

An abstract graphic of a green leaf, composed of various shades of green and teal, positioned on the right side of the page. The leaf is stylized with sharp, angular edges and a curved shape, resembling a modern architectural element or a stylized plant. It occupies the right half of the page, extending from the top to the bottom.

IB DIPLOMA PROGRAMME CURRICULUM GUIDE

B World School 04971

INTRODUCTION

Life in the 21st century, in an interconnected, globalized world, requires critical-thinking skills, creativity, a sense of international-mindedness and responsibility for our planet. We need to instill in our students courage and enthusiasm to make positive changes. Such is IB education – education for a better world!

We are the IB World School. In 2015, we obtained the authorization of the International Baccalaureate Organization in the Middle Years Programme (MYP), and two years later - in 2017 - in the International Baccalaureate Diploma Programme (DP). Our teaching staff in IB programmes have accomplished IB Professional Development approved by the IBO and we are constantly developing our professional skills by participating in international workshops and conferences.

This guide is addressed to all candidates interested in the IB profile at the Paderewski High School No. 1 in Wałbrzych, as well as our students of the IB profile and their parents. In this publication, we explain how the academically challenging two year IB Diploma Programme prepares for participation in a rapidly evolving and increasingly global society as DP students develop intellectually, emotionally, physically and ethically, while acquiring the skills that will prepare them for further academic education and life.

We wish you a pleasant reading ...

DP Coordinator – Beata Urbaniak

DP Teachers at the Paderewski High School No. 1 in Wałbrzych

PHILOSOPHY

For years our school mission and philosophy have emphasized values that go beyond academic education. We have always focused on the holistic development of our students, helping them to become socially responsible citizens and making them dedicated lifelong learners.

We offer bilingual education as we realize the importance of languages and communication in today's rapidly changing global world. Through participation in international projects and exchanges we develop our international awareness based on mutual understanding and respect. Our students collaborate with peers from other countries while working on global issues.

SCHOOL MISSION

The mission of our school is to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. We focus on the holistic development of students: academic, social, physical, cultural and emotional. We teach hard work, responsibility and critical thinking. We instill in our students the desire for lifelong learning and make them realize that the most important thing is the way which we follow to gain knowledge and seek truth, not the objectives in themselves.

"The world is simply the school of search, the point is not who is going to get first, but who runs the more beautiful way" Michael de Montaigne

INTERNATIONAL MINDEDNESS

The DP encourages students to inquire into different cultures, to respect and admire cultural diversity, to see and understand the connections between global and local issues, all of which make meaningful contributions to postsecondary success and are relevant to students' internationally oriented career aspirations.

IB LEARNER PROFILE



IB learner profile

The aim of all IB programmes is to develop internationally minded people who, recognizing their common humanity and shared guardianship of the planet, help to create a better and more peaceful world.

As IB learners we strive to be:

<p>INQUIRERS We nurture our curiosity, developing skills for inquiry and research. We know how to learn independently and with others. We learn with enthusiasm and sustain our love of learning throughout life.</p> <p>KNOWLEDGEABLE We develop and use conceptual understanding, exploring knowledge across a range of disciplines. We engage with issues and ideas that have local and global significance.</p> <p>THINKERS We use critical and creative thinking skills to analyse and take responsible action on complex problems. We exercise initiative in making reasoned, ethical decisions.</p> <p>COMMUNICATORS We express ourselves confidently and creatively in more than one language and in many ways. We collaborate effectively, listening carefully to the perspectives of other individuals and groups.</p> <p>PRINCIPLED We act with integrity and honesty, with a strong sense of fairness and justice, and with respect for the dignity and rights of people everywhere. We take responsibility for our actions and their consequences.</p>	<p>OPEN-MINDED We critically appreciate our own cultures and personal histories, as well as the values and traditions of others. We seek and evaluate a range of points of view, and we are willing to grow from the experience.</p> <p>CARING We show empathy, compassion and respect. We have a commitment to service, and we act to make a positive difference in the lives of others and in the world around us.</p> <p>RISK-TAKERS We approach uncertainty with forethought and determination; we work independently and cooperatively to explore new ideas and innovative strategies. We are resourceful and resilient in the face of challenges and change.</p> <p>BALANCED We understand the importance of balancing different aspects of our lives—intellectual, physical, and emotional—to achieve well-being for ourselves and others. We recognize our interdependence with other people and with the world in which we live.</p> <p>REFLECTIVE We thoughtfully consider the world and our own ideas and experience. We work to understand our strengths and weaknesses in order to support our learning and personal development.</p>
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The IB learner profile represents 10 attributes valued by IB World Schools. We believe these attributes, and others like them, can help individuals and groups become responsible members of local, national and global communities.

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DP MODEL



Figure 1. DP Model

The Diploma Programme (DP) is a rigorous pre-university course of study designed for students in the 16 to 19 age range. It is a broad-based two-year course that aims to encourage students to be knowledgeable and inquiring, but also caring and compassionate. There is a strong emphasis on encouraging students to develop intercultural understanding, open-mindedness, and the attitudes necessary for them to respect and evaluate a range of points of view.

The course is presented as six academic areas enclosing a central core (see figure 1). It encourages the concurrent study of a broad range of academic areas. Students study two modern languages (or a modern language and a classical language), a humanities or social science subject, an experimental science, mathematics and one of the creative arts. It is this comprehensive range of subjects that makes the Diploma Programme a demanding course of study designed to prepare students effectively for university entrance. In each of the academic areas students have flexibility in making their choices, which means they can choose subjects that particularly interest them and that they may wish to study further at university.

Students are required to choose one subject from each of the six academic areas, although they can, instead of an arts subject, choose two subjects from another area. Normally, three subjects (and not more than four) are taken at higher level (HL), and the others are taken at standard level (SL). At both levels, many skills are developed, especially those of critical thinking and analysis. At the end of the course, students' abilities are measured by means of external assessment. Many subjects contain some element of coursework assessed by teachers. All Diploma Programme students participate in the three elements that make up the core of the model.

GENERAL CONDITIONS FOR AN IB DIPLOMA

The academically challenging two year IB Diploma Programme includes: six subject areas (studies in language and literature, language acquisition, individuals and societies, sciences, mathematics, arts), an extended essay (EE) of 4,000 words; experiential learning through creativity, action, service (CAS); and theory of knowledge (TOK), a course that fosters critical thinking.

IB DP students should study six subjects of which:

- three subjects are at standard level (SL) – 4 hrs per week - three subjects are at higher level (HL) – 6 hrs per week

IB DP students should study:

- at least two languages of which at least one must be an 'A' language
- at least one science
- at least one Individuals and Societies subject
- Mathematics

Additionally, students must also satisfy IBDP conditions in Creativity, Action and Service (CAS), Theory of Knowledge (TOK) and the Extended Essay (EE).

IB DP SUBJECT GROUPS

At The Ignacy Paderewski High School No. 1 we offer the following subjects:

Group 1. Studies in Language and Literature: Polish A-Literature, English A-Literature

Group 2. Language acquisition: English B, French B, German B

Group 3. Individuals and Societies: History, Geography, Psychology

Group 4. Sciences: Biology, Chemistry, Physics, Computer Science

Group 5. Mathematics

Group 6. Arts: Visual Arts

IB DP students study one subject from groups 1-5 and as a sixth subject a student can choose either an artistic subject from group 6 or any other additional subject from groups 1-5.

ASSESSMENT IN THE DIPLOMA PROGRAMME

Criterion-related assessment => students performance is measured against pre-specified assessment criteria based on the aims and objectives of each subject curriculum

External assessment (EA) => written examinations at the end of the programme marked by external examiners (70%)

Internal assessment (IA) => assessment tasks completed by students in the schools and either initially marked by teachers and then moderated by external moderators or sent directly to external examiners

The highest total that a Diploma Programme student can be awarded is **45** (The highest mark **7** in each of the 6 subjects + **3** additional points for their combined results on TOK and Extended Essay).

The lowest total to receive a Diploma is **24**.

Depending on the final assessment of the Theory of Knowledge and Extended Essay components, up to three bonus points can be awarded for the diploma.

Grade:

A = Excellent, B = Good, C = Satisfactory, D = Mediocre, E = Elementary (N = Not submitted)

TOK /EE	A	B	C	D	E
A	3	3	2	2	Failing condition
B	3	2	2	1	
C	2	2	1	0	
D	2	1	0	0	
E	Failing condition				

For example, a candidate who writes a GOOD Extended Essay (grade B) and whose performance in Theory of Knowledge is judged to be SATISFACTORY (grade C), will be awarded + 2 bonus points. Whereas a candidate who submits an ELEMENTARY Extended Essay (grade E) will score no bonus points, and will not be awarded a Diploma irrespective of all other grades.

