Pearson

International Baccalaureate® Resources Catalogue 2020

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- 25 subjects covered
- 148 expertly-written textbooks
- 4,000+ interactive learning activities
- A pair of shoes with built-in jetpacks*

*OK, the jetpack bit isn't true, but we know that pointless gadgets aren't really what you need to teach the IB curriculum. What you need is a clear, effective and well-signposted toolkit. So, we've made sure all our resources are well-researched, clearly laid out and full of simple, practical ideas.

Everything you need, nothing you don't.
And no jetpack shoes. Sorry.

Welcome!

Our comprehensive resources are well-researched, carefully crafted, and written by experts to ensure they provide IB learners with what they need for their IB journey.

Using an international inquiry-based approach, our **PYP Readers and Companions Programme®** motivates learners to develop important early reading strategies.

Pearson's International Mathematics for the Middle Years* is our best-selling, five-book series, giving learners the opportunity to learn mathematics with a global perspective.

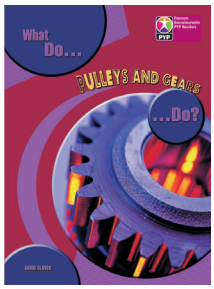
Our high-quality **Diploma textbooks** for the IB are written by leading IB experts, and every title comes with a free enhanced eBook for on-the-move learning.

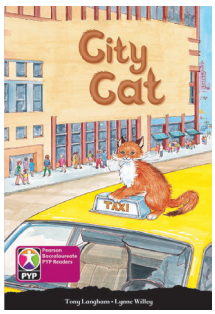
The accompanying **Essentials Series** is the perfect solution for your Diploma learners' revision needs. Clearly written with model answers, they're perfect for EAL learners too!

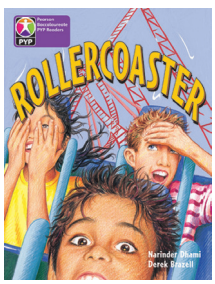
* Middle Years Programme (MYP) and Diploma Programme (DP) are trademarks of the International Baccalaureate Organisation (IB), which was not involved in the production of these products.

Contents

Primary Years Readers and Companions Programme







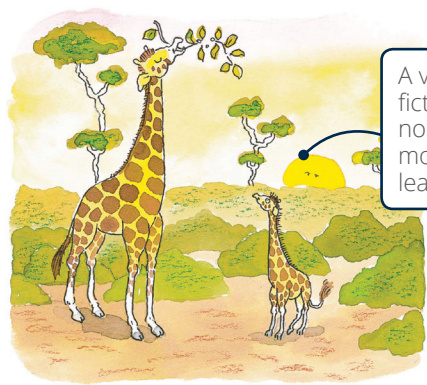
Our PYP Readers and Companions are specially designed to motivate younger learners and help them develop vital inquiry-based reading strategies.

This collection of 120 inquiry based readers provide plenty to explore, in line with the IB PYP core principles.

A ready made library of 120 titles, clearly categorised by age and organised into themes. These Readers span the six units of inquiry and come with nine Companions to support your PYP pupils with their learning.

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.

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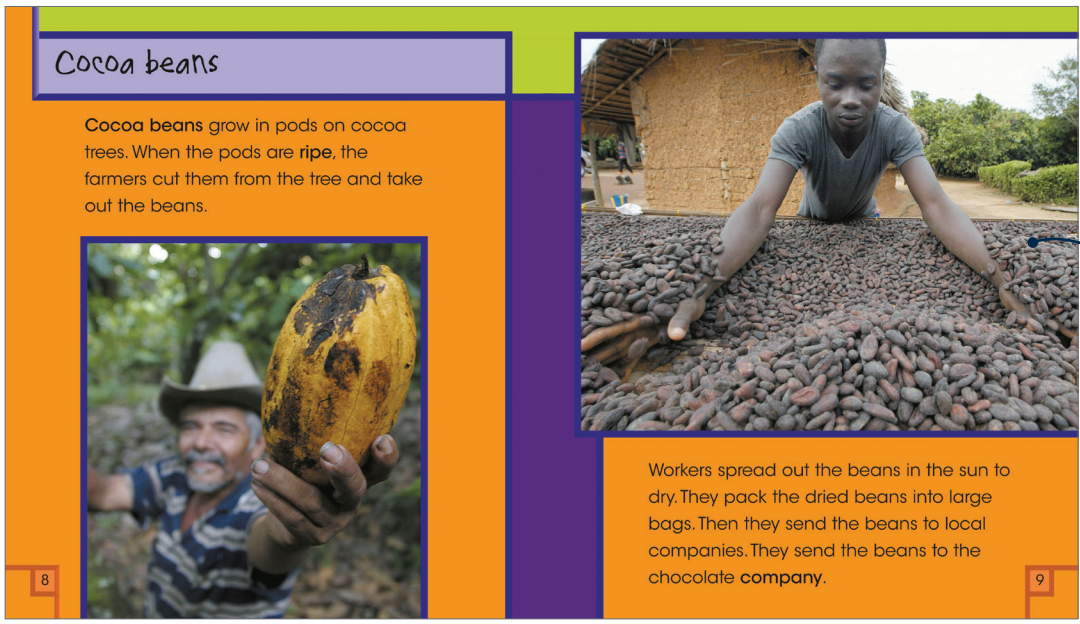
A variety of fiction and non-fiction will motivate all learners.

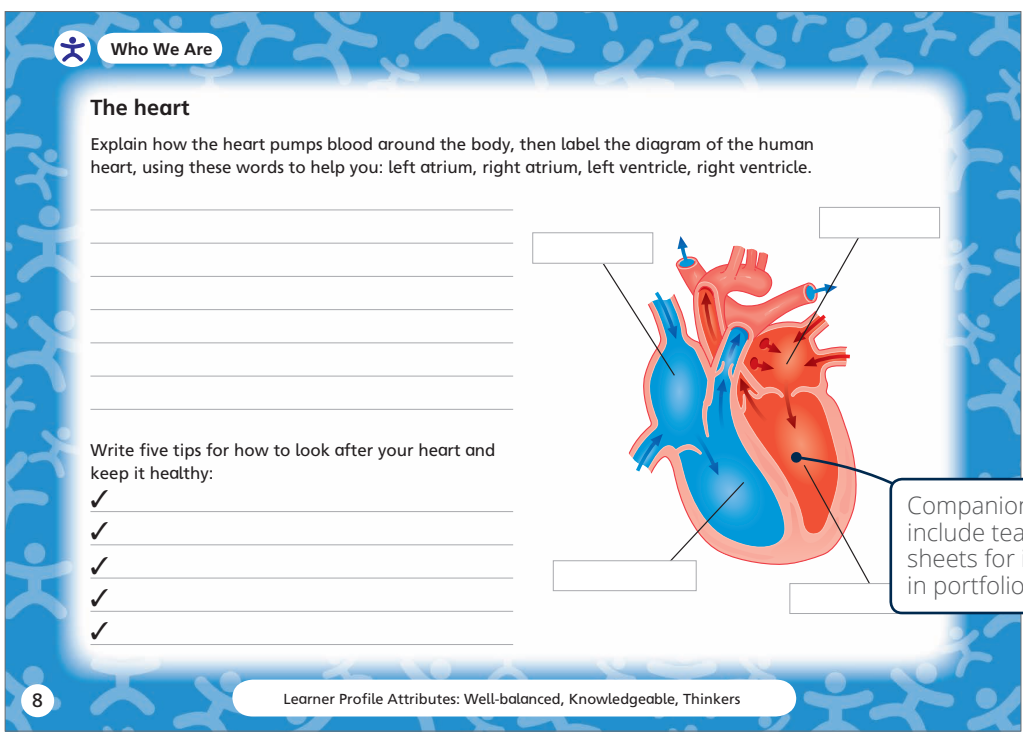
Summary of components

- 120 high-quality, inquiry-based readers.
- Nine supporting Companions with activities to build up individual portfolios.
- Money-saving packs available, organised by grade/year and theme.

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

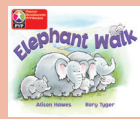
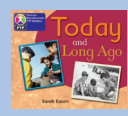
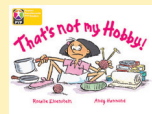
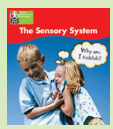
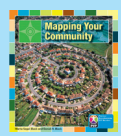
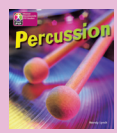
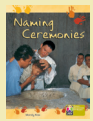
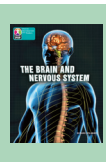
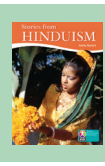


Readers have a strong international approach and are all linked to the IB Learner Profile.



Companions include tear-out sheets for inclusion in portfolios

PYP Readers and Companions Programme

	UK YEAR LEVEL	US GRADE LEVEL	PYP LEVEL	TRANSDISCIPLINARY THEMES		
				Who we are	Where we are in place and time	How we express ourselves
				UOI	UOI	UOI
Lower Primary	F	Pre K	1	My favourite things  	Journeys  	Colours  
	1	K	2	Friends  	Houses  	Creativity  
			3	Families  	Holidays  	Feelings  
	2	1	4	Our senses  	Past and present  	Celebrating  
			5	A new baby  	Home sweet home  	Pictures that tell stories  
Upper Primary	3	2	6	Emotions  	People around the world  	Artists  
			7	Our bodies  	Mapping  	Communicating  
	4	3	8	Right or wrong?  	Different places, different lives  	World music  
	5	4	9	What's in a name?  	Legacies  	Architecture  
	6	5	10	Healthy body, healthy mind  	World religions  	Media  

PRIMARY YEARS

TRANSDISCIPLINARY THEMES			
How the world works UOI	How we organise ourselves UOI	Sharing the planet UOI	
Movement	Working together	Animals	COMPANION GUIDES
Push and Pull	In town	How we use things	Companion Level 2
Where food comes from	Communities	Water	Companion Level 3
Growth	Planning	Habitats	Companion Level 4
Discoveries and inventions	How things are made	Planet in danger	Companion Level 5
Mammals	Be prepared	Life cycles	Companion Level 6
Water	Weather and seasons	Disappearing forests	Companion Level 7
Machines	Cities	Global issues	Companion Level 8
Changing Earth	People on the move	Pollution	Companion Level 9
Renewable Energy	Government systems	Endangered species	Companion Level 10

PRIMARY YEARS

HOW TO SAMPLE

To evaluate this series, visit: **www.pearsonglobalschools.com/pyp**

PEARSON PYP READERS AND COMPANIONS PROGRAMME

To place an order, contact your customer services team or local consultant **www.pearsonglobalschools.com/contact**

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PYP L7 Companion Class **Pack of 30**	978 0 435995 25 6	£128.00
PYP L8 Companion Class **Pack of 30**	978 0 435995 33 1	£128.00
PYP L9 Companion Class **Pack of 30**	978 0 435995 34 8	£128.00
PYP L10 Companion Class **Pack of 30**	978 0 435995 35 5	£128.00
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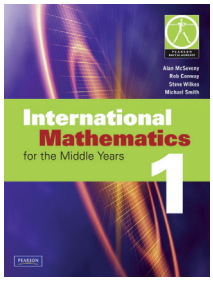
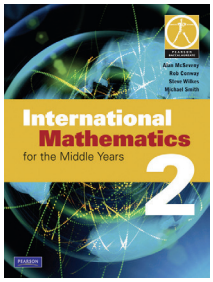
PYP Theme Pack How We Organise Ourselves	978 0 435993 26 9	£89.10
PYP Theme Pack Sharing the Planet	978 0 435993 27 6	£89.10
PYP Theme Pack Where We Are In Place and Time	978 0 435993 23 8	£89.10
PYP Theme Pack Who We Are	978 0 435993 22 1	£89.10

Download the PYP Readers and Companions Structure Chart
www.pearsonglobalschools.com/pyp

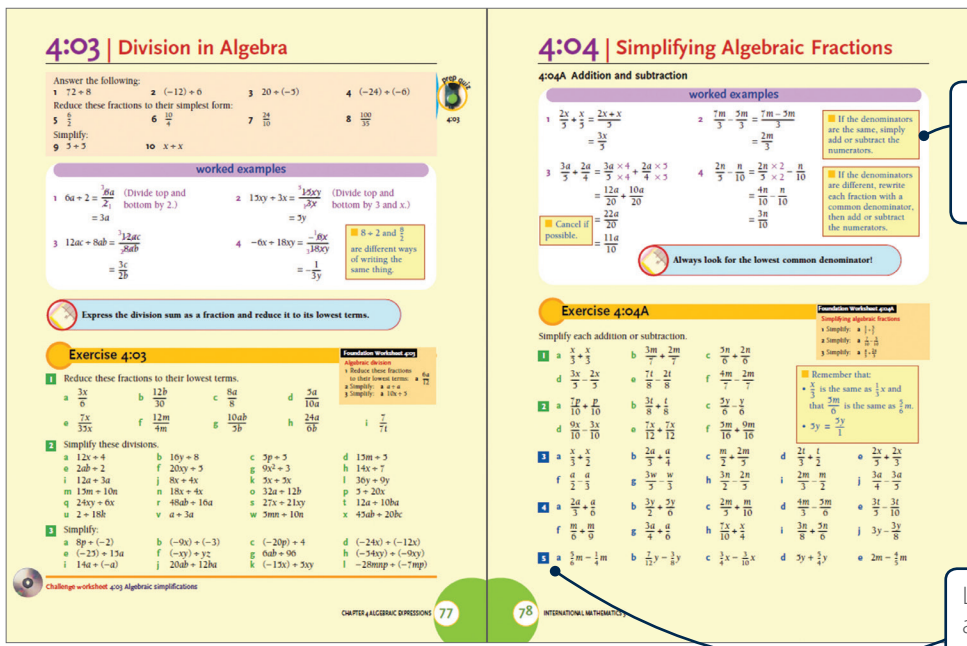
International Mathematics for the Middle Years





Our best-selling five-book series gives learners the opportunity to learn Mathematics with a global perspective.

