sim q$
This argument is invalid or fallacy using the fallacy of the Inverse

Learning Competency

Establish the validity and falsity of real-life arguments using logical propositions, syllogisms, and fallacies. **M11GM-IIi-3**

Directions/Instructions: Read and understand the directions in each exercise. If you have any question, feel free to message your teacher for clarification and assistance.

EXERCISE 1. Determine what rule of inference is used in each item. Write your answer on the blank provided. **[2 points each]**

1. If you are a student, then you go to school.
   If you go to school, then you have an allowance.
   Therefore, if you are a student, then you have an allowance.

Answer: _____

2. The statement is either true or false.
   The statement is not false.
   Therefore, the statement is true.

Answer: _____

3. If logic is an easy subject, then the students are happy.
   The students are not happy.
   So, logic is not an easy subject.

Answer: _____

4. All riders wear helmets.
   Allan doesn't wear a helmet.
   Therefore, Allan isn't a rider.

Answer: _____

5. Everybody will be happy if a scientist can discover a medicine that cures coronavirus.
   Everybody is happy.
   Thus, a scientist discovered a medicine that cures coronavirus.

Answer: _____

Exercise 2. Determine what a logical fallacy is used in each item. Write your answer on the blank provided. **[2 points each]**

1. You use either Google Map or Waze to reach your destination.
   You used Google Map to reach your destination.
   Therefore, you did not use Waze to reach your destination.
   Answer: _____

2. It is not true that classes starts in August and online class will be implemented.
   Classes did not start on August.
   Therefore, online class is implemented.
   Answer: _____

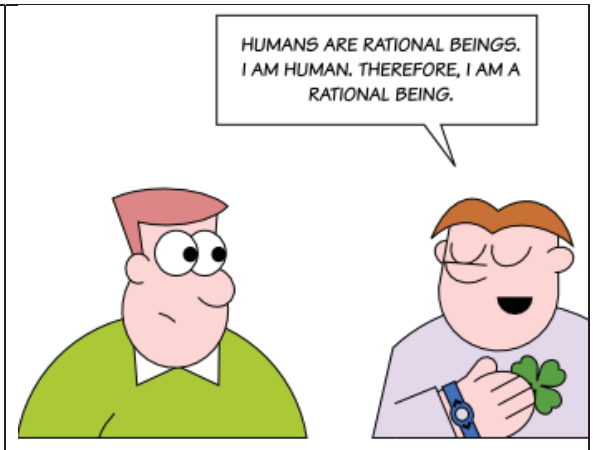
3. If I drink coffee, it will have a sleepless night.
   I did not drink coffee.
   Thus, it won't have a sleepless night.
   Answer: _____

4. If there is a limited supply of foods, then I will preserve foods.
   I preserved foods.
   Hence, there was a limited supply of goods.
   Answer: _____

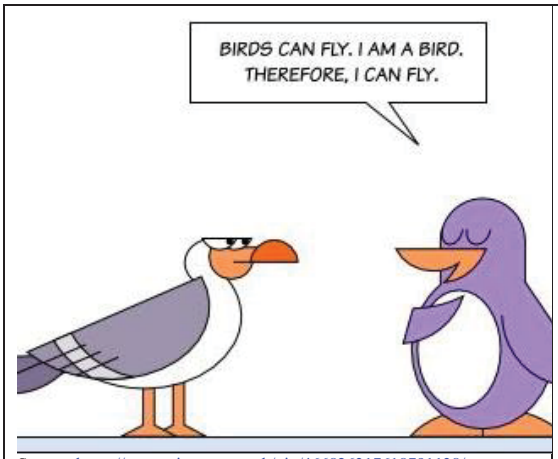
5. All students wear ID.
   The guard wears an ID.
   Hence, the guard is a student.
   Answer: _____

EXERCISE 3. Identify whether the following arguments are valid or not. Put a check mark (✓) on the picture if it is valid and (x) mark if it is not valid. **[2 points each]**

Source:https://thelogicofscience.com/2017/03/14/the-importance-of-logical-fallacies/