AWARD OF THE IB DIPLOMA and CERTIFICATES

The IB awards both a diploma and certificates. Candidates need to achieve a total of at least 24 points, with at least 12 points in the Higher Level subjects and no grade E in either Theory of Knowledge or the Extended Essay. Below are the official and exact failing conditions for the IB Diploma:

1. CAS requirements have not been met.
2. Candidate's total points are fewer than 24.
3. An N has been awarded for theory of knowledge, extended essay or for a contributing subject.
4. An E has been awarded for one or both of TOK and EE.
5. There is a grade 1 awarded in a subject/level.
6. Grade 2 has been awarded three or more times (HL or SL).
7. Grade 3 or below has been awarded four or more times (HL or SL).
8. Candidate has gained fewer than 12 points on HL subjects (for candidates who register for four HL subjects, the three highest grades count).
9. Candidate has gained fewer than 9 points on SL subjects (candidates who register for two SL subjects must gain at least 5 points at SL).

NOTE: If the final award committee has judged a candidate to be guilty of malpractice/academic misconduct a grade N is awarded. Also, a maximum of three examination sessions is allowed in which to satisfy the requirements for the award of the IB diploma.

Certificate candidates will receive a certificate indicating the results obtained in individual subjects. An IB diploma candidate who fails to satisfy the requirements for the award of an IB diploma will be awarded a certificate indicating the grades obtained in individual subjects, together with results in Theory of Knowledge and the Extended Essay and the completion of a CAS programme. A Diploma candidate wishing to take more than six subjects may register as an Extra Certificate candidate for the extra subjects at either Higher Level (HL) or Standard Level (SL). Certificates are not available for the Extended Essay, Theory of Knowledge or CAS.

AWARD OF THE IB BILINGUAL DIPLOMA

A bilingual diploma will be awarded to a successful candidate who:

(a) takes two languages A, with the award of a grade 3 or higher in both or

(b) takes examinations in at least one of the subjects from group 3 or group 4 in a language other than taken in group 1. The student must attain a grade 3 or higher in both, the group 1 language and the subject from group 3 or 4.

ACADEMIC HONESTY

The Paderewski High School No. 1 in Wałbrzych recognizes academic honesty as a set of values and skills that contribute to personal integrity and promote good practice in teaching, learning and assessment. As it may be affected by such external factors as peer pressure, cultural background or even parental expectations, the school acknowledges its role in ensuring the school community understands academic honesty and other relevant concepts, especially those of authenticity of work and intellectual property, very well. The IBO defines an authentic piece of work as “one that is based on the candidate’s individual and original ideas, with the ideas and work of others fully acknowledged” (Academic Honesty, 2009. p.2). Therefore, all kinds of assignments, written or oral, completed by a student for assessment, must wholly and authentically use the student’s own language and expression. Any sources used or referred to, whether in the form of direct quotation or paraphrase, must be fully and appropriately acknowledged. Equally important is the awareness of the concept of intellectual property as a form of intellectual and creative expression (e.g. works of literature, art or music) which is protected by a wide range of intellectual property rights such as patents, registered designs, trademarks, moral rights and copyright. When using someone else’s intellectual property, students should develop the habit of acknowledging it by using the appropriate referencing. It is made clear to students that malpractice is forbidden. Among the most frequent examples of malpractice there are:

- plagiarism: the representation of the ideas or work of another person as your own.
- collusion: supporting malpractice by another candidate, as in allowing one’s work to be copied or submitted for assessment by another.
- duplication of work: the presentation of the same work for different assessment components and/or requirements.
- misconduct during an examination, including the possession of unauthorized material.
- disclosing information to another student, or receiving information from another student, about the content of an examination paper within 24 hours after the examination.

THEORY OF KNOWLEDGE

Theory of Knowledge (TOK) is a course about critical thinking and inquiring into the process of knowing, rather than about learning a specific body of knowledge. The course examines how we know what we claim to know. In TOK classes students discuss knowledge questions which they derive from real life situations. Various areas of knowledge, like ethics, history, natural and human sciences are discussed during classes to find methodology behind them, crucial moments in their history. All of that to enable and encourage students to think critically and independently.

⇒ **The aims of the TOK course are:**

- to encourage students to reflect on the central question, “How do we know that?”, and to recognize the value of asking that question
- to expose students to ambiguity, uncertainty and questions with multiple plausible answers
- to equip students to effectively navigate and make sense of the world, and help prepare them to encounter novel and complex situations
- to encourage students to be more aware of their own perspectives and to reflect critically on their own beliefs and assumptions
- to engage students with multiple perspectives, foster open-mindedness and develop intercultural understanding
- to encourage students to make connections between academic disciplines by exploring underlying concepts and by identifying similarities and differences in the methods of inquiry used in different areas of knowledge
- to prompt students to consider the importance of values, responsibilities and ethical concerns relating to the production, acquisition, application and communication of knowledge

⇒ **Curriculum overview:**

- **Core theme: Knowledge and the Knower** - This theme provides an opportunity for students to reflect on themselves as knowers and thinkers, and on the different communities of knowers to which we belong.
- **Optional themes** Students are required to study two optional themes from the following five options. • Knowledge and technology • Knowledge and language • Knowledge and politics • Knowledge and religion • Knowledge and indigenous societies
- **Areas of knowledge** Students are required to study the following five areas of knowledge • History • The human sciences • The natural sciences • The arts • Mathematics

⇒ **Assessment model:** Students are required to complete two assessment tasks for TOK. • Theory of knowledge exhibition • Theory of knowledge essay on a prescribed title

⇒ **Assessment objectives:** Having completed the TOK course, students should be able to: • demonstrate TOK thinking through the critical examination of knowledge questions • identify and explore links between knowledge questions and the world around us • identify and explore links between knowledge questions and areas of knowledge • develop relevant, clear and coherent arguments • use examples and evidence effectively to support a discussion • demonstrate awareness and evaluation of different points of view • consider the implications of arguments and conclusions.

⇒ **Assessment details**

Type of assessment	Format of assessment	Hours	Weighting
External	Theory of knowledge essay	10	2/3 or 67%
Students are required to write an essay in response to one of the six prescribed titles that are issued by the IB for each examination session. As an external assessment component, it is marked by IB examiners.			
Internal	Theory of knowledge exhibition	8	1/3 or 33%
Students are required to create an exhibition of three objects with accompanying commentaries that explores how TOK manifests in the world around us. This component is internally assessed by the teacher and externally moderated by the IB at the end of the course.			

⇒ **Sample questions****Specimen essay titles**

- How important are the opinions of experts in the search for knowledge? Answer with reference to the arts and one other area of knowledge
- Is the division of the natural sciences and mathematics into separate areas of knowledge artificial?
- When historians and natural scientists say that they have explained something, are they using the word “explain” in the same way?
- Are there fewer ethical constraints on the pursuit of knowledge in the arts than in the human sciences?
- How do our expectations impact our interpretations? Discuss with reference to history and one other area of knowledge
- To what extent do you agree with the claim that “knowledge is of no value unless you put it into practice” (Anton Chekhov)? Answer with reference to two areas of knowledge.

Sample exhibition prompts

- What counts as knowledge?
- On what grounds might we doubt a claim?
- Are some types of knowledge less open to interpretation than others?
- Is bias inevitable in the production of knowledge?
- Should some knowledge not be sought on ethical grounds?
- What role do experts play in influencing our consumption or acquisition of knowledge?
- How can we distinguish between knowledge, belief and opinion?

EXTENDED ESSAY

The extended essay is a compulsory, externally assessed piece of independent research into a topic chosen by the student and presented as a formal piece of academic writing. The extended essay is intended to promote high-level research and writing skills, intellectual discovery and creativity while engaging students in personal research. This leads to a major piece of formally presented, structured writing of up to 4,000 words in which ideas and findings are communicated in a reasoned, coherent and appropriate manner.

Students are guided through the process of research and writing by an assigned supervisor (a teacher in the school). All students undertake three mandatory reflection sessions with their supervisor, including a short interview, or viva voce, following the completion of the extended essay. Extended essay topics may be chosen from a list of approved DP subjects—normally one of the student's six chosen subjects for the IB diploma or the world studies option. World studies provides students with the opportunity to carry out an in-depth interdisciplinary study of an issue of contemporary global significance, using two IB disciplines.

⇒ **The aims of the extended essay** are to provide students with the opportunity to:

- engage in independent research with intellectual initiative and rigour
- develop research, thinking, self-management and communication skills
- reflect on what has been learned throughout the research and writing process.