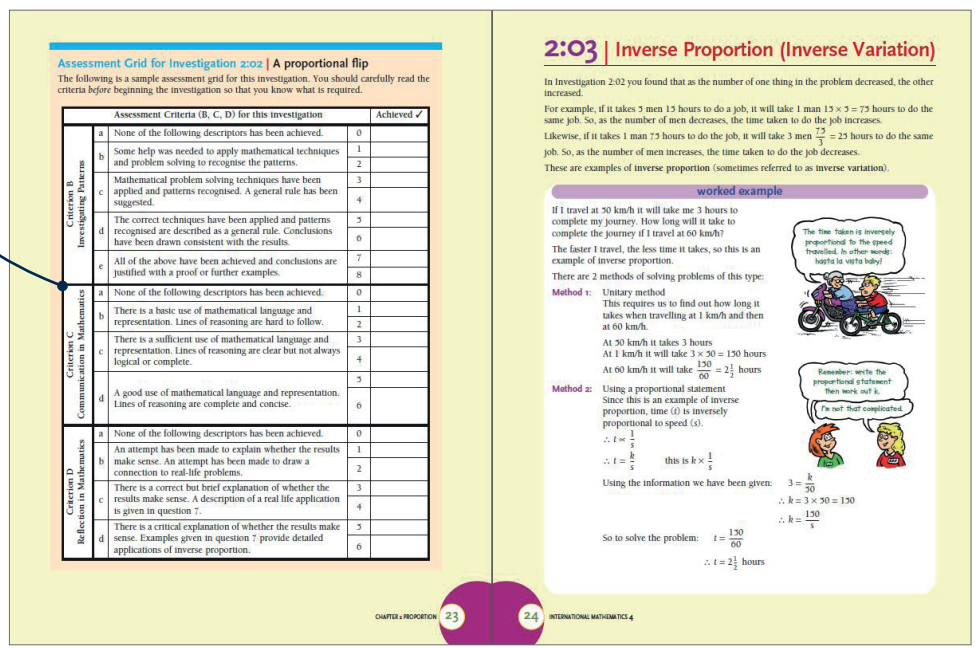
- Each full-colour book contains graded exercises with differentiated questions, worked examples, investigations, mathematical terms and time-saving assessment grids, plus a FREE interactive CD-ROM.
- The Teacher Resource contains practice tests with answers and editable unit plans.
- The Companion websites provide additional resources including review questions and interactive activities.
- Mapped to the new curriculum, with over 98% of the content matching the 2014 subject guide.



Worked examples show learners how to approach questions.

Levels of difficulty are indicated by colour.

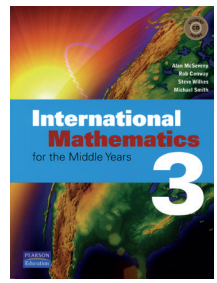
Assessment grids increase learner awareness of criteria.

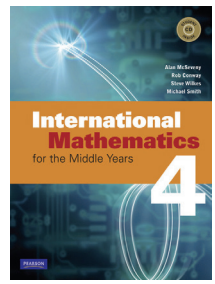


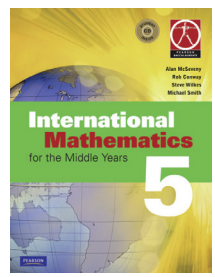
Summary of components

- 5 × Comprehensive Course Books
- 5 × Teacher's Guides .

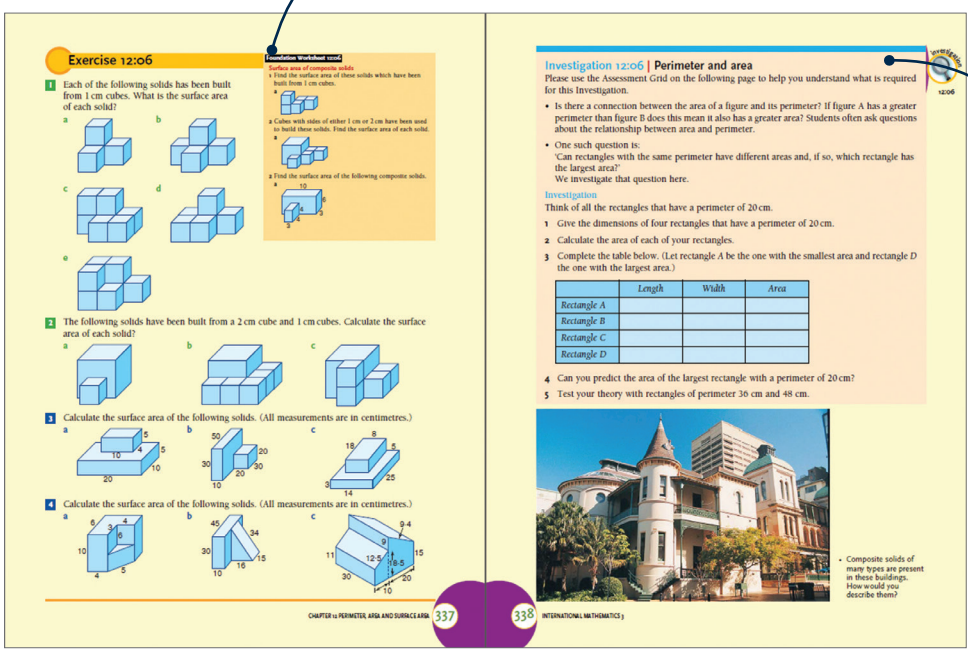
Mapped to the 2014 MYP Mathematics Guide. With 98% of topics and 91% of skills from the framework covered, you can be confident that our textbooks meet the needs of your students.







Links to foundation and challenge worksheets provide alternative exercises for consolidation or extension.



Exercise 12:06

Investigation 12:06 | Perimeter and area

Investigations encourage learners to seek knowledge and develop research skills.

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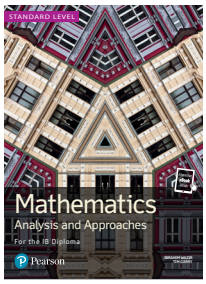

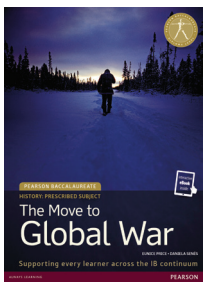

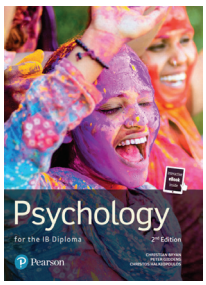

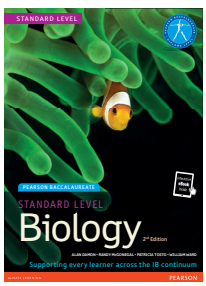

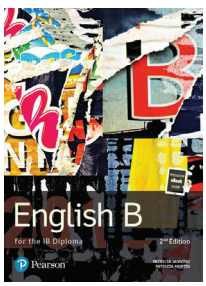

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- Clear links to TOK throughout, as well as advice on the Internal Assessment and the Extended Essay.

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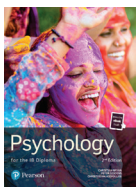
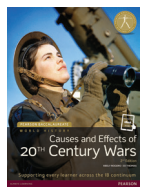
Core Curriculum Theory of Knowledge

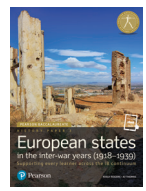
Group 1 Studies in Language and Literature

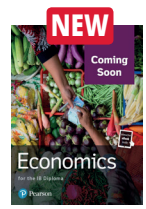
Group 2 Language Acquisition

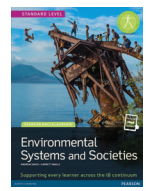
Group 3 Individuals and Societies





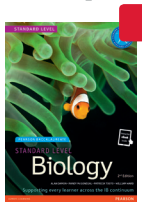


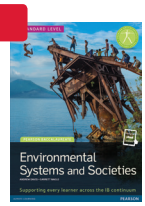




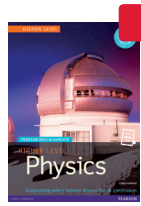
Group 4 Sciences

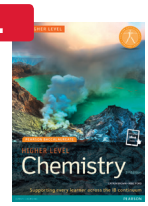
STANDARD LEVEL





HIGHER LEVEL



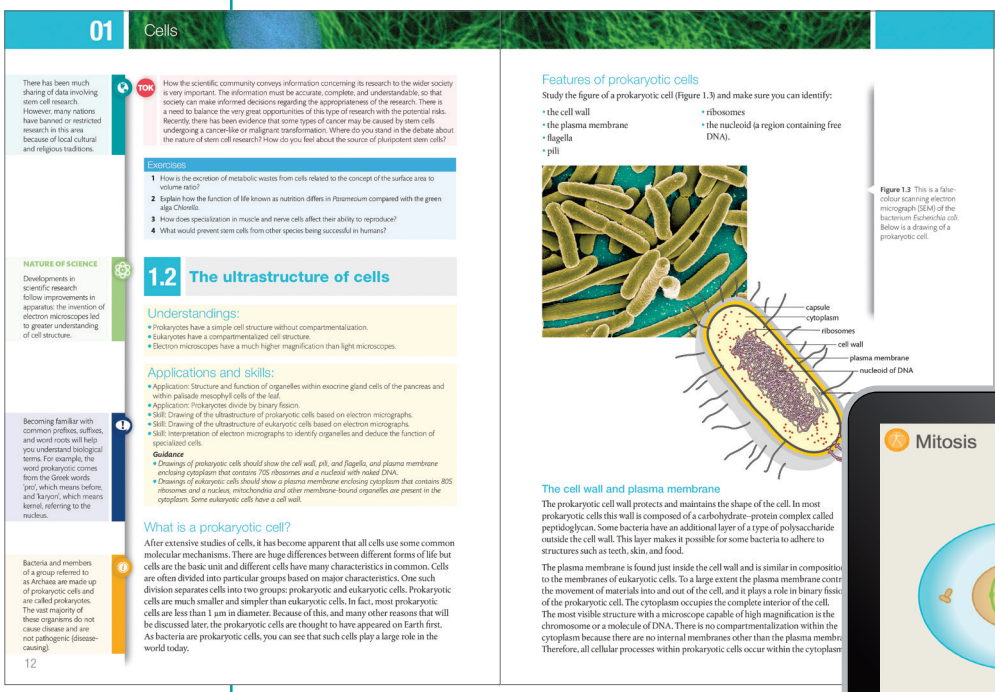


Group 5 Mathematics

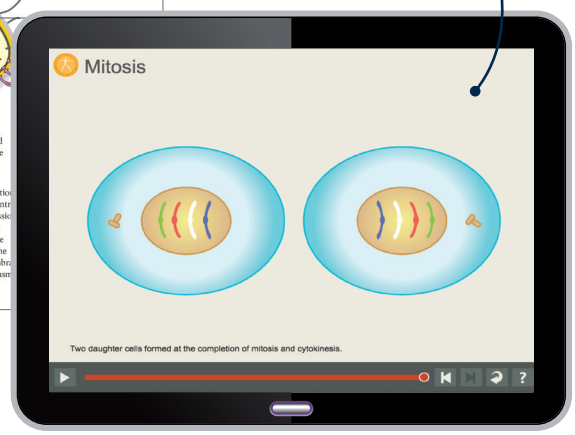
How does it work?

