

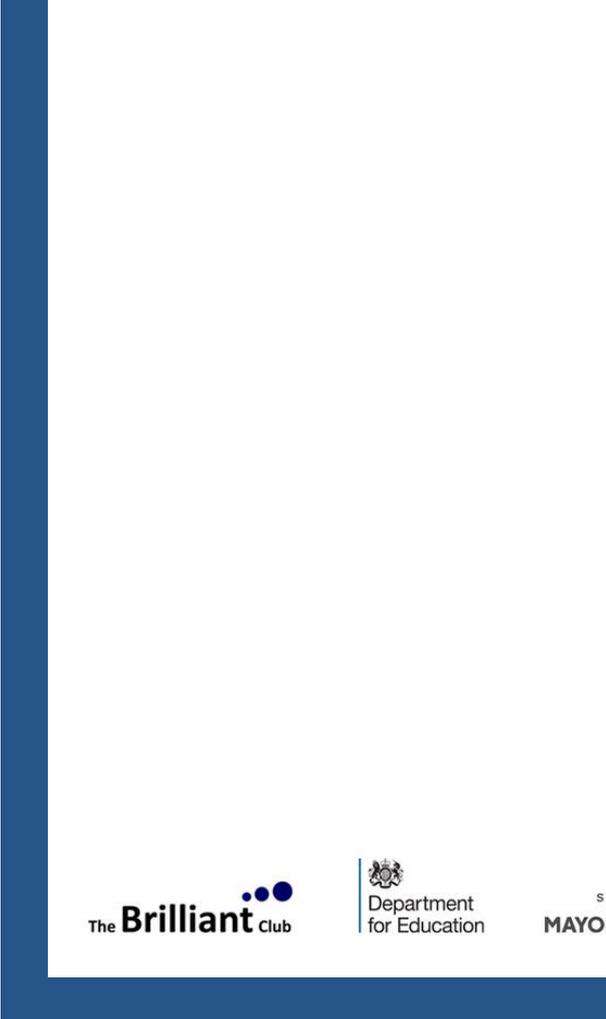


University Learning in Schools

Biology

My brain during the day

Lesson Plans



Two sides of your brain

Lesson	Learning Outcomes	Activities & Resources	Differentiation	Learner Habits		
1. Two sides of your brain	Identify personal preference of the 2 sides of the brain	<p>Introduction to topic – hand out handbook for next 6 lessons. Outline expectations and outcome of the course</p> <p>Task 1: Pupils identify which side of their brain is dominant by completing questionnaire. Compare outcome to functions of the different sides of the brain. Pupils summarise their findings. Resources: <i>questionnaire in handbook: PPT to identify and discuss outcomes</i></p>	<ul style="list-style-type: none"> All pupils complete questionnaire Most pupils link the outcome of questionnaire to descriptions of sides of brain Some pupils can evaluate effectiveness of questionnaire by providing examples of themselves that either agree or disagree with questionnaire outcome 	<p>Independent learner Creative thinker</p>		
	Explain what is meant by brain specificity and identify different areas of the brain	<p>Task 2: Video introduction. Describing brain specificity – circus fact hunt. Resources: <i>brain diagram and table in handbook Fact sheets (PPT)</i></p> <p>Pupils label brain and complete table describing functions of different part of the brain. Pupils also identify how damage in certain areas of the brain affects behaviour</p>			<ul style="list-style-type: none"> All have to label the correct areas in the brain Most should describe the function of the different parts of the brain Some could describe what happens when a certain brain area is damaged 	<p>Independent and reflective learner</p>
	Describe how damage to a certain area of the brain affects the body and behaviour	<p>Plenary: quiz. Learning check: did pupils collect correct information? Resources: <i>mini whiteboards/traffic light cards. Quiz on PPT</i></p> <p>Homework: Pick an activity/sport/hobby and</p> <ul style="list-style-type: none"> describe what parts of the brain are involved in this activity (C/B grade) 				

