Internal School Curriculum

Subject

Biology
Grade 7

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Grade 7

7.1. Cellular

G2 - Basic level M2 - Intermediate level
E2 - Advanced level

1. From Cell to Organism

Learners can describe cells, organs and organisms as systems. They can describe cells as functional units of living organisms and distinguish between animal and plant cells with regard to structure and function. They describe and explain the connection between structure and function of organs and organ systems with regard to the metabolism and energy conversion. They can explain the importance of cell division for growth.

Competencies Learners are able to			**Contents**	**Time**	**Methods curriculum**
G2	**M2**	**E2**			
(1) draw the structure of animal and plant cells based on microscopic observations and name the cell parts which can be identified under the light microscope	(1) draw the structure of animal and plant cells based on microscopic observations and name the cell parts which can be identified under the light microscope	(1) draw, describe and compare the structure of animal and plant cells based on microscopic observations and	• Assembling a light microscope • Operating a light microscope • Mounting of simple translucent slides (onion epidermis, mouth mucosa, *Elodea*) • Draw simple sketches • Cell division for growth • Cell structure (with important cell organelles) • Comparison between two cell types • Functions of the two cell types • Comparison between the two cell types under the light microscope (image interpretation)	10	• Observe, investigate and interpret • Work with the microscope • Mount slides (*Elodea*, mouth mucosa (human cheek cells), onion epidermis) • Build a model • Biological drawing, labelling of drawings • Dealing with models • *<u>For academically weaker learners use ready-made slides</u>*
(2) describe the functions of the cell components (*nucleus, cell wall,*	(2) describe the functions of the cell components (*nucleus, cell wall,*	(2) explain the functions of the cell components (*nucleus, cell wall,*	• Role and importance of the nucleus, chloroplast, cell membrane, vacuole and cell		• Dealing with models

chloroplast) and the membrane	*chloroplast, vacuole*) and the membrane	*chloroplast, vacuole)* and the significance of the membrane for compartmentalization	wall		
P 2.1 Knowledge acquisition 2.7 P 2.2 Communication 3,4, 7	P 2.1 Knowledge acquisition 2.7 P 2.2 Communication 3,4, 7	P 2.1 Knowledge acquisition 2.7 P 2.2 Communication 3,4, 7			
(3) State cell division and cell specialisation as basis for tissue formation	(3) State cell division and cell specialisation as basis for tissue formation	(3) Explain cell division and cell specialisation as basis for tissue formation	• Cell division using the example of plant growth and cell specialisation using the example of the structure of a leaf		• Dealing with models
(4) describe the process of photosynthesis (word equation) and the significance for organisms	(4) describe the process of photosynthesis (word equation) and explain the significance for organisms	(4) describe the process of photosynthesis (word equation) and explain the significance for organisms	• Photosynthesis equation in words • Significance of photosynthesis (conversion of light energy into chemical energy) • Photosynthetic performance of plants		• GIDA films
(5) carry out and document experiments on photosynthesis	(5) carry out and evaluate experiments for photosynthesis	(5) plan, carry out and evaluate experiments for photosynthesis	• Simple experiments, for example with *Elodea* and the dependence of photosynthesis rate on light intensity		• Learners conduct experiments, record and evaluate the results • *Experiments on internally differentiated stations*
(6) describe the process of cell respiration (word equation)	(6) describe the process of cell respiration (word equation) and compare it with photosynthesis	(6) describe the process of cell respiration (word equation) and compare it with photosynthesis (metabolism and energy conservation)	• Reaction equation in words • Significance of cell respiration • Plants also perform cell respiration • Circular flow model: Photosynthesis as a producer of oxygen and glucose - cell respiration as a consumer • Green plants as universal producers		• Demonstration/experiment : Proof of cell respiration using peas using lime water • GIDA films • Possible role play to represent the dependency of the two reactions
P 2.1 Knowledge acquisition 5, 6,7, 8, 9, 10,11 P 2.2 Communication 3,4,6,	P 2.1 Knowledge acquisition 5, 6,7, 8, 9, 10,11 P 2.2 Communication 3,4,6,	P 2.1 Knowledge acquisition 5, 6,7, 8, 9, 10,11 P 2.2 Communication 3,4,6,			

P 2.3 Evaluation 1.2	P 2.3 Evaluation 1.2	P 2.3 Evaluation 1.2			

7.2 Human Biology

7.2.1 **Nutrition and digestion**

Learners can name nutritional substances and describe their functions in the human body. They can explain the connection between structure and function as well as digestive process, using the digestive system. They can assess the importance of a balanced diet for maintaining the body and developing healthy dietary habits.

