



International Baccalaureate Catalogue 2026

Resources for schools following an International
Baccalaureate curriculum

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Pearson for International Schools

We've been supporting IB learners for nearly two decades with high-quality resources designed to inspire confidence, curiosity, and success at every stage of their journey.

In this catalogue, you'll find everything you need to help your learners thrive, from PYP to MYP to DP and beyond.

Resources for the Diploma Programme

Developed in cooperation with the IB



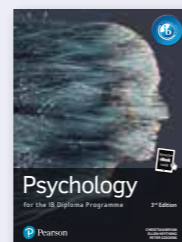
HIGHLIGHTS

History for the IB Diploma Programme – New series written by experienced IB teachers, examiners, curriculum developers and workshop leaders for the new 2026 Subject Guide.

NEW



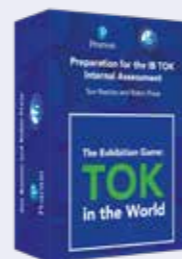
Psychology for the IB Diploma Programme – This latest edition provides coverage of the 2025 Subject Guide for first assessment in 2027.



Environmental Systems and Societies for the IB Diploma Programme – A new edition of our popular student book fully revised in line with the 2024 Subject Guide and providing comprehensive coverage of all eight topics and the HL lenses.



The Exhibition Game: TOK in the World – The only game available that supports TOK assessment, developed by TOK experts, Sue Bastian and Robin Press, to help your students prepare for their Internal Assessment (IA) task.



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GOOD TO KNOW

This catalogue contains a selection of our IB resources. To view the full range, please visit [pearson.com/international-schools](https://www.pearson.com/international-schools)



All products are suitable for English Language Learners (ELL).



* Primary Years Programme (PYP), Middle Years Programme (MYP), Diploma Programme (DP), and Career-related Programme (CP) are trademarks of the International Baccalaureate Organisation (IB), which was not involved in the production of these products. This excludes our collaboration resources, which carry the IB In Cooperation logo on their front covers, and have been developed in cooperation with the IB.

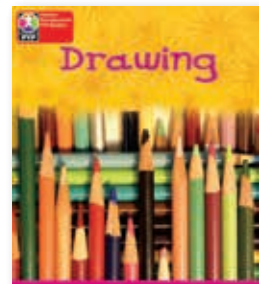
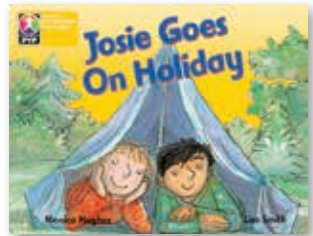


Primary Years Programme Readers


Specially designed to motivate younger learners and help them develop vital inquiry-based reading strategies.

This collection of 120 inquiry-based Readers provides plenty to explore, in line with the IB PYP core principles.

The ready-made library is clearly categorised by age and organised into the PYP themes supporting your PYP students with their learning.




A variety of fiction and non-fiction will motivate all learners.



The rain stopped. The giraffes came out from the trees and walked about by the river.
Twiga looked up at the sky.
'Look,' he said. 'The moon is back. When I am tall can I eat the moon?'

14



'You can't eat the moon,' said Twiga's father. 'But I will show you something that you can eat when you grow up.' He gave Twiga some beautiful fruit from the top of a very tall tree.
'Mmmm, that's good,' said Twiga.

15

Summary of components:

- 120 high-quality, inquiry-based Readers.
- Money-saving packs available, organised by grade/year and theme.
- To evaluate this series, visit pearsoninternational-schools.com/pyp

ELL

These books teach the higher-order skills and strategies that thinking readers need, and support comprehension and oral language.


Cocoa beans

Cocoa beans grow in pods on cocoa trees. When the pods are ripe, the farmers cut them from the tree and take out the beans.





Workers spread out the beans in the sun to dry. They pack the dried beans into large bags. Then they send the beans to local companies. They send the beans to the chocolate company.

Readers have a strong international approach and are all linked to the IB Learner Profile.




The city was too loud.



The sea was too wet.

9

But Elno liked the jungle. The jungle birds were bright with colours.
Rose red.
Sunshine yellow.
Sky blue.
Jungle green.



10

Readers offer a wealth of exploration opportunities, in line with the core principles of the IB PYP.

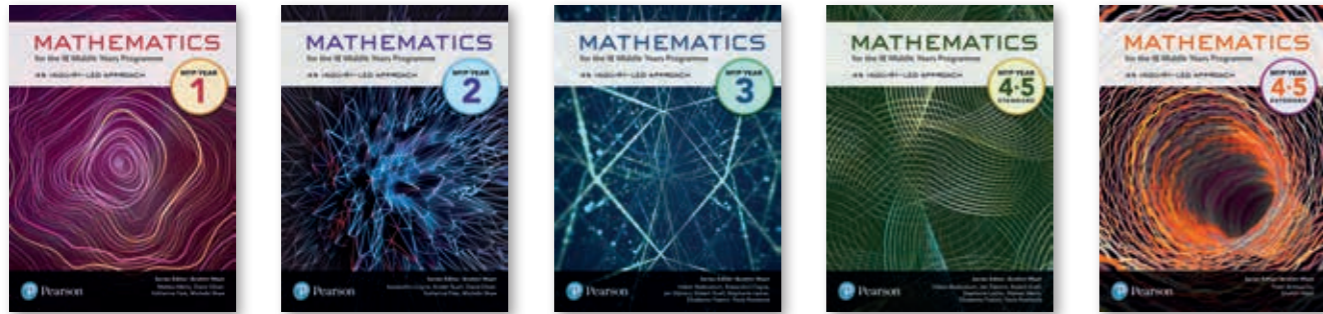
Download the PYP Readers Structure Chart at pearsoninternational-schools.com/pyp



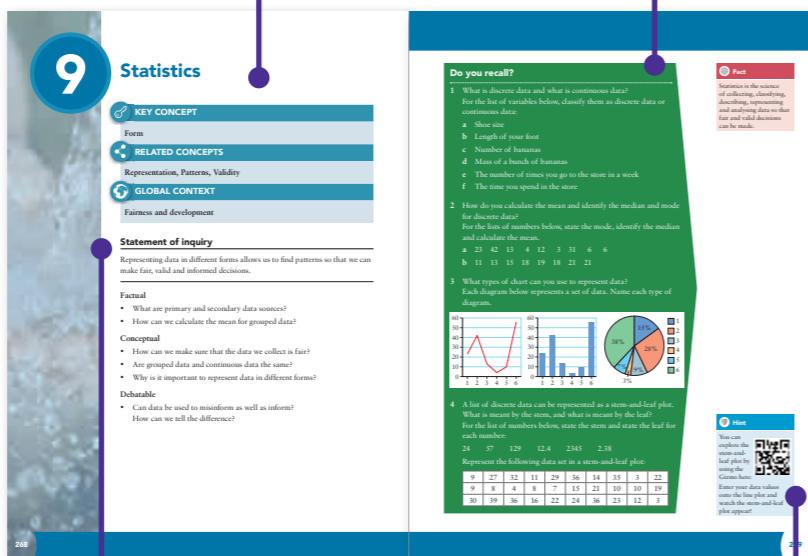


Mathematics for the IB Middle Years Programme

Put learners in charge with an exploratory inquiry-led approach to MYP Mathematics in our series, written for the 2020 curriculum.



- Each book and accompanying eBook contains detailed worked examples, ideas for investigations, reflections, differentiated exercises, and check your knowledge questions to put learning into practice.
- Clear links to key concepts, related concepts and global contexts in addition to statements of inquiry and inquiry questions for each chapter.
- ATLs identified throughout.
- Each book in our MYP Mathematics series is supported by a Teacher Guide, which includes detailed unit plans, prerequisites, extra questions, ideas for group work and much more.
- Written by an international team of highly experienced authors and teachers, and led by Series Editor, Ibrahim Wazir, this series fully matches the 2020 Guide.



Key concept, related concepts and global context identified for each chapter.

Reminders of prior learning.

Statement of inquiry and inquiry questions for each chapter.

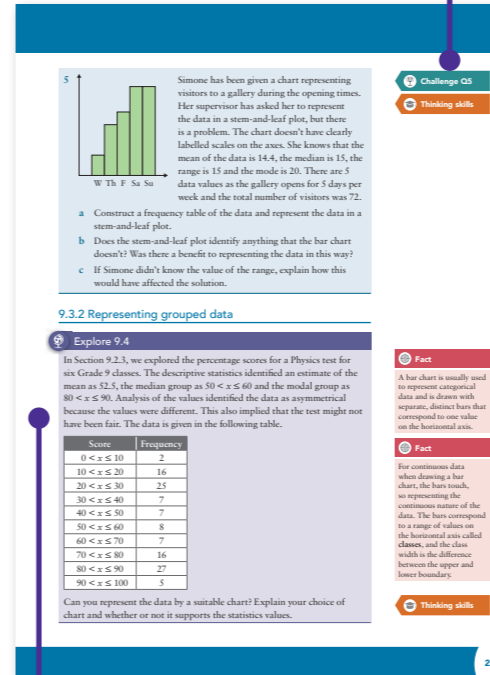
QR codes linking to additional digital resources.

GOOD TO KNOW

- Both our IB MYP Mathematics and IB Diploma Mathematics resources follow the same inquiry-led approach.
- Find Ibrahim Wazir's mapping document matching our MYP and DP Mathematics resources to the US Common Core Standards at [pearsoninternational-schools.com/myp](https://www.pearsoninternational-schools.com/myp).




Differentiated practice questions.



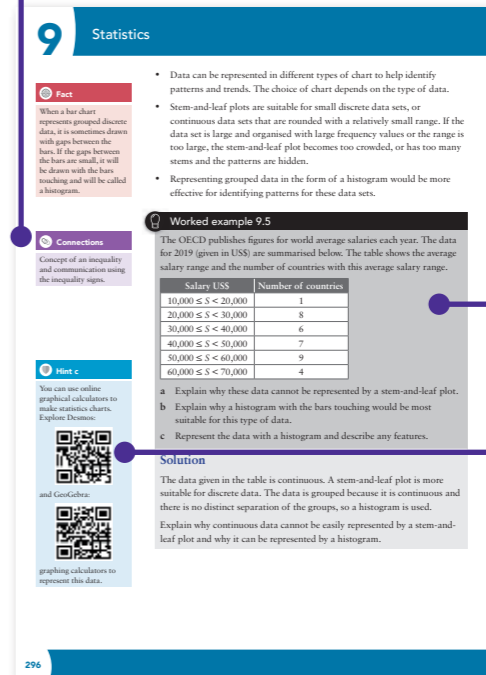
Learners are encouraged to explore concepts and problems.

Meet the Series Editor: Ibrahim Wazir is a leading expert in IB Mathematics. Watch him discuss using an exploratory approach in the classroom in an on-demand webinar.



