Chemistry 2.6 AS 91166 Demonstrate understanding of chemical reactivity

Writing Excellence answers to **Equilibrium – Pressure** questions

Equilibrium – Pressure QUESTION

Question: The two reactions shown in the following table are both at equilibrium.
Compare and contrast the effect of increasing the pressure on both reactions, with reference to the equilibrium positions.

Reaction	Equation	Affected by increased pressure
One	$H_{2(g)} + I_{2(g)} \rightarrow 2HI_{(g)}$	no
Two	$N_{2(g)} + 3H_{2(g)} \rightarrow 2NH_{3(g)}$	yes

ANSWER

1. State the **equilibrium principle**	When a change is made to a system that is at equilibrium, the system responds to **reduce the effect** of that change.
2. Describe the **factor** in your question AND Link increasing the principle to how the **system responds** [some questions will be decreasing]	The factor in the question above is **pressure.** If there is an increase in pressure, the system responds by decreasing the pressure.
3. **Generally,** explain which side of the equation is favoured (relate to moles) AND the general observations – at visible and particle level.	This occurs by **favouring the reaction,** either forward or reverse direction, **that produces fewer gas particles**. Because there are now fewer particles hitting the sides of the container, there is less pressure.
4. **Specifically,** in <u>reaction one</u> describe number of moles in both sides of the equation AND link to which direction of reaction would be favoured (and observation)	In <u>Reaction One</u> there are two moles of gas particles on each side of the equation. Because there are the **same numbers of gas particles on both sides** of the reaction, then a change in pressure will have **no effect** as neither reaction will be favoured.
5. **Specifically**, in <u>reaction two</u> link number of moles in both sides of the equation to observation **AND** link to which direction of reaction would be favoured	In <u>Reaction Two</u> however, there are four moles of gas particles on the reactant side of the equation and two moles of gas particles on the product side of the equation. Therefore, when there is an increase in pressure, the system would shift and **favour the forward reaction**
6. Describe how the **system shift** in <u>reaction two</u> would effect at particle level AND final observation.	meaning there are **now fewer gas particles overall** and hence fewer gas particles hitting the sides of the container and **therefore less pressure overall**.

NOTE: The white column is how your answer would appear on your test paper so make sure you **write out complete sentences**. The grey area is just to help you structure your answer and would not appear in the question.