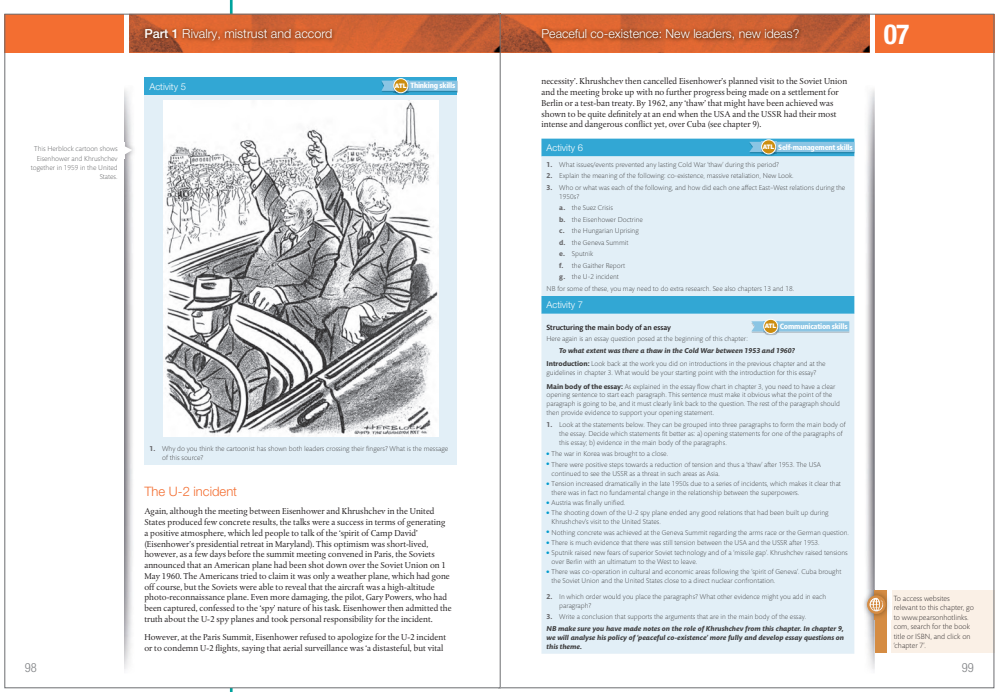
Teaching, learning and assessment with our printed and digital resources

Student material is available as a printed book with four-year free access to an online eBook or as a standalone eBook subscription.



Biology for the IB Diploma animation – just one of the many additional resources offered





Assessment tools and resources are aligned to the programme criteria and learning objectives. This means that learners know the areas they need to improve on and are offered plenty of practice along their learning journey.

Our enhanced eBooks

Our enhanced eBooks do just do that, enhance your students' learning.

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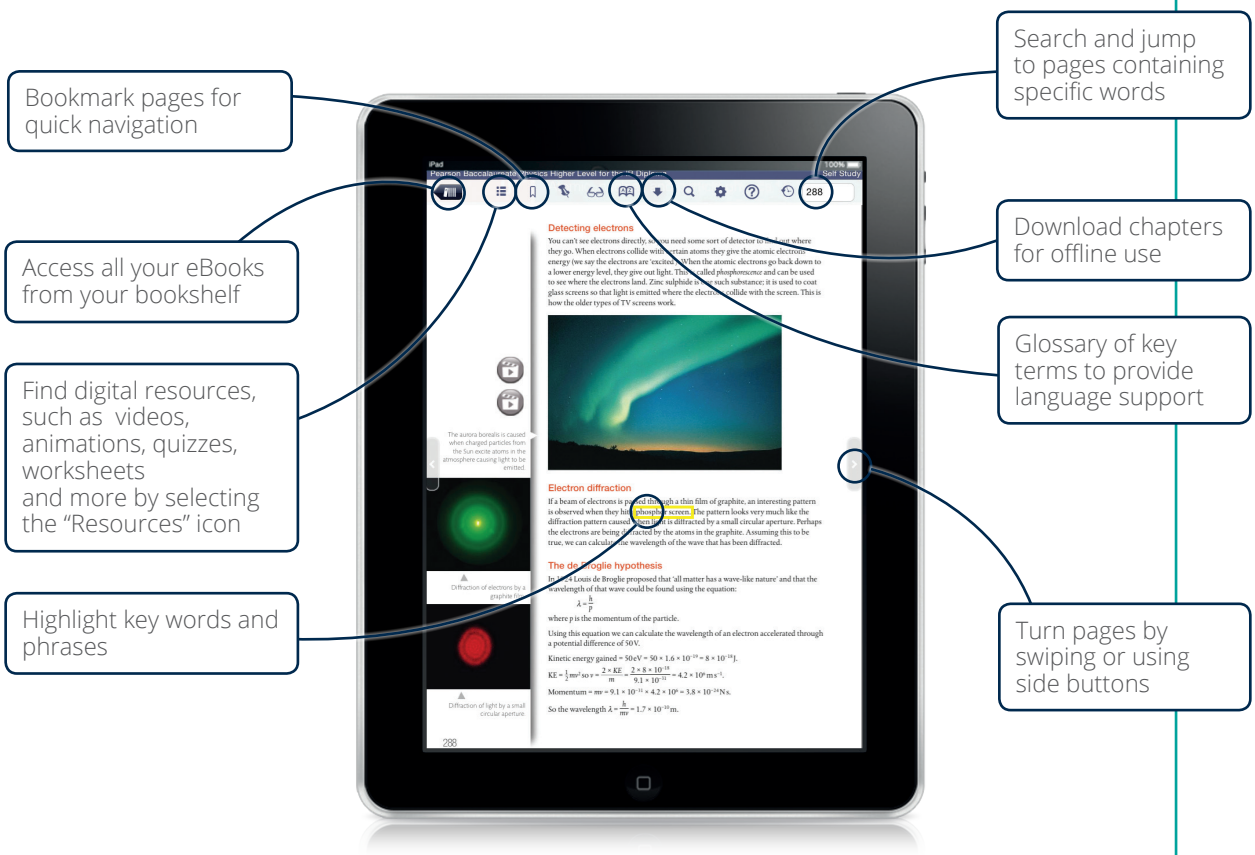
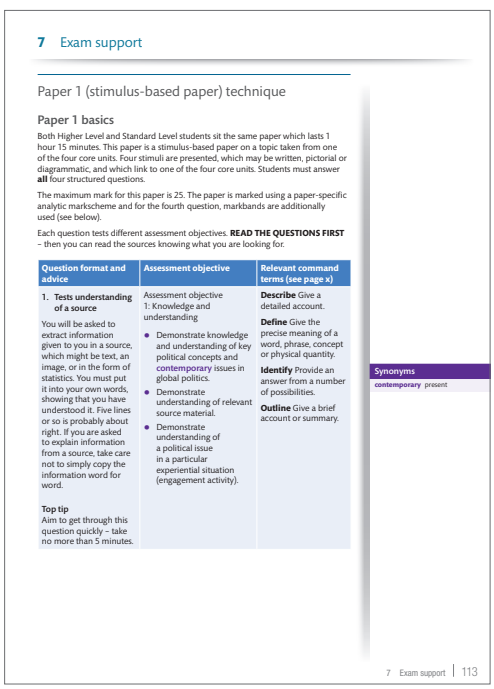



7 Exam support

Paper 1 (stimulus-based paper) technique

Paper 1 basics

Both Higher Level and Standard Level students sit the same paper which lasts 1 hour 15 minutes. This paper is a stimulus-based paper on a topic taken from one of the four core units. Four stimuli are presented, which may be written, pictorial or diagrammatic, and which link to one of the four core units. Students must answer **all** four structured questions.

The maximum mark for this paper is 25. The paper is marked using a paper-specific analytic markscheme and for the fourth question, markbands are additionally used (see below).

Each question tests different assessment objectives. **READ THE QUESTIONS FIRST** – then you can read the sources knowing what you are looking for.

Question format and advice	Assessment objective	Relevant command terms (see page x)
1. **Tests understanding of a source** You will be asked to extract information given to you in a source, which might be text, an image, or in the form of statistics. You must put it into your own words, showing that you have understood it. Five lines or so is probably about right. If you are asked to explain information from a source, take care not to simply copy the information word for word. **Top tip** Aim to get through this question quickly – take no more than 5 minutes.	Assessment objective 1: Knowledge and understanding • Demonstrate knowledge and understanding of key political concepts and contemporary issues in global politics. • Demonstrate understanding of relevant source material. • Demonstrate understanding of a political issue in a particular experiential situation (engagement activity).	**Describe** Give a detailed account. **Define** Give the precise meaning of a word, phrase, concept or physical quantity. **Identify** Provide an answer from a number of possibilities. **Outline** Give a brief account or summary.

Synonyms
contemporary present

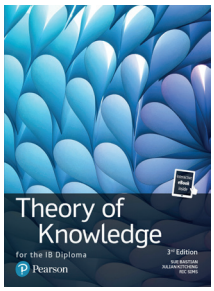
7 Exam support | 113

Sample page from *Essentials: Global Politics*

The **Essentials Series** is designed for revision and provides a condensed and practical exam preparation guide. Learners can get help on what is expected in the exam: model sentences, answer-openers, suggestions for case studies, and general exam advice.

Theory of Knowledge

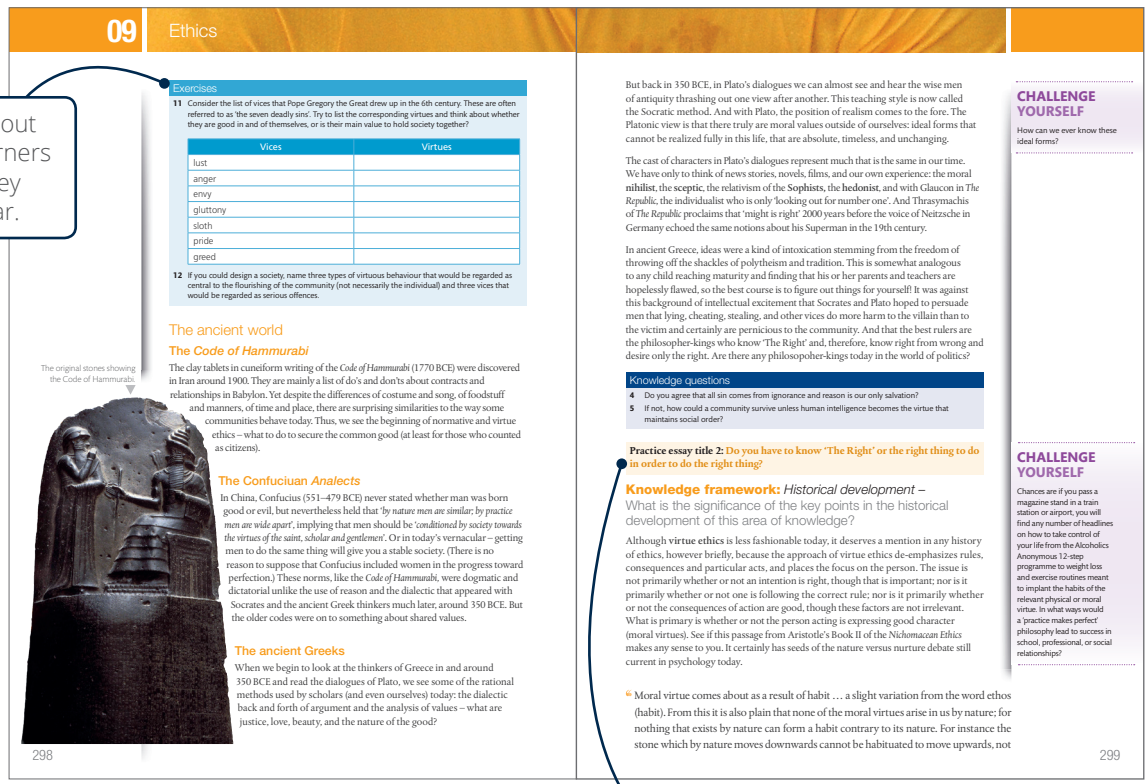
FOR SEPT 2020



Support your learners as they explore the latest Theory of Knowledge guide with our new edition text written by experts.