Scan me

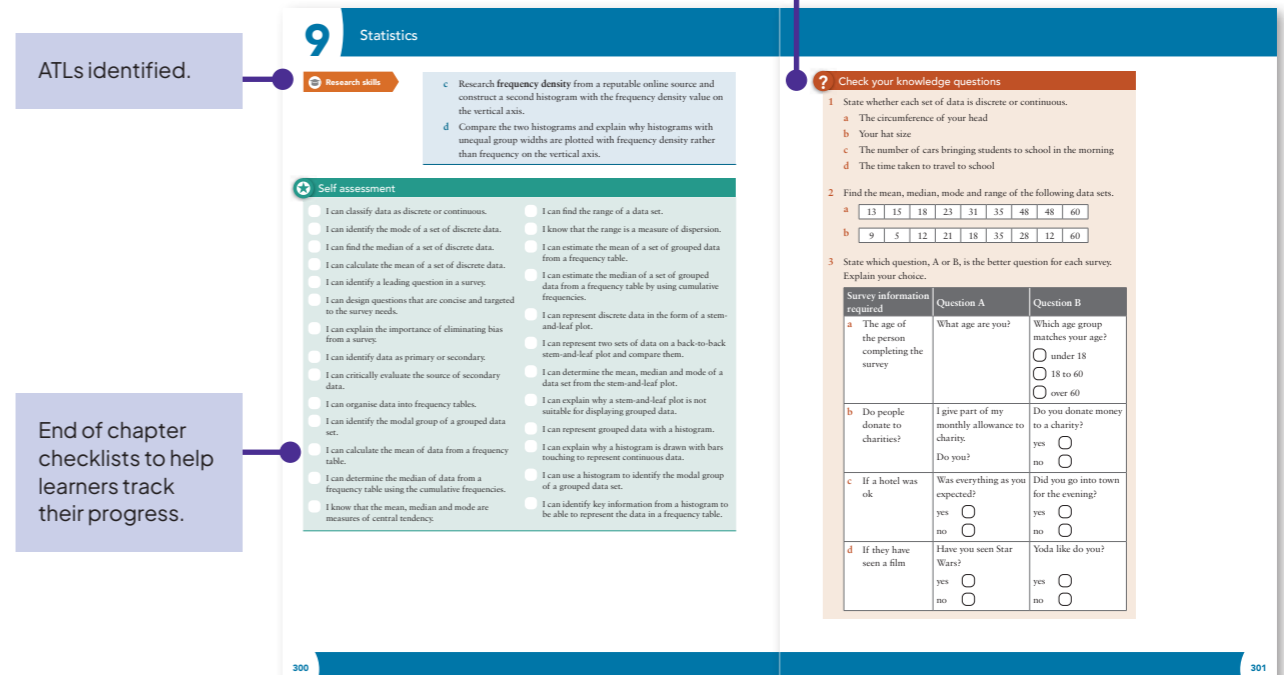
Connections to other areas highlighted.



Clear and structured worked examples throughout.

Hint boxes help learners tackle problems.

Check your knowledge questions at the end of each chapter to check understanding and put learning into practice.



ATLs identified.

End of chapter checklists to help learners track their progress.

IB Diploma Programme co-published resources



We're proud to be an official co-publisher for the IB Diploma Programme, working in close cooperation with the IB since 2022. Our co-published resources are designed to support educators and inspire learners every step of the way.

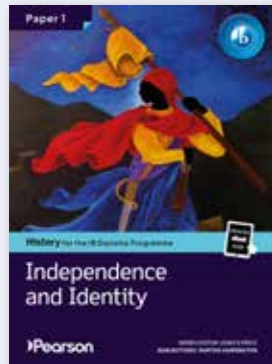
This year, we're expanding on our range of co-published resources even more with our brand-new **History series**.

All our co-published resources have undergone a thorough quality check by the IB. This ensures that they:

- align fully with the latest curriculum, covering all the essential learning objectives;
- have successfully passed the IB's comprehensive quality-assurance evaluation;
- have been reviewed and approved by IB subject matter experts;
- are appropriate for IB World Schools worldwide.

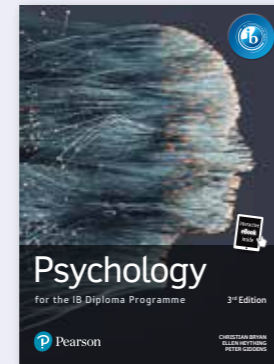
NEW First teaching in 2026

- DP History



First assessment in 2027

- DP Psychology



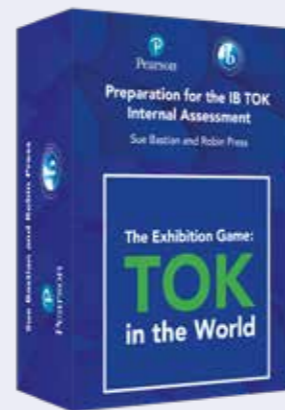
First assessments in 2026

- DP Environmental Systems and Societies
- DP Global Politics



Also available

- TOK: Exhibition Game.
- Theory of Knowledge.



For the IB Diploma Programme

Core Curriculum Theory of Knowledge

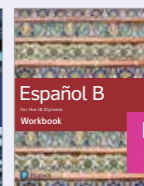
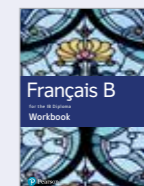
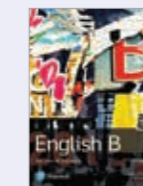


Look out for the IB Cooperation logo on the front covers of our co-published resources.

Studies in Language and Literature

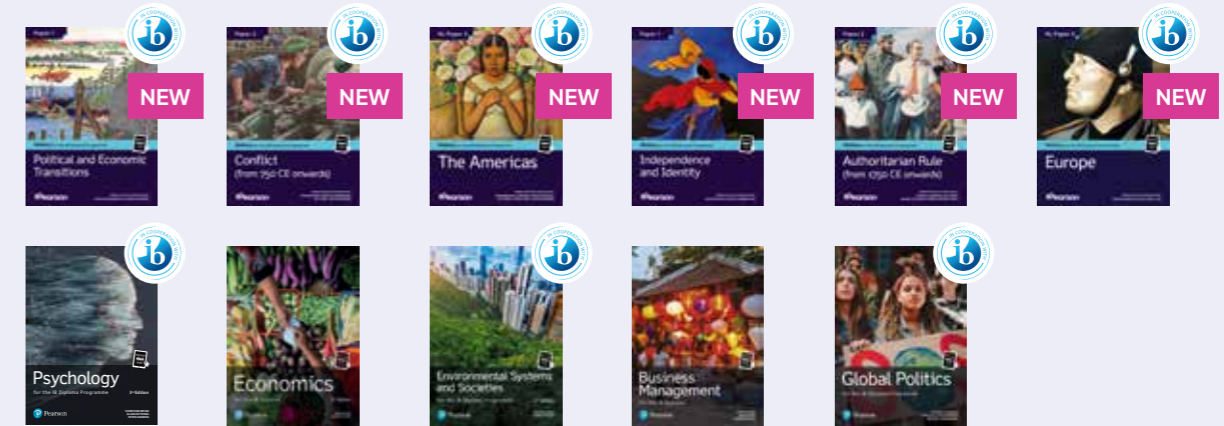


Language Acquisition

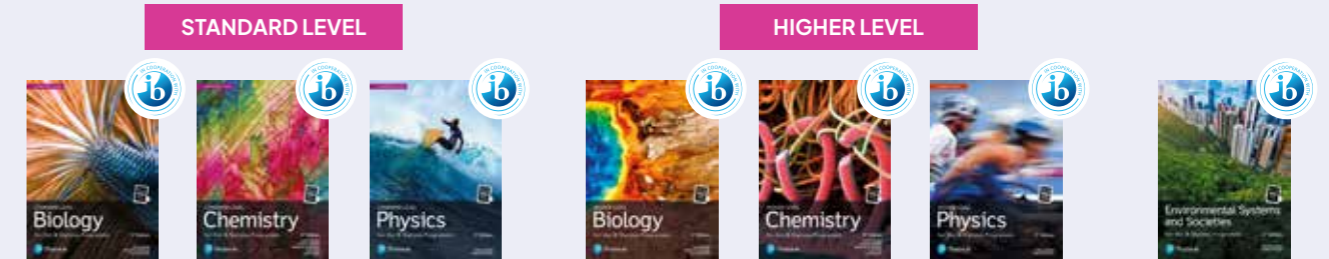


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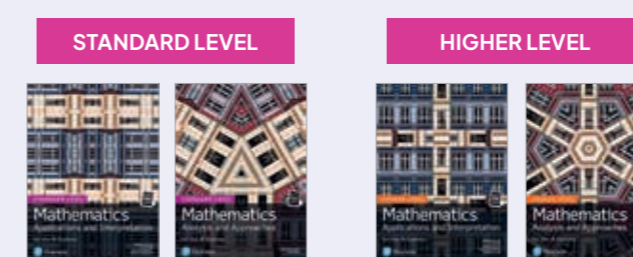
Individuals and Societies



Sciences



Mathematics



Included with each title:

- Student book; print and/or digital.
- Digital resources to support teaching and revision.
- eBook offered with a 2-year subscription, and included with the purchase of the print title or available as a separate purchase.

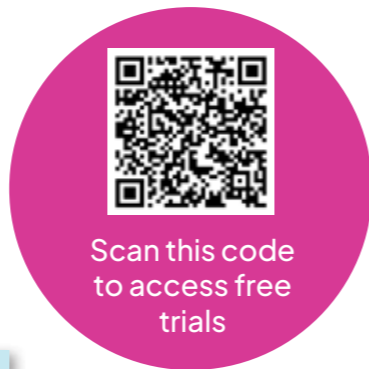
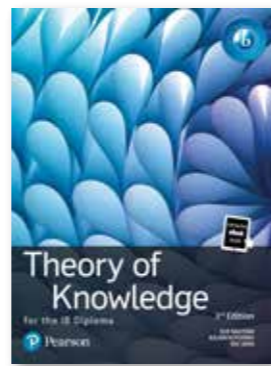


Theory of Knowledge



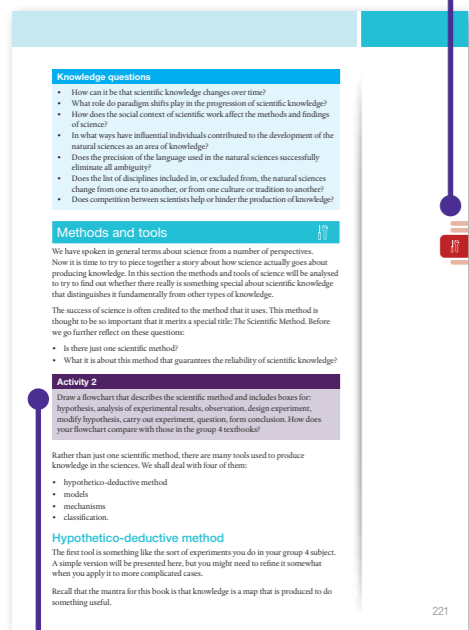
Support your learners as they explore the latest Theory of Knowledge Subject Guide with our revised edition, written by experts and updated in cooperation with the IB in 2024.

- Written by an extremely experienced authoring team, which includes examiners, curriculum reviewers and workshop leaders Sue Bastian, Julian Kitching and Ric Sims.
- Updated in 2024 with new technological and cultural examples to better reflect and represent global learners, and clearer language to improve accessibility for EAL students.
- Provides learners with comprehensive coverage of the knowledge framework and includes examples of knowledge questions to help students recognise and decipher them.
- Teaches learners how to prepare and evaluate their work with support for the essay and the exhibition assessment, helping them to develop lifelong academic skills.
- Provides full coverage of the 2020 Subject Guide including the Core, Optional themes, and Areas of Knowledge.

