High School
Information Session

EBGIS
EAST BAY GERMAN INTERNATIONAL SCHOOL

WELCOME!

Claudia Müller | Principal

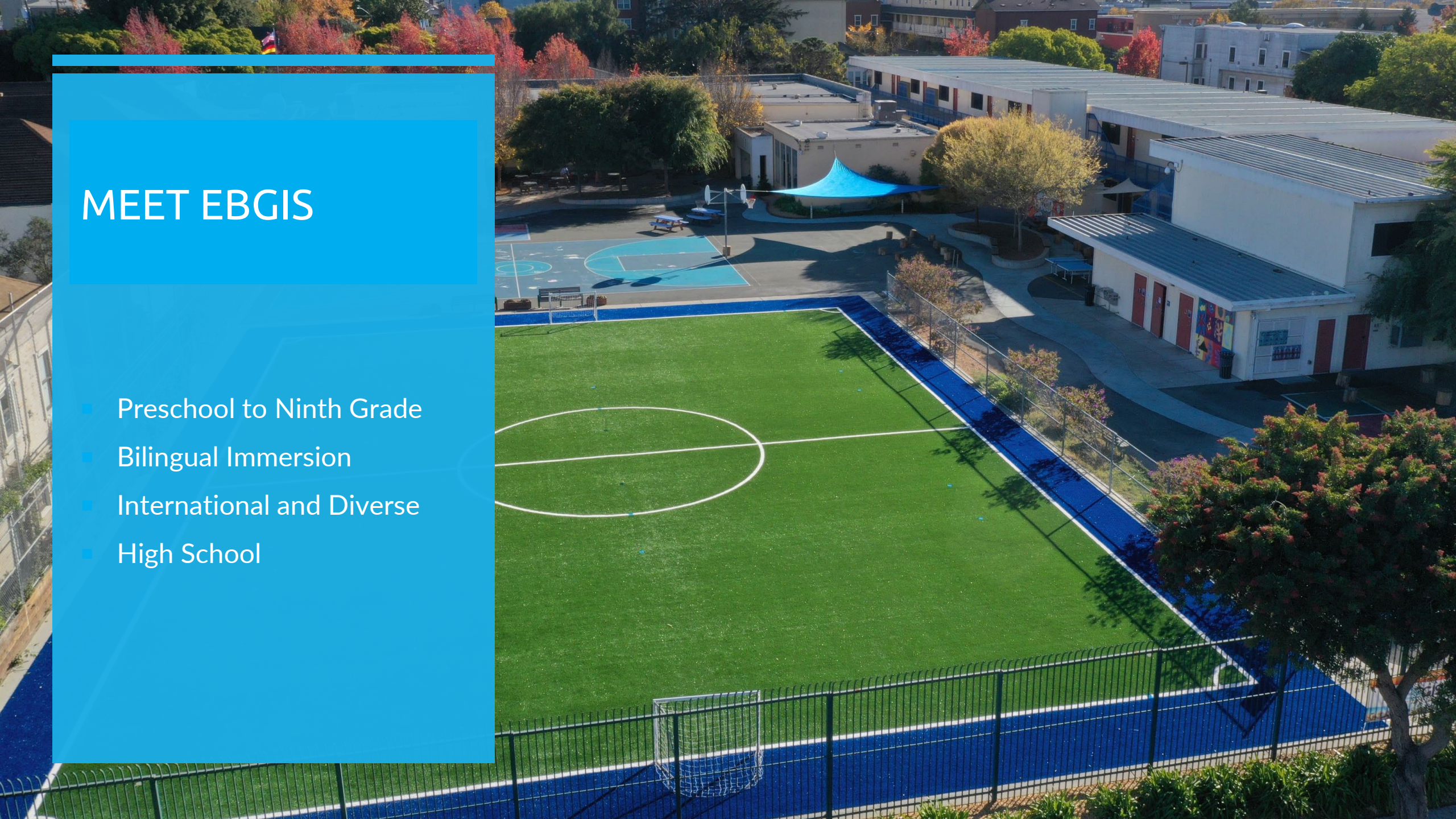
Yvonne Hagemann | IB Coordinator

Rufus Pichler | Board Chair

Kay Naumann | Board and Admissions

MEET EBGIS

- Preschool to Ninth Grade
- Bilingual Immersion
- International and Diverse
- High School



WHAT SETS US APART

- Faculty
- Program
- Campus
- Community

SCIENCE LAB | MUSIC | ART | MAKER SPACE | STUDENT LOUNGE | LIBRARY | AUDITORIUM | ATHLETIC FIELDS

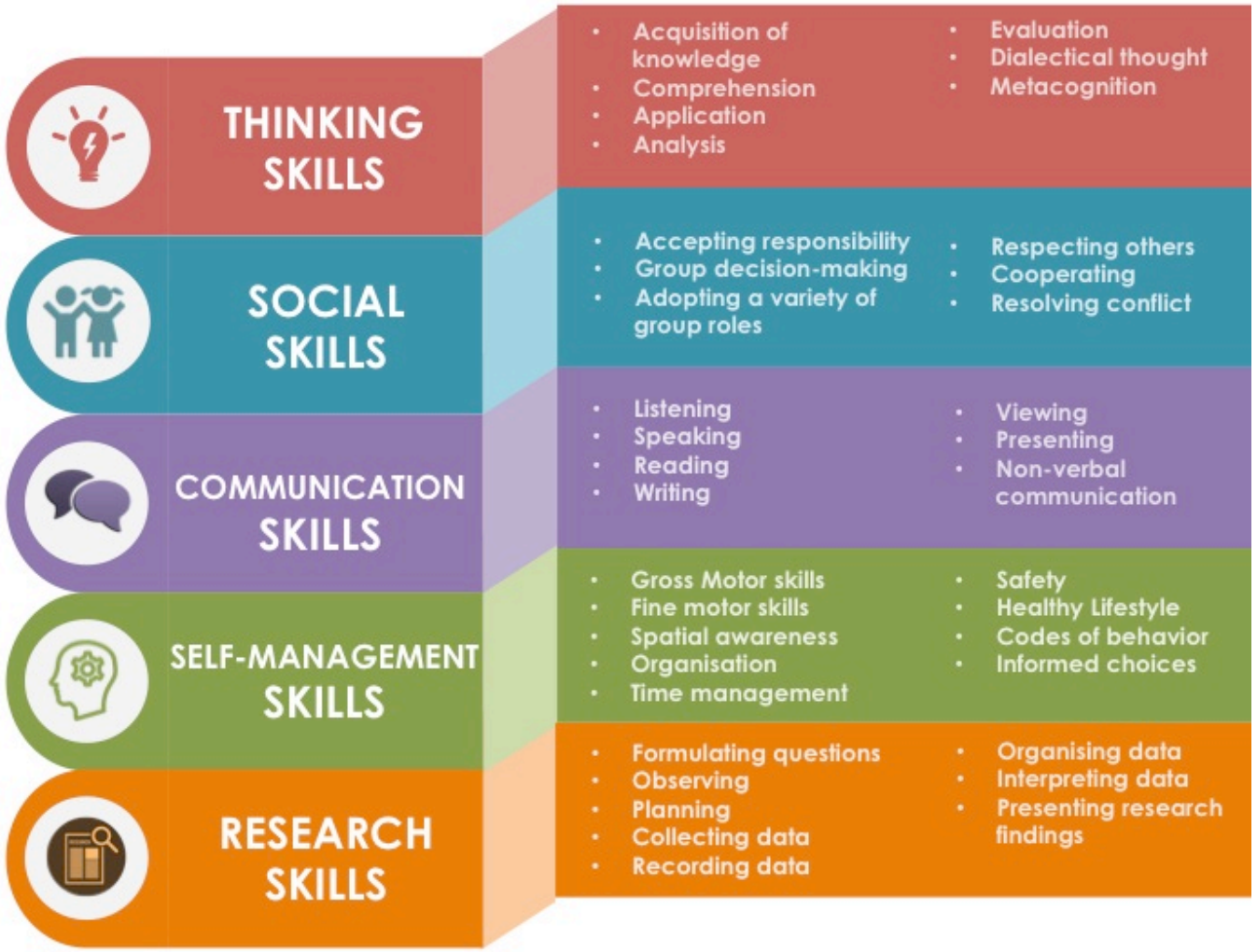
EDUCATING GLOBAL CITIZENS

- “The International Baccalaureate® aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect.”
- Natural continuation of EBGIS’ existing programs and approach
- EBGIS became an IB Diploma Programme candidate school in March

IB CURRICULUM

- Core Elements
  - Theory of Knowledge
  - Extended Essay
  - Creativity, Activity, Service
- Subject Groups
  - Language and Literature
  - Language Acquisition
  - Individuals and Society
  - Sciences
  - Mathematics
  - The Arts

CRITICAL 21ST CENTURY SKILLS



HOLISTIC EDUCATION

- Academically Advanced
- Well-Rounded
- Love of Learning
- Breadth and Depth of Knowledge
- Social-Emotional Development
- Multilingual

ADVANTAGES IN UNIVERSITY ADMISSIONS AND STUDIES

- IB students significantly more likely to attend “selective” and “highly selective” universities
- IB graduates perform better at the university level
- Top universities grant credit to IB students toward college

> “UC awards students who complete the IB diploma with a score of 30 or above with 6 quarter (4 semester) units toward their UC degree, in addition to the units earned for individual Higher Level exams (usually 24 quarter/16 semester units).”

IB DIPLOMA IS HIGHLY REGARDED

"When we see an IB student's application, we light up, we are excited … . Universities tend to view full diploma students as highly prepared for entering a liberal arts institution … it's something we really value in the admissions process."

Assistant Dean of Admissions, Stanford University

"The International Baccalaureate (IB) Diploma Programme (DP) is a two-year comprehensive and rigorous pre-university curriculum leading to an IB diploma. Successful IB candidates are typically granted advanced placement credit at the finest universities and colleges in the nation."

California Department of Education

EBGIS HIGH SCHOOL CURRICULUM

EBGIS HIGH SCHOOL CURRICULUM

- Grades 9 and 10
  - Continuation of advanced German-based curriculum
  - Meets and exceeds California requirements
  - Seamless transition to IB Diploma Programme
- Grades 11 and 12
  - IB Diploma Programme
  - Bilingual version (GIB)
- Graduation
  - IB Diploma
  - California high school diploma
  - GIB automatically recognized in Germany as equivalent to Abitur

IB Subject Groups	Subject	UC Subject Requirements (A-G)	9	10	11 SL/HL	12 SL/HL
Studies in Language and Literature	English	B	4	4	4/6	4/6
Studies in Language and Literature Language Acquisition	German	E/G	4	4	4/6	4/6
Language Acquisition	Spanish/ French*	E/G	3	3	4	4
Individuals and Societies	World History (Ger)	A	2	2	4/6	4/6
	US History and Geography (En)	A	2	-	-	-
	Geography (Ger)	A/G	1	2	-	-
	American Government/ Economics (En)	A		1	-	-
Core	Ethics/TOK (Ger)**	G	2	2	2	1
	Essay Writing (Ger)	G	2	2	-	-
	CAS/Extended Essay (Ger/En)	G	-	-	2	2
Mathematics	Mathematics (Ger/En)	C	4	4	4/6	4/6
Sciences	Biology (Ger)	D	2	2	4/6	4/6
	Chemistry (Ger)	D/G	2	2	-	-
	Physics (Ger/En)	D/G	2	2	2	2
The Arts	Visual Arts (En)	F/G	1	1	4/6	4/6
	Music (En)	F/G	1	1		
	PE		2	2	2	2
Individual Support	College Prep/Mentoring		2	2	1	1

Grade 9 Weekly Schedule | Stundenplan Klasse 9

	Monday	Tuesday	Wednesday	Thursday	Friday
08.15 - 09.00	**Mathematics**	**College Prep**	**Ethics**	**Chemistry**	**English**
09.00 - 9.45	**Mathematics**	**College Prep**	**Ethics**	**Chemistry**	**English**
9.45 - 10.05	Break	Break	Break	Break	Break
10.05 - 10.50	**Essay Writing**	**Geography**	**Biology**	**US History & Geo**	**German**
10.50 - 11.35	**Essay Writing**	**Geography**	**Biology**	**US History & Geo**	**German**
11.35 - 12.15	Lunch	Lunch	Lunch	Lunch	Lunch
12.15 - 13.00	**PE**	**Physics**	**World History**	**Mathematics**	**French/Spanish**
13.00 - 13.45	**PE**	**Physics**	**World History**	**Mathematics**	**French/Spanish**
13.45 - 14.00	Break	Break	Break	Break	Break
14.00 - 14.45	**English**	**Art/Music**	**German**	**French/Spanish**	**/**
14.45 - 15.30	**English**	**Art/Music**	**German**	**/**	**/**

