Unit B1 - Revision Lesson 3 Homeostasis				
Specification learning outcomes	**HSW statements**	**Exemplar teaching activities**	**Main differentiation**	**Resource sheets**
2.1 Define homeostasis as the maintenance of a stable internal environment. **2.2** Demonstrate an understanding of the homeostatic mechanisms of: a) thermoregulation and the effect of temperature on enzymes, b) osmoregulation, c) blood glucose regulation. **2.3** Explain how thermoregulation takes place, with reference to the function of the skin, including: a) the role of the dermis – sweat glands, blood vessels, nerve endings, hair, erector muscles and sebaceous glands, b) the role of the hypothalamus – regulating body temperature. **H 2.4** Explain how thermoregulation takes place, with reference to: a) vasoconstriction, b) vasodilation, c) negative feedback. **2.19** Recall that the central nervous system consists of the brain and spinal cord and is linked to sense organs by nerves. **2.20** Explain the structure and function of dendrons and axons in the nervous system. **2.21** Describe how stimulation of receptors in the sense organs sends electrical impulses along neurones. *2.22* Investigate human responses to external stimuli. **2.23** Describe the structure and function of sensory, relay and motor neurones and synapses including: a) the role of the myelin sheath, b) the role of neurotransmitters, c) the reflex arc	**HSW 2, 3, 4, 5, 6, 7, 11**	The theme of this lesson is homeostasis. **Starter:** *Hot and cold spider diagrams***.** Remind students of the definition of homeostasis and ask them what in the body is controlled by homeostasis. After 5 minutes, ask representatives from each group to say what their group thought and use the ideas to construct a big spider diagram on the board. **Main:** *Temperature homeostasis*. Students use Worksheet B11.d to revise thermoregulation. Please note that the extra challenge section is for Higher tier pupils only. *Sensitivity flowchart.* Ask students to draw a flowchart to show how electrical impulses from receptor cells reach the brain. They should then add notes to the flowchart to explain the functions of the three main parts (receptor cells, neurones, brain). Remind students that the brain and spinal cord make up the Central Nervous System. The flow chart can then be used to talk about the structure and function of axons and dendrons, myelin sheath and neurotransmitters in a synapse. This will eventually form a concept map. *Reflexes.* Demonstrate some reflex actions for example, dim the lights so that students observe each other's pupils growing in diameter, and then shrinking again once the lights are turned back on. Explain that this is a reflex action – one that is used to stop damage to the retina at the back of the eye from too much light. **Plenary:** *Receptors and effectors.* Give students the following sentence starters to complete: When an impulse is received by a motor neurone… A stimulus is detected… A response to a stimulus… Reflexes are useful… A reflex arc… **Homework:** Worksheets B1.14b (for students requiring extra support) and B1.14c (for those working at a higher level) contain questions on responses and reflexes.	**Stretch:** Students should complete the extra challenge section of worksheet B1.11d. Ask students to draw the reflex arc for the ankle jerk reflex. Before starting this, students need to be told that this arc contains an interneurone. **Support:** Help students to draw the diagram of thermostat control of room temperature. Then ask them to draw a similar diagram for body temperature using the information on the page. Use a ruler to measure the distance from knee to brain and back again, and compare this with the distance from knee to spinal cord and back again. This should help students appreciate that the distance travelled by impulses is less in a reflex arc, allowing a faster response.	Worksheet B1.11d Worksheet B1.14b Worksheet B1.14c

Unit B1 - Revision Lesson 4 Hormones				
Specification learning outcomes	**HSW statements**	**Exemplar teaching activities**	**Main differentiation**	**Resource sheets**
2.5 Recall that hormones are produced in endocrine glands and are transported by the blood to their target organs. **2.6** Explain how blood glucose levels are regulated by insulin and excess blood glucose is converted to glycogen in the liver. **H 2.7** Explain how blood glucose levels are regulated by glucagon causing the conversion of glycogen to glucose. **2.8** Recall that Type 1 diabetes is caused by a lack of insulin. **2.9** Explain how Type 1 diabetes can be controlled, including the roles of diet and injection of insulin usually into the subcutaneous fat. **2.10** Explain how, in Type 1 diabetes, the level of physical activity and diet affect the amount of insulin required. **2.11** Recall that Type 2 diabetes is caused by a person becoming resistant to insulin. **2.12** Explain how Type 2 diabetes can be controlled by diet and physical activity. **2.13** Evaluate the correlation between obesity (including calculations of BMI) and Type 2 diabetes. **2.14** Explain how plant growth substances (hormones) bring about: a) positive phototropism in shoots b) positive gravitropism (geotropism) in roots plants. **2.15** Explain how auxins bring about shoot curvature using cell elongation. *2.16 Investigate tropic responses.* **2.17** Analyse, interpret and evaluate data from plant hormone experiments, including the action of auxins and gibberellins. **H 2.18** Demonstrate an understanding of the uses of plant hormones, including: a) selective weedkillers b) rooting powder c) seedless fruit d) fruit ripening.	**HSW 2, 3, 5, 6, 7, 8, 10, 11, 12, 13**	<u>The theme of this lesson is plant and animal hormones.</u> **Starter:** *Hormones and nerves.* Draw a table on board and ask for students to help fill it in. The table should have one column for nervous responses and one for hormonal responses. Students should realise that nerves carry electrical impulses in neurones, allow the body to respond quickly and specifically but that the response does not last for long. Hormonal responses are slower, but longer term and can have a wider effect. Hormones are carried in the blood stream. You can also give some examples of hormones. **Main:** *Controlling blood glucose concentrations.* Worksheet B1.15d can be used to help pupils revise insulin. Only those following Higher tier should answer question 1 e onwards. This can be followed by worksheet B1.16d which looks at Type 2 diabetes and BMI. It may help to remind students the exact nature of Type 1 diabetes. *Trophic responses.* Show students a YouTube clip or photographs where phototropism and/or geotropism are explained. Ask groups of students to work together to produce a concept map with the words 'plant hormones' at the centre. **Plenary:** *Quiz design.* Students each make up one multiple choice question about what they have learnt in this lesson. Collect the questions in and read out some, asking for a show of hands for the correct answers. Correct any misconceptions. **Homework:** Worksheet B1.18d can be used with students requiring extra support – questions 1, 2 and 4 are most appropriate. Worksheet B1.19d is designed for students working at a higher level and contains questions on auxin and the uses of plant hormones. =	**Stretch:** Ask students to complete the whole of worksheet B1.15d. When drawing the concept map help can be provided by adding subheadings. Students working towards Higher tier should include: selective weed killers, rooting powder, seedless fruit and fruit ripening. **Support:** Demonstrate the balance that diabetics need to achieve between exercise, food and insulin by using a lever/balance kit and using the counters to represent exercise, food and insulin. When drawing the concept map help can be provided by adding subheadings.	Worksheet B1.15d Worksheet B1.16d Worksheet B1.18d Worksheet B1.19d [Also video clip or photos of plant shoots demonstrating photo or geotropism.]