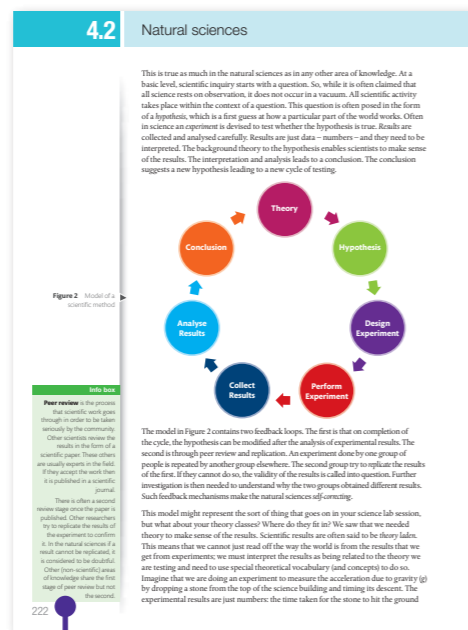


Scan this code to access free trials

Each chapter is structured to match the knowledge framework.

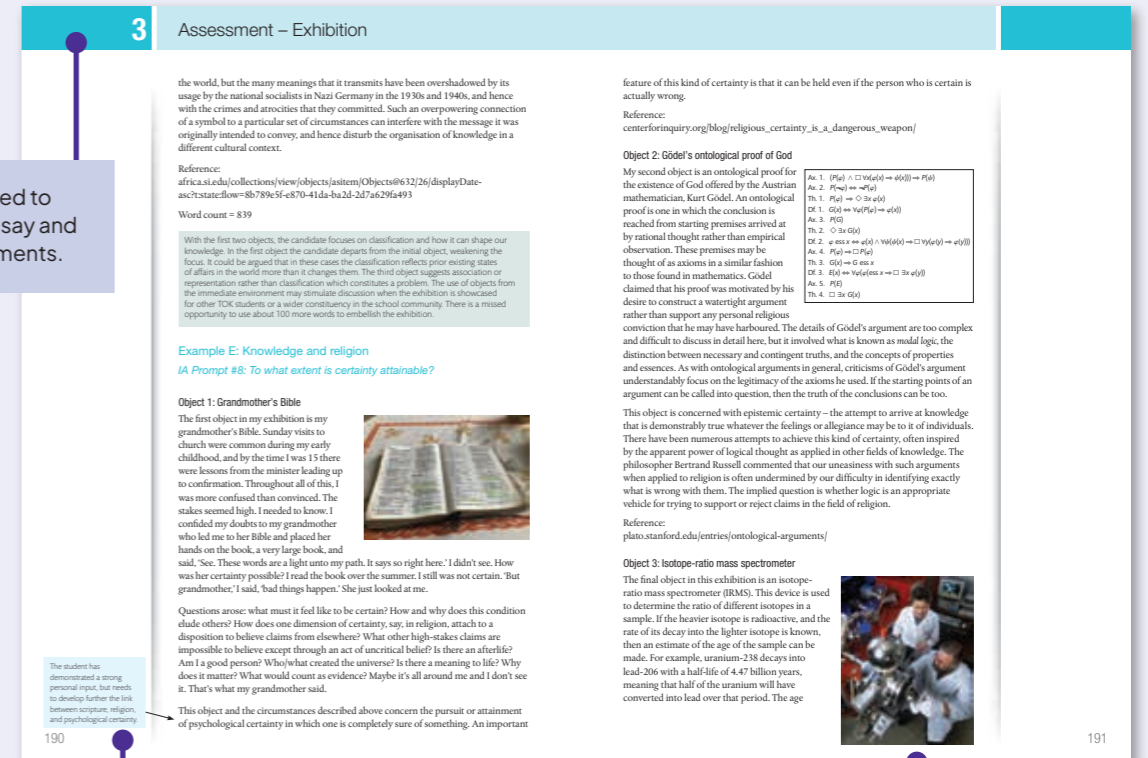


A wealth of ideas for individual and class activities.



Extra information for interest and further reading.

Chapters dedicated to support for the essay and exhibition assessments.



Examiners' comments to give further guidance.

Virtual exhibition objects to give students ideas for their own exhibition.

Meet the expert authors



Sue Bastian – Series Editor Explore Sue's new TOK Exhibition Game on pages 10–11

Sue Bastian has served the IB for over 40 years as a TOK teacher, workshop leader, examiner, textbook author and assessor, first in the Philippines and later at the UN School in New York City. She is now concentrating on designing lessons and instructional games for the TOK classroom.



Julian Kitching – Author

Julian Kitching has been involved with the IB for more than 35 years as a teacher of Biology and TOK, DP coordinator, workshop leader, curriculum review member, author and assessor while working at IB schools in Germany and Ghana. He is currently Head of the Secondary Division at Aves International Academy in the port city of Tema, Ghana.



Ric Sims – Author

Ric Sims has taught TOK for nearly three decades, as well as Economics, Philosophy, Maths and Music for the Diploma Programme. He has served on the examining team since the late 1990s, including more than a decade as an assessor. He has participated in four curriculum reviews, led workshops for TOK teachers, and is a regular keynote speaker.



TOK Exhibition Game



The only game available that supports TOK assessment



- Developed by TOK experts, Sue Bastian and Robin Press, in cooperation with the IB, to help your students prepare for their TOK Internal Assessment (IA) task.
- It is a rehearsal for the real thing – a learning by doing – to help students understand what they need to do to present their IA Exhibition.
- The Game is a simulation of the Exhibition with a scoresheet adapted from the Exhibition Assessment Instrument. The focus is on how TOK manifests in the real world.
- Available in English, French and Spanish.



“The size and feel and look of the colourful images all add to the way the game allows for imaginative responses and thoughtful connections. The ideas to include one blank object card, and two with sample object specifications were brilliant!”

I can't wait to use this edition of the game in my next TOK workshop. And I know teachers always want their own copy once they have tried it in our sessions. ”

Marilynne Sinclair, TOK Workshop Leader

What the game box contains

The Game box contains: 52 Object cards including 2 Sample Context cards and 1 blank card, 35 Prompt cards, Scoresheet card, and Teacher Guide.

How to play

1. Select a prompt

Students group into teams of four to six players and select a Prompt. They discuss possible interpretations of their Prompt and the issues about knowledge that it raises.



2. Choose the Objects

Each team chooses three Objects from the Gallery that link to their team's Prompt and give it a specific real-world context.



3. Discuss in teams

The teams justify how each of their three Objects contributes to understanding the knowledge question that the Prompt is asking.

4. Present to the group

Each team chooses a spokesperson to present their Exhibition to the class, explaining their justification for the inclusion of their three Objects in the Exhibition.

5. Mark the Presentation

The other teams mark the presentation based on the scoresheet, centred on the driving question: **Does the Exhibition successfully show how TOK manifests in the world around us?**

Does the Exhibition demonstrate how TOK manifests in the world around us?	Score				
	Team 1	Team 2	Team 3	Team 4	Team 5
Identifies a specific real-world context for each Object / 10					
Makes clear links between the Objects and the Prompt / 10					
Justifies the contribution of each of the Objects to the Prompt / 10					
Total / 30					

“The Exhibition Game is a rehearsal for the real thing – a learning by doing – to prepare students to tackle their IA with confidence!”

Sue Bastian and Robin Press, creators of The Exhibition Game



Studies in Languages and Literature

English A Literature

Written by IB expert authors to provide you and your students with comprehensive coverage of the requirements of the latest Subject Guide.

- Key terms from the Guide are explained and highlighted including concepts, areas of exploration and global issues.
- Inclusion of carefully selected, up-to-date, diverse texts to inspire learners.
- Activities to help strengthen appreciation and understanding of different works.
- Chapter insight summaries of the main points.
- Clear learning objectives and links to TOK throughout.
- Detailed support for the assessments including the Higher Level essay guidance.
- Intertextual connections and global issues highlighted.



Areas of exploration identified.

1.1 Approaches to learning in fiction

Activity 17 Intertextual links to natural science and mathematics
Scientist Brian Greene readily admits that the idea of parallel universes has applications in other fields, and even mentions Borges' story by name in his book, *The Hidden Reality: Parallel Universes and the Deep Laws of the Cosmos*.

[A]n early version of parallel universes resonated with themes of separate lands or alternative histories that were being explored in literature, television, and film, creative forays that continue today. My favorites since childhood include *The Wizard of Oz*, *It's a Wonderful Life*, the Borges story 'The Garden of Forking Paths'. Collectively, these and many other works of popular culture have helped integrate the concept of parallel realities into the engine and are responsible for fueling much public fascination with the topic.

1) In a small group, come up with a list of literary or other texts (films, TV series) in popular culture that explore time and space in parallel terms. What draws audiences to such narratives?
2) What is the significance of discussing the physics of time and space in a literary context? What might such intertextual connections yield beyond 'fueling much public fascination with the topic'?

Connections
In 2015, the manuscript for *The Garden of Forking Paths* was auctioned in New York for an estimated \$200,000–300,000. Beyond its merits as a quality detective fiction story, it is perhaps best known as the first example of hypertext, a key component of the World Wide Web that links one text to another in a seemingly endless maze.

Intertextual research activity:
Using the QR code and the internet, research Borges' connection to hypertext.

1) What types of articles did you find? Which subject areas are represented?
2) To what extent did this experience alter your understanding of Borges and/or *The Garden of Forking Paths*?
3) Why is it significant that Borges, a man of literature, is often cited as the original source for the idea of hypertext?

Activity 18 Lost and found in translation
For this activity you will read two different English translations of the last paragraph of *The Garden of Forking Paths* and then use a chart to compare your findings. Translation is an exercise in interpretation. While the translator's job is to accurately convey the meaning of the original text, meanings of words are often not exact, so different translations of the same text will include variations. As you complete the activity below, consider the following:

1) To what extent can different translations of the same text affect meaning?

Global issue
Work with a partner and discuss the global issue below. Record responses in your learner portfolio.

Why is it significant that so many cultures and nationalities are cobbled together in this story? What do such juxtapositions suggest about the connections between Nationalism, war, and culture?

TOK links. What is the significance of material objects such as books being able to produce a physical response? To what extent does this transformative energy apply to other objects? What is the effect?

Links to additional resources. A manuscript page from Borges' *The Garden of Forking Paths*.

Ideas for individual and group activities throughout.

Connections boxes highlight aspects of the text that ask learners to make connections.

Learning objectives at the start of every chapter.

Carefully selected, up-to-date, engaging and diverse texts from a huge range of works.

Detailed overview

Learning objectives
In this chapter you will...
• explore the question 'What is literature?'
• develop knowledge of the course through individual and collaborative activities
• engage with the aims of the IB literature course
• make connections between IB English A: literature and the IB philosophy course
• learn how the IB literature course is organised
• examine course areas of exploration:
• readers, writers, and texts
• time and space
• intertextuality
• understand how the areas of exploration are linked to the course concepts
• learn about the required assessments for IB literature
• explore the purpose of the learner portfolio.