⇒ **Overview of the extended essay process**

The research process	Writing and formal presentation	Reflection process
<ul style="list-style-type: none"> • Choose the approved DP subject. • Choose a topic. • Undertake some preparatory reading. • Formulate a well-focused research question. • Plan the research and writing process. • Plan a structure (outline headings) for the essay. This may change as the research develops. • Carry out the research. 	<p>The required elements of the final work to be submitted are as follows:</p> <ul style="list-style-type: none"> • Title page • Contents page • Introduction • Body of the essay • Conclusion • References and bibliography <p>The upper limit of 4,000 words includes the introduction, body, conclusion and any quotations</p>	<p>As part of the supervision process, students undertake three mandatory reflection sessions with their supervisor. These sessions form part of the formal assessment of the extended essay and research process. The purpose of these sessions is to provide an opportunity for students to reflect on their engagement with the research process and is intended to help students consider the effectiveness of their choices, re-examine their ideas and decide on whether changes are needed. The final reflection session is the viva voce. The viva voce is a short interview (10–15 minutes) between the student and the supervisor, and is a mandatory conclusion to the process. The viva voce serves as:</p> <ul style="list-style-type: none"> • a check on plagiarism and malpractice in general • an opportunity to reflect on successes and difficulties • an opportunity to reflect on what has been learned • an aid to the supervisor's report.

⇒ **Assessment model**

The extended essay is assessed against common criteria and is interpreted in ways appropriate to each subject. Students are expected to:

- provide a logical and coherent rationale for their choice of topic
- review what has already been written about the topic
- formulate a clear research question
- offer a concrete description of the methods used to investigate the question
- generate reasoned interpretations and conclusions based on their reading and independent research in order to answer the question
- reflect on what has been learned throughout the research and writing process

⇒ **Assessment criteria:**

Focus and method: The topic, the research question and the methodology are clearly stated.

Knowledge and understanding: The research relates to the subject area/discipline used to explore the research question, and knowledge and understanding is demonstrated through the use of appropriate terminology and concepts

Critical thinking: Critical-thinking skills have been used to analyse and evaluate the research undertaken.

Presentation: The presentation follows the standard format expected for academic writing.

Engagement: The student's engagement with their research focus and the research process.

The extended essay contributes to the student's overall score for the diploma through the award of points in conjunction with theory of knowledge. A maximum of three points are awarded according to a student's combined performance in both the extended essay and theory of knowledge.

⇒ **Sample extended essay topics / research questions:**

- What is the relationship between the length of an exhaust pipe and the frequency of the sound it emits?
- How far was the Christian Democrat victory in the Italian elections of 1948 influenced by Cold War tensions?
- How effective is Friedrich Dürrenmatt's use of colour to convey his message in the play *Der Besuch der alten Dame*?

CREATIVITY * ACTIVITY * SERVICE

Creativity, activity, service (CAS) is at the heart of the DP. With its holistic approach, CAS is organized around the three strands of creativity, activity and service defined as follows:

- **Creativity**—exploring and extending ideas leading to an original or interpretive product or performance.
- **Activity**—physical exertion contributing to a healthy lifestyle
- **Service**—collaborative and reciprocal engagement with the community in response to an authentic need.

⇒ **CAS aims** to develop students who:

- enjoy and find significance in a range of CAS experiences
- purposefully reflect upon their experiences
- identify goals, develop strategies and determine further actions for personal growth
- explore new possibilities, embrace new challenges and adapt to new roles
- actively participate in planned, sustained and collaborative CAS projects
- understand they are members of local and global communities with responsibilities towards each other and the environment.

⇒ **A CAS experience** is a specific event in which the student engages with one or more of the three CAS strands. It can be a single event or an extended series of events. A CAS project is a collaborative series of sequential CAS experiences lasting at least one month. Typically, a student's CAS programme combines planned/unplanned singular and ongoing experiences. All are valuable and may lead to personal development. However, a meaningful CAS programme must be more than just a series of unplanned/singular experiences. Students must be involved in at least one CAS project during the programme.

⇒ **Programme overview** The CAS programme formally begins at the start of the DP and continues regularly for at least 18 months with a reasonable balance between creativity, activity and service. A CAS experience must:

- fit within one or more of the CAS strands
- be based on a personal interest, skill, talent or opportunity for growth
- provide opportunities to develop the attributes of the IB learner profile
- not be used or included in the student's DP course requirements.

CAS students have guidance at the school level through a variety of resources including the school's CAS handbook, information sessions and meetings. In addition, students have three formal interviews with the school's CAS coordinator/adviser. Typically, students' service experiences involve the following stages:

- Investigation, preparation and action that meets an identified need.
- Reflection on significant experiences throughout to inform problem-solving and choices.
- Demonstration allowing for sharing of what has taken place.

All CAS students are expected to maintain and complete a **CAS portfolio** as evidence of their engagement with CAS. The CAS portfolio is a collection of evidence that showcases CAS experiences and student reflections; it is not formally assessed.

⇒ **Learning outcomes:** Completion of CAS is based on student achievement of the seven CAS learning outcomes:

Identify own strengths and develop areas for growth - Students are able to see themselves as individuals with various abilities and skills, of which some are more developed than others.

Demonstrate that challenges have been undertaken, developing new skills in the process. - A new challenge may be an unfamiliar experience or an extension of an existing one. The newly acquired or developed skills may be shown through new experiences or through increased expertise in an established area.

Demonstrate how to initiate and plan a CAS experience. - Students can articulate the stages from conceiving an idea to executing a plan for individual or collaborative CAS experiences. Students may show their knowledge and awareness by building on a previous experience or by launching a new idea or process.

Show commitment to, and perseverance in, CAS experiences. - Students demonstrate regular involvement and active engagement in CAS.

Demonstrate the skills and recognize the benefits of working collaboratively. - Students are able to identify, demonstrate and critically discuss the benefits and challenges of collaboration gained through CAS experiences.

Demonstrate engagement with issues of global significance. - Students are able to identify and demonstrate their understanding of global issues, make responsible decisions and take appropriate action in response to the issue either locally, nationally or internationally.

Recognize and consider the ethics of choices and actions. - Students show awareness of the consequences of choices and actions in planning and carrying out CAS experiences.

⇒ **Sample projects:**

- Creativity: A student group plans, designs and creates a mural.
- Activity: Students organize and participate in a sports team including training sessions and matches against other teams
- Service: Students set up and conduct tutoring for people in need.
- Service and activity: Students plan and participate in the planting and maintenance of a garden with members of the local community
- Creativity, activity and service: Students rehearse and perform a dance production for a community retirement home.

THE IB DIPLOMA PROGRAMME SUBJECTS

Group 1: Studies in Language and Literature

Language A Literature HL & SL (Polish A, English A)

The language A: literature aims at exploring the various manifestations of literature as a particularly powerful mode of writing across cultures and throughout history. The course aims at developing an understanding of factors that contribute to the production and reception of literature—the creativity of writers and readers, the nature of their interaction with their respective contexts and with literary tradition, the ways in which language can give rise to meaning and/or effect, and the performative and transformative potential of literary creation and response. Through close analysis of a range of literary texts in a number of literary forms and from different times and places, students will consider their own interpretations as well as the critical perspectives of others, to explore how such positions are shaped by cultural belief systems and to negotiate meanings for texts.

The aims of studies in language and literature courses are to enable students to:

- engage with a range of texts, in a variety of media and forms, from different periods, styles and cultures z develop skills in listening, speaking, reading, writing, viewing, presenting and performing
- develop skills in interpretation, analysis and evaluation
- develop sensitivity to the formal and aesthetic qualities of texts and an appreciation of how they contribute to diverse responses and open up multiple meanings z develop an understanding of relationships between texts and a variety of perspectives, cultural contexts, and local and global issues, and an appreciation of how they contribute to diverse responses and open up multiple meanings
- develop an understanding of the relationships between studies in language and literature and other disciplines
- communicate and collaborate in a confident and creative way
- foster a lifelong interest in and enjoyment of language and literature

Curriculum model overview - Syllabus component:

- Readers, writers and texts
- Time and space
- Intertextuality: connecting texts

Assessment model: It is the intention of this course that students are able to fulfill the following assessment objectives:

A. Know, understand and interpret:

- a range of texts, works and/or performances, and their meanings and implications
- contexts in which texts are written and/or received z elements of literary, stylistic, rhetorical, visual and/or performance craft
- features of particular text types and literary forms.

B. Analyse and evaluate:

- ways in which the use of language creates meaning
- uses and effects of literary, stylistic, rhetorical, visual or theatrical techniques
- relationships among different texts z ways in which texts may offer perspectives on human concerns.