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2. Senses	<p>Identify the different senses in our body</p> <p>Link the function of our senses to the effect they have on our behavior and responses</p> <p>Identify the effect of damage in a particular area of the brain on the functionality of our senses</p>	<ul style="list-style-type: none"> explain how the parts of the brain work together (A) suggest the effect of damage to one of the brain areas involved on how well you can carry out the activity (A*) <p>Starter: Picture slide; pupils identify what the lesson theme is. Most pupils should be able to identify all senses. Some pupils can give more detailed information and link sense organs to senses. <i>Pupil handbook: write a sentence on what you think the lesson is about.</i></p> <p>Discussion of learning objectives. Teacher introduction – keywords</p> <p>Sensing the world circus: pupils observe different sensations and try to identify what the receptors are in their body. Resources: <i>practical 'circus of senses' worksheet</i></p> <p>Pupil task: complete table linking sense, stimulus, receptor. Resources: <i>pupil hand book: table to complete PPT slide with options (core & lower)</i></p> <p>Teacher talk: explanation of the pathway within the body when a change in the environment is observed. Pupils complete flow chart to help understand reflex pathways. Resources: <i>table in hand-out</i> Learning check – pupils peer assess</p> <p>Pupils read article on health issue linked to a sense. In small groups they discuss the article using the speaking frame to identify important information. Pupils then pair up with someone else in the class who has read the other article and use the speaking frame to teach each other. Learning check – hot seating – teacher targets pupils to talk about what they have learnt from the other person.</p>	<p>Higher able pupils: no clues given Core: options given Lower: colour-coded options given</p> <p>Tinnitus article should be given to higher ability, as there is more information to extract and analyse.</p>	<p>Creative thinker Independent learner</p> <p>Independent and reflective learner</p> <p>Group work</p>

		<p>Resources: articles – tinnitus and anosmia. Divide class in two, hand out articles in groups of maximum 3. Speaking frame in PPT</p> <p>Plenary: identifying senses exam question</p>	Higher ability classes should not need a speaking frame.	Reflective learner
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Tech Requirements

Name	Date	Room	Period
Year 9	Topic AQA B1.2 Senses		Lesson number
<p>Number of pupils in class:</p> <ul style="list-style-type: none"> A circuit set up around the room (Sensing the world practical) <p>Station 1: A bag with different materials/cloths/cotton wool</p> <p>Station 2: Lots of different smelly chemicals, e.g. vinegar/air freshener/methylated spirits/ lavender oil etc.</p> <p>Station 3: Pins</p> <p>Station 4: Torches</p> <ul style="list-style-type: none"> Resources laminated 			

Lesson	Learning Outcomes	Activities & resources	Differentiation	Learner Habits
3. Neurons	<p>Identify and describe different neurons (sensory and motor neuron) and explain structural differences</p> <p>Explain the function of a synapse and how impulses are transmitted between neurons</p> <p>Explain what Alzheimer's is and how it affects people's lives</p>	<p>Starter: describe similarities and differences between diagrams and sensory and motor neuron Question pupils: what do they know about sensory and motor neurons; what do the names suggest; where in the pathway can these be found? Resources: starter task on pupil hand-out, PPT slide to accompany during class discussion</p> <p>Video: how does the brain works; function of different types of neurons Pupils label diagram of neuron and summarise function of different type of neurons. Resources: video link on PPT, task sheet in pupil hand-out</p> <p>Q&A: How do neurons 'communicate' with each other? Show animation how synapse works. Pupils complete labelling synapse and write a 4-step sequence. Resources: animation, video and task sheet in pupil hand-out</p> <p>Class discussion: What could go wrong in the brain that prevents signals being passed on? Link to Alzheimer's. Video: Pupils answer questions on how Alzheimer's affects people's lives. (Be aware: sensitive issue. Pupils might have people in their close environment suffering from Alzheimer's.)</p> <p>Plenary: exam question – application of knowledge on speed of impulse across pathway and effect of synapses on speed.</p>	<p>Most pupils: able to identify similarities and differences between diagrams Some pupils: could link to types of neuron and what they learnt last lesson regarding pathway of an impulse</p> <p>Lower/core: fill in the gaps text provided (for lower, word options are provided and first letter of word already filled in) Higher: pupils write their own summary for the 3 different types of neurons mentioned in the video.</p> <p>Lower: provide labels and fill in the gaps slide for 4-step sequence Middle: provide key points for each step Higher: should not need support to write 4-step sequence.</p> <p>Most pupils: should be able to identify effects of Alzheimer's, such as forgetfulness, loss of memory. Higher: should be able to identify more serious effects.</p>	<p>Reflective learner</p> <p>Creative thinker Reflective learner Independent learner</p> <p>Creative thinker</p> <p>Independent enquirer</p> <p>Reflective learner</p>