What is literature?
As we write this, the definition of literature is shifting and expanding to reflect the world around us. In simple terms, literature represents the **culture, practices, and communications** of people. From the Latin *litterarius/litteratus*, literature translates to 'writing formed with letters'. Broadly speaking, civilisations from Egypt to China have celebrated literature in many forms, including texts that are spoken or sung. Ancient Greek poets such as Homer and Sophocles composed poems and plays such as *The Iliad* and *Oedipus Rex* that are still studied today. Such literature provides a window into different cultures and times. But literature is more than just a marker of civilisation: it can introduce us to fantastical worlds that are fuelled by pure imagination. Of course, not every book can be considered literature and the definition of what 'makes the cut' is often elusive. When British writer Aldous Huxley published his futuristic novel, *Brave New World*, in 1932, it was regarded by some critics as politicised propaganda. And yet today it is hailed as a timeless classic that helped define the *dystopian* genre.

The question remains: What is literature? While it is evident that instruction manuals or handbooks do not demonstrate literary merit, a quick internet search for a definition produces a wide range of results, revealing that there is no one accepted definition. 'For the times they are a-changin'', Bob Dylan proclaims through his music lyrics that earned him the Nobel Prize for Literature in 2016. As the definition of literature broadens, music and visual texts such as graphic novels are now classified as literature.

Activity 1 Why does literature matter?
While there is no one set definition of literature, consider the observations below from literary-minded individuals across the globe who derive meaning from literature in specific ways. For these individuals, literature:
• 'allows us to be open, to listen, and to be curious' (Tracy K Smith)
• 'is dangerous; it awakens a rebellious attitude in us' (Mario Vargas Llosa)
• 'becomes the living memory of a nation' (Aleksandr Solzhenitsyn)
• 'is one of the most interesting and significant expressions of humanity' (PT Barnum)
• 'sucks you into another psyche. So the creation of empathy necessarily influences how you'll behave to other people' (Barbara Kingsolver)
• 'plays a huge role in examining difficult real-life issues' (Angie Thomas)
• 'helps us transcend ourselves' (Mobsian Hamid).

1) Which statement above most appeals to you? Why?
2) Create your own statement about literature and share it with your peers.
3) What do you notice about the statements that you and your peers have written? To what extent do they overlap or differ?
4) What does this activity reveal about the nature of literature?
5) Write your responses in your learner portfolio.

Key terms highlighted and defined.

Free independent study pack

Help your students develop the IB Learner Profile traits with a FREE independent study pack, written by our expert authors. Download it at [pearsoninternational-schools.com/diploma](https://www.pearsoninternational-schools.com/diploma)



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About the authors



Jan Adkins

Jan Adkins is now retired after teaching English for 40 years, including 24 years teaching IB English. Jan was an Assistant Examiner for 15 years and has led training workshops for 25 years. She is the recipient of the Robert O Lawton Award for Teaching Excellence at Florida State University, and the Teaching Excellence Award at Eckerd College.



Michele Lackovic

Michele Lackovic currently teaches IB Diploma Programme courses, coordinates the CAS programme, and chairs the English Department at Suncoast Community High School in Florida. She also leads teacher training workshops and marks IB English A Literature exams as well as Extended Essays.



Language Acquisition

English, French and Spanish B

English B

Our resources are fully tailored to the 2018 Subject Guide, to teach and practise the key skills required for the reading, writing and listening assessments.

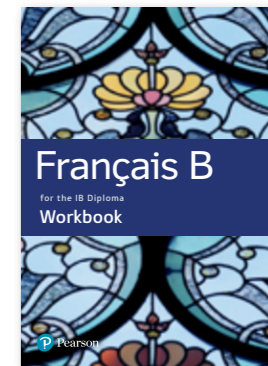
- Contains authentic text extracts, accompanied by a broad range of exercises, plus audio files for listening assessment practice in the eBook, to help students of all abilities prepare for their end of course assessment.
- Suitable for Standard Level and Higher Level students with clearly distinguished content.
- Support for the Internal Assessment.



French B and Spanish B

Our unique French and Spanish Workbooks provide flexible and focused independent practice to prepare your students for their end of course assessments.

- Exercises to prepare students for the reading, writing and listening assessments – with QR codes linking to extra content online, including audio.
- Students are encouraged to make the workbooks their own, writing in answers, highlighting and making notes – perfect for revision.
- The structure of the workbooks by prescribed theme means they can be used alongside, rather than instead of, other resources.
- TOK links integrated throughout.



Scan to access Free Spanish B Mini Unit Plans

TOK links throughout.

Tips for writing different text types.

1 Identities

Grammar in context

-ing form
Complete these sentences using a suitable verb in the -ing form

- 1 Try to stop him _____.
- 2 I like my teacher _____ grammar to me.
- 3 He keeps the central heating _____ all winter.
- 4 The girl couldn't forgive the boy for _____ her phone.
- 5 I miss her _____ me to school in the mornings.

by Alegria Lores
Below are the reflections of an educator who now lives in Costa Rica. Do you know where that is? Look online to find the location and see what else you can discover about Costa Rica.

What it means to be a Cuban-American-Costa Rican
by Alegria Lores
Answering the question "What is your native language?" is difficult for me. During my early years, my mother spoke to me in English and my father spoke to me in Spanish. She was from Minnesota, USA, and he was from Cuba. They lived in a Spanish-speaking area of Tangiers, Morocco, but we moved to New York City when I was three. There we lived among Hispanics, but school was in English. When I was nine my family moved to Costa Rica, where we settled. I married a Costa Rican and eventually adopted the Costa Rican citizenship in addition to my US citizenship.

My life has continued in this fashion, always immersed in a bilingual and bicultural environment. Depending on where it is, I become somewhat more fluent in that language – English or Spanish.

The advantages? Being equally comfortable attending school in either language, being able to translate and interpret in those languages, and the ability to have friends from many countries.

The disadvantages? Not identifying 100% with any one culture, feeling a bit like an outsider wherever I live, and people commenting "You have a different accent!" Would I choose to have it any other way? Absolutely not! I consider myself extremely fortunate to have had the opportunity to live and learn in two cultures and, as a result, be comfortable in both almost effortlessly!

Figure 1.2 Dried flowers in a Costa Rican market

Paper 1 practice task
Write a personal blog reflecting on your first language as it relates to your identity. Think about the following questions, plus any other ideas of your own when writing your blog.

- How does your life compare with Alegria's?
- How many countries have you lived in and how many languages have you learned?
- Do you agree with the advantages and disadvantages Alegria mentions? If not, explain your opinion.
- SL students should write 250–400 words. HL students should write 450–600 words.

Tips for writing a blog

- A blog is an online journal or informational website. It is usually started by one person who may then invite others to add their thoughts or comments.
- Before you start, decide:
 - why you are writing
 - what you want to say
 - which facts you want to include.
- Organize your ideas into paragraphs with key information and supporting details.
- Give your blog a strong heading and remember that people write blogs because they feel strongly about the topic.
- A blog is written in formal or semi-formal English. You can use phrases such as 'I strongly feel' or 'it is my opinion' because the style is often like a newspaper article.
- You must remember to show your knowledge of English by thinking about your choice of vocabulary and your use of correct grammar.

How is our identity formed?

Paper 2 practice listening task (1.1) – Alumni Speech Day
You will hear a speech made by an alumnus at his old school's Speech Day.

- 1 Complete the following gaps with words from his speech. Use no more than three words for each gap.
 - a Life in an office working at a desk is now (1).
 - b I was shy, physically weak, rather overweight, and (2) any kind of self-confidence.
 - c I grew older of course, but that alone wouldn't (4).
 - d I would still have been the boy people laughed at, who wasn't (5) anything, and was afraid of everybody.
 - e Sport was really popular then, as it is now, but PE classes were (6) to put it mildly.
- 2 What has Martin been doing since he left school?
- 3 List three of the problems Martin had as a teenager.
- 4 What did Martin do to escape his problems?
- 5 What effect did running have on Martin's self-confidence?
- 6 What is the real lesson the friend taught Martin?

Packed full of exam practice tasks.

Engaging, write-in format.

New vocabulary explained.

2 Expériences

2.2 L'immigration en question

Séance échauffement

Activité 1 : Immigration et vocabulaire
Regardez ces photos.
C'est où ? C'est quoi ?
Quels mots vous viennent à l'esprit ? Justifiez. (8 mots ou concepts)

Exemple : Un **bidonville** – Les personnes vivent dans des tentes de fortune et dans des conditions de vie insalubres. On dirait un bidonville.

Activité 2 : Immigration et définitions
1 Reliez les mots de la colonne de gauche à leur définition (dans le contexte de l'immigration).

1 un(e) sans-papier	Exemple : d	a Ligne « imaginaire » qui sépare un pays d'un autre pays
2 fuir son pays		b Personne qui a entamé une démarche légale pour obtenir l'autorisation de résider dans un pays
3 l'exil		c Renvoyer quelqu'un dans son pays d'origine
4 un(e) réfugié(e)		d Personne qui est entrée illégalement (clandestinement) dans un pays
5 un(e) demandeur / demandeuse d'asile		e Situation de quelqu'un qui a été forcé de quitter son pays
6 un(e) expatrié(e)		f Action de quitter son pays, souvent pour des raisons humanitaires ou politiques
7 accueillir		g Personne qui fait le choix de s'exiler pour des raisons professionnelles
8 un(e) étranger / étrangère	b Il / elle peut être politique ou climatique. Il / elle a été contraint(e) de quitter son pays d'origine et ne peut pas y retourner.	
9 une frontière	i Recevoir une personne / accepter un étranger sur son territoire	
10 expulser	j Personne qui vient d'un autre pays, ou d'une autre communauté ou d'un autre groupe. Personne qui ne m'est pas familière	

2 Choisissez quatre des mots de l'exercice 1 et écrivez quatre phrases pour exprimer une opinion sur l'immigration.

2.2 L'immigration en question

Activité 3 : Pourquoi partir ?
1 Réfléchissez aux raisons qui poussent parfois les gens à quitter leur pays natal. Dressez une liste de huit raisons.

2 Avec un(e) partenaire, essayez de justifier ces raisons. Le rôle de votre partenaire est d'essayer de vous convaincre que ce n'est pas une bonne idée et de contrecarrer vos arguments.
Exemple : En Europe, je pourrais trouver du travail et gagner de l'argent. Tu n'as pas les qualifications requises et le taux de chômage est élevé en Europe.

2.2.1 Immigration : positive ou négative ?

Avantages et problèmes

1 Faites une liste de cinq avantages et cinq problèmes que pose l'immigration :

- pour le pays où les personnes immigreront
- pour le pays dont les personnes sont originaires

À l'oral, justifiez / illustrez chacune de vos réponses.

Pour le pays où les personnes immigreront

BIENFAITS	PROBLÈMES
Exemple : un surcroît de main-d'œuvre pour le pays d'accueil	

Pour le pays dont les personnes sont originaires

BIENFAITS	PROBLÈMES
Exemple : La personne qui a émigré peut envoyer de l'argent à sa famille restée « au pays ».	

Approches de l'apprentissage
Complétez de communication et de collaboration

Approches de l'apprentissage
Complétez de communication et de collaboration

ATLs identified.