C. Communicate:

- ideas in clear, logical and persuasive ways
- in a range of styles, registers and for a variety of purposes and situations

Assessment

Type of assessment	Format of assessment	Time (hours)		Weighting	
		SL	HL	SL	HL
External					
Paper 1: Guided literary analysis	Guided analysis of unseen literary passage/ passages from different text types.	1,25	2,25	35	35
Paper 2: Comparative essay	Comparative essay based on two literary works written in response to a choice of one out of four questions.	1,75	1,75	35	25
HL essay	Written coursework component: 1,200–1,500 word essay on one work studied.				20
Internal					
Individual oral	Prepared oral response on the way that one work originally written in the language studied and one work studied in translation have approached a common global issue			30	20

THE IB DIPLOMA PROGRAMME SUBJECTS

Group 2: Language Acquisition: **English, French, German**

Language B is a language acquisition course designed for students with some previous experience of the target language. Students further develop their ability to communicate through the study of language, themes and texts. There are **five prescribed themes: identities, experiences, human ingenuity, social organization and sharing the planet.**

Language B HL students learn to communicate in the target language in familiar and unfamiliar contexts. At HL the study of two literary works originally written in the target language is required and students are expected to extend the range and complexity of the language they use and understand in order to communicate. Students continue to develop their knowledge of vocabulary and grammar, as well as their conceptual understanding of how language works, in order to construct, analyse and evaluate arguments on a variety of topics relating to course content and the target language culture(s).

Language acquisition course aims to:

- Develop international-mindedness through the study of languages, cultures, and ideas and issues of global significance.
- Enable students to communicate in the language they have studied in a range of contexts and for a variety of purposes.
- Encourage, through the study of texts and through social interaction, an awareness and appreciation of a variety of perspectives of people from diverse cultures.
- Develop students' understanding of the relationship between the languages and cultures with which they are familiar.
- Develop students' awareness of the importance of language in relation to other areas of knowledge.
- Provide students, through language learning and the process of inquiry, with opportunities for intellectual engagement and the development of critical- and creative-thinking skills.
- Provide students with a basis for further study, work and leisure through the use of an additional language.
- Foster curiosity, creativity and a lifelong enjoyment of language learning.

Curriculum model overview

The curriculum is organized around five prescribed themes with which the students engage through written, audio, visual and audio-visual texts. Students develop into successful, effective communicators by considering the conceptual understandings of context, audience, purpose, meaning and variation. Communication is evidenced through receptive, productive and interactive skills.

Assessment model: The language acquisition assessment objectives are:

- Communicate clearly and effectively in a range of contexts and for a variety of purposes.
- Understand and use language appropriate to a range of interpersonal and/or intercultural contexts and audiences.
- Understand and use language to express and respond to a range of ideas with fluency and accuracy.
- Identify, organize and present ideas on a range of topics.
- Understand, analyse and reflect upon a range of written, audio, visual and audio-visual texts.

Language B SL and HL assessment outline		Time (hours)		Weighting
		SL	HL	
External (75%)	Paper 1 (productive skills) One writing task from a choice of three Writing - 30 marks			25%
	Paper 2 (receptive skills) Separate sections for listening and reading Listening—25 marks Reading—40 marks			25% 25%
Internal (25%)	Individual oral assessment - 30 marks			25%

Theme	Guiding principle	Optional recommended topics	Possible questions
Identities	Explore the nature of the self and what it is to be human.	• Lifestyles • Health and well-being • Beliefs and values • Subcultures • Language and identity	What constitutes an identity? How do language and culture contribute to form our identity?
Experiences	Explore and tell the stories of the events, experiences and journeys that shape our lives	Leisure activities • Holidays and travel • Life stories • Rites of passage • Customs and traditions • Migration	How does our past shape our present and our future? • How and why do different cultures mark important moments in life?

Human ingenuity	Explore the ways in which human creativity and innovation affect our world.	Entertainment • Artistic expressions • Communication and media • Technology • Scientific innovation	What can we learn about a culture through its artistic expression? • How do the media change the way we relate to each other?
Social organization	Explore the ways in which groups of people organize themselves, or are organized, through common systems or interests.	• Social relationships • Community • Social engagement • Education • The working world • Law and order	What is the individual's role in the community? • What role do rules and regulations play in the formation of a society?
Sharing the planet	Explore the challenges and opportunities faced by individuals and communities in the modern world.	The environment • Human rights • Peace and conflict • Equality • Globalization • Ethics • Urban and rural environment	What environmental and social issues present challenges to the world, and how can these challenges be overcome? • What challenges and benefits does globalization bring?

THE IB DIPLOMA PROGRAMME SUBJECTS

Group 3: Individuals and societies: **History**

The DP history course is a world history course based on a comparative and multi-perspective approach to history. It involves the study of a variety of types of history, including political, economic, social and cultural, and provides a balance of structure and flexibility.

The course emphasizes the importance of encouraging students to think historically and to develop historical skills as well as gaining factual knowledge. It puts a premium on developing the skills of critical thinking, and on developing an understanding of multiple interpretations of history. In this way, the course involves a challenging and demanding critical exploration of the past. Teachers explicitly teach thinking and re-search skills such as comprehension, text analysis, transfer, and use of primary sources.

There are six **key concepts** that have particular prominence throughout the DP history course: **change, continuity, causation, consequence, significance and perspectives**.

The aims of the DP history course are to enable students to:

- develop an understanding of, and continuing interest in, the past
- encourage students to engage with multiple perspectives and to appreciate the complex nature of historical concepts, issues, events and developments
- promote international-mindedness through the study of history from more than one region of the world
- develop an understanding of history as a discipline and to develop historical consciousness including a sense of chronology and context, and an understanding of different historical perspectives
- develop key historical skills, including engaging effectively with sources
- increase students' understanding of themselves and of contemporary society by encouraging reflection on the past.

Curriculum model overview - Prescribed subjects (*One of the following, using two case studies, each taken from a different region of the world*):

1. Military leaders
2. Conquest and its impact
3. The move to global war
4. Rights and protest
5. Conflict and intervention

World history topics (Two of the following, using topic examples from more than one region of the world):

1. Society and economy (750–1400)
2. Causes and effects of wars (750–1500)
3. Dynasties and rulers (750–1500)
4. Societies in transition (1400–1700)
5. Early Modern states (1450–1789)
6. Causes and effects of Early Modern wars (1500–1750)
7. Origins, development and impact of industrialization (1750–2005)
8. Independence movements (1800–2000)
9. Emergence and development of democratic states (1848–2000)
10. Authoritarian states (20th century)
11. Causes and effects of 20th-century wars
12. The Cold War: Superpower tensions and rivalries (20th century)

HL options: Depth studies (*One of the following*):

1. History of Africa and the Middle East
2. History of the Americas
3. History of Asia and Oceania
4. History of Europe

Assessment model - There are four assessment objectives for the DP history course:

A: Knowledge and understanding

- Demonstrate detailed, relevant and accurate historical knowledge.
- Demonstrate understanding of historical concepts and context.
- Demonstrate understanding of historical sources.

B: Application and analysis

- Formulate clear and coherent arguments.
- Use relevant historical knowledge to effectively support analysis.
- Analyse and interpret a variety of sources.

C: Synthesis and evaluation

- Integrate evidence and analysis to produce a coherent response.
- Evaluate different perspectives on historical issues and events, and integrate this evaluation effectively into a response.

- Evaluate sources as historical evidence, recognizing their value and limitations.
- Synthesize information from a selection of relevant sources.

D: Use and application of appropriate skills

- Structure and develop focused essays that respond effectively to the demands of a question.
- Reflect on the methods used by, and challenges facing, the historian.
- Formulate an appropriate, focused question to guide a historical inquiry.
- Demonstrate evidence of research skills, organization, reference and selection of appropriate sources.

Type of assessment	Format of assessment	Time (hours)		Weighting	
		SL	HL	SL	HL
External					
Paper 1	Source-based paper based on the five prescribed subjects	1	1	30	20
Paper 2	Essay paper based on the 12 world history topics	1,5	1,5	45	25
Paper 3	Essay paper based on one of the four regional options	--	2,5	--	35
Internal					
Historical investigation	A historical investigation into a topic of the student's choice.	20	20	25	20

Sample questions: Paper 2 (HL and SL):

- Examine the impact of industrialization on standards of living and working conditions in one country.
- Compare and contrast the impact on women of the policies of two authoritarian states, each chosen from a different region.
- Compare and contrast the role of technology in determining the outcome of two 20th-century wars.
- Examine the impact of the US policy of containment on superpower relations between 1947 and 1964.

THE IB DIPLOMA PROGRAMME SUBJECTS

Group 3: Individuals and societies: **Geography**

Geography is a dynamic subject firmly grounded in the real world, and focuses on the interactions between individuals, societies and physical processes in both time and space. It seeks to identify trends and patterns in these interactions. It also investigates the way in which people adapt and respond to change, and evaluates actual and possible management strategies associated with such change. Geography describes and helps to explain the similarities and differences between different places, on a variety of scales and from different perspectives.

Geography as a subject is distinctive in its spatial dimension and occupies a middle ground between social or human sciences and natural sciences. The course integrates physical, environmental and human geography, and students acquire elements of both socio-economic and scientific methodologies. Geography takes advantage of its position to examine relevant concepts and ideas from a wide variety of disciplines, helping students develop life skills and have an appreciation of, and a respect for, alternative approaches, viewpoints and ideas.