- The author team consists of Julian Kitching and Ric Sims, highly regarded members of the curriculum review panel, and Sue Bastian, the architect of the original ToK curriculum.
- Provides full coverage of the 2020 curriculum guide covering the Core, Optional themes, and Areas of knowledge.
- Structured to match the new knowledge framework.
- Examples of knowledge questions to help students recognise and decipher them.
- Support for the essay and the new exhibition assessment.
- Illustrations by TOK teacher Gary Goodwin, to add interest and humour.
- eBook version contains inspiring lesson plans, particularly helpful for supporting newly qualified TOK teachers.

Exercises throughout the book help learners reflect on what they have learned so far.


09 Ethics

Exercises

11 Consider the list of vices that Pope Gregory the Great drew up in the 6th century. These are often referred to as 'the seven deadly sins'. Try to list the corresponding virtues and think about whether they are good in and of themselves, or is their main value to hold society together?

Vices	Virtues
lust	
anger	
envy	
gluttony	
sloth	
pride	
greed	

12 If you could design a society, name three types of virtuous behaviour that would be regarded as central to the flourishing of the community (not necessarily the individual) and three vices that would be regarded as serious offences.

The ancient world

The *Code of Hammurabi*

The original stones showing the Code of Hammurabi

The clay tablets in cuneiform writing of the *Code of Hammurabi* (1770 BCE) were discovered in Iran around 1900. They are mainly a list of do's and don'ts about contracts and relationships in Babylon. Yet despite the differences of costume and song, of foodstuff and manners, of time and place, there are surprising similarities to the way some communities behave today. Thus, we see the beginning of normative and virtue ethics – what to do to secure the common good (at least for those who counted as citizens).

The Confuciuan *Analects*

In China, Confucius (551–479 BCE) never stated whether man was born good or evil, but nevertheless held that '*by nature men are similar; by practice men are wide apart*', implying that men should be '*conditioned by society towards the virtues of the saint, scholar and gentlemen*'. Or in today's vernacular – getting men to do the same thing will give you a stable society. (There is no reason to suppose that Confucius included women in the progress toward perfection.) These norms, like the *Code of Hammurabi*, were dogmatic and dictatorial unlike the use of reason and the dialectic that appeared with Socrates and the ancient Greek thinkers much later, around 350 BCE. But the older codes were on to something about shared values.

The ancient Greeks

When we begin to look at the thinkers of Greece in and around 350 BCE and read the dialogues of Plato, we see some of the rational methods used by scholars (and even ourselves) today: the dialectic back and forth of argument and the analysis of values – what are justice, love, beauty, and the nature of the good?

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But back in 350 BCE, in Plato's dialogues we can almost see and hear the wise men of antiquity thrashing out one view after another. This teaching style is now called the Socratic method. And with Plato, the position of realism comes to the fore. The Platonic view is that there truly are moral values outside of ourselves: ideal forms that cannot be realized fully in this life, that are absolute, timeless, and unchanging.

The cast of characters in Plato's dialogues represent much that is the same in our time. We have only to think of news stories, novels, films, and our own experience: the moral **nihilist**, the **sceptic**, the relativism of the **Sophists**, the **hedonist**, and with Glaucon in *The Republic*, the individualist who is only 'looking out for number one'. And Thrasymachis of *The Republic* proclaims that 'might is right' 2000 years before the voice of Neitzsche in Germany echoed the same notions about his Superman in the 19th century.

In ancient Greece, ideas were a kind of intoxication stemming from the freedom of throwing off the shackles of polytheism and tradition. This is somewhat analogous to any child reaching maturity and finding that his or her parents and teachers are hopelessly flawed, so the best course is to figure out things for yourself! It was against this background of intellectual excitement that Socrates and Plato hoped to persuade men that lying, cheating, stealing, and other vices do more harm to the villain than to the victim and certainly are pernicious to the community. And that the best rulers are the philosopher-kings who know 'The Right' and, therefore, know right from wrong and desire only the right. Are there any philosopher-kings today in the world of politics?

Knowledge questions

4 Do you agree that all sin comes from ignorance and reason is our only salvation?

5 If not, how could a community survive unless human intelligence becomes the virtue that maintains social order?

Practice essay title 2: Do you have to know 'The Right' or the right thing to do in order to do the right thing?

Knowledge framework: *Historical development* – What is the significance of the key points in the historical development of this area of knowledge?

Although **virtue ethics** is less fashionable today, it deserves a mention in any history of ethics, however briefly, because the approach of virtue ethics de-emphasizes rules, consequences and particular acts, and places the focus on the person. The issue is not primarily whether or not an intention is right, though that is important; nor is it primarily whether or not one is following the correct rule; nor is it primarily whether or not the consequences of action are good, though these factors are not irrelevant. What is primary is whether or not the person acting is expressing good character (moral virtues). See if this passage from Aristotle's Book II of the *Nichomacean Ethics* makes any sense to you. It certainly has seeds of the nature versus nurture debate still current in psychology today.

> Moral virtue comes about as a result of habit … a slight variation from the word ethos (habit). From this it is also plain that none of the moral virtues arise in us by nature; for nothing that exists by nature can form a habit contrary to its nature. For instance the stone which by nature moves downwards cannot be habituated to move upwards, not

CHALLENGE YOURSELF

How can we ever know these ideal forms?

CHALLENGE YOURSELF

Chances are if you pass a magazine stand in a train station or airport, you will find any number of headlines on how to take control of your life from the Alcoholics Anonymous 12-step programme to weight loss and exercise routines meant to implant the habits of the relevant physical or moral virtue. In what ways would a 'practice makes perfect' philosophy lead to success in school, professional, or social relationships?

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Practice essay titles give learners assessment practice.

NEW SYLLABUS		
Theory of Knowledge 3rd edition		
Text and eBook	978 1 292326 00 9	£40.00
eBook	978 1 292326 01 6	£35.00

About the authors

Sue Bastian
Series Editor

Sue Bastian has served the IB as teacher, workshop leader, examiner, textbook author and Chief Assessor of Theory of Knowledge in the Philippines and at the UN School in New York City. She has just completed a review and revision of the TOK Lessons From Around the World and now is concentrating on teaching others how to design lessons for their classroom.

Julian Kitching
Author

Over 30 years involvement with the IB, Julian Kitching has taught Theory of Knowledge, contributed to four successive reviews of the course, and served as an workshop leader and examiner, including an 8-year period as Chief Assessor until 2018. He is Director of Studies at the SOS-Hermann Gmeiner International College in Ghana.

Ric Sims
Author

Ric Sims has taught ToK for nearly three decades as well as Economics, Philosophy, Maths and Music for the diploma. He has served on the senior examining team since the late 1990's, including more than a decade as Deputy Chief Assessor. He has participated in four curriculum reviews, led workshops for ToK teachers, and is a regular keynote speaker.

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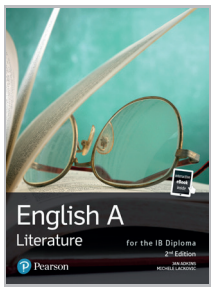
GROUP 1:

Studies in Languages and Literature

COMING MAY 2020

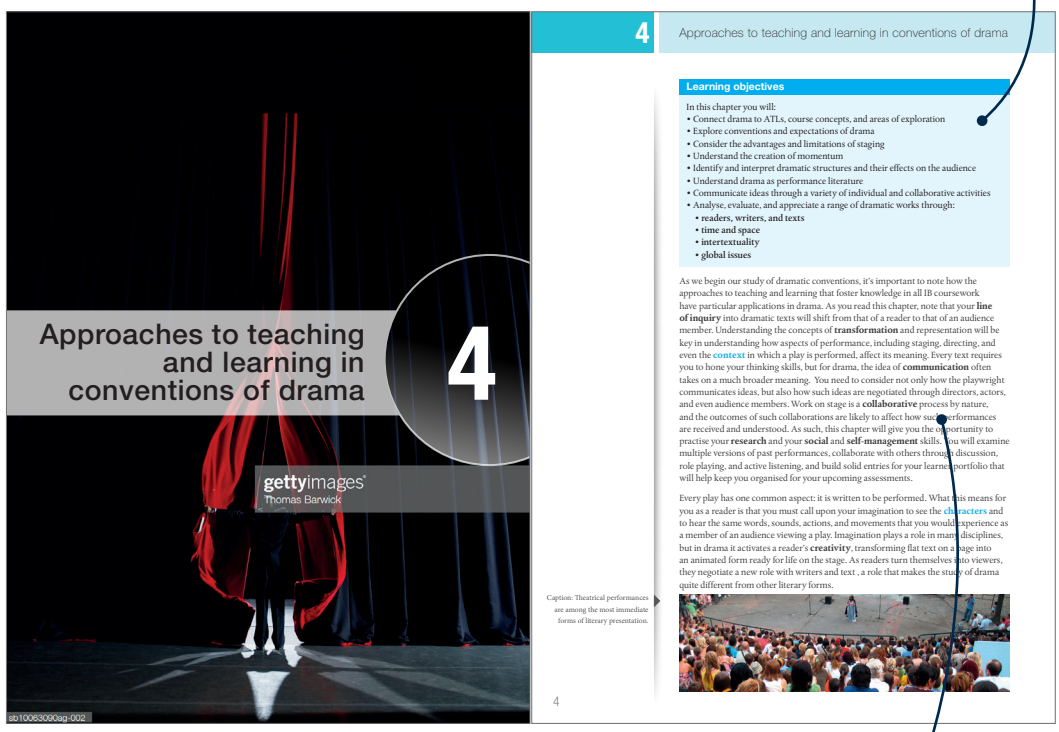
English Literature A



Written by IB expert authors to provide you and your students with comprehensive coverage of the requirements of the IB Guide for first assessments in 2021.

- Key terms from the guide explained and highlighted including Concepts, Areas of Exploration and Global Issues.
- Inclusion of carefully selected, up-to-date, 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. Extended Essay guidance.
- Intertextual connections highlighted.

Clear learning objectives



Key terms highlighted.

NEW SYLLABUS		
English A		
English A: Literature eText only edition (2nd edition)	978 1 292320 52 6	£35.00
English A (print and eText) (2nd edition)	978 1 292320 51 9	£40.00

About the authors

Jan Adkins

Jan Adkins is now retired after teaching English for 40 years, including 24 years teaching IB English. Assistant Examiner for 15 years and has lead teaching training workshops for 25 years. Jan holds a PhD in English, and is the recipient of the Robert O Lawton Award for Teaching Excellence at Florida State University, and the Teaching Excellence Award at Eckerd College. Jan was a co-author of our previous best-selling Pearson English A Literature for the IB Diploma textbook.

Michele Lackovic

Michele Lackovic has been involved with the IB for two decades. She began teaching IB Language A: literature in 2000 and TOK in 2008. She 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 Literature exams as well as Extended Essays. Michele is a National Board Certified Teacher and holds an MA in English from Penn State University and a BA in English from UCLA.