Individuals and Societies

NEW TITLES

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See pages 18–19

Psychology

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See page 17

Environmental Systems and Societies

- The third edition of our popular Environmental Systems and Societies for the IB Diploma Programme student book, fully revised in line with the 2024 Subject Guide, and providing comprehensive coverage of all eight topics and the HL lenses.

See page 20

Global Politics

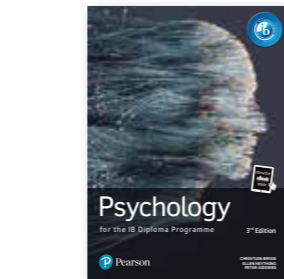
- Written by experienced IB teachers, this brand-new title has been developed for the new 2024 Subject Guide first assessment in 2026.

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- A first edition for the 2022 Subject Guide, using sustainable and ethical case studies to bring Business Management to life.

See page 22

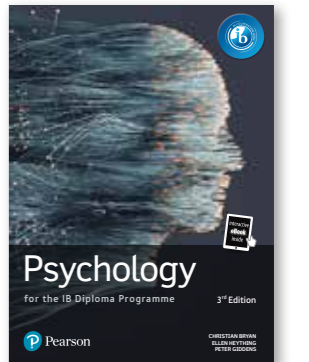


Psychology



This latest edition has been developed in cooperation with the IB in line with the 2025 Subject Guide.

- Written by experienced teachers, it provides thorough explanations of concepts, contents and contexts, as well as providing detailed examples to show how these interrelate. HL concepts are also explored in detail.
- Key studies are outlined and there are detailed examples of different research methods used by Psychology experts and professionals to help students form ideas for their own research methodology.
- Feature boxes help students to focus on specific areas of learning like TOK and critical thinking.
- Varied activities and comprehensive review questions help learners to recall what they have learned and consider their learning from different perspectives.
- Assessment support towards the end of the book includes advice on the exam at Standard and Higher Level, the IA, EE and TOK.
- Answers to practice questions are available in the eBook.



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Conceptual questions link the content to the six key concepts in Psychology. Understanding how these concepts connect to contents and contexts is key to understanding the subject.

Sociocultural Approach	Content														
<p>CAS activity 49</p> <p>Discuss these questions:</p> <ul style="list-style-type: none"> Why do people conform to group norms? Can you think of situations where conformity is beneficial? When might it be important to resist conformity? 	<p>Markus and Kitayama (1991) investigated how self-construals differ between individualistic and collectivistic cultures. Self-construals refer to how individuals define themselves in relation to others as independent from others or as interdependent with others. They found that people in individualistic cultures (for example, the United States) tend to have an independent view of the self, emphasizing personal goals, traits and achievements. In contrast, people in collectivistic cultures (for example, Japan) tend to have an interdependent view of the self, focusing on their roles and relationships within the group, and prioritizing group harmony and collective goals over individual ones.</p>														
<p>Cultural dimensions</p> <p>Cultures are made up of a set of attitudes, behaviors and symbols shared by a large group of people and are usually transmitted from one generation to the next. Cultural groups are characterized by different norms and conventions, and cultural norms can be assessed according to where they fall on various dimensions.</p> <p>Cultural dimensions refer to the academic framework used to describe and compare the underlying values, behaviors and attitudes that differentiate cultures from one another. These dimensions provide insight into how societies prioritize various aspects of life and interaction, impacting communication, business practices, government policies and individual behavior.</p> <p>One of the most influential theories in this area, Geert Hofstede, identified several key dimensions:</p> <ul style="list-style-type: none"> Power distance dimension: This dimension refers to the extent to which less powerful members of a society accept and expect power to be distributed unequally. Uncertainty avoidance dimension: This dimension assesses a culture's tolerance for ambiguity and uncertainty, influencing how strictly rules and regulations are followed in numerous unpredictable situations. Masculinity vs femininity dimension: This dimension assesses a culture's preference for achievement, assertiveness and material reward for success (masculinity) versus a preference for cooperation, modesty, caring for the weak and quality of life (femininity). <p>Another dimension is the individualism vs collectivism dimension.</p>	<p>Conceptual question</p> <p>Cultural dimensions provide a way to categorize and compare cultures, but how can we explore complex sociocultural contexts, such as power distance or individualism, in terms of observable, measurable behavior?</p> <p>This difference in self-construal influences various aspects of behavior such as communication styles, conflict resolution and decision-making. For instance, in individualistic cultures, direct communication and asserting one's opinion are valued, whereas in collectivistic cultures, indirect communication and maintaining social harmony are prioritized.</p> <p>However, while the study highlights cultural differences, it also implicitly suggests underlying human universals that transcend cultural boundaries. For instance, regardless of cultural background, all individuals navigate a complex interplay between the need for autonomy (associated more with individualism) and the need for belonging (associated more with collectivism). Every culture has mechanisms for addressing these fundamental aspects of human experience, albeit in different ways. The similarity lies in the universal human challenge of balancing self-interest with the interests of the group, which all societies must manage. Therefore, the study illustrates that, despite cultural differences in how self-concept is constructed and expressed, the underlying human needs driving these constructions, such as belonging, esteem and understanding, remain consistent across cultures.</p>														
<table border="1"> <thead> <tr> <th>In individualistic cultures:</th> <th>In collectivistic cultures:</th> </tr> </thead> <tbody> <tr> <td>the personal is emphasized more than the social.</td> <td>the social is emphasized more than the personal.</td> </tr> <tr> <td>individual autonomy and self-expression are encouraged, and people are viewed as unique.</td> <td>individual autonomy and self-expression are not encouraged.</td> </tr> <tr> <td>individual achievement is prioritized over the achievement of group harmony.</td> <td>the achievement of group harmony is prioritized over individual achievement.</td> </tr> <tr> <td>competitiveness and self-sufficiency are highly regarded.</td> <td>it is personal identity is heavily based on membership of the group.</td> </tr> <tr> <td>a priority is placed on the goals of the individual.</td> <td>it is priority is placed on the goals of important groups (e.g. extended families, social groups).</td> </tr> <tr> <td>conformity to group norms is low.</td> <td>conformity to group norms is high.</td> </tr> </tbody> </table>	In individualistic cultures:	In collectivistic cultures:	the personal is emphasized more than the social.	the social is emphasized more than the personal.	individual autonomy and self-expression are encouraged, and people are viewed as unique.	individual autonomy and self-expression are not encouraged.	individual achievement is prioritized over the achievement of group harmony.	the achievement of group harmony is prioritized over individual achievement.	competitiveness and self-sufficiency are highly regarded.	it is personal identity is heavily based on membership of the group.	a priority is placed on the goals of the individual.	it is priority is placed on the goals of important groups (e.g. extended families, social groups).	conformity to group norms is low.	conformity to group norms is high.	<p>CAS activity 50</p> <p>Write a story about this folk tale. Is a leader or is it being excluded by the group and, if so, what? Does this story tell us anything about your cultural tendencies to be more individualistic or collectivistic?</p> <p>Visit this website: https://www.bbc.com/culture/2019/01/190101-individualism-collectivism. Calculate your individualism and collectivism scores and consider what extent personal experiences and differences can be generalized to wider populations.</p>
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Activities allow learners to deepen their knowledge of Psychology independently or through discussion within their class.

Interesting facts in the margin provide extra insight and background to the subject.

TOK boxes help learners to see Psychology studies and research in the wider context of their learning.

Responsibility

Responsibility refers to the moral obligation to carry out research with integrity and with consideration and compassion for all stakeholders' well-being. This requires adhering to ethical guidelines, ensuring research validity and minimizing the risk of harm. Psychologists conduct research with human and animal participants, emphasizing respect and ethical treatment, and prioritizing informed consent, confidentiality, anonymity and voluntary participation in human research. For example, in a study that investigates the effects of social media on adolescents, researchers gain informed consent and ensure confidentiality and anonymity. In animal research, researchers consider efforts to minimize the risk of harm, such as using fewer animals and using alternatives such as computer modelling wherever possible. In animal research with adolescents, researchers would obtain informed consent from participants ensuring they understand the study's purpose and procedures and any risks to participants. The right to withdraw is made available to participants, minimizing the risk of coercion. Anonymity in data collection protects participants' privacy and allows for frank and honest responses that increase the data's reliability and validity.

Ethical principles

Ethical principles are frameworks that guide the priorities and decisions of psychologists and researchers, aiming to prioritize participants' welfare while maximizing benefits to the psychology community. Ethical principles shape research practices by influencing the choice of research topic and the design and procedure of studies. **Ethical considerations** apply to all aspects of research including informed consent, participant rights, confidentiality and anonymity. In a study examining the effect of alcohol consumption on aggression, researchers would obtain informed consent from participants ensuring they understand the study's purpose and procedures and any risks to participants. The right to withdraw is made available to participants, minimizing the risk of coercion. Anonymity in data collection protects participants' privacy and allows for frank and honest responses that increase the data's reliability and validity.



History

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Paper 1 – Focused Study

Political and Economic Transitions
Independence and Identity

Paper 2 – Thematic study

Conflict (from 750 CE onwards)
Authoritarian Rule (from 1750 CE onwards)

Paper 3 HL – Regional Study

The Americas
Europe
Asia and Oceania (digital teacher pack only)
Africa and the Middle East (digital teacher pack only)



The Second World War in Asia-Pacific, 1941–45

Checkpoints
What was Japan's strategic goal in launching attacks in December 1941? What was the 'island-hopping' strategy? How might you need to do some research. Why was Malaya so important to the Japanese? Name one tactical reason for the Japanese victory in Malaya.

Evaluating arguments and using evidence
The battle of Midway was very important to the outcome of the Second World War in the Asia-Pacific. In pairs, decide:
• How you would support this statement using evidence
• How you would engage against it
Check you have done this. Decide which argument is the more persuasive and why.

Defensive perimeter: The 'Absolute National Defense Zone.'
Although the 'island-hopping' strategy established a defensive perimeter in 1942–43 around the Great Asia Co-Prosperity Sphere, which stretched from the Aleutian and Kuril Islands in the north to the Solomon Islands and New Guinea in the south and included the Japanese homeland. It was made up of a series of 'stronghold' islands and outposts, defended with sophisticated tunnel and trench systems, bunkers (underground fortifications), airfields, naval bases, and troop garrisons. The aim was to discourage Allied counterattacks and protect sources of vital raw materials.

Activity 5
The island-hopping map which follows on page 8 shows the Solomon Islands and New Guinea. Find out where the Aleutian and Kuril Islands are. Why were they strategically important?

Japan itself was defended by thousands of similar fortifications, especially in coastal areas. Anti-aircraft, obstacles and barbed wire were also installed, and land mines laid. Kyushu, the southernmost main island, expected to be the first invasion point, was particularly heavily defended. All over Japan airfields were improvised from beaches, roads and public fields. There were even hidden or underground airfields from which kamikaze attacks could be launched. Factories, hospitals and command centres were moved underground.

As is shown by the Allied island-hopping described below, this strategy did not prevent steady Allied progress throughout 1942–45. The Japanese were not able to maintain defences over such a large area and were outnumbered and outgunned. Some of the fortified bases, such as Rabaul, near New Guinea, were bypassed by Allied offensives, which revealed a flaw in a static strategy which were against the Japanese preference for offensive warfare.