Students at both SL and HL are presented with a common core and optional geographic themes. HL students also study the HL core extension. Although the skills and activity of studying geography are common to all students, HL students are required to acquire a further body of knowledge, to demonstrate critical evaluation and to further synthesize the concepts in the HL extension.

The aims of the geography course at SL and HL are to enable students to:

- develop an understanding of the dynamic interrelationships between people, places, spaces and the environment at different scales
- develop a critical awareness and consider complexity thinking in the context of the nexus of geographic issues, including: ° acquiring an in-depth understanding of how geographic issues, or wicked problems, have been shaped by powerful human and physical processes ° synthesizing diverse geographic knowledge in order to form viewpoints about how these issues could be resolved.
- understand and evaluate the need for planning and sustainable
- development through the management of resources at varying scales.

Curriculum model overview - Syllabus component:

Geographic themes - seven options SL - two options; HL - three options: • Freshwater • Oceans and coastal margins • Extreme environments • Geophysical hazards • Leisure, tourism and sport • Food and health • Urban environments.

SL and HL core Geographic perspectives - global change • Population distribution - changing population • Global climate - vulnerability and resilience • Global resource consumption and security
HL only Geographic perspectives - global interactions • Power, places and networks • Human development and diversity

Assessment model There are four assessment objectives (AOs) for the SL and HL geography course.

A. Demonstrate knowledge and understanding of specified content

- between areas of film focus and film elements employed by
- the core theme - global change
- two optional themes at SL and three optional themes at HL
- at HL, the HL extension—global interactions
- in internal assessment, a specific geographic research topic.

B. Demonstrate application and analysis of knowledge and understanding

- apply and analyse geographic concepts and theories
- identify and interpret geographic patterns and processes in unfamiliar information, data and cartographic material
- demonstrate the extent to which theories and concepts are recognized and understood in particular contexts.

C. Demonstrate synthesis and evaluation

- examine and evaluate geographic concepts, theories and perceptions
- use geographic concepts and examples to formulate and present an argument
- evaluate materials using methodology appropriate for geographic fieldwork
- at HL only, demonstrate synthesis and evaluation of the HL extension - global interactions.

D. Select, use and apply a variety of appropriate skills and techniques

- select, use and apply: ° prescribed geographic skills in appropriate contexts ° techniques and skills appropriate to a geographic research question.
- produce well-structured written material, using appropriate terminology

Sample questions:

- Examine the role of plate margin type in determining the severity of volcanic hazards.
- Evaluate the success of attempts to predict tectonic hazard event and their possible impacts.
- Evaluate the role of agribusiness and new technologies in increasing world food supply.
- Examine the relationship between food security and health.
- Using examples, analyse how technological developments can threaten the security of states.
- To what extent does a global culture exist?

Type of assessment	Format of assessment	Time (hours)		Weighting	
		SL	HL	SL	HL
External					
Paper 1	Each option has a structured question and one extended answer question from a choice of two	1,5	2,25	35	35
Paper 2	Three structured questions, based on each SL/HL core unit. Infographic or visual stimulus, with structured questions. One extended answer question from a choice of two	1,25	1,25	40	25
Paper 3	Choice of three extended answer questions, with two parts, based on each HL core extension unit		1		20
Internal					
Fieldwork	One written report based on a fieldwork question from any suitable syllabus topic, information collection and analysis with evaluation.	20	20	25	20

THE IB DIPLOMA PROGRAMME SUBJECTS

Group 3: Individuals and societies: **Psychology**

At the core of the DP psychology course is an introduction to **three different approaches to understanding behaviour: the biological, cognitive and sociocultural approaches**. Students study and critically evaluate the knowledge, concepts, theories and research that have developed the understanding in these fields. The interaction of these approaches to studying psychology forms the basis of a holistic and integrated approach to understanding mental processes and behaviour as a complex, dynamic phenomenon, allowing students to appreciate the diversity as well as the commonality between their own behaviour and that of others.

The contribution and the interaction of the three approaches is understood through the four options in the course, focusing on **areas of applied psychology: abnormal psychology, developmental psychology, health psychology, and the psychology of relationships**. The options provide an opportunity to take what is learned from the study of the approaches to psychology and apply it to specific lines of inquiry.

Psychologists employ a range of research methods, both qualitative and quantitative, to test their observations and hypotheses. DP psychology promotes an understanding of the various approaches to research and how they are used to critically reflect on the evidence as well as assist in the design, implementation, analysis and evaluation of the students' own investigations. Surrounding the approaches and the options are the overarching themes of research and ethics. A consideration of both is paramount to the nature of the subject.

The aims of the psychology course at SL and at HL are to:

- develop an understanding of the biological, cognitive and sociocultural factors affecting mental processes and behaviour
- apply an understanding of the biological, cognitive and sociocultural factors affecting mental processes and behaviour to at least one applied area of study
- understand diverse methods of inquiry
- understand the importance of ethical practice in psychological research in general and observe ethical practice in their own inquiries
- ensure that ethical practices are upheld in all psychological inquiry and discussion
- develop an awareness of how psychological research can be applied to address real-world problems and promote positive change
- provide students with a basis for further study, work and leisure through the use of an additional language
- foster curiosity, creativity and a lifelong enjoyment of language learning.

Curriculum model overview - Syllabus component:

Core: biological approach to understanding behaviour, cognitive approach to understanding behaviour, sociocultural approach to understanding behaviour, approaches to researching behaviour.

Options: abnormal psychology, developmental psychology, health psychology, psychology of human relationships

Assessment model:

A. Knowledge and comprehension of specified content

- Demonstrate knowledge and comprehension of: { key terms and concepts in psychology { a range of psychological theories and studies { the biological, cognitive and sociocultural approaches to mental processes and behaviour { research methods used in psychology.

B. Application and analysis

- Demonstrate an ability to use examples of psychological research and psychological concepts to formulate an argument in response to a specific question.
- Demonstrate application and analysis of: { a range of psychological theories and research studies { the knowledge relevant to areas of applied psychology.
- At HL only, analyse qualitative and quantitative research in psychology.

C. Synthesis and evaluation

- Evaluate the contribution of: { psychological theories to understanding human psychology { research to understanding human psychology { the theories and research in areas of applied psychology.
- At HL only, evaluate research scenarios from a methodological and ethical perspective.

D. Selection and use of skills appropriate to psychology

- Demonstrate the acquisition of skills required for experimental design, data collection and presentation, data analysis and the evaluation of a simple experiment while demonstrating ethical practice.
- Work in a group to design a method for a simple experimental investigation, organize the investigation and record the required data for a simple experiment.
- Write a report of a simple experiment

Sample questions:

- Outline one study investigating schema.
- Discuss ethical considerations linked to genetic research into human behaviour.
- (HL only) Discuss how the use of technology affects one cognitive process.

Type of assessmt	Format of assessment	Time (hours)		Weighting	
		SL	HL	SL	HL
External					
Paper 1	Three short answer questions on the core. One essay from a choice of three on the biological, cognitive and sociocultural approaches. HL only: essays will reference additional HL topic	2	2	50	40
Paper 2	SL: one question from a choice of three on one option. HL: two questions; one each from a choice of three on two options.	1	2	25	20
Paper 3	Three short answer questions on approaches to research		1		20
Internal					
Experimental study	A report on an experimental study undertaken by the student	20	20	25	20

THE IB DIPLOMA PROGRAMME SUBJECTS

Group 4: Sciences: **Biology**

Biology is the study of life. The vast diversity of species makes biology both an endless source of fascination and a considerable challenge. Biologists attempt to understand the living world at all levels from the micro to the macro using many different approaches and techniques. Biology is still a young science and great progress is expected in the 21st century. This progress is important at a time of growing pressure on the human population and the environment.

By studying biology in the DP students should become aware of how scientists work and communicate with each other. While the scientific method may take on a wide variety of forms, it is the emphasis on a practical approach through experimental work that characterizes the sciences. Teachers provide students with opportunities to design investigations, collect data, develop manipulative skills, analyse results, collaborate with peers and evaluate and communicate their findings.

The aims of the DP biology course are to enable students to:

- appreciate scientific study and creativity within a global context through stimulating and challenging opportunities
- acquire a body of knowledge, methods and techniques that characterize science and technology
- apply and use a body of knowledge, methods and techniques that characterize science and technology
- develop an ability to analyse, evaluate and synthesize scientific information
- develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
- develop experimental and investigative scientific skills including the use of current technologies
- develop and apply 21st century communication skills in the study of science
- become critically aware, as global citizens, of the ethical implications of using science and technology
- develop an appreciation of the possibilities and limitations of science and technology
- develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge.

Curriculum model overview:

Core: Cell biology, Molecular biology, Genetics, Ecology, Evolution and biodiversity, Human physiology,
Additional higher level: Nucleid acids, Metabolism, Cell respiration and photosynthesis, Plant biology, Genetics and evolution, Animal Physiology,

Option (choice of 1 out of 4): Neurobiology and behaviour, Biotechnology and bioinformatics, Ecology and conservation, Human physiology.