IB DIPLOMA PROGRAMME

- IB Diploma Programme curriculum in grades 11 and 12
- Bilingual "GIB" version with German, History, Biology taught in German
- Continued focus on competencies
- Holistic approach

IB learners are:

- Inquirers
- Knowledgeable
- Thinkers
- Communicators
- Principled
- Open-minded
- Caring
- Risk-takers
- Balanced
- Reflective

Grade 11 Weekly Schedule | Stundenplan Klasse 11 | IB Diploma Programme

Period	Monday	Tuesday	Wednesday	Thursday	Friday
1	English (SL)	Biology (SL)	Biology (SL)	English (SL)	Mathematics (HL)
2					
Break	Break	Break	Break	Break	Break
3	Mathematics (SL)	Visual Arts (SL) Physics (SL) Spanish (SL)	Flex/Mentorship	Mathematics (SL)	German (HL)
4					
Break	Lunch	Lunch	Lunch	Lunch	Lunch
5	History (SL)	Theory of Knowledge	History (SL)	German (SL)	English (HL)
6					
Break	Break	Break	Break	Break	Break
7	PE	German (SL)	CORE - *Creativity, Activity, Service* - *Extended Essay*	Visual Arts (SL) Physics (SL) Spanish (SL)	Flex/Mentorship
8					

IB DIPLOMA PROGRAMME | CORE SUBJECTS

- Theory of Knowledge (TOK)
- Extended Essay (EE)
- Creativity, Activity, Service (CAS)

INDIVIDUALIZED SUPPORT

- Faculty Mentor
- IB Counselor
- Regular Assessments and Guidance
- Learning Support
- Individual Flex and Study Time
- College Counseling

CO- AND EXTRA CURRICULAR

- Global Citizen Internship Program
- German university trial month and high school exchange
- Student engagement and responsibility (*Schüler gestalten Schule*)
- Innovative enrichment program

Daniela Klimetschek | Teacher

Maria Yepes | Teacher

Alex Carroll | Teacher

FACULTY PANEL

Q&A

EBGIS EAST BAY GERMAN INTERNATIONAL SCHOOL

Art

Grade Span 9/10

The art of the twentieth and twenty-first centuries with its cross-disciplinary working methods forms the basis of the art curriculum for this grade span. Consequently, the overarching principle of teaching and learning activities is cross-disciplinary integration.

The student learns to make increasingly independent decisions in project planning and the selection of techniques, materials and tools.

Visual Media/Visual Communication

Graphic Design

In addition to German and Media Studies, Art occupies a key position in the curriculum with respect to the examination of the possibilities and limits of design using typeface and other design elements. The curricular content of Graphic Design stands at the intersection of language, computer technology and art. Its aim is the development of key skills relating to the use of diverse means of communication.

Subject Matter Competencies

- distinguish among the various functions of typeface and typographical design
- engage with combinations of text, images, symbols and figures and analyze their effects
- analyze text and graphic design and recognize and evaluate their purpose

Methodological Competencies

- appropriately select and use in a task-oriented manner various artistic and technical processes for the production of letters, letter combinations, fonts and layouts
- taking into account the functions of typeface and typographical design, create letters, words and short texts
- use combinations of fonts, images, symbols and figures in applied graphic design tasks
- experiment with the tension between originality and readability
- present work results appropriately and enable them to be used for other purposes

Social and Emotional Competencies

- document the development of one's own perceptual and design competencies based on reflection on one's written designs
- assess and critically evaluate typeface and graphic design in one's own work and that of others
- independently plan and execute complex work processes
- seek and make decisions regarding typographical design solutions in a self-directed and confident manner

Photography and Film

The student's perceptual competencies are expanded through the examination of various planes of reality in photography and film. The term *film* encompasses all conceivable forms of moving images such as videos, clips, animated films, and sequences.

The student gains familiarity with cinematic design tools and tests them through application to various tasks. He/she uses documentary and staged photography and film as bases for aesthetic work in conjunction with other areas of learning, interdisciplinary experiences and his/her personal living environment.

Photography

Subject Matter Competencies

- recognize, differentiate and describe the object of a photograph, its composition and media-specific design elements
- recognize and describe means of transforming reality in front of the camera to a reality produced in the final photograph
- view and critically evaluate photographs from the fields of private, commercial and art photography, and draw conclusions about the reality depicted by the photographer
- recognize differences in staging before, during and after a shot and the emergence of a new pictorial reality
- use various forms of image production and image processing to realize one's own intentions and to complete tasks
- when viewing documentary and staged photographs, discern the intention of the photographer and critically evaluate the images' historical and technical attributes

Film

Subject Matter Competencies

- recognize and distinguish the overall visual and media-specific design elements of the film medium
- operate appropriate (audio)visual recording devices
- recognize, differentiate and produce task-appropriate components of a film, including still images, scenes and sequences
- reflect on media experiences
- recognize and apply the relationship between content and design

Methodological Competencies

- relate the subject of a film, its composition and media-specific design elements
- create one's own filmic reality, in both analog and digital formats, using staging before, during and after recording
- select suitable design elements according to content

Social and Emotional Competencies

- make creative decisions in a targeted manner to achieve personal expressive goals
- perceive photography/film in a differentiated manner and critically evaluate the expressive accomplishments of one's own works and those of others
- convey one's point of view in a well-reasoned manner

The Designed Environment

Product Design

Given the diversity and omnipresence of designed products, the student requires orientation enabling him/her to recognize quality features and arrive at selection criteria. He/she recognizes that the border between art and design is fluid. Through practical work he/she gains experience with the properties of materials and their appropriateness for certain functions. The student is sensitized to his/her own consumer behavior and the conscious use of resources and develops an open-mindedness towards diverse lifestyles.

Subject Matter Competencies

- recognize and describe the relationship between the form and function of products
- test materials for their suitability for specific purposes
- describe, examine and critically evaluate the aesthetic, practical and symbolic functions of product design
- recognize and name products from the history of design

Methodological Competencies

- examine, compare and evaluate the functions of selected examples from the history of design and everyday products
- design an item for daily use graphically and/or plastically
- achieve practical execution of a design
- apply knowledge and skills from other curricular areas to product design
- appropriately present work outcomes

Social and Emotional Competencies

- independently arrive at design decisions regarding a product he/she designs depending on its function
- perceive product design in a differentiated way, and use and critically evaluate objects produced by himself/herself and others
- arrive at standards for the subjective evaluation of products and justify his/her choices
- document his/her subjective perception and the development of his/her design competencies by reflecting on product design
- independently plan and execute complex design-related assignments

Architecture

In this subject area the student receives an overview of the architecture of the twentieth century, its antecedents, and its further development in the twenty-first century. The focus is on experiencing various building forms and their construction principles and building materials. This increasingly leads to the recognition of the connection between function and design, which is then implemented in practice by experimenting with different materials. Through an interdisciplinary approach, the student grasps the interplay of art, architecture and the history of style.

Subject Matter Competencies

- categorize and evaluation characteristics of selected buildings of the twentieth and twenty-first century according to criteria such as function, construction methods, materials, design principles, cultural and geographical characteristics and ecology
- understand and describe architecture as a reaction to existing structures and the environment

Methodological Competencies

- investigate, describe and document buildings and selected architectural elements according to given criteria
- test construction principles
- investigate material properties with regard to their suitability for given design elements and apply the results in practice

- examine, describe and document architecture in relation to developed and undeveloped spaces with regard to proportion, lighting conditions, visual axes and ambiance

Social and Emotional Competencies

- reflect on the connection between design and function and evaluate it independently
- independently plan, organize and execute complex work processes
- contribute goal-oriented suggestions to group work and reliably complete one's own tasks

Visual Arts

In the visual arts curricular area, the student receives an overview of twentieth century art, its antecedents and its development in the twenty-first century. Through an examination of works in the fields of painting, graphics and sculpture, the student gains a deeper understanding of the art of the twentieth century.

The student gains insight into the relationship between form and content. In the process, he/she learns various means of analyzing and interpreting artwork. His/her own artistic practice is increasingly characterized by a reflective approach.

Subject Matter Competencies

- identify creative media and describe them according to their function; place them in relation to content in a reasoned manner; and assess their suitability for use in one's own designs
- distinguish among diverse methods of analyzing artwork
- arrive at various approaches to interpretation
- distinguish among artistic movements and recognize mutual influences

Methodological Competencies

- classify creative media based on their intended effect and apply them to one's own designs
- apply diverse methods of analyzing artwork to decipher and interpret works of art
- assign style-defining works of art to their respective artistic movements

Social and Emotional Competencies

- appropriately select creative media according to one's expressive intentions and justify their application in a reasoned manner
- plan, organize and execute complex work processes
- satisfactorily present one's own artistic results

EBGIS EAST BAY GERMAN INTERNATIONAL SCHOOL

Biology

Grade Span 9/10

Life Processes of Plants, Fungi and Bacteria

Selected Functions of Plant Organs

Subject Matter and Methodological Competencies

- explain structure-function relationships using the example of a leaf
- investigate the cross section of a leaf using a microscope
- explain uptake and transport of water within a plant (diffusion, osmosis,
- capillary action, transpiration, suction)

Photosynthesis and Metabolism of Green Plants

Subject Matter and Methodological Competencies

- describe the metabolism of green plants and its significance for the organism
  - identify the cell as the locus of material and energy transformations
  - explain the importance of carbon dioxide, water, mineral salts and light energy in the synthesis of plant tissue
  - name starting materials, end products and conditions for the process of photosynthesis and respiration and write equations describing these processes
- conduct experiments
  - detection of starch, dextrose, proteins and fats as components of plants
  - detection of carbon dioxide as a reaction product of respiration
- explain the influence of light on photosynthesis and the influence of temperature on respiration; propose and justify possibilities for increasing the yield of plants

Metabolism of Fungi and Bacteria

Subject Matter and Methodological Competencies

- describe the metabolism of fungi and bacteria using the examples of alcoholic fermentation and lactic acid fermentation
- explain the possibilities for commercial use of alcoholic fermentation and lactic acid fermentation

Systematization

Subject Matter and Methodological Competencies

- compare metabolic processes and place them within a system of classification
  - assimilation: autotrophy (photosynthesis) and heterotrophy
  - dissimilation: respiration and fermentation

Social and Emotional Competencies

- agree on, adhere to, and assess compliance with rules of conduct for experiments and microscopy

Organisms in Their Environments

Subject Matter and Methodological Competencies

- explain the effect of environmental factors on organism, namely
  - explain the ecological tolerance range of living beings and describe organisms' adaptation to their habitat using an example
  - explain the effect of biotic factors on the predator-prey relationship and competition, illustrating each using an example
- characterize ecosystems
  - characterize an ecosystem in terms of biotope and biocenosis, and define the terms ecosystem, biotope and biocenosis
  - explain spatial and temporal structures using an ecosystem as an example (stratification, aspect sequence)
- explain the cycle of matter and energy flow
- explain stability and dynamics as well as impacts on an ecosystem
  - explain possibilities for ecosystem self-regulation using an example
  - justify the importance of structural and species diversity for the stability of an ecosystem
  - compare ecosystems subject to intensive economic use with ecosystems nearer to a natural state
  - evaluate human interventions in nature using an example and explain the principle of sustainability
- in conjunction with an ecological field trip
  - describe the structure of an ecosystem
  - extend and apply knowledge of species

Social and Emotional Competencies

- use one's knowledge of ecology to form a point of view on a given topic and engage objectively with the opinions of others

- substantiate the necessity of scientific expertise in reaching appropriate decisions and taking action regarding
  - conservation of habitats
  - responsible use of natural resources
- agree on and adhere to rules of conduct during excursions and reflect on the behavior of the group
- work cooperatively in groups and take responsibility for the communal work process

Storage, Transmission, Expression and Modification of Genetic Information

Storage of Genetic Information

Subject Matter Competencies

- describe the main features of the cellular, structural and molecular bases of heredity (cell nucleus, chromosomes, genome, DNA and RNA)

Transfer of Genetic Information

Subject Matter Competencies

- describe the duplication of DNA using the rule of complementary base pairing as a prerequisite for constancy of genetic information
- explain the transmission of genetic information
  - describe the process of mitosis and the formation of genetically identical cells
  - describe the process of meiosis and explain the development of genetically variable cells
- explain the importance of the transmission of genetic information for cell division and for sexual reproduction
- explain Mendel's First and Second Laws (dominant-recessive, intermediate and codominant heredity)
- explain recombination possibilities

Expression of Genetic Information

Subject Matter Competencies

- explain the path from gene to protein using the rule of complementary base pairing
  - coding of proteins by sequences of DNA triplets (codons)
  - transcription
  - translation
- understand the importance of proteins in the expression of characteristics

Modification of Genetic Information

Subject Matter Competencies

- explain mutation, recombination, and modification as causes of variability; characterize modification as a non-hereditary alteration
- explain the importance of variability for living organisms

