LEARNING AS ONE NATION

Expanded Project

SHS LEARNING ACTIVITY

Name: _____ **Score/Mark:** _____

Grade and Section: _____ **Date:** _____

Strand: ☐ STEM ☐ ABM ☐ HUMSS ☐ ICT (*TVL Track*)

Subject: *Physical Science*

Type of Activity: ☐ Concept Notes ☑ Skills: Exercise/Drill ☐ Illustration ☐ Performance Task ☐ Essay/Report ☐ Others: _____

Activity Title: **LA03.1: Exercises on Synthesis of Elements – Light and Heavy Elements**

Learning Targets:
1) To write the nuclear fusion reactions that take place in stars, which lead to the formation of elements.
2) To write and represent nuclear reactions.

References: *(Author, Title, Pages)*
1) Atkins, P.W., *et al.* (2009). *Inorganic Chemistry*, 5th edition, pp. 4–7;
2) Sadudaquil, J. A. *CVIF–DLP Learning Activities*

Exercise:

Tabulated below are the most important nuclear reactions in the nuclear burning cycle. Complete the table by giving the type of nuclear reaction and balancing the reactions.

Type of Nuclear Reaction	Balanced Nuclear Reaction
Proton ($^{1}_{1}p$) capture by carbon-12	$^{12}_{6}C + ^{1}_{1}p \rightarrow ^{13}_{7}N + \gamma$
Positron (β^{+}) decay from nitrogen-13 accompanied by neutrino (v) emission	$^{13}_{7}N \rightarrow ^{13}_{6}C + ^{0}_{+1}\beta + ^{0}_{0}\nu$
_____	$^{13}_{6}C + ^{1}_{1}p \rightarrow ^{14}_{7}N + \gamma$
Proton capture by nitrogen-14	_____
_____	$^{15}_{8}O \rightarrow ^{15}_{7}N + ^{0}_{+1}\beta + ^{0}_{0}\nu$
Proton capture by nitrogen-15	_____
Net nuclear reaction:	

(Note: To get the **over-all** or **net reaction** of successive nuclear reactions:

1) just simply **cancel** or **eliminate** the component/s in the reaction that is/are **produced** (present on the **product side**) in the previous reaction and is/are **consumed**, **used** or **reacted** (**present in the reactant side**) in the **subsequent reaction**.
2) The components that **remain** are **added**, with the **appropriate coefficients** written.
3) The net reaction should be balanced, following the **conservation of mass number** and **conservation of atomic number**.)