The group 4 project is a collaborative activity where students from different group 4 subjects, within or between schools, work together. It can be practically or theoretically based and aims to develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge. The emphasis is on interdisciplinary cooperation and the scientific processes.

Assessment objectives:

A. Demonstrate knowledge and understanding of:

- facts, concepts, and terminology
- methodologies and techniques
- communicating scientific information.

B. Apply:

- facts, concepts, and terminology
- methodologies and techniques
- methods of communicating scientific information.

C. Formulate, analyse and evaluate:

- hypotheses, research questions and predictions
- methodologies and techniques
- primary and secondary data
- scientific explanations.

D. Demonstrate the appropriate research, experimental, and personal skills necessary to carry out insightful and ethical investigations.

Sample questions: - SL	Sample questions: -HL
Cyclins were discovered by Timothy R. Hunt in 1982 while studying sea urchins. What is a function of cyclins? (Paper 1)	Membrane proteins of mice cells were marked with green and membrane proteins of human cells were marked with red. The cells were fused together. What would be seen after two hours? (Paper 1)
Antibiotics can be used to treat bacterial infections in human tissues because of differences in cell structure between prokaryotes and eukaryotes. o Distinguish between the structure of prokaryotes and eukaryotes. o Evaluate the drug tests that Florey and Chain carried out on penicillin. o Explain the reasons for the ineffectiveness of antibiotics in the treatment of viral diseases. (Paper 2)	The species is the basis for naming and classifying organism. o Explain how new species can emerge by • directional selection • disruptive selection • polyploidy. o Outline the advantages to scientists of the binomial system for naming species. o Describe the use of dichotomous keys for the identification of specimens. (Paper 2)
The company BASF produces a genetically modified potato called Amflora. Outline the purpose of modifying the potato. (Paper 3)	Brain death is a clinical diagnosis based on the absence of neurological function, with a known irreversible cause of coma. o Explain a named method to assess brain damage. o Distinguish between a reflex arc and other responses by the nervous system. o Describe the events that occur in the nervous system when something very hot is touched. (Paper 3)

Type of assessment	Format of assessment	Time (hours)		Weighting	
		SL	HL	SL	HL
External					
Paper 1	30 multiple-choice questions (SL) 40 multiple-choice questions (HL)	0,75	1	20	20
Paper 2	Data-based, short answer and extended response questions	2,25	2	40	36
Paper 3	Data-based, short answer and extended response questions	1	1,25	20	24
Internal					
Individual investigation	Investigation and write-up of 6 to 12 pages	10	10	20	20

THE IB DIPLOMA PROGRAMME SUBJECTS

Group 4: Sciences: **Chemistry**

Chemistry is an experimental science that combines academic study with the acquisition of practical and investigational skills. Chemical principles underpin both the physical environment in which we live and all biological systems. Chemistry is often a prerequisite for many other courses in higher education, such as medicine, biological science and environmental science. Both theory and practical work should be undertaken by all students as they complement one another naturally, both in school and in the wider scientific community. The DP chemistry course allows students to develop a wide range of practical skills and to increase facility in the use of mathematics. It also allows students to develop interpersonal and information technology skills, which are essential to life in the 21st century.

By studying chemistry students should become aware of how scientists work and communicate with each other. While the scientific method may take on a wide variety of forms, it is the emphasis on a practical approach through experimental work that characterizes the subject. Teachers provide students with opportunities to develop manipulative skills, design investigations, collect data, analyse results and evaluate and communicate their findings.

The aims of the DP chemistry enable students to:

- appreciate scientific study and creativity within a global context through stimulating and challenging opportunities
- acquire a body of knowledge, methods and techniques that characterize science and technology
- apply and use a body of knowledge, methods and techniques that characterize science and technology
- develop an ability to analyse, evaluate and synthesize scientific information
- develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
- develop experimental and investigative scientific skills including the use of current technologies
- develop and apply 21st century communication skills in the study of science
- become critically aware, as global citizens, of the ethical implications of using science and technology
- develop an appreciation of the possibilities and limitations of science and technology
- develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge.

Curriculum model overview.

Core: 1. Stoichiometric relationships 2. Atomic structure 3. Periodicity 4. Chemical bonding and structure 5. Energetics/thermochemistry 6. Chemical kinetics 7. Equilibrium 8. Acids and bases 9. Redox processes 10. Organic chemistry 11. Measurement and data processing.

Additional higher level (AHL) 12.Atomic structure 13.The periodic table—the transition metals 14.Chemical bonding and structure 15.Energetics/thermochemistry 16.Chemical kinetics 17.Equilibrium 18.Acids and bases 19.Redox processes 20.Organic chemistry 21.Measurement and analysis. **Option** (Choice of one out of four) A. Materials B. Biochemistry C. Energy D. Medicinal chemistry.

The group 4 project is a collaborative activity where students from different group 4 subjects, within or between schools, work together. It allows for concepts and perceptions from across disciplines to be shared. It can be practically or theoretically based and aims to develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge. The emphasis is on interdisciplinary cooperation and the scientific processes.

A. Demonstrate knowledge and understanding of:

- facts, concepts, and terminology
- methodologies and techniques
- communicating scientific information.

B. Apply:

- facts, concepts, and terminology
- methodologies and techniques
- methods of communicating scientific information.

C. Formulate, analyse and evaluate:

- hypotheses, research questions and predictions
- methodologies and techniques
- primary and secondary data
- scientific explanations.

D. Demonstrate the appropriate research, experimental, and personal skills necessary to carry out insightful and ethical investigations.

Sample questions: - SL	Sample questions: -HL
What is the total number of atoms in 0.50 mol of 1,4-diaminobenzene, $\text{H}_2\text{NC}_6\text{H}_4\text{NH}_2$? A. 16.0×10^{23} B. 48.0×10^{23} C. 96.0×10^{23} D. 192.0×10^{23} (Avogadro's constant (L or N_A) = $6.0 \times 10^{23} \text{ mol}^{-1}$.) (Paper 1)	What is the sum of the coefficients when the equation for the combustion of ammonia is balanced using the smallest possible whole numbers? $___ \text{NH}_3(\text{g}) + ___ \text{O}_2(\text{g}) \rightarrow ___ \text{N}_2(\text{g}) + ___ \text{H}_2\text{O}(\text{g})$ A. 6 B. 12 C. 14 D. 15 (Paper 1)
Many automobile manufacturers are developing vehicles that use hydrogen as a fuel. 1. Suggest why such vehicles are considered to cause less harm to the environment than those with internal combustion engines. 2. Hydrogen can be produced from the reaction of coke with steam: $\text{C}(\text{s}) + 2\text{H}_2\text{O}(\text{g}) \rightarrow 2\text{H}_2(\text{g}) + \text{CO}_2(\text{g})$ Using information from section 12 of the data booklet, calculate the change in enthalpy, ΔH , in kJ mol^{-1} , for this reaction. (Paper 2)	The two isomers of $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ are crystalline. One of the isomers is widely used in the treatment of cancer. i. Draw both isomers of the complex, ii. Explain the polarity of each isomer using a diagram of each isomer to support your answer, iii. State a suitable method (other than looking at dipole moments) to distinguish between the two isomers iv. Compare and contrast the bonding types formed by nitrogen in $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$ (Paper 2)

Type of assessment	Format of assessment	Time (hours)		Weighting	
		SL	HL	SL	HL
External					
Paper 1	30 multiple-choice questions (SL) (Core) 40 multiple-choice questions (HL) (Core and AHL)	0,75	1	20	20
Paper 2	Data-based, short answer and extended response questions (Core and AHL)	2	2,25	40	36
Paper 3	Data-based, short answer and extended response questions , plus short answer and extended response questions on the option	1	1,25	20	24
Internal					
Individual investigation	Investigation and write-up of 6 to 12 pages	10	10	20	20

THE IB DIPLOMA PROGRAMME SUBJECTS

Group 4: Sciences: **Physics**

Physics is the most fundamental of the experimental sciences, as it seeks to explain the universe itself, from the very smallest particles to the vast distances between galaxies. Despite the exciting and extraordinary development of ideas throughout the history of physics, observations remain essential to the very core of the subject. Models are developed to try to understand observations, and these themselves can become theories that attempt to explain the observations. Besides helping us better understand the natural world, physics gives us the ability to alter our environments. This raises the issue of the impact of physics on society, the moral and ethical dilemmas, and the social, economic and environmental implications of the work of physicists.

By studying physics students should become aware of how scientists work and communicate with each other. While the scientific method may take on a wide variety of forms, it is the emphasis on a practical approach through experimental work that characterizes the subject. Teachers provide students with opportunities to develop manipulative skills, design investigations, collect data, analyse results and evaluate and communicate their findings.