Social and Emotional Competencies

- discuss the importance of genetic knowledge (e.g. chromosomes as material carriers of genetic information, laws of heredity) for a scientifically based world view
- use one's knowledge of genetics to evaluate the effects of mutagens

Applied Genetics

Human Genetics

Subject Matter Competencies

- describe causes and symptoms of genetic disorders
  - Trisomy 21 as a spontaneously occurring disorder
  - Hemophilia as a hereditary coagulation disorder
- using one of these examples, explain the possibilities and limits of genetic counseling, diagnosis and therapy with respect to genetic disorders

Applications of Genetics in Biotechnology

Subject Matter Competencies

- explain the production of genetically modified bacteria (principle of gene transfer) and their use in the manufacture of pharmaceuticals using the example of human insulin
- critically evaluate the use of genetically modified bacteria
- describe basic applications of knowledge about mitosis
  - plant propagation
  - cloning

Social and Emotional Competencies

- demonstrate respect for people with congenital physical and mental disabilities
- explain the necessity of applying genetic expertise to appropriately evaluate biotechnological applications

Evolution

Theories of Evolution

Subject Matter Competencies

- distinguish scientific views on the origin and development of living beings from the teachings of creationism
- explain the fundamental statements of Charles Darwin on the origin of species and their importance for the development of the scientific theory of evolution
- explain the emergence of new species according to the synthetic theory of evolution (interaction of mutation, recombination, isolation and selection) using an example

Evidence of Evolution

Subject Matter Competencies

- explain the importance of fossils, homologies, rudiments and transitional forms as evidence of evolution

Evolution of Humans from Animal Ancestors

Subject Matter Competencies

- explain the general principles relevant to the development of humans from animal ancestors (evolutionary family of humanoid apes and humans, Australopithecus, *Homo* genus with the important representatives *H. erectus*, *H. neanderthalensis* and *H. sapiens*)

Social and Emotional Competencies

- explain the importance of findings in evolutionary biology for a scientifically based world view
- engage objectively with the opinions of others and accommodate diverse views on the origin and development of life

EBGIS EAST BAY GERMAN INTERNATIONAL SCHOOL

Chemistry

Grade Span 9/10

Carbon and Carbon Compounds

Subject Matter and Methodological Competencies

- name the allotropes of carbon and use them to explain the relationship between its structure and properties
- state the characteristics of the oxides of carbon
- conduct experiments to
  - detect evidence of carbon dioxide
  - detect evidence of carbonates (using carbon dioxide detection)
  - describe the natural formation and decay processes of carbonates and hydrogen carbonates and use this to explain a simple model of the carbon cycle

Natural Gas and Crude Oil

Subject Matter and Methodological Competencies

- identify natural gas, crude oil and coal as fossil fuels
- explain the causes and consequences of increasing carbon dioxide concentrations in the atmosphere
- discuss the economic and ecological consequences of the production and transport of natural gas and crude oil
- apply knowledge of substance mixtures and substance separation using the example of fractional distillation of petroleum
- describe the molecular structure of the gaseous alkanes using chemical formulas, structural formulas and simplified structural formulas
- conduct experiments to
  - examine the flammability and solubility of selected alkanes
  - determine that water and carbon dioxide are the products of combustion
  - explain the relationship between the construction, properties and uses of important alkanes (e.g. methane - natural gas, propane and butane - liquid gas, octane - gasoline, decane - diesel, octadecane - paraffin candle wax)

- explain the cohesion of alkane molecules by way of van der Waals forces
- name alkanes up to decane, simple branched alkanes, and use the nomenclature system for organic compounds
- compare the construction and properties of isomeric alkanes using an example
- name combustion, substitution and elimination as typical reactions of the alkanes and express them as word equations and chemical equations
- describe the characteristics of a homologous series using the example of alkanes
- describe catalytic cracking and explain the production of gasoline and diesel
- name combustion and addition as typical alkene reactions and express them as word equations and chemical equations
- detect multiple bonds
- perform simple stoichiometric calculations to determine the volume of starting materials and reaction products
- describe the polymerization of ethene and propene
- explain the production, use and recycling of the polymers polyethylene (PE) and polypropylene (PP)
- explain characteristics of reaction types such as substitution, addition and elimination reactions

Social and Emotional Competencies

- engage with the opinions and views of others and articulate and express one's knowledge of chemistry from one's own point of view
- consciously use knowledge of chemistry to
  - make appropriate decisions in everyday life and behave accordingly
  - appropriately evaluate human interventions in the environment
  - appropriately evaluate practical applications of chemical findings

Alcohols, Aldehydes und Carboxylic Acids

Ethanol - An Alcohol

Subject Matter and Methodological Competencies

- describe the structure, properties and production of ethanol
- identify the hydroxyl group as a functional group
- conduct experiments to
  - examine the flammability and solubility of ethanol
  - compare an ethanol solution and a sodium hydroxide solution
  - explain the cohesion of ethanol molecules by means of the hydrogen bond
  - assess the effects of ethanol (alcohol) as a stimulant and addictive substance
  - describe the structure and uses of other alcohols

Aldehydes and Carboxylic Acids

Subject Matter and Methodological Competencies

- explain the catalytic oxidation of ethanol to ethanal and ethanoic acid
- identify the aldehyde group and the carboxyl group as functional groups
- conduct experiments to
  - oxidize a solution of propanol using a copper catalyst
  - detect propanol as an aldehyde by reaction with Schiff's reagent
  - describe the production of ethanoic acid by biocatalysis
  - compare ethanoic acid and hydrochloric acid
  - perform reactions of ethanoic acid with a base metal and a metal hydroxide solution
  - research the occurrence, meaning and use of selected carboxylic acids
  - describe the reaction of alcohols with carboxylic acids to form esters and express these as word equations and chemical equations
  - produce a fruit ester

Social and Emotional Competencies

- work cooperatively with others in groups
- take responsibility for the outcome of group work
- accept and give help
- communicate in an appropriate and fair way

Elemental Nitrogen and Nitrogen Compounds

Subject Matter and Methodological Competencies

- explain the relationship between atomic structure and the position of an element in the periodic table
- derive information about the atomic structure and properties of particles (atom, ion, molecule) of nitrogen from the periodic table
- describe using oxidation numbers the reaction of nitrogen with hydrogen as a redox reaction
- describe the synthesis, properties and uses of ammonia
- explain the countercurrent principle, continuous process control and circulation principle as general technical principles, using the example of the technical implementation of ammonia synthesis
- explain the influence of reaction conditions and the effect of catalysts using the example of ammonia synthesis
- evaluate the historical achievements of Haber and Bosch
- conduct experiments to
    - detect ammonia
    - explain a proton transfer reaction using the reaction of ammonia, water and hydrogen chloride as an example
    - identify bases as proton acceptors and acids as proton donors
    - explain the relationship between atomic structure and the position of an element in the periodic table
    - describe the donor-acceptor principle using as examples known acid-base reactions and illustrate it using chemical notation
    - examine the formation and decay of ammonium chloride
    - create profiles for nitrogen monoxide and nitrogen dioxide
    - explain a redox reaction using the Ostwald process and illustrate using the example of the production of nitric acid
    - explain and apply knowledge of oxidation numbers
    - research the properties and uses of nitric acid
    - compare the properties of concentrated and dilute nitric acid
    - neutralize dilute nitric acid with caustic soda lye
    - explain the characteristics of a chemical reaction, e.g. a neutralization reaction, in terms of
    - substance conversion
    - energy conversion
    - atomic rearrangement
    - breaking and reforming of chemical bonds
    - describe the synthesis, properties and uses of nitrates
    - represent the production route from nitrogen to ammonium nitrate

- explain the characteristics of a redox reaction and reaction with proton transfer using the example of the production of ammonium nitrate from nitrogen
- systematize detection reactions for ions (H3O+, OH-, Ag+, Ba+2, NH4+, Cl-, Br-,I-, SO4 -2, CO3 -2)

Social and Emotional Competencies

- form personal points of view on chemistry topics, taking into account ecological, social and economic considerations
- carry on a discussion in which one articulates one's own point of view and expresses it in a way that is appropriate to the situation
- consciously use knowledge of chemistry to
  - appropriately make decisions in everyday life and to behave accordingly
  - appropriately evaluate human interventions in the environment

EBGIS EAST BAY GERMAN INTERNATIONAL SCHOOL

Ethics

Grade Span 9/10

The Student's Individuality and Personal Development - "I"

Through reflection on ethical questions about how the student uses his/her time and the consequences of this decision for one's life circumstances, the student understands his/her responsibility for his/her own life course.

Subject Matter Competencies

- discuss ethical questions relating to time and consequences for the way we live
- examine the effects of economies of scale on living standards
- understand changes in traditions, norms and values over the course of history
- explain tensions between tradition and societal change using examples
- discuss the possibilities and limitations affecting how one allocates one's time

Methodological Competencies

- use changes of perspective in a targeted manner
- develop questionnaires
- conduct and evaluate interviews
- represent past and future living conditions in a creative way, e.g. through pictures, dioramas

Social and Emotional Competencies

- engage with various temporal frames of reference and critically reflect on one's own perspective
- consciously perceive and communicate one's own relationship to the past, present and future
- develop one's own life plans and visions for the future
- take responsibility for shaping one's own life course

The Student's Individuality and Personal Development - "I"

Through engagement with diverse views of human nature and various ethical viewpoints, the student reflects on his/her own views and develops his/her vision for a

successful personal and social life. The student also examines how our society approaches death and dying and compares it with the approaches taken by other cultural traditions.

Subject Matter Competencies

- describe how contemporary Western societies deal with death and dying and compare this with the approaches of other cultural traditions
- explain the forms and meaning of grieving
- consider the conditions of a dignified death
- engage with ethical questions relating to organ donation
- consider various ideas regarding life after death
- describe basic ancient beliefs regarding happiness
- compare various conceptions of human nature and draw connections to the resulting social models
- represent and compare the basic principles of the ethics surrounding duty and benefit

Methodological Competencies

- perform thought experiments
- understand the key points of complex texts and communicate this understanding in an audience-appropriate manner
- conduct a Socratic discussion

Social and Emotional Competencies

- reflect on the importance of empathizing with others' suffering
- approach death as a feature of life
- compare ancient understandings of virtue and happiness with today's values
- compare one's own ideas of an ideal society with other social models
- reflect on one's own points of view in light of diverse ethical positions and values

The Student's Relationship to His/Her Own and Diverse Cultures - "We and Others"

The student explores the origin, basic ethical statements and current development of one or more religious or moral systems. He/she examines the commonalities among such systems and models of thought, compares various understandings of human dignity and interprets contemporary approaches to ethics.

The student recognizes the necessity of treating other models of thought and ways of life with respect. He/she can apply human rights principles when approaching his/her own moral system as well as those of others.

Subject Matter Competencies

- describe the emergence and current form of one or more religions or moral systems; understand their essential principles of thought and action; describe their basic ethical statements or positions
- find commonalities among religions and models of thought
- understand and apply to examples Kant's philosophical concept of the categorical imperative
- discuss the difference between a categorical imperative and a hypothetical imperative
- compare diverse understandings of human dignity
- interpret modern approaches to ethics
- discuss the ethical demand for the cross-cultural application of human rights

Methodological Competencies

- understand, compare and present the central statements of one or more religious or moral systems outside one's own

Social and Emotional Competencies

- approach diverse understandings of the world with open-mindedness and respect
- critically evaluate one's own moral outlook and those of others, especially in relation to universal human rights concepts
- examine the application of Kant's categorical imperative

The Student's Relationship to the World - "The World and I"

The student understands the search for truth as a central human undertaking and the limitations of human knowledge as a challenge when approaching nature and humanity. The student understands that from a recognition of human dignity as an inviolable principle spring on the one hand human rights and on the other hand the duties of individuals to one another and to their communities. He/she understands the operation of an ethic of reasonable self-restraint in maintaining human societies.