Competencies			**Contents**	**Time**	**Methods curriculum**
G2	**M2**	**E2**			
(1) name food components (*carbohydrates, fats, proteins, vitamins, minerals, fibre, water*)	(1) name food components (*carbohydrates, fats, proteins, vitamins, minerals, fibre, water*)	(1) distinguish energy-rich *nutrients* (*carbohydrates, fats, proteins*) from other *food components* (*vitamins, minerals, fibre, water*)	• Food components	20	• Create a mindmap • Learning circle • Food tests
(2) name enzymes and their functions	(2) describe the main characteristics of enzymes and their functions	(2) describe the main characteristics of enzymes and their functions	• Enzymes		• *Learning buffet with internal differentiation (for topics 1-5)*
(3) name the significance of vitamins, minerals, fibre and water and describe them, using named examples	(3) name the significance of vitamins, minerals, fibre and water and describe them, using named examples	(3) describe the significance of vitamins, minerals, fibre and water	• Vitamins, minerals, fibre		
P 2.1 Knowledge acquisition 11	P 2.1 Knowledge acquisition 11	P 2.1 Knowledge acquisition 11			
(4) explain and determine energy demand (*basic metabolic rate, active metabolic rate and total*	(4) explain and determine energy demand (*basic metabolic rate, active metabolic rate and total*	(4) explain and determine (mathematically) energy demand (*basic metabolic rate, active*			

metabolic rate)	*metabolic rate*)	*metabolic rate and total metabolic rate*)	• Calorie content		• Nutrition workshop
(5) read nutritional information on product packaging and evaluate the food item with regard to the recommended daily allowance	(5) evaluate information on energy content of food items (e.g. Product packaging, nutritional information) with regard to energy requirements	(5) evaluate information on energy content of food items (e.g. Product packaging, nutritional information) with regard to energy requirements			
P 2.2 Communication 2 P 2.3 Evaluation 1,3, 7.9	P 2.2 Communication 2 P 2.3 Evaluation 1,3, 7.9	P 2.2 Communication 2 P 2.3 Evaluation 1,3, 7.9			
(6) describe a healthy and balanced diet and implement it in practice	(6) describe a healthy and balanced diet and implement it in practice	(6) create a *balanced diet* plan (ingredients, energy balance)			
(7) describe eating disorders as a type of addictive behaviour and the effects on the body and the body-image	(7) describe eating disorders as a type of addictive behaviour and the effects on the body and the body-image	(7) describe *eating disorders* as a *behavioural disorder* and explain possible causes and consequences	• Health and healthy diet		
P 2.2 Communication 5.8 P 2.3 Evaluation 1.5,6,8,12	P 2.2 Communication 5.8 P 2.3 Evaluation 1.5,6,8,12	P 2.2 Communication 5.8 P 2.3 Evaluation 1.5,6,8,12			
(8) describe path taken by food through the body (*mouth, stomach, intestines*) and describe the digestive processes taking place	(8) describe organs involved in digestion (*mouth, stomach, pancreas, liver, intestines*) and explain their functions	(8) describe path taken by food through the body and describe the functions of the organs involved in digestion (*mouth, stomach, pancreas, liver, intestines*) and explain the connection between structure and function in the digestive process, using appropriate examples (*among others: principle of increased*	• Structure and function of the digestive system		• GIDA films • Dealing with models

		area)			

7.2.2 Blood and circulatory system

Learners can explain the structure and function of the cardiovascular system and the interaction of the two. They can describe the composition and function of blood. For this purpose, they carry out experiments and use models or real models. They can describe cardiovascular diseases and preventive measures.