The aims of the DP physics enable students to:

- appreciate scientific study and creativity within a global context through stimulating and challenging opportunities
- acquire a body of knowledge, methods and techniques that characterize science and technology
- apply and use a body of knowledge, methods and techniques that characterize science and technology
- develop an ability to analyse, evaluate and synthesize scientific information
- develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
- develop experimental and investigative scientific skills including the use of current technologies
- develop and apply 21st century communication skills in the study of science
- become critically aware, as global citizens, of the ethical implications of using science and technology
- develop an appreciation of the possibilities and limitations of science and technology
- develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge.

Curriculum model overview: Core

- | | |
|-----------------------------------|---|
| 1. Measurements and uncertainties | 5. Electricity and magnetism |
| 2. Mechanics | 6. Circular motion and gravitation |
| 3. Thermal physics | 7. Atomic, nuclear and particle physics |
| 4. Waves | 8. Energy production |

Additional higher level

9. Wave phenomena
10. Fields
11. Electromagnetic induction
12. Quantum and nuclear physics

Option (Choice of one out of four)

- A. Relativity
- B. Engineering physics
- C. Imaging
- D. Astrophysics

The group 4 project is a collaborative activity where students from different group 4 subjects, within or between schools, work together. It allows for concepts and perceptions from across disciplines to be shared. It can be practically or theoretically based and aims to develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge. The emphasis is on interdisciplinary cooperation and the scientific processes

Assessment objectives:**A. Demonstrate knowledge and understanding of:**

- facts, concepts, and terminology
- methodologies and techniques
- communicating scientific information.

B. Apply:

- facts, concepts, and terminology
- methodologies and techniques
- methods of communicating scientific information.

C. Formulate, analyse and evaluate:

- hypotheses, research questions and predictions
- methodologies and techniques
- primary and secondary data
- scientific explanations.

D. Demonstrate the appropriate research, experimental, and personal skills necessary to carry out insightful and ethical investigations.

Sample questions: - SL	Sample questions: -HL
An object falls freely from rest through a vertical distance of 44.0m in a time of 3.0s. What value should be quoted for the acceleration of free-fall? (Paper 1) A. 9.778ms ⁻² B. 9.780ms ⁻² C. 9.78ms ⁻² D. 9.8ms ⁻²	Why is wave-particle duality used in describing the properties of light? A. Light is both a wave and a particle B. Both wave and particle models can explain all the properties of light C. Different properties of light can be more clearly explained by using one of the wave or particle models D. Scientists feel more confident when using more than one model to explain a phenomenon (Paper 1)
There is a suggestion that the temperature of the Earth may increase if the use of fossil fuels is not reduced over the coming years. Explain, with reference to the enhanced greenhouse effect, why this temperature increase may occur. (Paper 2)	The tower is 120m high with an internal diameter of 3.5m. When most of the air has been removed, the pressure in the tower is 0.96 Pa. Determine the number of molecules of air in the tower when the temperature of the air is 300 K. (Paper 2)

<p>In an experiment to measure the specific heat capacity of a metal, a piece of metal is placed inside a container of boiling water at 100°C. The metal is then transferred into a calorimeter containing water at a temperature of 10°C. The final equilibrium temperature of the water was measured. One source of error in this experiment is that the small mass of boiling water will be transferred to the calorimeter along with the metal. (a) Suggest the effect of the error on the measured value of the specific heat capacity of the metal (b) State one other source of error for this experiment (Paper 3)</p>	<p>The streamlines above the airfoil are closer to each other than the streamlines below the airfoil. Suggest why this implies that the speed of the air above the airfoil is greater than the speed of air below the airfoil. (Paper 3)</p>
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Type of assessment	Format of assessment	Time (hours)		Weighting	
		SL	HL	SL	HL
External					
Paper 1	30 multiple-choice questions (SL) 40 multiple-choice questions (HL)	0,75	1	20	20
Paper 2	Data-based, short answer and extended response questions (Core and AHL)	1,25	2,25	40	36
Paper 3	Data-based, short answer and extended response questions plus, short answer and extended response questions on the option	1	1,25	20	24
Internal					
Individual investigation	Investigation and write-up of 6 to 12 pages	10	10	20	20

THE IB DIPLOMA PROGRAMME SUBJECTS

Group 4: Sciences: **Computer Science**

The IB DP computer science HL course requires an understanding of the fundamental concepts of computational thinking as well as knowledge of how computers and other digital devices operate. The course, underpinned by conceptual thinking, draws on a wide spectrum of knowledge, and enables and empowers innovation, exploration and the acquisition of further knowledge. Students study how computer science interacts with and influences cultures, society and how individuals and societies behave, and the ethical issues involved. During the course the student will develop computational solutions. This will involve the ability to: • identify a problem or unanswered question • design, prototype and test a proposed solution • liaise with clients to evaluate the success of the proposed solution and make recommendations for future developments.

The aims of the computer science course are to:

- provide opportunities for study and creativity within a global context that will stimulate and challenge students developing the skills necessary for independent and lifelong learning
- provide a body of knowledge, methods and techniques that characterize computer science
- enable students to apply and use a body of knowledge, methods and techniques that characterize computer science
- demonstrate initiative in applying thinking skills critically to identify and resolve complex problems
- engender an awareness of the need for, and the value of, effective collaboration and communication in resolving complex problems
- develop logical and critical thinking as well as experimental, investigative and problem-solving skills
- develop and apply the students' information and communication technology skills in the study of computer science to communicate information confidently and effectively
- raise awareness of the moral, ethical, social, economic and environmental implications of using science and technology
- develop an appreciation of the possibilities and limitations associated with continued developments in IT systems and computer science
- encourage an understanding of the relationships between scientific disciplines and the overarching nature of the scientific method.

Curriculum model overview: syllabus content SL/HL core:

- Topic 1: System fundamentals
- Topic 2: Computer organization
- Topic 3: Networks
- Topic 4: Computational thinking, problem-solving and programming

HL extension

- Topic 5: Abstract data structures

- Topic 6: Resource management
- Topic 7: Control Case study Additional subject content introduced by the annually issued case study

Option SL/HL core - HL extension Students study one of the following options:

- Option A: Databases
- Option B: Modelling and simulation
- Option C: Web science
- Option D: Object-oriented programming (OOP)

Internal assessment Solution Practical application of skills through the development of a product and associated documentation **Group 4 project.**

A. Know and understand:

- relevant facts and concepts
- appropriate methods and techniques
- computer science terminology
- methods of presenting information.

B. Apply and use:

- relevant facts and concepts
- relevant design methods and techniques
- terminology to communicate effectively
- appropriate communication methods to present information.

C. Construct, analyse, evaluate and formulate:

- success criteria, solution specifications including task outlines, designs and test plans
- appropriate techniques within a specified solution.

D. Demonstrate the personal skills of cooperation and perseverance as well as appropriate technical skills for effective problem-solving in developing a specified product.

Sample questions: - SL	Sample questions: -HL
<p>The colour of a pixel can be stored as a 16-bit integer. (a) State how many different colours can be represented in a 16-bit integerfield. (b) State whether this storage system for colour values is digital or analog. (c) Outline one advantage and one disadvantage of using 32-bits per-pixel to store colours instead of 16-bits per-pixel. • State the output of the following code fragment: double n= 1234.5678; double p = math.floor((n*100)/100); output (p); Recall that math.floor(3.7) produces the integer result 3.</p>	<p>Draw the representation of the binary search tree if the following data were inserted in this order: •FALCON, CANARY, PIGEON, TURKEY, OSPREY. Discuss the methods used by criminals to hide or disguise certain files. For each method, identify the countermeasures that can be taken by a computer forensic scientist.</p>

Internal assessment Solution Practical application of skills through the development of a product and associated documentation **Group 4 project.**

Type of assessment	Format of assessment	Time (hours)		Weighting	
		SL	HL	SL	HL
External					
Paper 1	• Section A consists of several compulsory short answer questions. • Section B consists of three (SL) and five (HL) compulsory structured questions.	0,75	2,10	45	40
Paper 2	An examination paper of between three and seven compulsory question; linked to the option studied.	1	1,20	25	20
Paper 3	An examination paper consisting of four compulsory questions based on a pre-seen case		1		20
Internal					
HL - Written commentary	A report of The development of a computational solution. Students must produce: • a cover page that follows the prescribed format • a product • supporting documentation (word limit 2,000 words).	30	30		25
SL – Solution	The development of a computational solution. Students must produce: • a cover page that follows the prescribed format • a product supporting documentation (word limit 2,000 words). There must be evidence of independent research and investigation for students to reach the top level.				
Group 4 Project	To be assessed using the criterion Personal skills.	10	10		

THE IB DIPLOMA PROGRAMME SUBJECTS

Group 5: Mathematics

Individual students have different needs, aspirations, interests and abilities. For this reason there are two different DP subjects in mathematics, Mathematics: analysis and approaches and Mathematics: applications and interpretation. Each course is designed to meet the needs of a particular group of students. Both courses are offered at SL and HL.