Subject Matter Competencies

- distinguish among cosmologies, e.g. mythical and pre-Socratic
- discuss Socrates as the founder of the discursive search for truth
- describe human dignity as a basic principle from which human rights are derived

- discuss the human rights obligations of individuals and communities in the interests of individual welfare and the common good

Methodological Competencies

- conduct a discussion using the Socratic method
- develop rules of conduct based on human rights
- develop, undertake and present independent interdisciplinary projects on regional and global topics

Social and Emotional Competencies

- understand the limitations of human knowledge and approach the search for truth as a central human endeavor
- reflect on the importance of justice in the realms of intergenerational justice, access to opportunities and material wealth, diversity, and the natural world
- reflect on the operation of the ethics of reasonable self-restraint in one's own interest, in the common interest, and in the interest of human survival

EBGIS EAST BAY GERMAN INTERNATIONAL SCHOOL

Geography

Grade Span 9/10

National Characteristics and Development Trends

Subject Matter Competencies

- explain selected features of a state and draw connections to its physical geography
- analyze and give reasons for demographic structures and development
- examine urban development trends
- discuss economic development prospects
- characterize sociocultural diversity

Spatial reference: America, Europe

The student can use the following subject-specific terms properly: gross domestic product (GDP), gross national product (GNP), import and export, push and pull factors, suburbanization, urbanization

Political and Ecological Conflicts and Conflict Resolution Strategies

Subject Matter Competencies

- assess regional resource potential and describe resource use
- evaluate interconnected interventions from economic and ecological points of view
- discuss opportunities and limits related to water use, using as an example the desiccation of the Aral Sea
- analyze and evaluate social, ethnic and political conflicts

Spatial reference: North and Central Asia, Australia

The student can use the following subject-specific terms properly: conflict, ethnic groups, national/regional/geographic identity

Landscape Development and Ecosystems

Subject Matter Competencies

- describe changes in land use in Central Europe and discuss current landscape conservation measures
- explain basic processes of soil formation and describe the formation of selected soil types
- describe regional climatic features and explain selected weather phenomena
- analyze and discuss a local or regional example of human intervention in the natural environment from an ecological point of view

Spatial reference: Central Europe, Germany

The student can use the following subject-specific terms properly: biosphere reserve, chernozem, cultural landscape, depression, ecosystem, front, landscape conservation, humification, mineralization, national park, natural landscape, podzol, soil texture, soil type

Demographic Change in Germany and Europe

Subject Matter Competencies

- describe and explain current demographic developments
- discuss the effects of demographic changes on urban and rural regional development
- examine regional planning measures and the possibilities of active civic involvement using an example
- explain types of spatial mobility and describe individual considerations

Spatial reference: Europe, Germany

The student can use the following subject-specific terms properly: graying population, commuter, land use plan, regional development planning, regional reorganization, spatial mobility

Methodological Competencies

- with teacher assistance, conduct conflict analysis
- draw up a map and reflect critically on geographical features and trends
- plan, carry out and reflect on field trips
- navigate using various technical and electronic aids
- carry out independent research into geography topics

- review complex thematic maps, interpret them and reflect critically on their content
- select suitable images, diagrams, illustrations and tables relevant to an issue and interpret and reflect critically on them
- independently prepare and conduct pro and contra discussions and reflect on them
- interpret weather maps
- draw relevant information from selected specialist texts, critically assess sources, and think in an interdisciplinary manner incorporating multiple perspectives

Social and Emotional Competencies

- contribute to ecological sustainability through one's actions
- discuss critically and in-depth geographical current affairs issues as represented in various media
- engage diverse value systems and ways of life in an open-minded manner
- in a discussion, reflect on statements and assessments on complex issues and form an educated opinion
- reflect critically on one's own thoughts, beliefs and moral values and draw constructive conclusions
- work effectively in teams and constructively assess the group's work
- give presentations on complex topics individually and in a group

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German

Grade Span 9/10

Receiving Texts

Comprehension of Audio- and Audiovisual Materials

Subject Matter Competencies

- absorb, understand, process, interpret and place in a broader context audio- and audiovisual materials
  - pertaining to familiar, less familiar and abstract topics
  - with known and new vocabulary
  - with complex linguistic structures
- accomplish tasks with respect to audio- and audiovisual materials such as:
  - grasp their topic and gist and express them satisfactorily
  - comprehend and reiterate global, selective and detailed content
  - describe and interpret the effect of linguistic and non-linguistic devices within the communicative situation
  - analyze, interpret and evaluate the intent of the communication

Methodological Competencies

- use linguistic, sociocultural and thematic knowledge as well as general knowledge as an aid to understanding
- develop and express expectations of audio- and audiovisual materials
- independently apply various techniques to audio- and audiovisual materials appropriate to the task at hand
  - recognize key words and use them to make sense of context
  - summarize information
  - compensate for gaps in understanding
  - independently create structured notes
  - create memory aids
- compare and evaluate the effectiveness of different versions of audio- and audiovisual materials

Social and Emotional Competencies

- adjust to the hearing and/or viewing situation, and listen to and/or watch audio- or audiovisual materials in a concentrated fashion
- according to the task at hand, independently master the hearing and/or viewing process and
  - continue to listen with concentration even when encountering comprehension difficulties
  - ask questions when the student's comprehension is uncertain
  - respect the characteristics of various speakers
- carry on an exchange with others about what one has seen and/or heard and thereby
  - express the emotional effect of an audio- or audiovisual work
  - reflect on comprehension problems
- independently assess and, if necessary, document the development of one's own competencies

Reading Comprehension

Subject Matter Competencies

- read and understand texts
  - pertaining to familiar, less familiar and abstract topics
  - with known and new vocabulary
  - with complex linguistic structures
- independently examine the content, language and structure of texts and thereby
  - use literary terminology
  - develop main ideas and topics
  - extract, sequence, process, compare, evaluate, supplement and interpret information in relation to the text
  - reflect on the function and effect of structural and linguistic design elements
- distinguish, describe and compare a wide range of text types, and
  - identify type- and genre-typical characteristics
  - establish and describe connections between text characteristics, intention and effect
- read fluently, meaningfully and expressively and present texts creatively
- independently read, absorb and understand literary texts and
  - identify the characteristics of epic, lyrical and dramatic texts
  - draw connections between author, work and era
  - analyze and reflect essential textual elements in a genre-appropriate manner
- independently read, absorb and understand factual and practical texts and

    - determine the specificity and function of linear and non-linear texts in various media
    - draw connections between the author's intentions and characteristics of a text
    - analyze and reflect on essential textual elements, thereby grasping the author's train of thought, distinguishing between factual information and opinion, evaluating the structure of the text,
    - and drawing well-reasoned conclusions
- independently examine, compare and evaluate media products with regard to their specific content, functions and intent; design and effectiveness; use and and likely reception

Methodological Competencies

- use linguistic, sociocultural and thematic knowledge as well as general knowledge as aids to understanding texts
- independently apply various reading techniques according to the reading goal
    - reading fluently
    - skimming (gaining an overview)
    - scanning (selective reading for details)
    - formulating questions about the text
- independently apply reading strategies for text comprehension
    - consciously using reading expectations and experiences
    - formulating assumptions about the subject/object of a text
    - deriving and answering questions from a text
    - clarifying word meanings
    - marking key passages
    - identifying keywords, making notes in page margins, and formulating comments
    - making text diagrams
    - independently structuring texts
    - recording information derived from texts in a structured manner
    - creating appropriate visual representations of text content and structure
    - comprehend texts analytically and in terms of action and production
- independently select and use suitable media for text comprehension and the presentation of material drawn from readings
- independently use school libraries, public libraries and archives

Social and Emotional Competencies

- independently master complex reading tasks

- adjust to the reading situation, nature of the text and task at hand and read in a concentrated manner
- develop one's own approach to time management to accomplish complex reading-related tasks
- reflect on one's personal reading experiences and interests and thereby
  - take a critical approach to text content
  - evaluate the meaning of the text to oneself
  - demonstrate aesthetic understanding
- carry on exchanges with others about a text that has been read and thereby
  - express well-grounded reactions to the text
  - understand literature as a means of expressing the feelings, thoughts and actions of others
  - draw connections between one's personal reality and that depicted in the text
  - develop and discuss various interpretations of the text
- independently assess and document one's own reading process and development of reading competencies
- provide fair and well-grounded evaluations of the reading presentations of other students

Producing Texts

Speaking

Speaking in Dialogue

Subject Matter Competencies

- conduct conversations on relatively familiar and less familiar topics and in doing so
  - speak standard German
  - contribute to discussions in a linguistically appropriate manner suited to the situation and audience
- achieve one's objectives in spoken conversations and thereby
  - obtain or provide information
  - explain, evaluate and comment on facts and relationships
  - represent one's own opinion in a well-grounded and comprehensible manner
  - express one's concerns appropriately and, if necessary, provide objective reasons
- respond to and build on the contributions of others
- respond to opposing positions factually and through reasoned argument

- prepare and lead/moderate discussions independently and in so doing
  - provide discussion prompts
  - influence the course of the discussion in a solution-oriented way
  - reflect on the results of the discussion and draw conclusions
- stage texts and use this as an approach to textual interpretation

Speaking in Monologue

Subject Matter Competencies

- speak on familiar and less familiar topics in front of and to others and in so doing
  - independently distinguish various speech prompts
  - use standard language and technical vocabulary in a confident and differentiated manner
  - speak in a way that is appropriate to the audience and situation
  - independently employ linguistic and non-linguistic expressive devices
- independently distinguish and apply different forms of spoken representation, i.e.
  - speak in a creative and expressive way
  - expressing and retelling from different perspectives
  - speaking or reciting texts in a meaningful and expressive way with and without a model
  - speak on factual topics in an expressive way
  - transmitting and summarizing both general and detailed information from literary and non-literary texts
  - describing, comparing, and, where appropriate, interpreting objects, pictorial representations, living things and events
  - characterizing people and literary figures
  - giving short lectures, presentations and speeches

Methodological Competencies

- independently incorporate and use linguistic, socio-cultural and thematic knowledge and world knowledge
- independently create and adhere to a speaking outline and in so doing
  - apply methods for systematizing, structuring and summarizing information
  - apply speech strategies
  - plan and adhere to a time limit
  - select and use suitable media to illustrate spoken points
  - independently apply memorization strategies

Social and Emotional Competencies

- independently adapt one's linguistic actions to the task at hand

- observe, reflect on and evaluate one's own and others' spoken work in a criteria-oriented manner
- independently agree on and adhere to rules of discussion
  - actively listening, concentrating on the topic and course of the discussion
  - showing respect and tolerance
  - adapting to different discussion partners
  - distinguishing the factual and relationship levels in discussions
  - consciously perceiving and appreciating cultural and linguistic diversity
- take responsibility for what is said in cooperative learning exercises
- independently assess and, if necessary, document the development of one's own competencies

Writing

Subject Matter Competencies

- independently compose texts according to functional and aesthetic criteria and thereby
  - distinguish among various purposes for written work
  - write in a manner appropriate to the addressee and situation
  - write in a manner appropriate to one's goals
  - appropriately use primary writing modalities, i.e. analyzing, persuading, debating, expressing, informing
- independently compose formal linear and non-linear texts and employ them in a manner appropriate to their intended function
- independently present the results of one's textual work and thereby
  - relate the abstracted contents of complex linear and non-linear texts
  - present formal and linguistic-stylistic design elements and their effects
  - formulate and justify textual interpretations
  - compare texts according to specified criteria
- independently document work and learning processes
- design media products according to specified criteria

Methodological Competencies

- independently incorporate and use linguistic, socio-cultural and thematic knowledge and world knowledge
- independently apply analytical and productive methods
- independently plan writing processes according to the writing task, i.e.
  - assemble necessary material
  - develop a writing concept
- formulate texts and thereby

    - comply with the standards of linguistic correctness
    - formulate texts in a linguistically varied and stylistically appropriate manner
- revise texts largely independently in terms of content, language and form, thereby
    - confidently applying various strategies to verify linguistic accuracy
    - using reference books and word processing programs
- take notes
- use citations
- use source attribution correctly

Social and Emotional Competencies

- plan, carry out, and reflect on extensive writing projects independently, with a partner, or in a group
- write texts
    - in legible handwriting
    - in an appropriate form
    - at an appropriate speed
- reflect on one's own texts and those composed by others and thereby
    - give and accept constructive feedback
    - develop critical distance
    - largely independently recognize the need for revision
- revise one's own writing and that of others independently, with a partner, or in a group
- independently assess and, if necessary, document the development of one's competencies

Reflecting on Language, Language Use and Language Learning

Subject Matter Competencies

- on the word level
    - in a targeted manner, use one's knowledge of the potential effects of all word types and forms for text analysis and production
    - confidently use the rules of capitalization, agglutination and punctuation
    - write and use foreign and technical terms correctly
    - write abbreviations and acronyms correctly and use them effectively
    - explore word meanings and use words effectively and intentionally
- on the sentence level
    - investigate, form and effectively use simple and multiply-compound sentences
    - comprehend the functionality of phrases and their components
    - apply the rules of punctuation
    - apply linguistic means of linking sentences in a varied and effective manner

    - use direct and indirect speech effectively
- on the textual level
    - independently describe the structure of texts, thereby
        - demonstrating comprehension of the function of the text's linguistic and formal characteristics
        - describing their effect
    - recognize connections between text structure, and linguistic and formal design
    - regularly use quotations and indicate sources
- on the level of reflecting on language
    - comprehend and evaluate changes in contemporary German and thereby
        - reflect on historical and contemporary influences on the development of the German language
        - reflect on and evaluate language variants and their functions
    - analyze the effect of linguistic and stylistic devices
    - use multilingualism to develop language awareness and compare languages

Methodological Competencies

- revise texts grammatically and orthographically applying learned techniques
- independently and critically use reference works, secondary literature and electronic/digital media
- independently apply techniques of language comparison to German, English and other languages, including one's native language if appropriate
- document, present and comment on the result and the process of comparison among languages

Social and Emotional Competencies

- use his or her mother tongue in spoken and written form in accordance with standards and
- demonstrating conscious control, i.e.
    - independently implementing strategies to avoid specific orthographic and grammatical errors
    - experimenting with the effect of language and using language in a targeted manner
- perceive linguistic and non-linguistic phenomena attentively and consciously
- independently assess and, if necessary, document the development of one's competencies

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History

Grade Span 9/10

In the 9/10 grade span, all subjects of the social science program are taught in parallel. This enables coordinated presentation of teaching content within the framework of each thematic area, avoiding redundancies and taking advantage of synergies including possibilities for on-site historical work at locations such as archives, memorials and museums. This holistic approach promotes cross-disciplinary thinking and critical reflection on social science topics.