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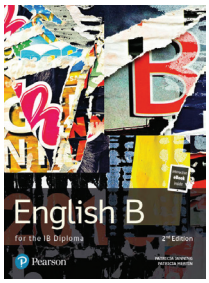
GROUP 2:

Language Acquisition

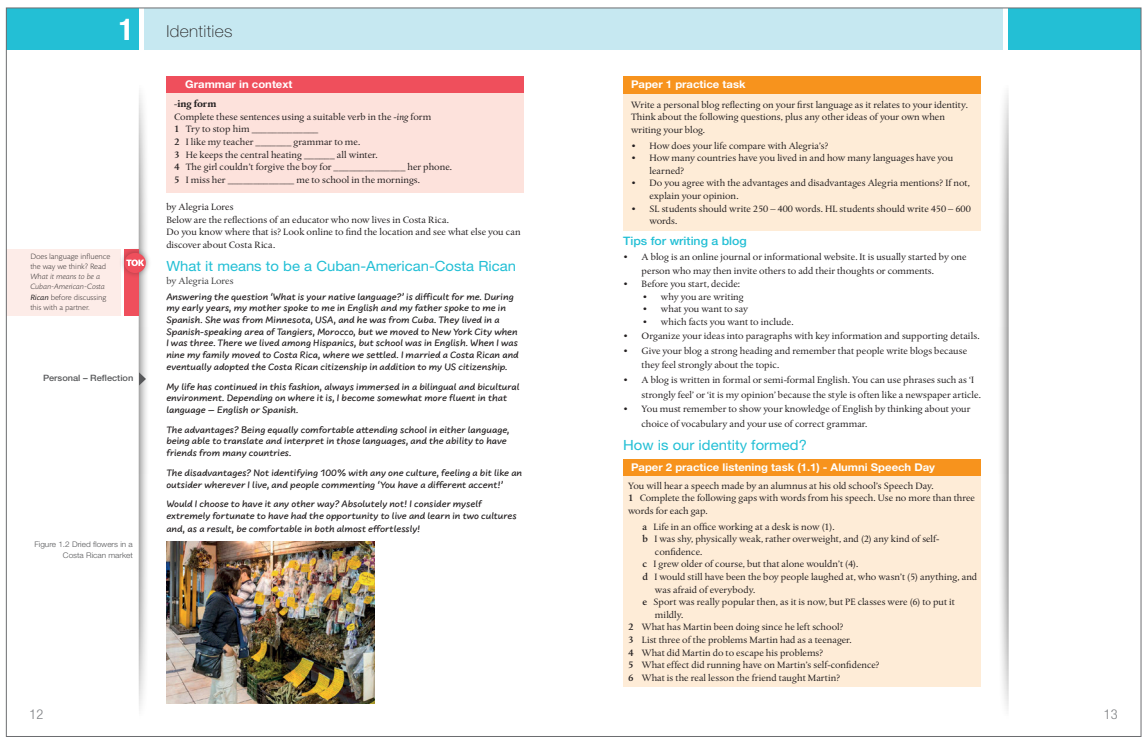
NEW

English B Textbook and eBook.



Our new English B Textbook and eBook fully support the 2018 Subject Guide.

- Contains authentic text extracts, accompanied by a broad range of exercises which will help students of all abilities prepare for their end of course assessment.
- Suitable for Standard Level and Higher Level students with clearly distinguished content.
- The eBook includes additional auto-marked quizzes, essay question practice and audio files for listening assessment practice.
- Support for the Internal Assessment.



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.

TOK Does language influence the way we think? Read *What it means to be a Cuban-American-Costa Rican* before discussing this with a partner.

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.

Personal – Reflection

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

12

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?

13

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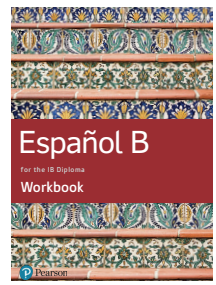

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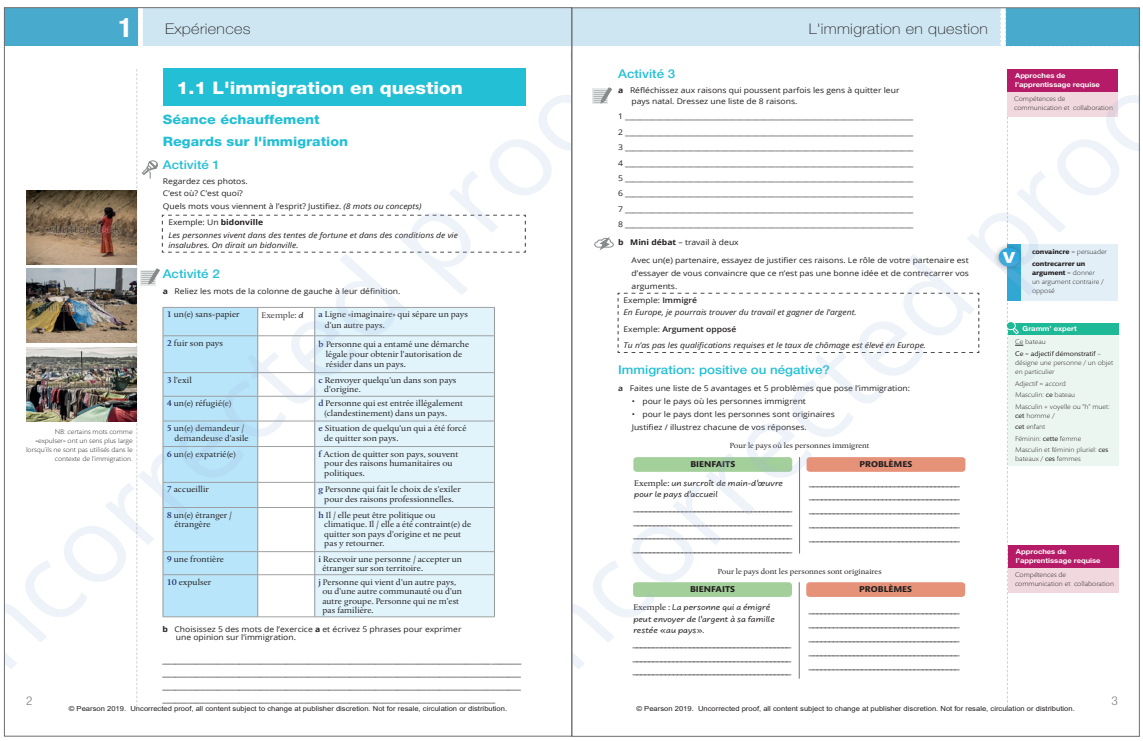

1 Expériences

1.1 L'immigration en question

Séance échauffement

Regards sur l'immigration

Activité 1

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

a Reliez les mots de la colonne de gauche à leur définition.

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		h 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.

b Choisissez 5 des mots de l'exercice **a** et écrivez 5 phrases pour exprimer une opinion sur l'immigration.

NB: certains mots comme «expulser» ont un sens plus large lorsqu'ils ne sont pas utilisés dans le contexte de l'immigration.

2

L'immigration en question

Activité 3

a Réfléchissez aux raisons qui poussent parfois les gens à quitter leur pays natal. Dressez une liste de 8 raisons.

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____
7 _____
8 _____

b **Mini débat** – travail à deux

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: **Immigré**
En Europe, je pourrais trouver du travail et gagner de l'argent.
Exemple: **Argument opposé**
Tu n'as pas les qualifications requises et le taux de chômage est élevé en Europe.

Immigration: positive ou négative?

a Faites une liste de 5 avantages et 5 problèmes que pose l'immigration:
- pour le pays où les personnes immigrent
- pour le pays dont les personnes sont originaires

Justifiez / illustrez chacune de vos réponses.

Pour le pays où les personnes immigrent

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 requise
Compétences de communication et collaboration

convaincre = persuader
contrecarrer un argument = donner un argument contraire / opposé

Gramm' expert
Ce bateau
Ce = adjectif démonstratif – désigne une personne / un objet en particulier
Adjectif = accord
Masculin: **ce** bateau
Masculin + voyelle ou "h" muet: **cet** homme / **cet** enfant
Féminin: **cette** femme
Masculin et féminin pluriel: **ces** bateaux / **ces** femmes

Approches de l'apprentissage requise
Compétences de communication et collaboration

3

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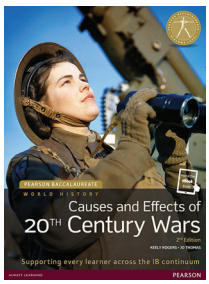

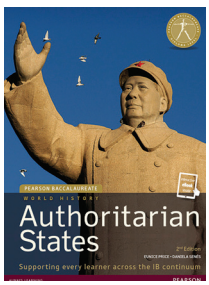

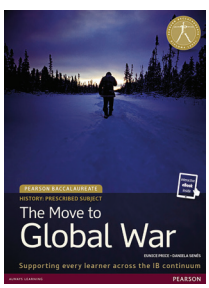

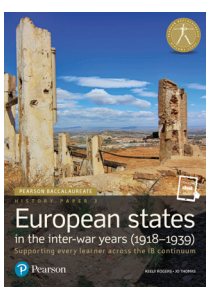

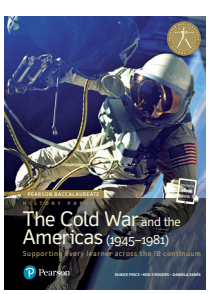

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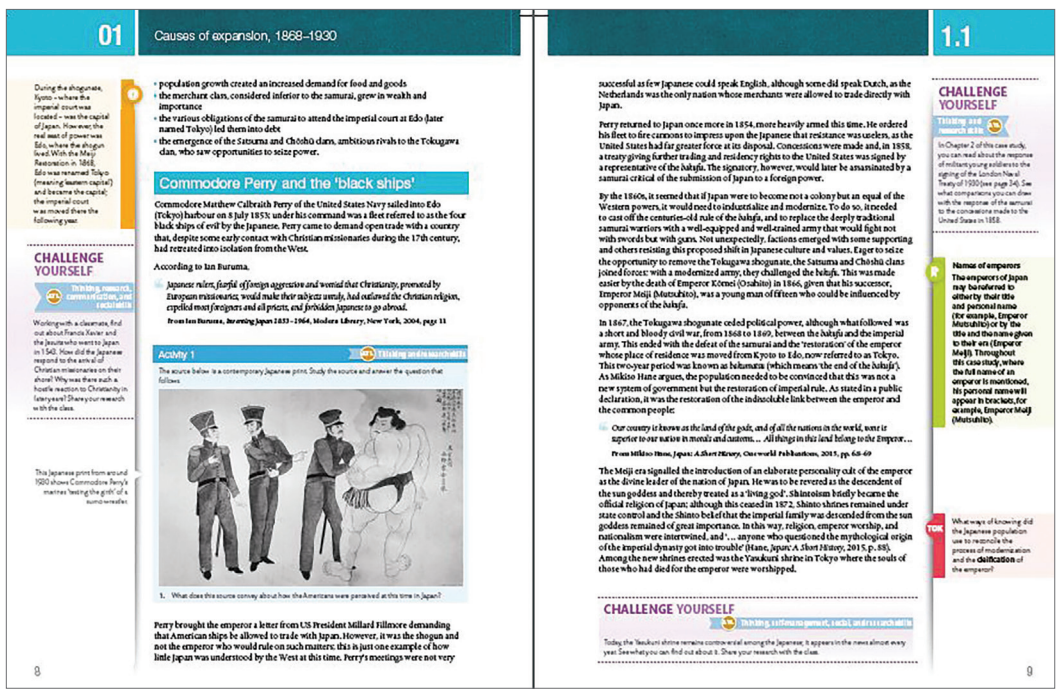

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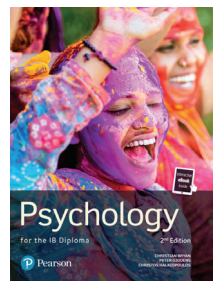

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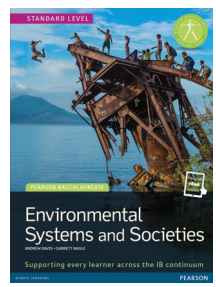

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- For more detail see page 25.

