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**Knowledge Rich Curriculum Plan**

GCSE PE - The effects of exercise on the body systems



| **Lesson/Learning Sequence**  | **Intended Knowledge:***Students will know that…* | **Tiered Vocabulary** | **Prior Knowledge:***In order to know this students, need to already know that…* | **Assessment**  |
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| **Lesson 1 - 1.1.e - Short term effects of exercise** | * Understand the short-term effects of exercise on:

**Muscular System*** + **Muscle temperature** - increases
	+ **Lactic acid production** - produced in muscles during anaerobic exercise (prolonged high-intensity activity - lack of oxygen present in muscles during anaerobic activity)

**Cardiovascular system*** + **Heart rate** - increases (working heart rate). The raising of heart rate before exercise is due to an **anticipatory rise.**
	+ **Anticipatory rise** - This is the raising of the heart rate before exercise begins. It is caused through the release of **adrenaline,** which is a **hormone.**
	+ **Adrenaline** - this is the **hormone** released from the **adrenal glands** and its major action is to prepare the body for **‘fight or flight’**
	+ **Stroke volume** - increases during exercise
	+ **Cardiac output** - increases during exercises
	+ **Redistribution of blood (blood/vascular shunting)** - during **exercise blood is sent to the muscles** to use through **vasodilation** occurs in **arterioles (smaller arteries) - (diameter increases) -** and this **increases blood flow to the muscles. Vasoconstriction** occurs in **arterioles (diameter decreases)** that supply other **organs** such as the **liver** means that **blood flow is lessened to these organs** that does not require blood supply**).** During **rest blood is sent to organs to digest food.**

**Respiratory system*** + **Respiratory (breathing) rate** - increases during exercise
	+ **Tidal volume - depth of breathing** and **speed of breathing increases.** On a **spirometry trace** the **tidal volume increases in speed and depth. Tidal volume is the volume of air either inspired or expired per breath**
	+ **Minute ventilation - increases. This is the volume of air that is inspired and expired in one minute**
	+ **Oxygen to working muscles** - the amount of oxygen sent to the **working muscles increases** due to increased demand and increase in breathing rate. Faster removal of CO2 and intake of oxygen.
 | TemperatureLactic acidHeart rateAnticipatory riseAdrenalineStroke volumeCardiac outputRedistributionBlood/vascular shuntingVasodilationDiameterVasoconstrictionRespiratory - breathingTidal volumeSpirometry traceMinute ventilationOxygenCarbon dioxide | * *Know through practical activities that muscle temperature increases*
* *The definition of heart rate from CV unit (1.1d)*
* *The definition of stroke volume from CV unit (1.1d)*
* *The definition of cardiac output from CV unit (1.1d)*
 | * Targeted Questioning
* Active plenary
* Point to partner
* **Label the diagram** of lever systems
* **Application task** - which lever system?
* **Application task** - how does the golfer, baseballer gain mechanical advantage?
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| **Lesson 2 - 1.1.e - long-term effects of exercise on the body systems** | * Know the meaning
 |  |  | * Pose pause pounce bounce
* Targeted questioning
* White boards Q&A
* Application task
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