The development of Germany and Europe in the context of an increasingly globalized world as well as daily life in and the characteristics of democracies and dictatorships are the main focus of twentieth century studies in this grade span. Determinative international challenges and opportunities following the end of the East West conflict and the outlook for the twenty-first century are examined through a historical perspective.

Continuing their work from middle school, students first examine the period from the age of imperialism until the end of the First World War from a global-historical perspective. European power politics, colonial policy and expansionism marked the *Age of Imperialism*. The terms of peace following World War I and their consequences for Europe, Germany and the world are explored. Students analyze the causes of the First World War and draw lessons applicable to current crises and conflicts.

The characterization of war and its interpretation as a *primal catastrophe* is discussed in light of historical and cultural considerations. The possibilities for periodization of history are illustrated using epochal designations such as the *long nineteenth century* and the *short twentieth century*. The significance of historical upheavals and caesuras (1917, 1945, 1990) and the construction of meaning surrounding these events is examined.

The subject area *The Weimar Republic - Opportunities and Constraints on the First German Democracy* concerns struggles for democracy and between tradition and modernity in post-1919 Germany. Historical processes of upheaval and lines of continuity observable in the emergence of the domestic and foreign policy reality as well as cultural and social history questions are investigated and problematized. Reasons for the failure of the

Republic, such as the consequences of the global economic crisis and increasing popular support for the opponents of parliamentary democracy, are analyzed and evaluated.

The subject area *Nazi Germany 1933-1945* concerns the mechanisms by which a state becomes a dictatorship, and the ways in which a dictatorship expands and consolidates power. Mass loyalty and terror are examined as means by which power was secured in National Socialist Germany. The disenfranchisement, persecution and annihilation of minority groups, legitimized by racist ideology and laws, as well as atrocities committed during the Second World War, are examined. Students come to recognize the characteristics of National Socialist totalitarianism. Examination of daily life and the organization of the National Socialist dictatorship raises questions concerning the guilt and responsibility borne by subsequent generations.

Key concepts that help explain and organize historical facts support the recollection of facts and facilitate the creation of transferable and connectable knowledge. This methodology is deployed in the study of power structures and peace agreements of the nineteenth and twentieth century in the subject areas *Comparing Forms of Government* and *Conflicts and Conflict Resolution*. In the subject area *East West Conflict and the German Question*, the discussion centers on the interwoven histories of the divided postwar Germany against the background of the Cold War and conflicting ideological systems in Europe and the world. In this area, key moments in the history of Germany's division as well as significant events, developments, structures and life in the political and economic systems of East and West are examined in relation to democracy and dictatorship.

Students explore the causes and events of the Peaceful Revolution, as well as the meaning of German reunification within the context of the end of the East West conflict. Students examine perspectives on the unification process and consider it in light of its status as the immediate prehistory of contemporary political and social conditions, questions and problems. Following on from this, the subject area *The World Since 1990 - Challenges and Opportunities* provides an outlook on current and future challenges and possible solutions in the globalized world of the twenty-first century.

The subject area *Reflections on History* involves an examination of forms of individual and collective memory. An assessment of social controversies regarding historical-cultural interpretation elucidates for the student the present-boundedness of historical interpretation. The student reflects on and internalizes these considerations by participating in the public discourse, preparing the student for further advanced studies in the field of history.

Subject Matter Competencies
The target competencies involve the ability to ask historical questions, use historical terms appropriately and place historical events in context.

- develop, narrow down and structure questions independently as means of inquiry-based learning and creating personal narratives
- recognize and understand questions raised by historical accounts and apply them in formulating one's own questions
- reflect on history as a construct and apply principles of historical insight
- use historical terminology correctly, and extend and reflect on such terminology
- distinguish between contemporary and present-day language used in historical texts
- independently organize historical events and developments spatially and chronologically; recognize and present historical sequences and juxtapositions
- independently apply, extend and reflect on selected concepts to explain historical facts and structure historical knowledge
- distinguish between sources and historical accounts
- identify and describe a variety of sources and accounts on the basis of their characteristics

Methodological Competencies
Students develop methodological competencies permitting sophisticated interpretation of historical accounts.

- develop hypotheses and develop methods to verify the hypotheses
- investigate in a goal-oriented and independent manner information relevant to a selected historical topic in light of the characteristics of various media
- purposefully select, describe, analyze and interpret sources when examining a historical question
- independently compare the viewpoints of a diversity of sources regarding a historical issue and analyze and assess perspectives, intentions and possible contradictions
- independently analyze and compare historical accounts with reference to their symbolic patterns and intended meaning, and examine indicia of validity
- depict the results of historical learning in increasingly complex contexts and present them appropriately for the target audience and using suitable media

Social and Emotional Competencies
Social and emotional competencies in the field of history relate to the student's ability to gain historical orientation.

- consciously perceive and reflect on the historical development of present conditions and the omni-presence of history
- examine and reflect on the significance of selected historical facts for the present day and one's own life
- explain and assess human behavior in the past within its historical context and independently arrive at well-grounded conclusions
- examine, extend and where necessary revise existing concepts of the past
- compare one's own moral conceptions and views with those of other cultures and eras; perceive and reflect on any differences
- independently form and substantiate conclusions and viewpoints as to historical topics
- discuss diverse viewpoints and evaluate, extend and where necessary revise personal orientations and beliefs

Orientation in Time and Space

The following topics are discussed in all learning areas: issues of periodization in historical accounts and the meaning of epochs in history

The Age of Imperialism and the Post-World War I Era

- motives and sociocultural consequences of colonialism
- changes in German foreign policy
- imperial politics and the road to World War I
- the epoch-making year 1917
- World War I as "the seminal catastrophe of this century"
- The Paris Peace Conference/Treaty of Versailles and the reshaping of Europe

The Weimar Republic - Opportunities and Constraints on the First German Democracy

- the conditions giving rise to the Republic
- the Republic between self-assertion and decline (political, economic, cultural and social)
- mentalities - *a republic without republicans*
- ideology and the rise of Nazism

Nazi Germany 1933-1945

- the establishment and expansion of the Nazi dictatorship
- the character of Nazi Germany (economy, society and culture as instruments of the Nazi regime)

- implementation of racial policy in Nazi Germany
- life under the dictatorship (active participation, conformity and resistance)
- Nazi foreign policy in the run-up to World War II
- World War II

Comparing Forms of Government

- the legitimacy of power and power structures on the basis of European examples from the nineteenth and the first half of the twentieth centuries (constitutional and parliamentary monarchy, dictatorship and democracy)

Conflicts and Conflict Resolution

- historical context, motives, aims and consequences of European peace treaties (Congress of Vienna, Paris Peace Conference/Treaty of Versailles, Potsdam Conference/The Two Plus Four Agreement)

East West Conflict and the *German Question*

- tensions and confrontations in the context of a bipolar world
- FRG and GDR: one nation - two states (formation, political ambitions and social reality, everyday experiences, response to criticism and opposition)
- the two German states between confrontation and rapprochement
- the process of reunification
- experiencing dictatorship - field trip or other direct encounter with witness(es) to history

The World Since 1990 - Challenges and Opportunities

- Europe after the East West conflict (collapse of the Eastern bloc, new nationalisms, conflicts and wars, process of European integration)
- changes in the global balance of power

Reflections on History

- ways of commemorating the victims of National Socialism
- cultures of remembrance in Europe (days and places of remembrance and symbols) or history as controversy - public discourses on interpretations of a selected example

Elective Subject Areas

- encounters with history in the media (e.g. comic books, movies, documentary accounts, young adult novels, computer games)
- reflecting remembrance in various countries (e.g. World War I)
- the Germans and their neighbors: common past - divergent histories
- migration during the nineteenth and twentieth centuries
- perceptions of women and men in the nineteenth and twentieth centuries
- youth culture in East and West Germany
- political extremism and terrorism in history

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Mathematics

Grade Span 9/10

The development of mathematical competencies is supported in specific ways through the introduction of Computer Algebra Systems (CAS). This calls for a continuous, mandatory use of CAS in the classroom. Parallel to this, students continuously develop basic competences through coursework performed without aids. *Without aids* means that no tools other than writing instruments may be used.

Arithmetic/Algebra - Working with Numbers, Variables and Symbols

Subject Matter Competencies

- convert among power, root and logarithmic notation
- justify the Laws of Exponents with examples and apply them without the use of aids
- convert angle measurements between degrees and radians
- convert terms and select and apply suitable methods for the determination of solutions to equations and inequalities
- graphically interpret solution sets of linear equation systems with two equations and two variables
- explain and apply an algorithmic solution method to linear systems of equations
- select and apply suitable methods for determining the solution sets of systems of equations
- investigate questions of solvability and solution multiplicity of quadratic equations and systems of linear equations
- apply a solution formula to the normal form of a quadratic equation
- without any aids in terms of content or calculation, solve:
  - linear systems of equations with two equations and two variables
  - simple quadratic equations
  - simple exponential equations
  - simple fractional equations
- apply knowledge of equations and systems of equations to problems drawn from everyday situations in mathematics, science, economics and technology

Methodological Competencies

- communicate and reflect upon mathematical solutions and results in an understandable and appropriate form:
  - in writing
  - through verbal explanation
  - in a presentation
- apply the interactive exploration capabilities of a CAS to experimental and heuristic work in pure and applied mathematics contexts

Social and Emotional Competencies

- independently develop and implement various solution plans and assess their advantages and disadvantages
- work cooperatively in groups on complex assignments
- understand the mathematical arguments of other students and evaluate their correctness
- and completeness
- critically assess and work with the results and instructions provided by the CAS and, if necessary, make appropriate changes to the student's solution strategy

Functions - Exploring, Describing and Representing Relationships and Changes

Subject Matter Competencies

- investigate and graphically represent quadratic functions on the basis of definition and range of values, vertex, axis intersection points, monotonicity and symmetry
- describe the influence of parameters on the properties and graphs of bell-shaped quadratic functions
- based on graphical representations of quadratic functions, determine the equation of the quadratic functions
- based on points on the graph of a function, determine the equation of a quadratic function
- describe and solve pure and applied mathematical problems using quadratic functions
- specify characteristic properties of:
  - power functions $f(x)=x^n$ with integer and rational exponents
  - exponential functions $f(x)=a^x$, $a \in \mathbb{Q}+$
  - the sine function $f(x)=\sin(x)$ and the cosine function $f(x)=\cos(x)$

- describe the relationship between the graph of the functions $a \cdot f(x-d)+c$ and the graph of the function f(x) and in addition the influence of the parameter b on the properties of sine functions $f(x)=\sin(bx)$ and cosine functions $f(x) = \cos(bx)$
- determine an equation for a function based on their representation as a possible function type (in simple cases without the use of aids)
- represent functions and describe their properties (in simple cases without aids)
- explain the relationship between functions and their inverses using examples
- explain the limit value based on given assumptions and describe graphs (also considering horizontal and vertical asymptotes) using the limit value representations:
- lim f(x) and lim f(x)
- $x \to \pm\infty$ $x \to x0$
- Use functions to solve pure and applied mathematical problems, including using an appropriate function to approximately describe the relationship between two data sets

Methodological Competencies

- extract, work with and interpret information from functional equations and computer displays
- use a formula table properly

Social and Emotional Competencies

- document and present one's findings regarding functional relationships using mathematical terminology in oral and written form
- use a CAS to check one's own results
- evaluate results critically

Geometry - Describing Two- and Three-Dimensional Figures According to Size and Shape

Subject Matter Competencies

- draw congruent two-dimensional figures using centric stretching with a positive scale factor
- describe the influence of the scale factor on the size of angles, the length of sides, area and volume
- illustrate centric stretching and congruence using dynamic geometry software
- for right triangles:
    - specify without the use of aids and illustrate using examples the definitions of sine, cosine and tangent of an angle