The final strategy: Trying to force a peace settlement
By 1943 the Japanese had little hope of avoiding defeat. Their strategy now was to make it clear to the Allies that victory could only be won at enormous cost. As we will see when analysing the American strategy of island-hopping, Japanese defenders often inflicted enormous casualties. The fortifications of the defensive perimeter often

Hints for success.
Historical skills boxes identify opportunities for learners to demonstrate effective use of skills.

The Second World War in Asia-Pacific, 1941–45

Figure 2.15 Mitsubishi Zero

as the US were producing new and better aircraft in huge numbers, mastery of the skies was almost complete. As we have seen, aircraft technology was hugely important to the Allied victory.

The atomic bomb
On 16 July 1945 President Truman received a coded message from Leslie Groves, director of the Manhattan Project, to confirm that atomic bomb testing had been successful. The first ever atomic bomb was dropped from a B-29 Superfortress bomber named after the pilot, Colonel Paul Tibbets's mother, on Hiroshima, Japan, on 6 August 1945. On 9 August 1945 a further attack on Nagasaki was carried out, also from a B-29. There is debate about the role of the atomic bomb in Hiroshima's decision to surrender.

Activity 8
In groups, answer the following questions:
1. What factors were influencing Hirohito's thinking about whether to surrender in August 1945?
2. Which of these factors were the most significant (choose one or two)?

Inquiry question: How did the conflict affect people's lives?

Conceptual focus: Perspectives
Understanding the impact of the war on people's lives requires engaging with a wide range of historical perspectives. These include those of local civilians, soldiers, collaborators, and resistance fighters, as well as later historians, each offering different interpretations. Survivors might focus on personal loss, suffering, and resilience, while outside observers might emphasise economic aspects and longer-term impact. The perspectives of women and marginalised groups, such as ethnic minorities, have often been overlooked both at the time and in posterity, but are now central to a fuller understanding. These accounts can both support and contradict each other, creating ambiguities that historians must investigate and interpret.

The First World War

Exam practice

Section A
Use the First World War (1914–18) as an example to answer the following questions.
1. Analyze how historical events can be considered to have short- and long-term consequences. Use one example from your Thematic Study to support your response. (4 marks)
2. Analyze how there could be diverse perspectives held by those who looked back on events. Use one example from your Thematic Study to support your response. (4 marks)
3. Analyze the ways in which societies can undergo historical change and continuity at the same time. Use one example from your Thematic Study to support your response. (4 marks)
4. Analyze how people can be historically significant because of their impact. Use one example from your Thematic Study to support your response. (4 marks)

Section B
Part 1
Use the First World War (1914–18) as an example to answer the following questions.
1. Explain how economic factors caused the conflict to arise. (4 marks)
2. Explain how mobilization of resources determined the outcome of the conflict. (4 marks)
3. Explain how social factors helped to establish peace in the conflict. (4 marks)

Part 2
Use the First World War and one other conflict from a different region as examples to answer the following questions.
1. To what extent were political factors the main cause of the conflict? Use at least two different conflicts from different regions to support your response. (15 marks)
2. To what extent were the experiences of marginalized groups the most important way in which conflict affected people's lives? Use at least two different conflicts from two different regions to support your response. (15 marks)

Checkpoints to help review and consolidate understanding.

Conceptual focus boxes explore inquiry-based links to the four historical concepts.
Exam practice questions help learners become familiar with the questions they are likely to encounter in their exams.

1 The First World War

Key concepts: Cause and consequence, Continuity and change, Perspectives, Significance

Inquiry question: Why did conflict emerge?

Line of inquiry: Political factors

Figure 1.1 Europe in 1900

Balance of power
To prevent conflict, it is important that no single country or group of countries becomes so powerful that it can overwhelm its rivals. Wars often happen because a country either (a) is encouraged to declare war because it is very confident of victory or (b) feels that a rival country is becoming so strong that it threatens its security. That is when the balance of power is threatened.

Activity 1
Find a map of Europe as it is today to compare with Figure 1.1, a map of Europe in 1900.
(a) What differences do you see in the frontiers of Germany?
(b) How many modern countries now occupy Austria-Hungary as it was in 1900?
(c) Now compare a map of Russia as it is today with a map of Russia in 1900 and list the differences.
(d) Why was control of the Straits of Constantinople so important for the Ottoman Empire and Russia?

Long-term political factor 1: The rise of nationalism and militarism in Europe, Germany, 1871–88
Germany was a relatively new country in 1914. It had only become unified in 1871, after defeating France in the Franco-Prussian War. This war led to the founding of the German Empire. Germany's rise to power was not only political. It also became a

Inquiry questions, Lines of inquiry and Specified content clearly labelled for easy navigation.

Activities linked to the ATL skills to help learners engage with the content.



Environmental Systems and Societies



Global Politics



Fully revised in line with the 2024 Subject Guide, this latest edition has been developed in cooperation with the IB.

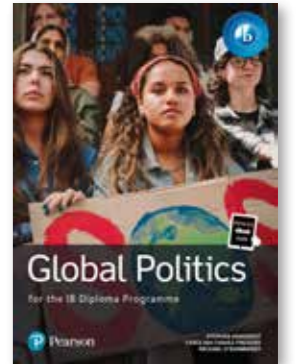
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- Self-contained real-world examples put learning into context, encouraging critical thinking and building awareness of environmental issues.
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- Chapters dedicated to TOK, the IA, EE, and exam strategies offer learners effective support with their assessments.
- Exercises and practice questions, including past-paper questions, provide opportunities for formative and summative assessment. Answers are available in the eBook.
- eBook resources include downloadable activities and auto-marked quizzes.



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- Matched to the syllabus outline to provide great flexibility, it offers full coverage of the Core, Thematic Studies, the Internal Assessment Engagement Project, and the Higher Level Extension.
- Learning outcomes listed at the start of each chapter, and clear links between concepts and HL themes, help learners focus and build a strong network of knowledge.
- Feature boxes provide extra support, context, and interest, while Activity boxes encourage learners to put knowledge into practice and show their understanding of key issues.
- Case studies include room for additional individual research helping learners make connections with the practical application of global politics issues.
- Additional chapters dedicated to Paper 1, Paper 2, Paper 3, TOK and the EE, plus a wide variety of practice questions throughout, offer learners support for their assessments.
- eBook resources include additional teacher support and auto-marked quizzes.



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1 Foundation

1.1 Environmental value systems

1.1.7 Environmental value systems

1.1.8 Environmental perspectives (worldviews) and their categories

Key fact boxes emphasise the main learning points and provide definitions of key terms.

Hints for success boxes.

Global application boxes help learners make real-world links.

Peace and conflict

Thematic studies

Concepts

Learning outcomes

Peace

Conceptual question

Activities throughout.

Key fact boxes summarise the main learning points.

TOK boxes encourage consideration of knowledge issues in context.

Learning outcomes at the start of each chapter link to the concepts.



Business Management

Developed for the 2022 Subject Guide, using sustainable and ethical case studies to bring Business Management to life.

- Written and reviewed by experienced IB teachers with combined IB experience of more than 50 years, using our tried-and-tested approach to the Diploma Programme in this subject for the first time.
- Comprehensive coverage of the five course units and a clear introduction to the business management toolkit, which is signposted throughout.
- Clearly differentiated Higher Level content.
- Emphasis on conceptual understanding and inquiry questions to focus learners and transform them into active thinkers.
- Integrated references to TOK and the IB Learner Profile throughout.
- Sustainable and ethical case studies bring the subject to life in context, and help to build awareness of real-world business management.
- Guidance on Internal and External Assessment, including practice exam-style questions. Answers to practice questions can be found in the eBook.
- Links to engaging online resources to consolidate knowledge and explore topics further.
- Full glossary of subject-specific terms.



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1 Introduction to business management

Primary sector

- Extracts and uses natural resources
- Example: Forestry

Secondary sector

- Produces goods from natural resources
- Example: Furniture manufacturers and furniture stores

Tertiary sector

- Provides services
- Example: Carpentry services, such as making or repairing furniture

Quaternary sector

- Provides consultancy
- Example: Social media marketing for furniture store

Figure 1.2 Business sectors which aggregate to form the chain of production

developing economies (labour intensive), while in more developed economies, they make more use of machinery to extract the materials (capital intensive). The type of products produced by primary sector businesses have lower value added than the difference between the cost to extract the natural resource and the price at which it is sold. Natural resources or raw materials are sold, without any modifications, to other businesses or consumers. In the primary sector, there is not much difference between the cost and price of the product sold.

Secondary sector

The secondary sector consists of businesses that manufacture goods using natural resources and raw materials provided by the primary sector. For example, a business that buys oranges from the primary sector and transforms them into bottled orange juice is a secondary sector business.

These products have more value added as they have been transformed before being sold to customers. These customers might be local or international. Globalization has made it common to trade these goods with different parts of the world.

Tertiary sector

A business that sells services to consumers or other businesses, such as a bank, transportation company or insurance company, belongs to the tertiary sector.

In developed economies, the tertiary sector is more significant because people specialize in the provision of services that have higher value added.

The tertiary sector tends to employ a larger proportion of the labor in developed countries than in developing countries. According to the International Labour Organization (ILO), in Europe, more than 60 percent of the jobs created in 2021 were created in the tertiary sector. This figure falls to less than 35 percent in Africa.

Quaternary sector

The quaternary sector is comprised of businesses that provide services such as consultancy, research and development (R&D), information services or technology services. This sector requires a highly educated workforce because these services require deep knowledge of the areas in which businesses operate.

One example of the type of activity these businesses deal with is the creation of vaccines. This sector has experienced significant growth in recent years.

Case study – Repsol

Repsol is a global energy company that operates in more than one sector across different countries.

One of the things the company does is to extract crude oil from the ground (primary sector) in places like South America and North America.

They then process the oil and transform it into fuel (secondary sector) in operations fields like the Shaw field located in the United Kingdom's North Sea.

Conceptual understanding: Ethics

An ethical business is one that tries to minimize any negative impact on the environment, its workforce or society. Ethical behavior can originate in a business' single as well as customer loyalty.

Research and inquiry

Using an online search engine, find some examples of ethical businesses.

Interesting information boxes to inspire learners to make links to real-life contexts.

Concepts highlighted and explained.

Engaging global case studies to bring the subject to life.



Economics

Latest edition fully matched to the 2020 Subject Guide, designed to develop students' understanding of real-world Economics.

- Written by highly experienced authors.
- Well-structured and signposted material based around clear learning outcomes.
- Clearly differentiated content for both Standard Level and Higher Level learners.
- Specifically developed for international learners with global examples and case studies.
- Glossary of key Economics terms.
- Links to TOK highlighted throughout.
- Specific guidance on Internal and External Assessment (Papers 1, 2 and 3 and the EE), including practice exam questions.
- Worksheets, revision quizzes and links to online videos in the eBook.



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Up-to-date global case studies bring the learning to life.

15 Macroeconomic objective: low unemployment

Examples of people who are part of the labour force include the following.

- A part-time retail sales clerk, who is also going to college, is part of the labour force because she is employed.
- A full-time nurse is part of the labour force because he is employed.
- A factory worker whose plant closed and who is applying for jobs at other firms is part of the labour force because she is unemployed.
- A recent college graduate interviewing at different companies for his first job is part of the labour force because he is unemployed.