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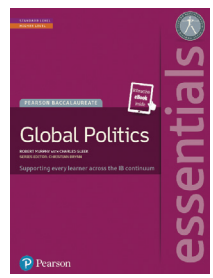

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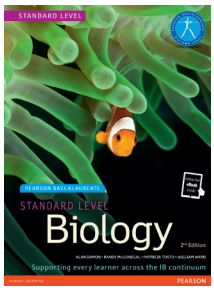

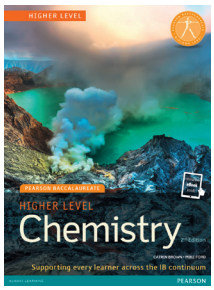

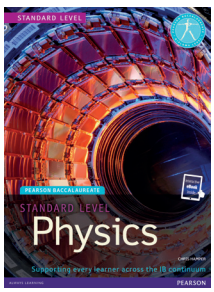

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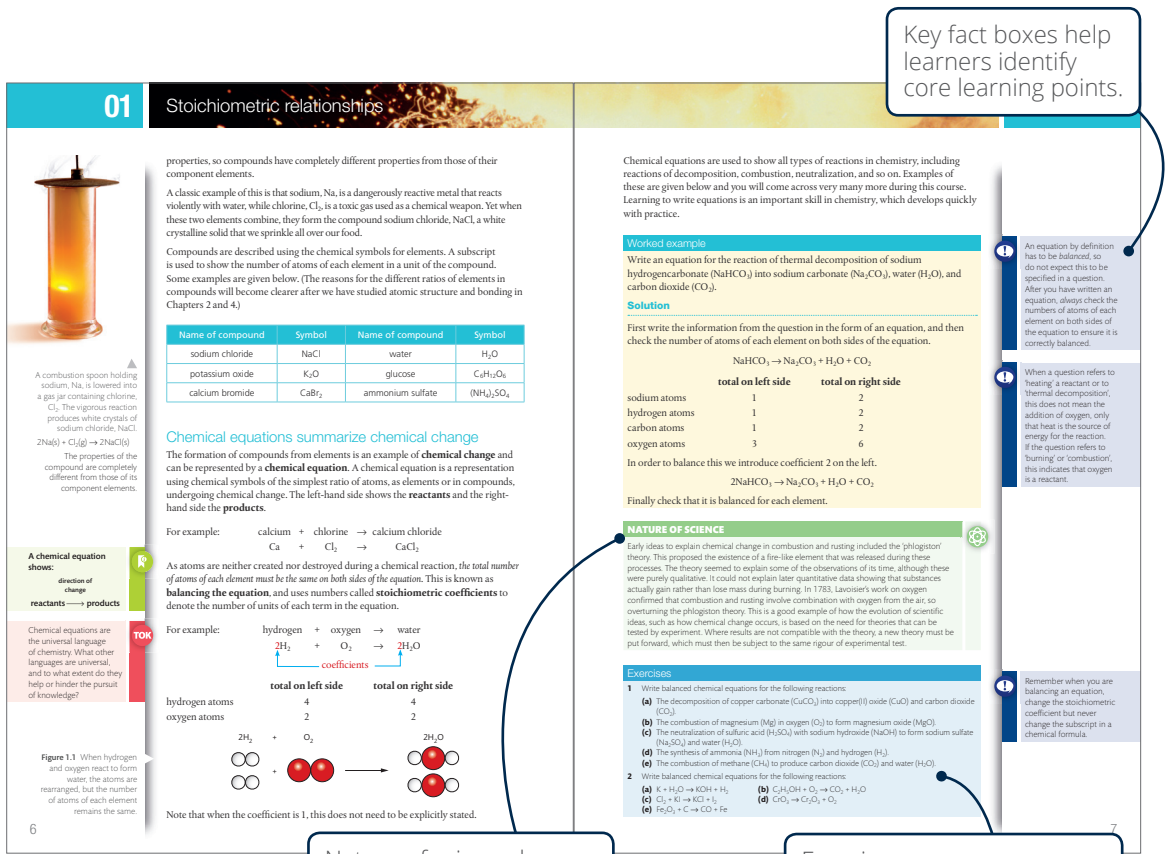

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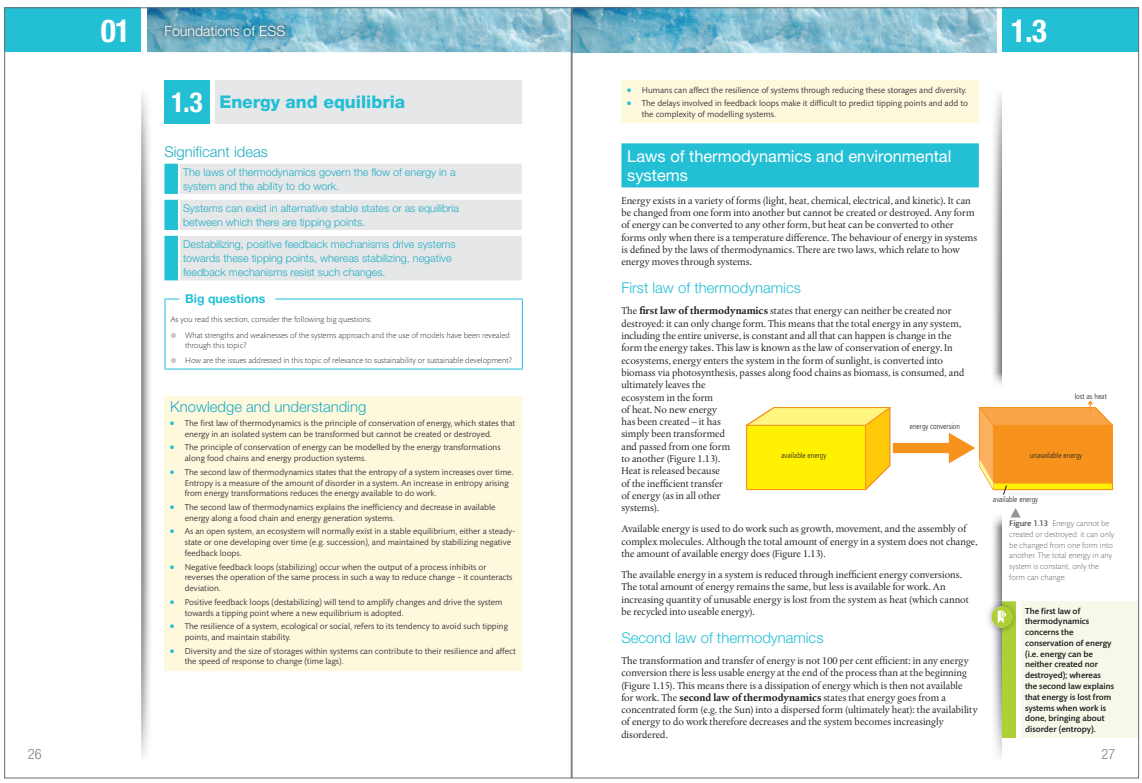


01 Foundations of ESS

1.3 Energy and equilibria

Significant ideas

The laws of thermodynamics govern the flow of energy in a system and the ability to do work.

Systems can exist in alternative stable states or as equilibria between which there are tipping points.

Destabilizing, positive feedback mechanisms drive systems towards these tipping points, whereas stabilizing, negative feedback mechanisms resist such changes.

Big questions

As you read this section, consider the following big questions:

- What strengths and weaknesses of the systems approach and the use of models have been revealed through this topic?
- How are the issues addressed in this topic of relevance to sustainability or sustainable development?

Knowledge and understanding

- The first law of thermodynamics is the principle of conservation of energy, which states that energy in an isolated system can be transformed but cannot be created or destroyed.
- The principle of conservation of energy can be modelled by the energy transformations along food chains and energy production systems.
- The second law of thermodynamics states that the entropy of a system increases over time. Entropy is a measure of the amount of disorder in a system. An increase in entropy arising from energy transformations reduces the energy available to do work.
- The second law of thermodynamics explains the inefficiency and decrease in available energy along a food chain and energy generation systems.
- As an open system, an ecosystem will normally exist in a stable equilibrium, either a steady-state or one developing over time (e.g. succession), and maintained by stabilizing negative feedback loops.
- Negative feedback loops (stabilizing) occur when the output of a process inhibits or reverses the operation of the same process in such a way to reduce change – it counteracts deviation.
- Positive feedback loops (destabilizing) will tend to amplify changes and drive the system towards a tipping point where a new equilibrium is adopted.
- The resilience of a system, ecological or social, refers to its tendency to avoid such tipping points, and maintain stability.
- Diversity and the size of storages within systems can contribute to their resilience and affect the speed of response to change (time lags).

26

1.3

- Humans can affect the resilience of systems through reducing these storages and diversity.
- The delays involved in feedback loops make it difficult to predict tipping points and add to the complexity of modelling systems.

Laws of thermodynamics and environmental systems

Energy exists in a variety of forms (light, heat, chemical, electrical, and kinetic). It can be changed from one form into another but cannot be created or destroyed. Any form of energy can be converted to any other form, but heat can be converted to other forms only when there is a temperature difference. The behaviour of energy in systems is defined by the laws of thermodynamics. There are two laws, which relate to how energy moves through systems.

First law of thermodynamics

The **first law of thermodynamics** states that energy can neither be created nor destroyed: it can only change form. This means that the total energy in any system, including the entire universe, is constant and all that can happen is change in the form the energy takes. This law is known as the law of conservation of energy. In ecosystems, energy enters the system in the form of sunlight, is converted into biomass via photosynthesis, passes along food chains as biomass, is consumed, and ultimately leaves the ecosystem in the form of heat. No new energy has been created – it has simply been transformed and passed from one form to another (Figure 1.13). Heat is released because of the inefficient transfer of energy (as in all other systems).

Figure 1.13 Energy cannot be created or destroyed: it can only be changed from one form into another. The total energy in any system is constant, only the form can change.

Available energy is used to do work such as growth, movement, and the assembly of complex molecules. Although the total amount of energy in a system does not change, the amount of available energy does (Figure 1.13).

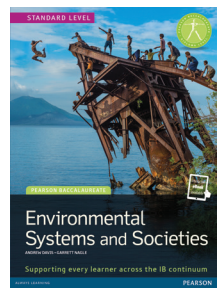
The available energy in a system is reduced through inefficient energy conversions. The total amount of energy remains the same, but less is available for work. An increasing quantity of unusable energy is lost from the system as heat (which cannot be recycled into useable energy).

Second law of thermodynamics

The transformation and transfer of energy is not 100 per cent efficient: in any energy conversion there is less usable energy at the end of the process than at the beginning (Figure 1.15). This means there is a dissipation of energy which is then not available for work. The **second law of thermodynamics** states that energy goes from a concentrated form (e.g. the Sun) into a dispersed form (ultimately heat): the availability of energy to do work therefore decreases and the system becomes increasingly disordered.

The first law of thermodynamics concerns the conservation of energy (i.e. energy can be neither created nor destroyed); whereas the second law explains that energy is lost from systems when work is done, bringing about disorder (entropy).

27



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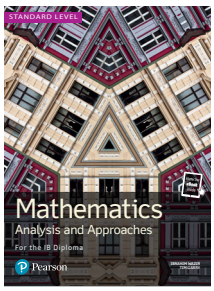

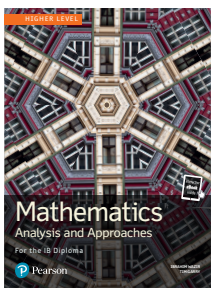

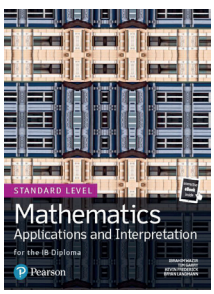

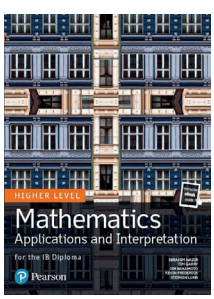

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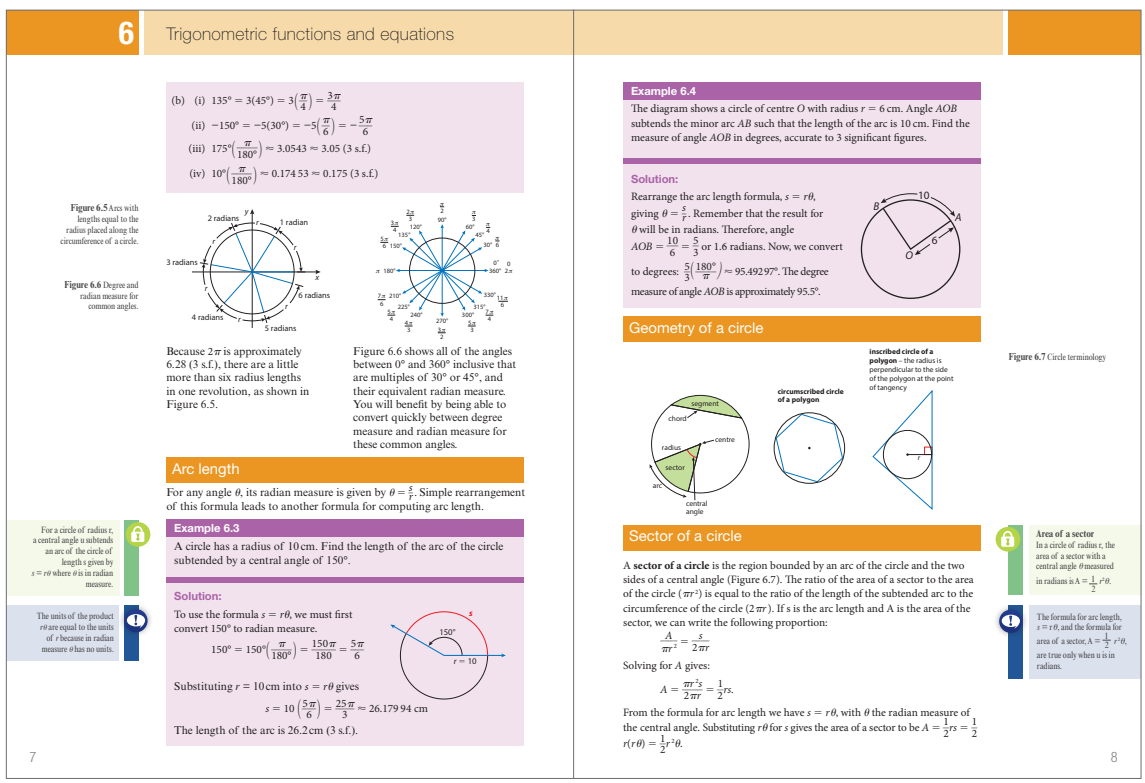