    - calculate angles and side lengths using sine, cosine and tangent
- explain using examples and apply (in simple cases without aids) the main Similarity Theorem for triangles and the Ray Theorem (first and second part)
- apply the Sine Theorem and the Cosine Theorem to calculate side lengths and angles
- state and apply the formula Area=½a·b·sin(γ) to given triangles
- properly decompose and use in calculations scale drawings and sketches of composite three-dimensional bodies
- calculate the surface area and volume of composite bodies

Methodological Competencies

- apply solution strategies to geometric constructions and calculations:
    - decompose a problem into sub-problems
    - recognize special lines, triangles and polygons in two- and three-dimensional figures
    - work through problems forward and backward
- present, explain and reflect upon solutions and results in an understandable and appropriate manner

Social and Emotional Competencies

- plan work steps for individual and cooperative work and implement them independently
- compare and evaluate solutions, arguments and representations

Probability - Working with Data and Chance

Subject Matter Competencies

- determine and describe the probabilities of related events using symbols such as: A∪B, A∩B, $\bar{A}$
- using four field tables and tree diagrams:
    - illustrate probability experiments having two or more stages
    - calculate the probability of events (in simple cases without aids)
    - examine events in simple contexts for probabilistic independence
- determine probability distributions of discrete random variables
- calculate and interpret the expected value and standard deviation of discrete random variables (in simple cases without aids)
- calculate using the symbol Σ
- describe Bernoulli chains as multistage random experiments and use the Bernoulli formula

- to determine binomial coefficients and interpret them
- evaluate conditions for the applicability of the Bernoulli formula and critically evaluate the results

Methodological Competencies

- evaluate and display data, including by using computer software, in tables and histograms
- formulate, evaluate and present Ideas for and the results of the description, simulation and calculation of experiments in probability
- graphically represent the probability distributions of discrete random variables
- interpret graphical representations of the probability distributions of discrete random variables

Social and Emotional Competencies

- evaluate results of probability calculations for plausibility and evaluate them critically
- assess opportunities and risks in stochastic contexts

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Music

Grade Span 9/10

Creating and Experiencing Music

Vocal and Instrumental Music Making

With the student's increasing confidence in singing and instrumental music-making, the student's capacity to express his/her individual life experience musically is consolidated and expanded. To this end, the continuous work of previous years is continued during this grade span.

Subject Matter Competencies

- sing a diverse repertoire musically correctly and appropriately to the genre, and partly by memory
- apply basic knowledge of harmony (e.g. simple cadences)
- accompany songs instrumentally
- handle musical instruments properly and play them using correct technique
- translate musical motifs, progressions or effects into other aesthetic and media forms of representation (e.g. movement)

Methodological Competencies

- sing solo and in an ensemble with appropriate posture and breathing, clear articulation and clean intonation
- play group instrumental pieces displaying confidence as to rhythm and tone
- make original music in a variety of creative ways (e.g. improvisation)
- use traditional musical notation and alternative notation

Social and Emotional Competencies

- use one's young adult voice physiologically correctly
- develop a musical repertoire with increasing independencew
- experience singing and instrumental music-making as essential elements of personal development

Music and Media

Engagement with the music of the twentieth and twenty-first centuries begins with an exploration of computer-aided music production and the operation and laws of the music industry.

Subject Matter Competencies

- describe the main features of the development of film scores
- explain how music is utilized in films and commercials
- use music from all accessible legal sources
- describe legal bases for the use of music on the internet
- realize extensive multimedia projects on the computer including music and film
- understand how music is created using modern media
- comprehend in basic terms how the music industry shapes modern life

Methodological Competencies

- describe the effects of film music using concrete examples
- improvise live musical accompaniment to film clips
- using appropriate software, lay a suitable musical soundtrack to a film
- create new music using modern media technology

Social and Emotional Competencies

- consciously perceive music as an important component in film and advertising
- understand the value of music that he/she creates himself/herself, whether by traditional means or with computer technology
- comply with legal regulations for the use of music (e.g. from the internet)

Listening to and Understanding Music

Music in Historical Context

The development of humankind has always been and continues to be connected to music. Consideration of anthropological connections therefore leads to a deeper understanding of the history of music and humanity. Through an exploration of the interaction between musical development and socio-political as well as cultural-historical backgrounds, the student comes to understand music in its historical context and becomes able to interpret music on the basis of this understanding. This process also clarifies the influences of other cultures on Western music.

Through the study of a body of representative works, the student gains insight into important stages in the development of music. In combination with an overarching

knowledge of musical epochs, this provides the student lifelong enrichment of one's education and experience.

Subject Matter Competencies

- appreciate the importance of music as one of humankind's oldest cultural assets
- distinguish characteristics of music from diverse cultures
- recognize essential musical genres, forms, stylistic features and processing techniques
- in a well-reasoned fashion, place familiar music in its historical context

Methodological Competencies

- describe in general terms the genesis of Western musical forms
- interpret the conditions for the creation of music in social context
- recognize and explain stylistic features in audio examples and musical notation

Social and Emotional Competencies

- reflect on the development of music and gain aesthetic insights into musical forms
- contribute and expand on one's own musical experiences

Music in the Twentieth and Twenty-First Centuries

The music of this era deserves special attention for several reasons and is therefore explored separately from the Music in Historical Context unit. During this time period, common lines of development that persisted until the end of the nineteenth century diverged, resulting in an unprecedented diversity of musical styles and techniques. The newly observed separation between classical/art and popular music produces differences in how these categories of music are received and perceived.

It is therefore important to approach new forms of composition and the subject of jazz, as these forms continue to exert a special influence on the further development of music.

Subject Matter Competencies

- recognize the diversity of music in the twentieth and twenty-first centuries
- grasp musical and non-musical influences on the development of music
- analyze selected compositional techniques
- distinguish among forms of improvisation (especially in jazz)

Methodological Competencies

- describe and systematize musical developments in their historical context
- identify musical and non-musical influences on the development of music
- apply compositional techniques through musical notation and when making music

- apply forms of musical improvisation vocally and instrumentally

Social and Emotional Competencies

- approach a diversity of forms of musical expression in an open-minded manner
- develop and describe in a well-reasoned manner one's own tastes in music

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Physics

Grade Span 9/10

Electromagnetic Interactions

Subject Matter and Methodological Competencies

- characterize magnets by the presence of two inseparably connected poles and the force effect
- on ferromagnetic materials, current carrying conductors and other magnets
- model magnetic fields using field lines
- describe magnetic fields in terms of their non-contact force effect in space and compare with electric fields
- describe the magnetic field of the Earth
- describe the structure and operation of electromagnets
- quantitatively describe the dependence of the strength of a magnetic field on current, number of turns and coil length
- describe and explain the influence of the iron core on the strength of the magnetic field of a coil
- describe the force effect on a current-carrying conductor in a magnetic field
- describe applications of magnetism (e.g. electric motor, loudspeaker, relay, door opener)
- state the conditions of induction and qualitatively formulate the law of induction
- describe the construction of a generator and a transformer and describe how they work
- compare DC and AC voltage on the basis of a time course
- describe the following parameters using the example of an alternating current: frequency, period and amplitude
- describe and explain energy transfer in the power grid
- student experiment on the force effects of magnets
- student experiment on induction

Social and Emotional Competencies

- prepare, conduct and evaluate experiments as part of a team in a concentrated and responsible manner

- learn cooperatively in a group and take responsibility for the communal work process
- on the basis of physics competencies draw conclusions regarding the handling of electrical energy
- appreciate the role of electromagnetism as a significant factor in a high societal standard of living

Project Recommendations

- development of electrical lighting technology
- photovoltaics as a technical use of solar energy
- alternative drive concepts
- applications of electromagnets in technology
- electrical measuring instruments over the course of history
- applications of induction in technology

Movement, Forces and Laws of Conservation

Movement

Subject Matter and Methodological Competencies

- define the concept of motion
- characterize, measure and calculate distance, time, speed and acceleration as physical quantities
- describe linear motion at a constant speed using equations and diagrams
- describe linear motion at a constant acceleration using equations and diagrams
- apply the laws of motion to free fall and other examples, and interpret diagrams
- describe a horizontal throw as superimposed movement (superposition) and apply to examples
- differentiate the types and forms of movement
- describe uniform circular motion in terms of linear speed, period of revolution and rotational speed
- characterize angular velocity as a physical quantity to describe circular movements
- describe vibrations as periodic movements using their characteristics and graphical representations
- qualitatively describe periodic energy conversions in oscillations
- describe a wave as the propagation of an oscillation in space by means of its characteristics and give examples
- define a wave as a special form of energy transfer

- describe examples of wave propagation and its applications
- student experiment investigating a movement event
- student experiment on period of oscillation

Forces

Subject Matter and Methodological Competencies

- determine component forces and resulting forces (e.g. on an inclined plane)
- explain everyday processes with the help of Newton's laws
- apply Newton's Second Law to calculate accelerations and forces during motion
- apply Newton's Second Law in complex calculations
- explain and quantitatively describe the dynamics of uniform circular motion using radial force and radial acceleration
- describe gravity as a natural phenomenon
- interpret and quantitatively apply the law of gravity
- describe examples of the effects of gravity (e.g. weight force, tides, planetary motion)

Conservation Laws

Subject Matter and Methodological Competencies

- name different forms of energy and categorize given examples
- define energy as a state variable
- illustrate the connection between work and energy and explain it using examples
- describe energy conversion, transmission and storage using the example of the supply of
- of electrical energy
- apply the equation for calculating kinetic energy
- describe and calculate the efficiency of energy conversions using selected examples
- apply the law of conservation of energy to various processes
- quantitatively apply the law of conservation of mechanical energy
- characterize and apply to various scenarios force of impact and momentum as physical quantities
- describe the relationship between force of impact and momentum
- apply the law of momentum conservation to different processes
- quantitatively apply the conservation laws to central elastic and inelastic impact processes

Social and Emotional Competencies

- set goals for one's own work and when working in groups; in group work, agree upon an approach and realistically assess its implementation
- deduce the outcomes of behavior (e.g. in road traffic) based on one's knowledge of kinematics and dynamics
- plan, carry out and evaluate measurements in a concentrated, independent and responsible manner
- generalize from the effects of causal relationship and include them in one's personal decision-making based on one's knowledge of the Newtonian laws
- within a team, prepare and lead a discussion session on the efficiency of using various forms of energy

Project Recommendations

- movement in everyday life and sports
- noise and noise protection
- construction of musical instruments
- air currents and flight
- applications of regenerative energy sources
- determination of astronomical quantities
- determination of the efficiency of technical devices
- possibilities for sensible energy conservation in homes

Radioactivity

Subject Matter and Methodological Competencies

- distinguish the components of an atomic nucleus
- identify the composition of atomic nuclei using scientific symbols
- differentiate among isotopes
- differentiate among α, β and γ radiation with reference to their characteristics
- state means of detecting radiation
- name protective measures against radiation
- describe the nuclear transformation during radioactive decay using an example
- describe the origin of α, β and γ radiation and state the associated decay equations
- define the term half-life
- interpret a graphical representation of the time course of radioactive decay and determine half-life
- describe an example of the application of radionuclides

Social and Emotional Competencies

- form a personal point of view regarding the application of radiation technology based on one's scientific knowledge and taking into account economic and social factors as well as ecological considerations
- engage the opinions of others on the subject of radioactivity in an objective and understanding manner
- deduce the consequences of their own actions with regard to radiation protection

Project Recommendations

- possibilities and problems associated with the use of nuclear energy (nuclear fission and fusion)
- use of radioactive nuclides in medicine and technology
- biological effects of radiation

International Baccalaureate Diploma Programme Subject Brief

Sciences:

Biology—Higher level

First assessments 2016 – Last assessments 2022

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To ensure both breadth and depth of knowledge and understanding, students must choose at least one subject from five groups: 1) their best language, 2) additional language(s), 3) social sciences, 4) experimental sciences, and 5) mathematics. Students may choose either an arts subject from group 6, or a second subject from groups 1 to 5. At least three and not more than four subjects are taken at higher level (240 recommended teaching hours), while the remaining are taken at standard level (150 recommended teaching hours). In addition, three core elements—the extended essay, theory of knowledge and creativity, action, service—are compulsory and central to the philosophy of the programme.

These IB DP subject briefs illustrate four key course components.

I. Course description and aims
II. Curriculum model overview
III. Assessment model
IV. Sample questions

I. Course description and aims

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.