Source: http://fleasnobbery.blogspot.com/2011/02/syllogism.html



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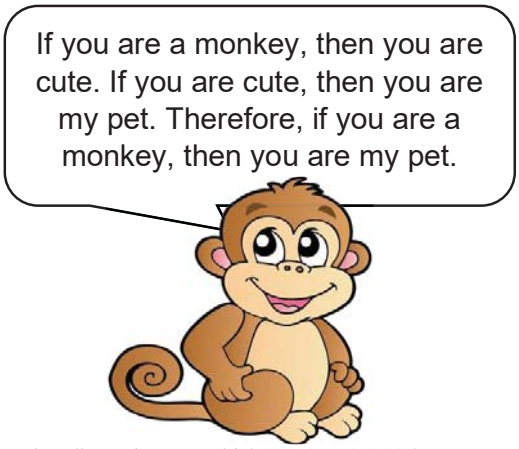

Source:https://www.pinterest.com/pin/129267451778131847/

If you use cellphone during a storm, you will be hit by lightning. You were not hit by lightning. Therefore, you did not use cellphone during a storm.

Source:https://www.quora.com/Is-it-safe-to-use-cell-phones-during-lightning

You will be infected with corona virus or you will stay at home. You were not infected with corona virus. Therefore, you stayed at home.

Source: https://www.istockphoto.com/vector/stay-at-home-stop-corona-virus-concept-vector-illustrator-gm1213503886-352699947

EXERCISE 4. Create a valid conclusion from each set of premises. If no valid conclusion is possible, write "no valid conclusion." **[2 points each]**

1. If it rains, then the weather is cold.
   If the weather is cold, then I fall asleep quickly.

   _____

2. If you stay at home, then you are safe.
   If you are safe, then spreading of virus will be lessen.

   _____

3. All riders wear helmets.
   Allan wear a helmet.

   _____

4. If Ivana Alawi is a famous vlogger, then she knows how to edit videos.
   Ivana Alawi is not a famous vlogger.

   _____

5. The season in the Philippines is either wet or dry.
   The season in the Philippines is not wet.

   _____

EXERCISE 5. Think and write out two valid arguments you have encountered in your daily life. **[5 points each]**

1. _____
   _____
   _____

2. _____
   _____
   _____

Reflection

Write your insights about the activities you have undertaken.

_____
_____
_____

References

Verzosa, D. et. Al. (2016). General Mathematics. Lexicon Press Inc.
https://www.stat.berkeley.edu/~stark/SticiGui/Text/reasoning.htm
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https://www.istockphoto.com/vector/stay-at-home-stop-corona-virus-concept-vector-illustrator-gm1213503886-352699947

Answer Key

EXERCISE 1

1. Law of Syllogism
2. Rule of Disjunctive Syllogism
3. Modus Tollens
4. Modus Tollens
5. Modus Ponens

EXERCISE 2

1. Affirming the disjunct
2. Denying a Conjunct
3. Fallacy of the inverse
4. Fallacy of the converse
5. Fallacy of converse

EXERCISE 3

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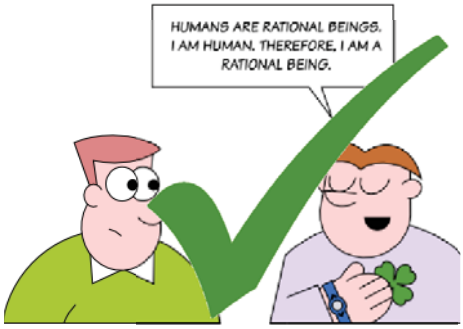

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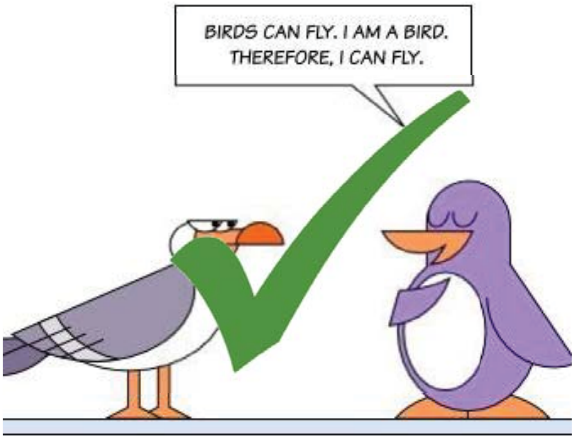

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You will be infected with corona virus or you will stay at home. You were not infected with corona virus. Therefore, you stayed at home.

EXERCISE 4.

1. Therefore, if it rains, then I fall asleep quickly.
2. Therefore, if you stay at home, then spreading of virus will be lessen.
3. No valid conclusion
4. No valid conclusion
5. Therefore, the season in the Philippines is dry

EXERCISE 5. Answers may vary.