6 Trigonometric functions and equations

(b) (i) $135° = 3(45°) = 3\left(\frac{\pi}{4}\right) = \frac{3\pi}{4}$

(ii) $-150° = -5(30°) = -5\left(\frac{\pi}{6}\right) = -\frac{5\pi}{6}$

(iii) $175°\left(\frac{\pi}{180°}\right) \approx 3.0543 \approx 3.05$ (3 s.f.)

(iv) $10°\left(\frac{\pi}{180°}\right) \approx 0.174\,53 \approx 0.175$ (3 s.f.)

Figure 6.5 Arcs with lengths equal to the radius placed along the circumference of a circle.

Figure 6.6 Degree and radian measure for common angles.

Because 2π is approximately 6.28 (3 s.f.), there are a little more than six radius lengths in one revolution, as shown in Figure 6.5.

Figure 6.6 shows all of the angles between 0° and 360° inclusive that are multiples of 30° or 45°, and their equivalent radian measure. You will benefit by being able to convert quickly between degree measure and radian measure for these common angles.

Arc length

For any angle θ, its radian measure is given by $\theta = \frac{s}{r}$. Simple rearrangement of this formula leads to another formula for computing arc length.

For a circle of radius r, a central angle θ subtends an arc of the circle of length s given by $s = r\theta$ where θ is in radian measure.

The units of the product $r\theta$ are equal to the units of r because in radian measure θ has no units.

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.

$150° = 150°\left(\frac{\pi}{180°}\right) = \frac{150\pi}{180} = \frac{5\pi}{6}$

Substituting $r = 10$ cm into $s = r\theta$ gives

$s = 10\left(\frac{5\pi}{6}\right) = \frac{25\pi}{3} \approx 26.179\,94$ cm

The length of the arc is 26.2 cm (3 s.f.).

7

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: $\frac{5}{3}\left(\frac{180°}{\pi}\right) \approx 95.4929°$. The degree measure of angle AOB is approximately 95.5°.

Geometry of a circle

Figure 6.7 Circle terminology

Sector of a circle

A **sector of a circle** is the region bounded by an arc of the circle and the two sides of a central angle (Figure 6.7). The ratio of the area of a sector to the area of the circle (πr^2) is equal to the ratio of the length of the subtended arc to the circumference of the circle ($2\pi r$). If s is the arc length and A is the area of the sector, we can write the following proportion:

$\frac{A}{\pi r^2} = \frac{s}{2\pi r}$

Solving for A gives:

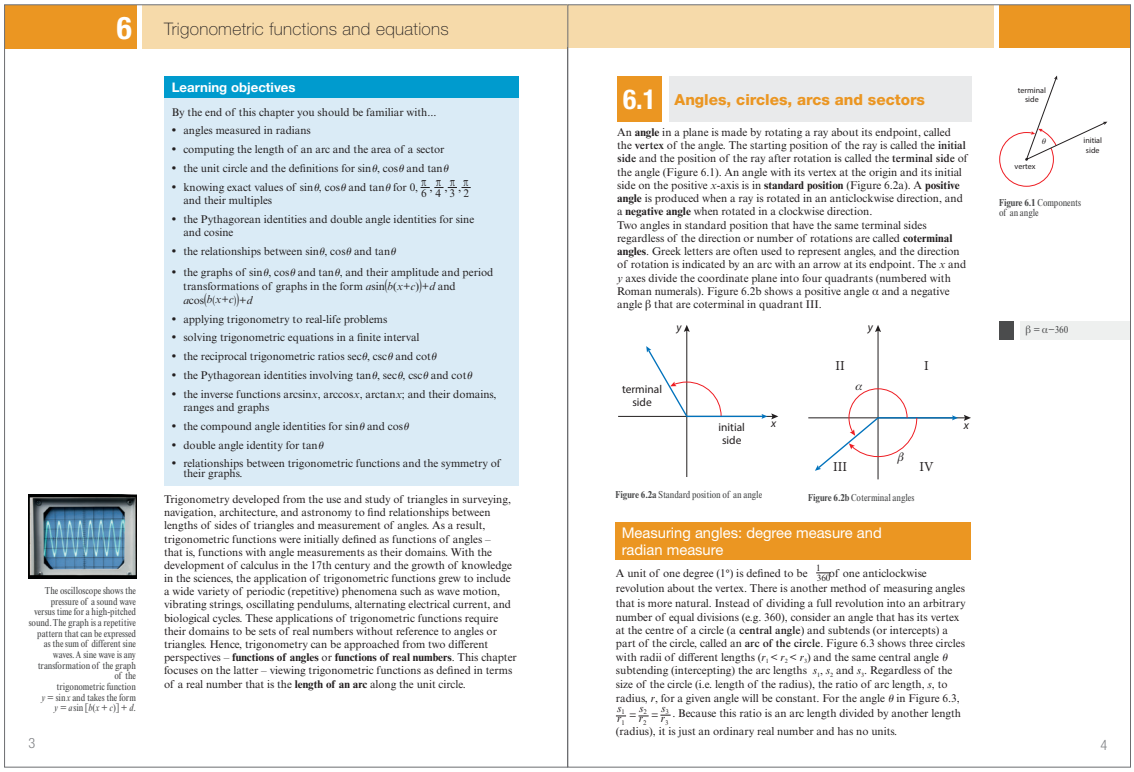
$A = \frac{\pi r^2 s}{2\pi r} = \frac{1}{2}rs.$

From the formula for arc length we have $s = r\theta$, with θ the radian measure of the central angle. Substituting $r\theta$ for s gives the area of a sector to be $A = \frac{1}{2}rs = \frac{1}{2}r(r\theta) = \frac{1}{2}r^2\theta$.

Area of a sector
In a circle of radius r, the area of a sector with a central angle θ measured in radians is $A = \frac{1}{2}r^2\theta$.

The formula for arc length, $s = r\theta$, and the formula for area of a sector, $A = \frac{1}{2}r^2\theta$, are true only when θ is in radians.

8



6 Trigonometric functions and equations

Learning objectives

By the end of this chapter you should be familiar with...

- angles measured in radians
- computing the length of an arc and the area of a sector
- the unit circle and the definitions for $\sin\theta$, $\cos\theta$ and $\tan\theta$
- knowing exact values of $\sin\theta$, $\cos\theta$ and $\tan\theta$ for $0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}, \frac{\pi}{2}$ and their multiples
- the Pythagorean identities and double angle identities for sine and cosine
- the relationships between $\sin\theta$, $\cos\theta$ and $\tan\theta$
- the graphs of $\sin\theta$, $\cos\theta$ and $\tan\theta$, and their amplitude and period transformations of graphs in the form $a\sin(b(x+c))+d$ and $a\cos(b(x+c))+d$
- applying trigonometry to real-life problems
- solving trigonometric equations in a finite interval
- the reciprocal trigonometric ratios $\sec\theta$, $\csc\theta$ and $\cot\theta$
- the Pythagorean identities involving $\tan\theta$, $\sec\theta$, $\csc\theta$ and $\cot\theta$
- the inverse functions $\arcsin x$, $\arccos x$, $\arctan x$; and their domains, ranges and graphs
- the compound angle identities for $\sin\theta$ and $\cos\theta$
- double angle identity for $\tan\theta$
- relationships between trigonometric functions and the symmetry of their graphs.

The oscilloscope shows the pressure of a sound wave versus time for a high-pitched sound. The graph is a repetitive pattern that can be expressed as the sum of different sine waves. A sine wave is any transformation of the graph of the trigonometric function $y = \sin x$ and takes the form $y = a\sin[b(x+c)] + d$.

Trigonometry developed from the use and study of triangles in surveying, navigation, architecture, and astronomy to find relationships between lengths of sides of triangles and measurement of angles. As a result, trigonometric functions were initially defined as functions of angles – that is, functions with angle measurements as their domains. With the development of calculus in the 17th century and the growth of knowledge in the sciences, the application of trigonometric functions grew to include a wide variety of periodic (repetitive) phenomena such as wave motion, vibrating strings, oscillating pendulums, alternating electrical current, and biological cycles. These applications of trigonometric functions require their domains to be sets of real numbers without reference to angles or triangles. Hence, trigonometry can be approached from two different perspectives – **functions of angles** or **functions of real numbers**. This chapter focuses on the latter – viewing trigonometric functions as defined in terms of a real number that is the **length of an arc** along the unit circle.

3

6.1 Angles, circles, arcs and sectors

An **angle** in a plane is made by rotating a ray about its endpoint, called the **vertex** of the angle. The starting position of the ray is called the **initial side** and the position of the ray after rotation is called the **terminal side** of the angle (Figure 6.1). An angle with its vertex at the origin and its initial side on the positive x-axis is in **standard position** (Figure 6.2a). A **positive angle** is produced when a ray is rotated in an anticlockwise direction, and a **negative angle** when rotated in a clockwise direction.

Two angles in standard position that have the same terminal sides regardless of the direction or number of rotations are called **coterminal angles**. Greek letters are often used to represent angles, and the direction of rotation is indicated by an arc with an arrow at its endpoint. The x and y axes divide the coordinate plane into four quadrants (numbered with Roman numerals). Figure 6.2b shows a positive angle α and a negative angle β that are coterminal in quadrant III.

Figure 6.1 Components of an angle

Figure 6.2a Standard position of an angle

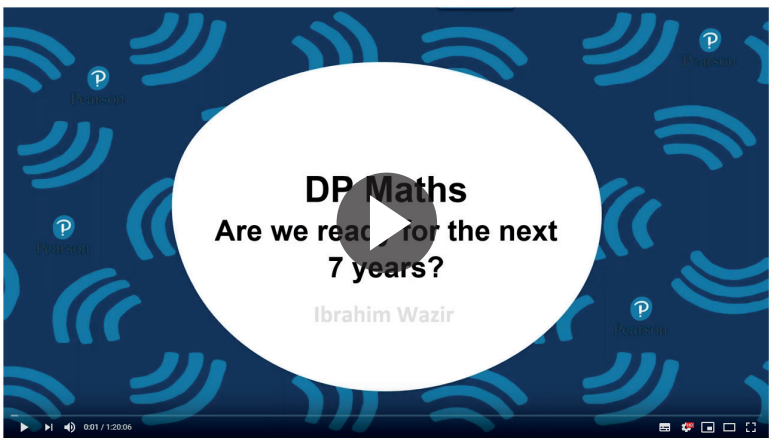
Figure 6.2b Coterminal angles

$\beta = \alpha - 360$

Measuring angles: degree measure and radian measure

A unit of one degree (1°) is defined to be $\frac{1}{360}$ of one anticlockwise revolution about the vertex. There is another method of measuring angles that is more natural. Instead of dividing a full revolution into an arbitrary number of equal divisions (e.g. 360), consider an angle that has its vertex at the centre of a circle (a **central angle**) and subtends (or intercepts) a part of the circle, called an **arc of the circle**. Figure 6.3 shows three circles with radii of different lengths ($r_1 < r_2 < r_3$) and the same central angle θ subtending (intercepting) the arc lengths s_1, s_2 and s_3. Regardless of the size of the circle (i.e. length of the radius), the ratio of arc length, s, to radius, r, for a given angle will be constant. For the angle θ in Figure 6.3, $\frac{s_1}{r_1} = \frac{s_2}{r_2} = \frac{s_3}{r_3}$. Because this ratio is an arc length divided by another length (radius), it is just an ordinary real number and has no units.