Examples of people who are not part of the labour force include the following.

- A stay-at-home parent is not part of the labour force because he or she is not employed nor seeking employment.
- A college graduate who volunteers in a community centre is not part of the labour force because, although she is working, she is not formally employed nor is she seeking employment.
- A discouraged worker who has been looking for a job for 18 months but has given up the job search is not part of the labour force because he is no longer seeking employment.
- An engineer who goes back to school to earn a teaching degree is not part of the labour force because she is not currently seeking employment.

Figure 15.1 Average unemployment rates for 17 selected developed and developing countries, 2018–20

Figure 15.1 can be compared with confidence despite the fact that the figures reported by each individual nation may vary due to different methods of collection.

Unemployment rates vary across countries depending on the current macroeconomic conditions and institutional factors in each, such as the existence of social safety nets, the education levels of the workforce and the evolving structures of the economy, among others.

Worked example 15.1

In 2019 Brazil's labour force totalled approximately 186 million people. The number of people of working age, but who were unable to find work (the unemployed) in Brazil totalled 12,751,800.

What is Brazil's unemployment rate?

$$\text{Unemployment rate (UR)} = \frac{\text{number of unemployed}}{\text{labour force}} \times 100$$

$$= \frac{12,751,800}{106,000,000} \times 100$$

$$= 12.03\%$$

What are the difficulties in measuring unemployment? Methods of data collection

The source and method of calculating the unemployment rate can vary significantly, affecting the degree of comparability between countries. One method is to report unemployment claims. Another is to rely on survey data of thousands of people. Counting unemployment benefit claims may underestimate the actual rate of unemployment, especially during prolonged recessions, which may last longer than the period of time government provides benefits to unemployed workers. Survey methods are often considered more reliable but may also miss marginal populations (immigrants, undocumented workers) that are unlikely to be captured by household surveys.

Disparities by group

Subgroups within the broad population may have higher or lower unemployment rates than the overall national figure.

- **Regional disparities:** Larger countries tend to have greater variance than smaller ones. Turkey is among the countries with the largest variance, with a 20-point difference between regions with the lowest and highest rate.
- **Ethnic/racial disparities:** Unemployment rates are typically higher among ethnic minorities, especially those that have experienced formal and informal discrimination. Countries that identify indigenous populations typically also report higher unemployment rates among those populations.

TOK

It is often the case that two or more accounts observing an identical set of macroeconomic data (such as the unemployment rate for a particular country), arrive at very different interpretations of events. How can an ability to understand different perspectives account for this difference?

Areas for further inquiry or research highlighted.

Worked examples show how to carry out calculations in detail.

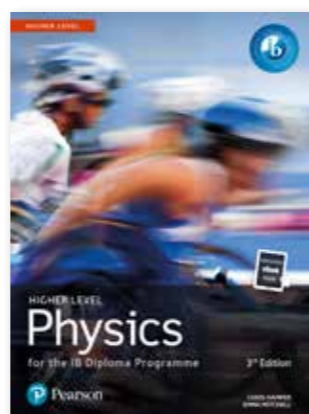
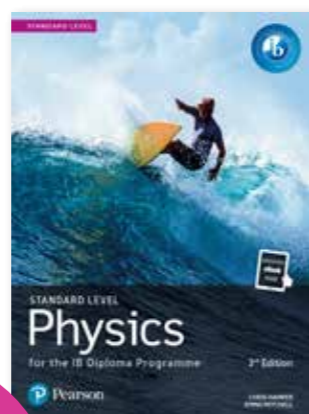
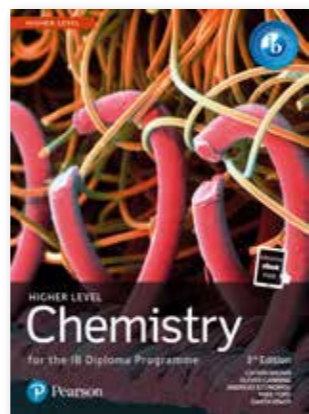
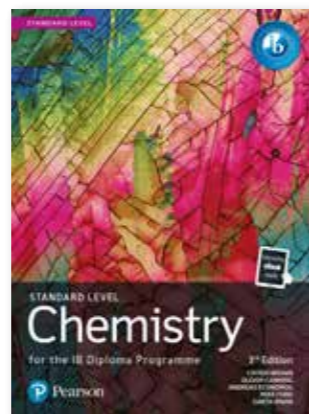
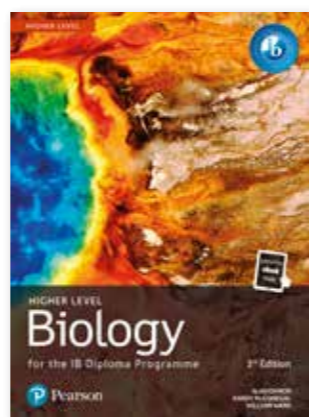
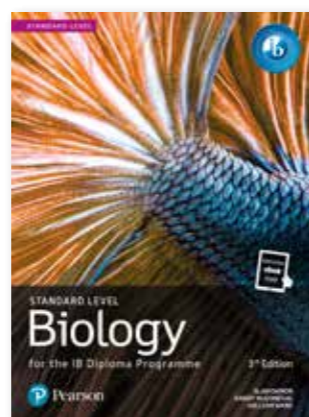
TOK integrated throughout.

Highly visual graphs and topical examples.



New editions of our popular Biology, Chemistry and Physics student books, fully revised in line with the 2023 Subject Guides and developed in cooperation with the IB.

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Available for Standard Level and Higher Level

Tried-and-tested features

Nature of Science boxes included as related themes and questions arise.

CONTINUITY AND CHANGE D4.1 Ecosystems

Humans can breed organisms to increase what we see as desirable characteristics, for example higher yields in crops such as wheat, or greater milk production in cattle. This process, known as **artificial selection**, is performed by selective breeding: humans decide which organisms have the most desirable traits and breed them together, hoping for offspring with enhanced features.

Natural selection and antibiotic resistance
Antibiotic resistance in bacteria is a modern example of natural selection. What is striking is its rapidity. Although evolution is generally considered to be a long-term process, the mechanism of natural selection can sometimes be quick, taking place over months, years or decades, rather than millennia. As you read the description below, see if you can identify the main features of how natural selection works.

Antibiotics are medications such as penicillin that kill or inhibit the growth of bacteria. They are given to patients suffering from bacterial infections. However, overuse of antibiotics has led to resistant strains of bacteria.

Antibiotic resistance in bacteria develops over several steps. Consider the following scenarios.

1. A woman gets tuberculosis, which is a bacterial infection.
2. Her doctor gives her an antibiotic to kill the bacteria.
3. She gets better because the vast majority of bacteria are destroyed.
4. Thanks to a pre-existing variation in its genetic makeup, however, one bacterium is resistant to the antibiotic.
5. That bacterium is not killed by the antibiotic and it later multiplies in the patient's body, making her sick again. With all the other bacteria dead, there is little competition for space and food so the mutant strain is able to flourish.
6. She feels unwell again and goes back to the doctor and gets the same antibiotic.
7. This time, the antibiotic does not make any difference: she is still sick and asks her doctor what is wrong.
8. The doctor prescribes a different antibiotic that (hopefully) works. But if the population of bacteria continues to contain mutations, new strains could display resistance to all the antibiotics available.

Notice how, unlike a soybean plant that has been intentionally artificially bred to have beneficial characteristics such as high protein yields, the production of antibiotic-resistant bacteria has happened by natural selection because of decisions humans made: the intention had not been to generate superbugs.

The development of antibiotic-resistant bacteria has happened more than once. New strains of *aphis*, for example, have adapted to antibiotics and show multiple resistance. Some strains of tuberculosis are resistant to as many as nine different antibiotics. There may be no cure for people who get sick from such super-resistant genes; they may have to rely on their own immune system to recover.

Finding new antibiotics is only a temporary solution, and pharmaceutical companies cannot find new medications fast enough to treat these super-resistant genes. As a result, the best way to stop these organisms is to make sure that doctors minimize the use of antibiotics and that patients realize that antibiotics are not always the best solution to a health problem.

Nature of Science
A *Staphylococcus* bacterium discovered in a hospital is suspected of being resistant to a certain number of antibiotics. To test this hypothesis, the bacterium is introduced into a Petri dish along with small discs of paper that are soaked in different types of antibiotics. In an experiment like this, when the colonies of bacteria grow close to the discs, they show resistance to the antibiotic, whereas when wide, clear circles of inhibited bacterial growth are present, they show that the antibiotic is stopping the bacteria the way it should. Can you interpret the results of the experiment shown in the photo?

Doctors use such tests to help decide which medications to prescribe. In this case, they should prescribe the antibiotics that the bacteria do not show a resistance to, preferably the three at the bottom of the image. This resistant bacterium is part of a growing number of super bugs, among which we find MRSA, which stands for methicillin-resistant *Staphylococcus aureus*. Resistant bacteria have evolved because of the way humans use antibiotics.

In some countries, there is an intense debate about whether the concept of evolution should be taught in schools. To support the critics of evolution, there are thousands of websites and publications that carefully try to dismantle and disprove the arguments of evolutionary biologists. What criteria are used to determine whether these criticisms are valid or not? What kind of evidence would be necessary to refute Darwin's theory?

Guiding question revisited
What processes can cause changes in allele frequencies within a population?

In this chapter you have learned that:

- which versions of genes (alleles) are present in a population and the proportions in which they are found can change over time
- if the environment changes or there is another selective pressure on a population, the frequencies of alleles can be modified by natural selection
- abiotic changes, such as temperature, humidity or pH, can contribute, as can biological factors, such as the presence of predators.
- Organisms within a species compete with each other for resources – this is intraspecific competition.
- The individual which is best suited to the environment is more likely to survive to reproduce and pass on its genes.

Global application boxes emphasise the importance of science in an international context.

TOK boxes stimulate thought and consideration of knowledge issues as they arise in context.

Skills boxes link to ideas for lab work and activities to support learning and help prepare for the Internal Assessment.

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Power
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Power is defined as:

$$\text{power} = \frac{\text{work done}}{\text{per unit time}}$$

The unit of power is the J s^{-1} which is the same as the watt (W). Power is a scalar quantity.

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A power lifter is someone who can lift heavy weights, so should we not say they are strong people rather than powerful? A power lifter certainly is a strong person if they are good at it but they are also powerful. This is because they can lift a big weight in a short time.

Worked example
A car of mass 1000 kg accelerates from rest to 100 km h^{-1} in 5 seconds. What is the average power of the car?

Solution

$$100 \text{ km h}^{-1} = 28 \text{ m s}^{-1}$$

$$\text{gain in kinetic energy of the car} = \frac{1}{2} m v^2 = \frac{1}{2} \times 1000 \times 28^2 = 392 \text{ kJ}$$

If the car does this in 5 s, then:

$$\text{power} = \frac{\text{work done}}{\text{time}} = \frac{392}{5} = 78.4 \text{ kW}$$

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We know that to do work requires energy, but work can be done quickly or it can be done slowly. This does not alter the energy transferred but the situations are certainly different. For example, we know that to lift one thousand 1 kg bags of sugar from the floor to the table is not an impossible task – we can simply lift them one by one. It will take a long time but we would manage it in the end. However, if we were asked to do the same task in 5 seconds, we would either have to lift all 1000 kg at the same time or move each bag in 0.005 s both of which are impossible. Power is the quantity that distinguishes between these two tasks.