Lesson	Learning Outcomes:	Activities & resources	Differentiation	Learner Habits
<p>4. Reflexes</p>	<p>Give examples of reflexes & explain the importance of a reflex arc</p> <p>Describe the sequence in a reflex arc</p> <p>Explain the importance of a reflex arc</p>	<p>Starter: quiz questions, revising neurons. Pupils write an EBI comment</p> <p>Quick Q&A: Why do we have reflexes? Pupils identify reflexes in their own body.</p> <p>Quick Teacher talk: interactive PPT slide, describing the path of a reflex arc Independent work: pupils complete their own reflex arc by labelling and describing the pathway.</p> <p>Task: practical: what affects reflexes Pupils work in pairs. Pupil 1 holds a long ruler above their partner's outstretched hand. When they drop the ruler, partner must try to catch it. Ensure pupils drop suddenly when they are not expecting it. Measure the distance between top finger and the bottom of the ruler. Use the chart to convert the distance to a time.</p> <p>Analysis and evaluation questions. What did they notice? Could you train your reflexes? How could this be useful?</p> <p>Plenary: Checking/correcting statements & exam question (high demand). Self-assess.</p>	<p>Differentiation by outcome. Pupils check and score their own work.</p> <p>All: list examples of reflexes Most: identify the receptor and effector involved Some: describe the consequence when the reflex does not work</p> <p>All: Write your own reflex arc for the leg and label the diagram with the numbers. Some: identify and explain the difference between a reflex arc and a 'normal' response</p> <p>All: identify independent and dependent variables in the investigation Most: identify control variables Some: explain how control variables could affect reflex</p>	

Tech Requirements

Name	Date	Room	Period
Year 9	Topic AQA B1.2 Reflexes		Lesson number 4
Number of pupils in class: <ul style="list-style-type: none">• 30 cm rulers per pair			

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<p>5. Drugs and the brain</p>	<p>Describe effects of drugs on our body</p> <p>Describe the role of different neurotransmitters in our body</p> <p>Explain the effect of drugs on our nervous system</p> <p>Evaluate the use of neurotransmitters in treating disabilities</p>	<p>Starter: true/false on drugs Pupils complete starter worksheet independently; after completing, use traffic light cards to discuss answers. Highlight misconceptions; explain difference between physical dependence and addiction.</p> <p>Group task: groups of 7. Pupils are assigned a different station and study the information on a neurotransmitter (7 different neurotransmitters available). 2 minutes to study. (Pupils can be given a post-it note to make notes.)</p> <p>After 2 minutes return to their group and share information, Complete the task, identifying the correct neurotransmitter with the description and structures provided on the hand-out.</p> <p>Video tasks: pupils watch 2 videos showing the effect of cocaine and alcohol in the working of the nervous system.</p> <p>Task: list at least 2 drugs for each different type of effect on the brain. Describe their effect on the nervous system.</p> <p>Video: Watch the video showing how neurotransmitters and electrical stimulations are used to make paralysed rats be able to walk again. Complete the 3-2-1 exercise.</p> <p>Homework: exam question on the effect of cannabis on mental health</p>	<p>Differentiation by task and outcome.</p> <p>ALL: choose true/false statements MOST: describe why the choice is made SOME: rewrite 'false' statements into a true statement</p> <p>ALL: link descriptions and structures to the correct neurotransmitters SOME: predict the effect of drugs on the working of neurotransmitters</p> <p>ALL: make simple observations on the effect of drugs on the body MOST: describe what the effect is in more detail SOME: link the effect to the workings on particular neurotransmitters</p>	<p>Independent and reflective learners</p> <p>Group work Creative thinker</p> <p>Reflective learner Creative thinker</p>

Lesson	Learning Outcomes	Activities & resources	Differentiation	Learner Habits
<p>6. Memory</p>	<p>List types of memory and link them to brain areas</p> <p>Identify how different types of memory are linked to learning</p> <p>Explain what happens in the brain as we learn (brain plasticity)</p>	<p>Starter: pupils list a memory from yesterday, last week and last year.</p> <p>Video task & class discussion: importance of memories. Q&A: what could pupils not do without their memory? Does it matter if they lose their memory? Summarize on worksheet.</p> <p>Types of memory; conversion of short-term to long-term memory. Labelling exercise – link to brain areas</p> <p>Implicit vs explicit memory; sorting activity – sort statements into the correct category. Some pupils can think of additional statements.</p> <p>Literacy task: Extract information on what brain plasticity is.</p> <p>Plenary: pupils summarize what they have learnt about the nervous system and memory to explain how we learn. (extended writing task).</p>	<p>Differentiation by task and outcome.</p> <p>ALL: list simple memories MOST: write down what sense this memory is linked to SOME: for each memory give a reason why you have this memory.</p> <p>ALL: annotate the structure of the brain with: short term-memory, long-term memory, hippocampus, cortex. MOST: describe what happens with the memories in our sleep. SOME: explain what sleep is essential in learning new skills.</p>	<p>Independent and reflective learners</p> <p>Creative thinker</p> <p>Reflective learner Creative thinker</p>