Learners are able to

Competencies			**Contents**	**Time**	**Methods curriculum**
G2	**M2**	**E2**			
(1) describe the composition of blood and name the function of the cellular components	(1) describe the composition of blood and name the function of the cellular components	(1) describe the composition of blood and name the function of the cellular components	Composition of blood	6	• *<u>Compile a blood book (internally differentiated)</u>*
P 2.1 Knowledge acquisition 2,9,11 P 2.2 Communication 1,3,4 P 2.3 Evaluation 1	P 2.1 Knowledge acquisition 2,9,11 P 2.2 Communication 1,3,4 P 2.3 Evaluation 1	P 2.1 Knowledge acquisition 2,9,11 P 2.2 Communication 1,3,4 P 2.3 Evaluation 1			
(2) examine the structure of the heart and describe the role of double circulatory system	(2) examine the structure of the heart, explain the function and describe the role of double circulatory system	(2) examine the structure of the heart, explain the function and describe the role of double circulatory system			• Build a heart model • Dealing with models • GIDA films
P 2.1 Knowledge acquisition 1,2,6,11 P 2.2 Communication 2.4 P 2.3 Evaluation 1	P 2.1 Knowledge acquisition 1,2,6,11 P 2.2 Communication 2.4 P 2.3 Evaluation 1	P 2.1 Knowledge acquisition 1,2,6,11 P 2.2 Communication 2.4 P 2.3 Evaluation 1			• Dissection of porcine- or bovine heart

(3) name cardiovascular diseases and name their possible causes and provide preventative measures	(3) describe cardiovascular diseases, describe their possible causes and effects and provide preventative measures	(3) describe cardiovascular diseases, describe their possible causes and effects and provide preventative measures			
P 2.2 Communication 2,5,9 P 2.3 Evaluation 1,3,8.12	P 2.2 Communication 2,5,9 P 2.3 Evaluation 1,3,8.12	P 2.2 Communication 2,5,9 P 2.3 Evaluation 1,3,8.12			

7.2.3 Reproduction and Development

Learners can describe the basic processes of the menstrual cycle. They describe the development of human life by fusion of the ovum and sperm and the subsequent multiplication and differentiation of cells. They explain the development of a child in the womb until birth and understand the significance of caring for the unborn life.
Learners are able to

Competencies			**Contents**	**Time**	**Methods curriculum**
G2	**M2**	**E2**			
(1) describe the most important phases of the menstrual cycle	(1) describe the most important phases of the menstrual cycle in context	(1) be able to describe and identif the most important phases of the menstrual cycle in context	• Menstrual cycle	20	• Short films • Contraception box • Models
(2) describe the process of fertilisation of the egg and formation of the embryo by cell division and cell differentiation.	(2) describe fertilisation of the egg and the first cell divisions before implantation of the embryo	(2) describe fertilisation of the egg, the first cell divisions before implantation and forming of the embryo by cell division and cell differentiation	• Ova and fertilisation		
P2.2 Communication 4	P2.2 Communication 4	P2.2 Communication 4			
(3) describe the main stages of development during pregnancy (*implantation, embryo, organ formation,*	(3) describe the main developmental stages during pregnancy (*implantation, embryo, organ formation,*	(3) describe the main developmental stages during pregnancy (*blastocyst, implantation, embryo, organ*	• Pregnancy and Birth		• *Compiling a "pregnancy-*

foetus, birth)	*foetus, birth*)	*formation, foetus, birth*)			*<u>booklet' (internally differentiated)</u>*
(4) Describe risks and dangers during pregnancy	(4) Describe risks and dangers during pregnancy	(4) Describe risks and dangers during pregnancy			
P 2.1 Knowledge acquisition 11 P 2.2 Communication 4.5 P 2.3 Evaluation 12	P 2.1 Knowledge acquisition 11 P 2.2 Communication 4.5 P 2.3 Evaluation 12	P 2.1 Knowledge acquisition 11 P 2.2 Communication 4.5 P 2.3 Evaluation 12			
(5) state the importance of using condoms for protection against sexually transmitted infections	(5) state the importance of using condoms for protection against sexually transmitted infections	(5) state the importance of using condoms for protection against sexually transmitted infections	• Protection against sexually transmitted infections		
P 2.2 Communication 5 P 2.3 Evaluation 10.12	P 2.2 Communication 5 P 2.3 Evaluation 10.12	P 2.2 Communication 5 P 2.3 Evaluation 10.12			