Through the overarching theme of the nature of science, the aims of the DP biology course are to enable students to:

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

II. Curriculum model overview

Component	Recommended teaching hours
Core	**95**
1. Cell biology	15
2. Molecular biology	21
3. Genetics	15
4. Ecology	12
5. Evolution and biodiversity	12
6. Human physiology	20
Additional higher level	**60**
7. Nucleic acids	9
8. Metabolism, cell respiration and photosynthesis	14
9. Plant biology	13
10. Genetics and evolution	8
11. Animal physiology	16

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Option (Choice of one out of four)	**25**
A. Neurobiology and behaviour	25
B. Biotechnology and bioinformatics	25
C. Ecology and conservation	25
D. Human physiology	25
Practical scheme of work	**60**
Prescribed and other practical activities	40
Individual investigation	10
Group 4 project	10

The group 4 project

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 while appreciating the environmental, social and ethical implications of science and technology. 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. The emphasis is on interdisciplinary cooperation and the scientific processes

III. Assessment model

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

1. Demonstrate knowledge and understanding of:
   - facts, concepts, and terminology
   - methodologies and techniques
   - communicating scientific information.
2. Apply:
   - facts, concepts, and terminology
   - methodologies and techniques
   - methods of communicating scientific information.
3. Formulate, analyse and evaluate:
   - hypotheses, research questions and predictions
   - methodologies and techniques
   - primary and secondary data
   - scientific explanations.
4. Demonstrate the appropriate research, experimental, and personal skills necessary to carry out insightful and ethical investigations.

Assessment at a glance

Type of assessment	Format of assessment	Time (hours)	Weighting of final grade (%)
External		4.5	80
Paper 1	40 multiple-choice questions	1	20
Paper 2	Data-based, short answer and extended response questions	2.25	36
Paper 3	Data-based, short answer and extended response questions	1.25	24
Internal		10	20
Individual investigation	Investigation and write-up of 6 to 12 pages	10	20

IV. Sample questions

- 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)

- 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)

- 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)

About the IB: For over 40 years the IB has built a reputation for high-quality, challenging programmes of education that develop internationally minded young people who are well prepared for the challenges of life in the 21st century and able to contribute to creating a better, more peaceful world.

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International Baccalaureate Diploma Programme Subject Brief

Sciences:

Biology—Standard level

First assessments 2016 – Last assessments 2022

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To ensure both breadth and depth of knowledge and understanding, students must choose at least one subject from five groups: 1) their best language, 2) additional language(s), 3) social sciences, 4) experimental sciences, and 5) mathematics. Students may choose either an arts subject from group 6, or a second subject from groups 1 to 5. At least three and not more than four subjects are taken at higher level (240 recommended teaching hours), while the remaining are taken at standard level (150 recommended teaching hours). In addition, three core elements—the extended essay, theory of knowledge and creativity, action, service—are compulsory and central to the philosophy of the programme.

These IB DP subject briefs illustrate four key course components.

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II. Curriculum model overview
III. Assessment model
IV. Sample questions

I. Course description and aims

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

Through the overarching theme of the nature of science, the aims of the DP biology course are to enable students to:

1. appreciate scientific study and creativity within a global context through stimulating and challenging opportunities
2. acquire a body of knowledge, methods and techniques that characterize science and technology
3. apply and use a body of knowledge, methods and techniques that characterize science and technology
4. develop an ability to analyse, evaluate and synthesize scientific information
5. develop a critical awareness of the need for, and the value of, effective collaboration and communication during scientific activities
6. develop experimental and investigative scientific skills including the use of current technologies
7. develop and apply 21st century communication skills in the study of science
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9. develop an appreciation of the possibilities and limitations of science and technology
10. develop an understanding of the relationships between scientific disciplines and their influence on other areas of knowledge.

II. Curriculum model overview

Component	Recommended teaching hours
Core	**95**
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3. Genetics	15
4. Ecology	12
5. Evolution and biodiversity	12
6. Human physiology	20
Option (choice of 1 out of 4)	**15**
1. Neurobiology and behaviour	15
2. Biotechnology and bioinformatics	15
3. Ecology and conservation	15
4. Human physiology	15

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Practical scheme of work	**40**
Prescribed and other practical activities	20
Individual investigation	10
Group 4 project	10

The group 4 project

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 while appreciating the environmental, social and ethical implications of science and technology. 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.

III. Assessment model

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

1. Demonstrate knowledge and understanding of:
   - facts, concepts, and terminology
   - methodologies and techniques
   - communicating scientific information.
2. Apply:
   - facts, concepts, and terminology
   - methodologies and techniques
   - methods of communicating scientific information.
3. Formulate, analyse and evaluate:
   - hypotheses, research questions and predictions
   - methodologies and techniques
   - primary and secondary data
   - scientific explanations.
4. Demonstrate the appropriate research, experimental, and personal skills necessary to carry out insightful and ethical investigations.

Assessment at a glance

Type of assessment	Format of assessment	Time (hours)	Weighting of final grade (%)
External		3	80
Paper 1	30 multiple-choice questions	0.75	20
Paper 2	Data-based, short answer and extended response questions	1.25	40
Paper 3	Data-based, short answer and extended response questions	1	20
Internal		10	20
Individual investigation	Investigation and write-up of 6 to 12 pages	10	20

IV. Sample questions

- Cyclins were discovered by Timothy R. Hunt in 1982 while studying sea urchins. What is a function of cyclins? (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 company BASF produces a genetically modified potato called Amflora. Outline the purpose of modifying the potato. (Paper 3)

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International Baccalaureate Diploma Programme Subject Brief

Creativity, activity, service

For students graduating in 2017 and after

The IB Diploma Programme (DP) is a rigorous, academically challenging and balanced programme of education designed to prepare students aged 16 to 19 for success at university and life beyond. The DP aims to encourage students to be knowledgeable, inquiring, caring and compassionate, and to develop intercultural understanding, open-mindedness and the attitudes necessary to respect and evaluate a range of viewpoints. Approaches to teaching and learning (ATL) are deliberate strategies, skills and attitudes that permeate the teaching and learning environment. In the DP, students develop skills from five ATL categories: thinking, research, social, self-management and communication.

To ensure both breadth and depth of knowledge and understanding, students must choose six courses from six distinct groups: 1) studies in language and literature; 2) language acquisition; 3) individuals and societies, 4) sciences; 5) mathematics; 6) the arts. Students may chooseto replace the arts course with a second course from one of the other five groups. At least three, and not more than four, subjects are taken at higher level (240 recommended teaching hours), while the remaining are taken at standard level (150 recommended teaching hours). In addition, three core elements—the extended essay, theory of knowledge and creativity, activity, service—are compulsory and central to the philosophy of the programme.

These DP subject briefs illustrate four key course components.

I. Description and aims
II. Programme overview
III. Learning outcomes
IV. Sample projects

I. Description and aims

Creativity, activity, service (CAS) is at the heart of the DP. With its holistic approach, CAS is designed to strengthen and extend students' personal and interpersonal learning from the Primary Years Programme (PYP) and Middle Years Programme (MYP).

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.

II. 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.

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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.

A school's CAS programme is evaluated as part of the school's regular programme evaluation and self-study process that assesses the overall implementation of the DP.

III. Learning outcomes

Completion of CAS is based on student achievement of the seven CAS learning outcomes. Through their CAS portfolio, students provide the school with evidence demonstrating achievement of each learning outcome. Some learning outcomes may be achieved many times, while others may be achieved less frequently. In their CAS portfolio, students provide the school with evidence of having achieved each learning outcome at least once through their CAS programme.

Learning outcome	Descriptor
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.

IV. 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.

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International Baccalaureate Diploma Programme Subject Brief

Diploma Programme Core:
Extended essay, including the world studies option

First assessment 2018

The IB Diploma Programme (DP) is a rigorous, academically challenging and balanced programme of education designed to prepare students aged 16 to 19 for success at university and life beyond. The DP aims to encourage students to be knowledgeable, inquiring, caring and compassionate, and to develop intercultural understanding, open-mindedness and the attitudes necessary to respect and evaluate a range of viewpoints. Approaches to teaching and learning (ATL) within the DP are deliberate strategies, skills and attitudes that permeate the teaching and learning environment. In the DP, students develop skills from five ATL categories: thinking, research, social, self-management and communication.

To ensure both breadth and depth of knowledge and understanding, students must choose six courses from six distinct groups:
1) studies in language and literature; 2) language acquisition; 3) individuals and societies; 4) sciences; 5) mathematics; 6) the arts. Students may choose to replace the arts course with a second course from one of the other five groups. At least three, and not more than four, subjects are taken at higher level (240 recommended teaching hours), while the remaining are taken at standard level (150 recommended teaching hours). In addition, three core elements—the extended essay, theory of knowledge, and creativity, activity, service—are compulsory and central to the philosophy of the programme.

These DP subject briefs illustrate four key course components.
I. Course description and aims
II. Overview of the extended essay process
III. Assessment model
IV. Sample extended essay topics

I. Course description and aims

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.

II. Overview of the extended essay process

The extended essay process

The research process

1. Choose the approved DP subject.
2. Choose a topic.
3. Undertake some preparatory reading.
4. **Formulate a well-focused research question.**
5. Plan the research and writing process.
6. Plan a structure (outline headings) for the essay. This may change as the research develops.
7. Carry out the research.

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Writing and formal presentation

The required elements of the final work to be submitted are as follows.

- Title page
- Contents page
- Introduction
- Body of the essay
- Conclusion
- References and bibliography

The upper limit of 4,000 words includes the introduction, body, conclusion and any quotations.

Reflection process

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:

- 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.

III. Assessment model

The extended essay, including the world studies option, 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 at a glance

Assessment criteria	Description
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.

IV. Sample extended essay topics

- 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*?

About the IB: For over 50 years the IB has built a reputation for high-quality, challenging programmes of education that develop internationally minded young people who are well prepared for the challenges of life in the 21st century and able to contribute to creating a better, more peaceful world.

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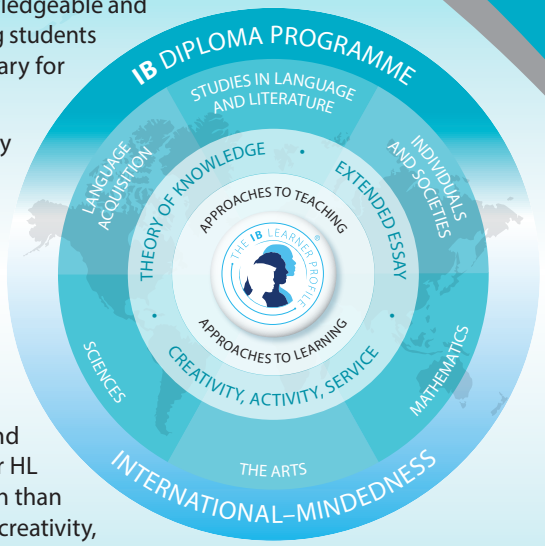
International Baccalaureate Diploma Programme Subject Brief

Individuals and societies: History—higher level

First assessments 2017—last assessments 2025

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. 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. Instead of an arts subject, students can choose two subjects from another area. 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.

Normally, three subjects (and not more than four) are taken at higher level (HL), and the others are taken at standard level (SL). The IB recommends 240 teaching hours for HL subjects and 150 hours for SL. Subjects at HL are studied in greater depth and breadth than at SL. In addition, three core elements—the extended essay, theory of knowledge and creativity, activity, service—are compulsory and central to the philosophy of the programme.

These DP subject briefs illustrate four key course components.

I. Course description and aims
II. Curriculum model overview
III. Assessment model
IV. Sample questions

I. Course description and aims

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 va-riety 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 think-ing, and on developing an understanding of multiple interpre-tations 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, sig-nificance 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 contempo-rary society by encouraging reflection on the past.

II. Curriculum model overview

Component	Recommended teaching hours
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	40

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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)	90
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	90
Internal assessment Historical investigation	20

III. Assessment model

There are four assessment objectives for the DP history course. Having followed the course at higher level (HL), students will be expected to meet the following objectives.

Assessment objective 1: Knowledge and understanding
- Demonstrate detailed, relevant and accurate historical knowledge.
- Demonstrate understanding of historical concepts and context.
- Demonstrate understanding of historical sources.

Assessment objective 2: Application and analysis
- Formulate clear and coherent arguments.
- Use relevant historical knowledge to effectively support analysis.
- Analyse and interpret a variety of sources.

Assessment objective 3: 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.

Assessment objective 4: 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.

Assessment at a glance

Type of assessment	Format of assessment	Time (hours)	Weighting of final grade (%)
External		5	80
Paper 1	Source-based paper based on the five prescribed subjects	1	20
Paper 2	Essay paper based on the 12 world history topics	1.5	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

IV. Sample questions

Paper 1

When presented with five sources related to the enforcements of the provisions of the treaties, disarmament and London Naval Conference (1930), students will:
- explain the significance of the Conference
- compare and contrast the views of the Conference presented in different sources
- assess the value and limitations of sources
- use the sources and their own knowledge to discuss the extent to which they agree with the view that the London Naval Conference was unsuccessful.