Power is defined as:

$$\text{power} = \frac{\text{work done}}{\text{per unit time}}$$

The unit of power is the J s^{-1} which is the same as the watt (W). Power is a scalar quantity.

Example 1: The powerful car
We often use the term power to describe cars. A powerful car is one that can accelerate from 0 to 100 km h^{-1} in a very short time. When a car accelerates, energy is being transferred from the chemical energy in the fuel to kinetic energy. To have a big acceleration, the car must gain kinetic energy in a short time; hence be powerful.

Example 2: Power lifter
A power lifter is someone who can lift heavy weights, so should we not say they are strong people rather than powerful? A power lifter certainly is a strong person if they are good at it but they are also powerful. This is because they can lift a big weight in a short time.

Worked example
A car of mass 1000 kg accelerates from rest to 100 km h^{-1} in 5 seconds. What is the average power of the car?

Solution

$$100 \text{ km h}^{-1} = 28 \text{ m s}^{-1}$$

$$\text{gain in kinetic energy of the car} = \frac{1}{2} m v^2 = \frac{1}{2} \times 1000 \times 28^2 = 392 \text{ kJ}$$

If the car does this in 5 s, then:

$$\text{power} = \frac{\text{work done}}{\text{time}} = \frac{392}{5} = 78.4 \text{ kW}$$

Challenge yourself
A 200 g red ball traveling at 6 m s^{-1} collides with a 500 g blue ball at rest, such that after the collision the red ball travels at 4 m s^{-1} at an angle of 45° to its original direction. Calculate the speed of the blue ball.

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Power
We know that to do work requires energy, but work



Mathematics

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6 Trigonometric functions and equations

(b) (i) $135^\circ = 3(45^\circ) = 3\left(\frac{\pi}{4}\right) \Rightarrow \frac{3\pi}{4}$
(ii) $150^\circ = 5(30^\circ) = 5\left(\frac{\pi}{6}\right) = \frac{5\pi}{6}$
(iii) $175^\circ \left(\frac{\pi}{180^\circ}\right) = 3.0543 = 3.05 \text{ (3 s.f.)}$
(iv) $10^\circ \left(\frac{\pi}{180^\circ}\right) = 0.17453 = 0.175 \text{ (3 s.f.)}$

Figure 6.5 Arcs with lengths equal to the radii subtending angles of a circle.

Figure 6.6 Diagram and tables for common angles.

Figure 6.7 Circle knowledge.

Example 6.4
The diagram shows a circle of centre O with radius $r = 6$ cm. Angle AOB subtends the minor arc AB such that the length of the arc is 10 cm. Find the measure of angle AOB in degrees, accurate to 3 significant figures.

Solution:
Rearrange the arc length formula, $s = r\theta$, giving $\theta = \frac{s}{r}$. Remember that the result for θ will be in radians. Therefore, angle $AOB = \frac{10}{6} = \frac{5}{3}$ or 1.6 radians. Now, we convert to degrees: $\left(\frac{5}{3}\right) \left(\frac{180^\circ}{\pi}\right) = 95.49297^\circ$. The degree measure of angle AOB is approximately 95.5° .

Geometry of a circle

Area of a sector
The formula for an angle θ in radians is $A = \frac{1}{2}r^2\theta$. The formula for an angle θ in degrees is $A = \frac{1}{2}r^2\theta \frac{\pi}{180}$.

Example 6.3
A circle has a radius of 10 cm. Find the length of the arc of the circle subtended by a central angle of 150° .

Solution:
To use the formula $s = r\theta$, we must first convert 150° to radian measure:
 $150^\circ = 150 \left(\frac{\pi}{180^\circ}\right) = \frac{5\pi}{6}$
Substituting $r = 10$ cm into $s = r\theta$ gives
 $s = 10 \left(\frac{5\pi}{6}\right) = \frac{25\pi}{6} = 26.17994$ cm
The length of the arc is 26.2 cm (3 s.f.).

- Worked examples to show how to tackle problems.
- Key facts for emphasis of important points.
- Hints and tips to help learners answer questions.

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GOOD TO KNOW

- Also developed by Ibrahim Wazir, our MYP Mathematics resources follow the same inquiry-led approach, offering your learners consistent and effective maths learning. Find out more on page 4.



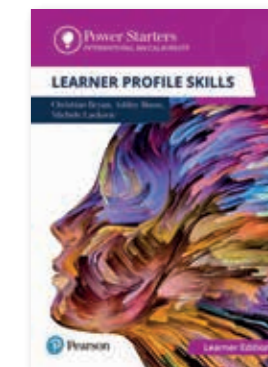
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Diagnostic tests identify any gaps in the skills and knowledge learners need to start their new course successfully.

TOPIC 2: STOICHIOMETRY AND ANALYSIS

SKILLS CHECK 1

This test is designed to check skills and knowledge in this topic. It should be completed without any outside assistance and should take no longer than 30 minutes. After completion, the mark scheme will help you decide what intervention is needed.

- Give the relative formula mass for the following compounds:
 - a CO_2 (1 mark)
 - b $(\text{NH}_4)_2\text{SO}_4$ (1 mark)
- Balance the following equations:
 - a $\text{C}_2\text{H}_6 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ (1 mark)
 - b $\text{N}_2 + \text{H}_2 \rightarrow \text{NH}_3$ (1 mark)
- Determine the number of carbon atoms in 0.025 moles of pentane, C_5H_{12} (1 mark)
- Calculate the mass of 0.00945 moles of aluminium oxide, Al_2O_3 (1 mark)
- Give the empirical formula for the following compounds:
 - a NH_3 (1 mark)
 - b P_2O_5 (1 mark)
 - c Al_2O_3 (1 mark)
- Phenylendiamine, a compound used to make polymers such as Kevlar, has the following percentage composition: C, 66.6%; H, 7.5%; N, 25.9%. Use this data to determine the empirical formula for phenylendiamine. (3 marks)
- The relative formula mass of phenylendiamine is 106.16. Use this information to determine the molecular formula of phenylendiamine. (2 marks)
- The reaction of zinc sulfide, ZnS , with oxygen, O_2 , at high temperatures can produce zinc oxide, ZnO , and sulfur dioxide, SO_2 .

$$2\text{ZnS} + 3\text{O}_2 \rightarrow 2\text{ZnO} + 2\text{SO}_2$$
 Determine the number of moles of zinc oxide that will be formed in a reaction where:
 - a 0.40 moles O_2 is reacted with excess zinc sulfide (1 mark)
 - b 175 moles of sulfur dioxide is formed. (1 mark)
- Copper oxide, Cu_2O , can be formed by combining copper metal with oxygen, O_2 , at high temperatures:

$$2\text{Cu} + \text{O}_2 \rightarrow 2\text{Cu}_2\text{O}$$
 a If 4.76 g of copper is reacted with 4.00 g of oxygen, what is the mass of copper oxide that can be formed? (4 marks)
- When the reaction was conducted with the masses given in part a an experimental yield of 5.37 g of copper oxide was obtained. What was the percentage yield for the reaction? (1 mark)
- 33.0 g of sugar (sucrose, $\text{C}_{12}\text{H}_{22}\text{O}_{11}$) is dissolved in water to make 355 cm³ of solution. Determine the concentration in mol dm⁻³. (3 marks)
- 25.00 cm³ of a potassium hydroxide solution, KOH(aq) , of unknown concentration was titrated with a sulfuric acid solution, $\text{H}_2\text{SO}_4(\text{aq})$, that had a concentration of 1.00 mol dm⁻³:

$$2\text{KOH(aq)} + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{K}_2\text{SO}_4(\text{aq}) + 2\text{H}_2\text{O(l)}$$
 Determine the concentration of the potassium hydroxide solution if the equivalence point was reached after the addition of 19.85 cm³ of the sulfuric acid solution. (3 marks)
- A solution of hydrogen peroxide (H_2O_2) has a concentration of 0.8 mol dm⁻³.
 - a Determine the concentration of 65.0 cm³ of this solution is diluted to a volume of 1.000 dm³ by adding water. (1 mark)
 - b What volume of the original hydrogen peroxide solution must be used to make 250.0 cm³ of a solution with a concentration of 0.00100 mol dm⁻³. (1 mark)

Total = 29 marks

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Intervention lesson plans and content written by IB subject experts.

TOPIC 2: STOICHIOMETRY AND ANALYSIS

TEACHING GUIDE 1

Lesson 1: Compounds and balancing equations

Skills

- To be able to calculate the relative formula mass for a compound from relative atomic masses.
- To understand the significance of subscripts and coefficients in chemical formulae and chemical equations.
- To be able to balance chemical equations.

Timing 1 hour

25 min

- Ask learners to read the sections on **Chemical compounds and Relative formula mass** in the **Support notes**, including the worked example.
- Ask learners work in groups or pairs and assign each a simple reaction of two elements to form a compound, such as $\text{Mg} + \text{Cl}_2 \rightarrow \text{MgCl}_2$ or $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$.
- Confirm through their investigation of these reactions that learners understand the key concepts:
 - Chemical compounds are formed when different elements bond/combine in fixed ratios.
 - Chemical compounds have different properties from the elements they are made from.
 - Compounds are described using chemical formulae that use the atomic symbols of the elements in the compound.
 - Subscripts are used in the chemical formula to show when more than one atom of an element is present in the compound.
- Ask learners determine the relative atomic or relative formula masses for the reactants and products in the assigned reaction to confirm that they understand the key concept.
- The relative formula mass of a compound is calculated by adding the relative atomic masses of all the elements present in the compound.
- Ask learners to confirm their understanding by completing **question 1** at the end of the **Support notes** and checking their answers.

25 min

- Ask learners to read the section on **Balancing chemical equations** in the **Support notes**, including the worked example.
- Confirm through discussing with the class, or directing questions, that learners understand from the examples in the text, and/or the worked example, that they understand the key concepts:
 - Reactants are on the left side and products are on the right side of the arrow in a chemical equation.
 - Balanced chemical equations have the same number of atoms for each element on the reactants side and the products side.
 - State symbols can be included in chemical equations to provide extra information about the states of reactants and products.
- Ask learners to confirm their understanding by completing **question 1** at the end of the **Support notes** and checking their answers.

5 min

- If time allows, ask learners to summarise through class discussion the key understandings they have gained from the lesson.

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Identify and tailor lesson plans to learner needs.

Check that the skills and knowledge from the lessons have been embedded with end of topic tests.



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DID YOU KNOW

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7-8	Year 3	Key Stage 2	Grade 2	
8-9	Year 4		Grade 3	
9-10	Year 5		Grade 4	
10-11	Year 6		Grade 5	
11-12	Year 7	Key Stage 3	Grade 6	MYP
12-13	Year 8		Grade 7	
13-14	Year 9		Grade 8	
14-15	Year 10	Key Stage 4	Grade 9	
15-16	Year 11	GCSE / International GCSE	Grade 10	
16-17	Year 12	Key Stage 5	Grade 11	
17-18	Year 13	AS / A Level / International A Level	Grade 12	

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