The IB DP Mathematics: analysis and approaches course recognizes the need for analytical expertise in a world where innovation is increasingly dependent on a deep understanding of mathematics. The focus is on developing important mathematical concepts in a comprehensible, coherent and rigorous way, achieved by a carefully balanced approach. Students are encouraged to apply their mathematical knowledge to solve abstract problems as well as those set in a variety of meaningful contexts. Mathematics: analysis and approaches has a strong emphasis on the ability to construct, communicate and justify correct mathematical arguments. Students should expect to develop insight into mathematical form and structure, and should be intellectually equipped to appreciate the links between concepts in different topic areas. Students are also encouraged to develop the skills needed to continue their mathematical growth in other learning environments. The internally assessed exploration allows students to develop independence in mathematical learning. Throughout the course students are encouraged to take a considered approach to various mathematical activities and to explore different mathematical ideas.

The aims of DP mathematics course enable students to:

- develop a curiosity and enjoyment of mathematics, and appreciate its elegance and power
- develop an understanding of the concepts, principles and nature of mathematics
- communicate mathematics clearly, concisely and confidently in a variety of contexts
- develop logical and creative thinking, and patience and persistence in problem solving to instil confidence in using mathematics
- employ and refine their powers of abstraction and generalization
- take action to apply and transfer skills to alternative situations, to other areas of knowledge and to future developments in their local and global communities
- appreciate how developments in technology and mathematics influence each other
- appreciate the moral, social and ethical questions arising from the work of mathematicians and the applications of mathematics
- appreciate the universality of mathematics and its multicultural, international and historical perspectives
- appreciate the contribution of mathematics to other disciplines, and as a particular “area of knowledge” in the TOK course z develop the ability to reflect critically upon their own work and the work of others
- independently and collaboratively extend their understanding of mathematics.

Curriculum model overview - Syllabus component:

- Number and algebra z Functions
- Geometry and trigonometry
- Statistics and probability
- Calculus

The assessment objectives:

- A. **Knowledge and understanding:** Recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of familiar and unfamiliar contexts.
- B. **Problem solving:** Recall, select and use their knowledge of mathematical skills, results and models in both abstract and real-world contexts to solve problems.
- C. **Communication and interpretation:** Transform common realistic contexts into mathematics; comment on the context; sketch or draw mathematical diagrams, graphs or constructions both on paper and using technology; record methods, solutions and conclusions using standardized notation; use appropriate notation and terminology.
- D. **Technology:** Use technology accurately, appropriately and efficiently both to explore new ideas and to solve problems.
- E. **Reasoning:** Construct mathematical arguments through use of precise statements, logical deduction and inference and by the manipulation of mathematical expressions.
- F. **Inquiry approaches:** Investigate unfamiliar situations, both abstract and from the real world, involving organizing and analyzing information, making conjectures, drawing conclusions, and testing their validity.

The exploration is an integral part of the course and its assessment, and is compulsory for both SL and HL students. It enables students to demonstrate the application of their skills and knowledge, and to pursue their personal interests, without the time limitations and other constraints that are associated with written examinations.

Type of assessment	Format of assessment	Time (hours)		Weighting	
		SL	HL	SL	HL
External					
Paper 1	No technology allowed. Section A: compulsory short-response questions based on the syllabus. Section B: compulsory extended-response questions based on the syllabus.	1,5	2	40	30

Paper 2	Technology allowed. Section A: compulsory short-response questions based on the syllabus. Section B: compulsory extended-response questions based on the syllabus	1,5	2	40	30
Paper 3	Technology allowed. Two compulsory extended-response problem-solving questions.		1		20
Internal					
Exploration	Investigation and write-up of 6 to 12 pages	15	15	20	20

THE IB DIPLOMA PROGRAMME SUBJECTS

Group 6: Visual Arts

The IB Diploma Programme visual arts course encourages students to challenge their own creative and cultural expectations and boundaries. It is a thought-provoking course in which students develop analytical skills in problem-solving and divergent thinking, while working towards technical proficiency and confidence as art-makers. In addition to exploring and comparing visual arts from different perspectives and in different contexts, students are expected to engage in, experiment with and critically reflect upon a wide range of contemporary practices and media. The course is designed for students who want to go on to further study of visual arts in higher education as well as for those who are seeking lifelong enrichment through visual arts. The role of visual arts teachers should be to actively and carefully organize learning experiences for the students, directing their study to enable them to reach their potential and satisfy the demands of the course. Students should be empowered to become autonomous, informed and skilled visual artists.

The aims of the arts are to enable students to:

- enjoy lifelong engagement with the arts
- become informed, reflective and critical practitioners in the arts
- understand the dynamic and changing nature of the arts
- explore and value the diversity of the arts across time, place and cultures
- express ideas with confidence and competence
- develop perceptual and analytical skills.

In addition, the aims of the visual arts course at SL and HL are to enable students to:

- make artwork that is influenced by personal and cultural contexts
- become informed and critical observers and makers of visual culture and media
- develop skills, techniques and processes in order to communicate concepts and ideas.

Curriculum model overview – Component: Visual arts in context

- Examine and compare the work of artists from different cultural contexts.
- Consider the contexts influencing their own work and the work of others.
- Make art through a process of investigation, thinking critically and experimenting with techniques.
- Apply identified techniques to their own developing work.
- Develop an informed response to work and exhibitions they have seen and experienced.
- Begin to formulate personal intentions for creating and displaying their own artworks.

Visual arts methods:

- Look at different techniques for making art.
- Investigate and compare how and why different techniques have evolved and the processes involved.
- Experiment with diverse media and explore techniques for making art.
- Develop concepts through processes informed by skills, techniques and media.
- Evaluate how their ongoing work communicates meaning and purpose.
- Consider the nature of “exhibition”, and think about the process of selection and the potential impact of their work on different audiences.

Communicating visual arts:

- Explore ways of communicating through visual and written means.
- Make artistic choices about how to most effectively communicate knowledge and understanding.
- Produce a body of artwork through a process of reflection and evaluation, showing a synthesis of skill, media and concept.
- Select and present resolved works for exhibition.
- Explain the ways in which the works are connected.
- Discuss how artistic judgments impact the overall presentation.

Throughout the course students are required to maintain **a visual arts journal**. Although sections of the journal will be selected, adapted and presented for assessment, the journal itself is not directly assessed or moderated. It is, however, regarded as a fundamental activity of the course.

Assessment - the visual arts course, students are expected to:

A. Demonstrate knowledge and understanding of specified content:

- Identify various contexts in which the visual arts can be created and presented
- Describe artwork from differing contexts, and identify the ideas, conventions and techniques employed by the art-makers
- Recognize the skills, techniques, media, forms and processes associated with the visual arts
- Present work, using appropriate visual arts language, as appropriate to intentions

B. Demonstrate application and analysis of knowledge and understanding:

- Express concepts, ideas and meaning through visual communication
- Analyse artworks from a variety of different contexts
- Apply knowledge and understanding of skills, techniques, media, forms and processes related to art-making

C. Demonstrate synthesis and evaluation:

- Critically analyse and discuss artworks created by themselves and others and articulate an informed personal response

- Formulate personal intentions for the planning, development and making of artworks that consider how meaning can be conveyed to an audience
- Demonstrate the use of critical reflection to highlight success and failure in order to progress work
- Evaluate how and why art-making evolves and justify the choices made in their own visual practice

D. Select, use and apply a variety of appropriate skills and techniques:

- Experiment with different media, materials and techniques in art-making
- Make appropriate choices in the selection of images, media, materials and techniques in art-making
- Demonstrate technical proficiency in the use and application of skills, techniques, media, images, forms and processes
- Produce a body of resolved and unresolved artworks as appropriate to intentions

Type of assessment	Format of assessment	Time (hours)	Weighting	
			SL	HL
External				
Comparative study	<ul style="list-style-type: none">• 10–15 screens which examine and compare at least 3 artworks, at least 2 of which need to be by different artists• (Only HL) 3–5 screens which analyse the extent to which the student’s work and practices have been influenced by the art and artists examined• A list of sources used	20	20	
Process portfolio	<ul style="list-style-type: none">• 9-18 (SL) and 13–25 (HL) screens which evidence sustained experimentation, exploration, manipulation and refinement of a variety of art-making activities	40	40	
Internal				
Exhibition	<ul style="list-style-type: none">• A curatorial rationale that does not exceed 400 words (SL) and 700 words (HL)• 4 – 7 (SL) and 8 –11 (HL) artworks• Exhibition text (stating the title, medium, size and intention) for each artwork	40	40	

BIBLIOGRAPHY:

DP Subject Guides
www.ibo.org