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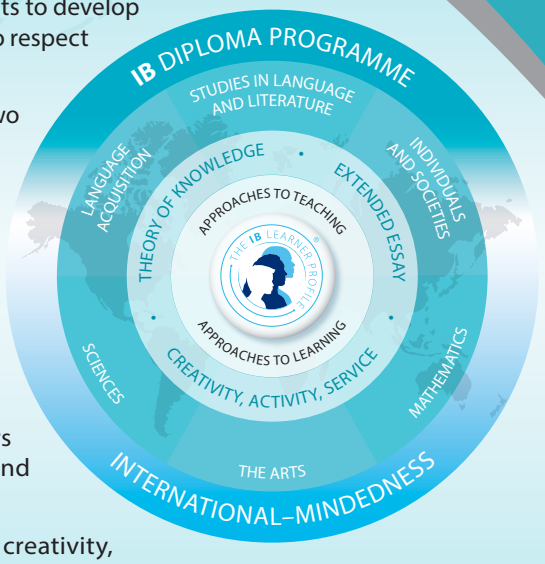
International Baccalaureate Diploma Programme Subject Brief

Language A: language and literature

First assessments for SL and HL—2021

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. 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. Instead of an arts subject, students can choose two subjects from another area. 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.

Normally, three subjects (and not more than four) are taken at higher level (HL), and the others are taken at standard level (SL). The IB recommends 240 teaching hours for HL subjects and 150 hours for SL. Subjects at HL are studied in greater depth and breadth than at SL.

In addition, three core elements—the extended essay, theory of knowledge and creativity, activity, service—are compulsory and central to the philosophy of the programme.

This IB DP subject brief has three key components:
I. Course description and aims II. Curriculum model overview III. Assessment model

I. Course description and aims

The language A: language and literature course aims at studying the complex and dynamic nature of language and exploring both its practical and aesthetic dimensions. The course will explore the crucial role language plays in communication, reflecting experience and shaping the world, and the roles of individuals themselves as producers of language. Throughout the course, students will explore the various ways in which language choices, text types, literary forms and contextual elements all effect meaning.

Through close analysis of various text types and literary forms, 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
- 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
- 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.

II. Curriculum model overview

Syllabus component	Recommended teaching hours	
	SL	HL
Readers, writers and texts	50	80
Time and space	50	80
Intertextuality: connecting texts	50	80
Total teaching hours	**150**	**240**

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III. Assessment model

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

1. 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
   - elements of literary, stylistic, rhetorical, visual and/or performance craft
   - features of particular text types and literary forms.
2. 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
   - ways in which texts may offer perspectives on human concerns.
3. Communicate:
   - ideas in clear, logical and persuasive ways
   - in a range of styles, registers and for a variety of purposes and situations
   - (for literature and performance only) ideas, emotion, character and atmosphere through performance.

Assessment at a glance

Type of assessment	Format of assessment	Time (hours)		Weighting of final grade (%)	
		SL	HL	SL	HL
External					
Paper 1: Guided textual analysis	Guided analysis of unseen non-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 literary work or a non-literary body of work studied.				20
Internal					
Individual oral	Prepared oral response on the way that one literary work and one non-literary body of work studied have approached a common global issue.			30	20

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International Baccalaureate Diploma Programme Subject Brief

Language B

First assessment 2020

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. 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. Instead of an arts subject, students can choose two subjects from another area. 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.

Normally, three subjects (and not more than four) are taken at higher level (HL), and the others are taken at standard level (SL). The IB recommends 240 teaching hours for HL subjects and 150 hours for SL. Subjects at HL are studied in greater depth and breadth than at SL.

In addition, three core elements—the extended essay, theory of knowledge and creativity, activity, service—are compulsory and central to the philosophy of the programme.

This IB DP subject brief has four key components:

I. Course description and aims II. Curriculum model overview III. Assessment model IV. Content outline

I. Course description and aims

Language acquisition consists of two modern language courses—language ab initio and language B—designed to provide students with the necessary skills and intercultural understanding to enable them to communicate successfully in an environment where the language studied is spoken.

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.

Both language B SL and HL students learn to communicate in the target language in familiar and unfamiliar contexts. The distinction between language B SL and HL can be seen in the level of competency the student is expected to develop in receptive, productive and interactive skills.

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).

The following language acquisition aims are common to both language ab initio and language B.

- 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.

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- 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.

II. Curriculum model overview

The curriculum is organized around five prescribed themes with which the students engage though 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.

III. Assessment model

The language acquisition assessment objectives are common to both language ab initio and language B.

- 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.

Assessment at a glance

Language B SL and HL assessment outline		Weighting
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%**

The assessment outlines for language B SL and HL are identical; it is the nature of the assessment that differs and this is what distinguishes SL assessments from those of HL.

For language B HL paper 1, the tasks set will require more complex language and structures and demand higher-order thinking skills. Additionally for HL, a higher word range has been provided in order to accommodate the more complex responses required.

For the individual oral internal assessment, the stimulus at language B SL is a visual image that is clearly relevant to one (or more) of the themes of the course. The stimulus at language B HL is an excerpt from one of the two literary works studied.

IV. Content outline

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?

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International Baccalaureate Diploma Programme Subject Brief

Mathematics: analysis and approaches

First assessments for SL and HL—2021

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This IB DP subject brief has three key components:

I. Course description and aims II. Curriculum model overview III. Assessment model

I. Course description and aims

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 all DP mathematics courses are to 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
- develop the ability to reflect critically upon their own work and the work of others
- independently and collaboratively extend their understanding of mathematics.

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II. Curriculum model overview

Mathematics: analysis and approaches and Mathematics: applications and interpretation share 60 hours of common SL content.

Syllabus component	Recommended teaching hours	
	SL	HL
• Number and algebra • Functions • Geometry and trigonometry • Statistics and probability • Calculus	19 21 25 27 28	39 32 51 33 55
Development of investigational, problem-solving and modelling skills and the exploration of an area of mathematics	30	30
Total teaching hours	150	240

III. Assessment model

Problem-solving is central to learning mathematics and involves the acquisition of mathematical skills and concepts in a wide range of situations, including non-routine, open-ended and real-world problems.

The assessment objectives are common to Mathematics: analysis and approaches and to Mathematics: applications and interpretation.

- **Knowledge and understanding:** Recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of familiar and unfamiliar contexts.
- **Problem solving:** Recall, select and use their knowledge of mathematical skills, results and models in both abstract and real-world contexts to solve problems.
- **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.
- **Technology:** Use technology accurately, appropriately and efficiently both to explore new ideas and to solve problems.
- **Reasoning:** Construct mathematical arguments through use of precise statements, logical deduction and inference and by the manipulation of mathematical expressions.
- **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.

Assessment at a glance

Type of assessment	Format of assessment	Time (hours)		Weighting of final grade (%)	
		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		15	15	20	20

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International Baccalaureate Diploma Programme Subject Brief

Mathematics: applications and interpretation

First assessments for SL and HL—2021

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. 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. Instead of an arts subject, students can choose two subjects from another area. 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.

Normally, three subjects (and not more than four) are taken at higher level (HL), and the others are taken at standard level (SL). The IB recommends 240 teaching hours for HL subjects and 150 hours for SL. Subjects at HL are studied in greater depth and breadth than at SL. In addition, three core elements—the extended essay, theory of knowledge and creativity, activity, service—are compulsory and central to the philosophy of the programme.

This IB DP subject brief has three key components:

I. Course description and aims II. Curriculum model overview III. Assessment model

I. Course description and aims

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: applications and interpretation course recognizes the increasing role that mathematics and technology play in a diverse range of fields in a data-rich world. As such, it emphasizes the meaning of mathematics in context by focusing on topics that are often used as applications or in mathematical modelling. To give this understanding a firm base, this course includes topics that are traditionally part of a pre-university mathematics course such as calculus and statistics. Students are encouraged to solve real-world problems, construct and communicate this mathematically and interpret the conclusions or generalizations.

Students should expect to develop strong technology skills, and will be intellectually equipped to appreciate the links between the theoretical and the practical concepts in mathematics. All external assessments involve the use of technology. 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 all DP mathematics courses are to 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
- develop the ability to reflect critically upon their own work and the work of others
- independently and collaboratively extend their understanding of mathematics.

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II. Curriculum model overview

Mathematics: applications and interpretation and Mathematics: analysis and approaches share 60 hours of common content.

Syllabus component	Recommended teaching hours	
	SL	HL
• Number and algebra • Functions • Geometry and trigonometry • Statistics and probability • Calculus	16 31 18 36 19	29 42 46 52 41
Development of investigational, problem-solving and modelling skills and the exploration of an area of mathematics	30	30
Total teaching hours	150	240

III. Assessment model

Problem-solving is central to learning mathematics and involves the acquisition of mathematical skills and concepts in a wide range of situations, including non-routine, open-ended and real-world problems.

The assessment objectives are common to Mathematics: applications and interpretation and to Mathematics: analysis and approaches.

- **Knowledge and understanding:** Recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of familiar and unfamiliar contexts.
- **Problem solving:** Recall, select and use their knowledge of mathematical skills, results and models in both abstract and real-world contexts to solve problems.
- **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.
- **Technology:** Use technology accurately, appropriately and efficiently both to explore new ideas and to solve problems.
- **Reasoning:** Construct mathematical arguments through use of precise statements, logical deduction and inference and by the manipulation of mathematical expressions.
- **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.

Assessment at a glance

Type of assessment	Format of assessment	Time (hours)		Weighting of final grade (%)	
		SL	HL	SL	HL
External					
Paper 1	Technology allowed. Compulsory short-response questions based on the syllabus.	1.5	2	40	30
Paper 2	Technology allowed. 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		15	15	20	20

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International Baccalaureate
Diploma Programme Subject Brief

Diploma Programme core: Theory of knowledge

First assessment 2022

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. 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. Instead of an arts subject, students can choose two subjects from another area. 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.

Normally, three subjects (and not more than four) are taken at higher level (HL), and the others are taken at standard level (SL). The IB recommends 240 teaching hours for HL subjects and 150 hours for SL. Subjects at HL are studied in greater depth and breadth than at SL. In addition, three core elements—the extended essay, theory of knowledge and creativity, activity, service—are compulsory and central to the philosophy of the programme.

I. Course description and aims

The theory of knowledge (TOK) course plays a special role in the DP by providing an opportunity for students to reflect on the nature, scope and limitations of knowledge and the process of knowing. In this way, the main focus of TOK is not on students acquiring new knowledge but on helping students to reflect on, and put into perspective, what they already know. TOK underpins and helps to unite the subjects that students encounter in the rest of their DP studies. It engages students in explicit reflection on how knowledge is arrived at in different disciplines and areas of knowledge, on what these areas have in common and the differences between them.

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 inter-cultural 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.

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II. Curriculum model overview

Course elements	Minimum teaching hours
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.	32
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	50

III. 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.			

IV. 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?

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International Baccalaureate Diploma Programme Subject Brief

The arts:

Visual arts—Standard level

First assessments 2016 – Last assessments 2022

The IB Diploma Programme (DP) is a rigorous, academically challenging and balanced programme of education designed to prepare students aged 16 to 19 for success at university and life beyond. The DP aims to encourage students to be knowledgeable, inquiring, caring and compassionate, and to develop intercultural understanding, open-mindedness and the attitudes necessary to respect and evaluate a range of viewpoints. Approaches to teaching and learning (ATL) within the DP are deliberate strategies, skills and attitudes that permeate the teaching and learning environment. In the DP students develop skills from five ATL categories: thinking, research, social, self-management and communication.

To ensure both breadth and depth of knowledge and understanding, students must choose at least one subject from five groups: 1) their best language, 2) additional language(s), 3) social sciences, 4) experimental sciences, and 5) mathematics. Students may choose either an arts subject from group 6, or a second subject from groups 1 to 5. At least three and not more than four subjects are taken at higher level (240 recommended teaching hours), while the remaining are taken at standard level (150 recommended teaching hours). In addition, three core elements—the extended essay, theory of knowledge and creativity, action, service—are compulsory and central to the philosophy of the programme.

These IB DP subject briefs illustrate three key course components.
I. Course description and aims II. Curriculum model overview III. Assessment model

I. Course description and aims

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 study 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 subjects are to enable students to:

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

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

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

II. Curriculum model overview

Component	Recommended teaching hours
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.	**50**

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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.	**50**
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.	**50**

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.

III. Assessment model

Having followed the visual arts course, students are expected to:

1. 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
2. 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
3. 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
4. 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

Assessment at a glance

Type of assessment	Format of assessment	Weighting of final grade (%)
External		60
Comparative study	• 10–15 screens which examine and compare at least 3 artworks, at least 2 of which should be by different artists • A list of sources used	20
Process portfolio	• 9–18 screens which evidence the student's sustained experimentation, exploration, manipulation and refinement of a variety of art-making activities	40
Internal		40
Exhibition	• A curatorial rationale that does not exceed 400 words • 4–7 artworks • Exhibition text (stating the title, medium, size and intention) for each artwork	40

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