4



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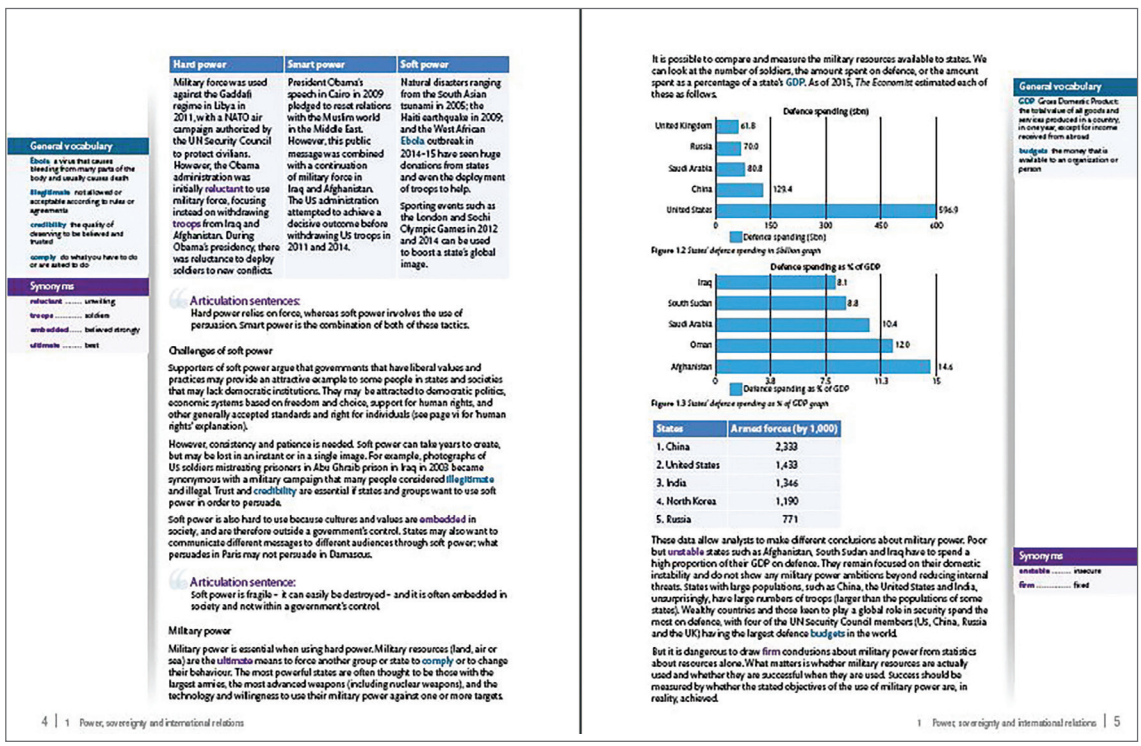

General vocabulary

Ebola a virus that causes bleeding from many parts of the body and usually causes death

Illegitimate not allowed or acceptable according to rules or agreements

credibility the quality of deserving to be believed and trusted

comply do what you have to do or are asked to do

Synonyms

reluctant ..... unwilling

troops ..... soldiers

embedded ..... believed strongly

ultimate ..... best

Hard power	Smart power	Soft power
Military force was used against the Gaddafi regime in Libya in 2011, with a NATO air campaign authorized by the UN Security Council to protect civilians. However, the Obama administration was initially **reluctant** to use military force, focusing instead on withdrawing **troops** from Iraq and Afghanistan. During Obama's presidency, there was reluctance to deploy soldiers to new conflicts.	President Obama's speech in Cairo in 2009 pledged to reset relations with the Muslim world in the Middle East. However, this public message was combined with a continuation of military force in Iraq and Afghanistan. The US administration attempted to achieve a decisive outcome before withdrawing US troops in 2011 and 2014.	Natural disasters ranging from the South Asian tsunami in 2005; the Haiti earthquake in 2009; and the West African **Ebola** outbreak in 2014–15 have seen huge donations from states and even the deployment of troops to help. Sporting events such as the London and Sochi Olympic Games in 2012 and 2014 can be used to boost a state's global image.

Articulation sentences:
Hard power relies on force, whereas soft power involves the use of persuasion. Smart power is the combination of both of these tactics.

Challenges of soft power

Supporters of soft power argue that governments that have liberal values and practices may provide an attractive example to some people in states and societies that may lack democratic institutions. They may be attracted to democratic politics, economic systems based on freedom and choice, support for human rights, and other generally accepted standards and right for individuals (see page vi for 'human rights' explanation).

However, consistency and patience is needed. Soft power can take years to create, but may be lost in an instant or in a single image. For example, photographs of US soldiers mistreating prisoners in Abu Ghraib prison in Iraq in 2003 became synonymous with a military campaign that many people considered **illegitimate** and illegal. Trust and **credibility** are essential if states and groups want to use soft power in order to persuade.

Soft power is also hard to use because cultures and values are **embedded** in society, and are therefore outside a government's control. States may also want to communicate different messages to different audiences through soft power; what persuades in Paris may not persuade in Damascus.

Articulation sentence:
Soft power is fragile – it can easily be destroyed – and it is often embedded in society and not within a government's control.

Military power

Military power is essential when using hard power. Military resources (land, air or sea) are the **ultimate** means to force another group or state to **comply** or to change their behaviour. The most powerful states are often thought to be those with the largest armies, the most advanced weapons (including nuclear weapons), and the technology and willingness to use their military power against one or more targets.

4 | 1 Power, sovereignty and international relations

It is possible to compare and measure the military resources available to states. We can look at the number of soldiers, the amount spent on defence, or the amount spent as a percentage of a state's GDP. As of 2015, *The Economist* estimated each of these as follows.

Figure 1.2 States' defence spending in $billion graph

Figure 1.3 States' defence spending as % of GDP graph

Status	Armed forces (by 1,000)
1. China	2,333
2. United States	1,433
3. India	1,346
4. North Korea	1,190
5. Russia	771

These data allow analysts to make different conclusions about military power. Poor but **unstable** states such as Afghanistan, South Sudan and Iraq have to spend a high proportion of their GDP on defence. They remain focused on their domestic instability and do not show any military power ambitions beyond reducing internal threats. States with large populations, such as China, the United States and India, unsurprisingly, have large numbers of troops (larger than the populations of some states). Wealthy countries and those keen to play a global role in security spend the most on defence, with four of the UN Security Council members (US, China, Russia and the UK) having the largest defence **budgets** in the world.

But it is dangerous to draw **firm** conclusions about military power from statistics about resources alone. What matters is whether military resources are actually used and whether they are successful when they are used. Success should be measured by whether the stated objectives of the use of military power are, in reality, achieved.

General vocabulary

GDP Gross Domestic Product: the total value of all goods and services produced in a country, in one year, except for income received from abroad

budgets the money that is available to an organization or person

Synonyms

unstable ..... insecure

firm ..... fixed

1 Power, sovereignty and international relations | 5

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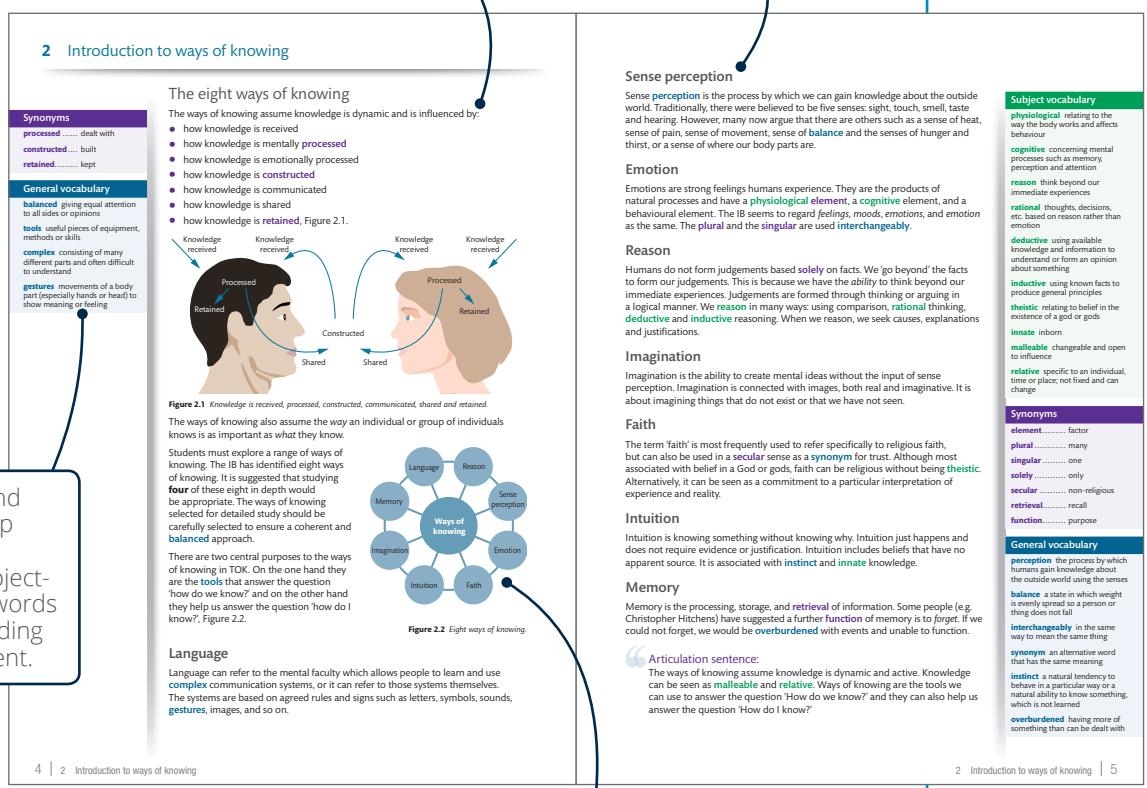

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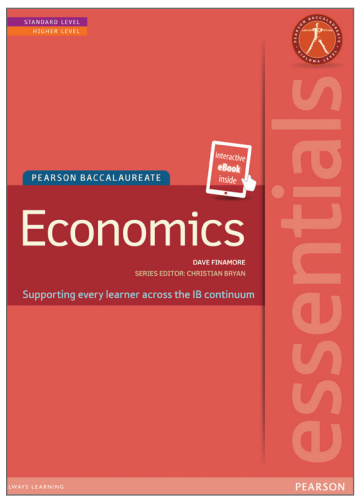

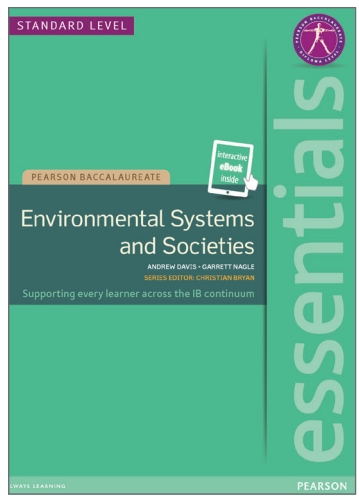

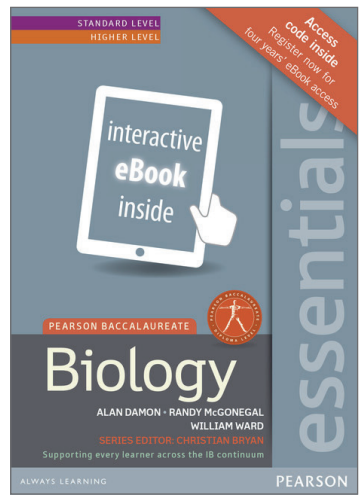

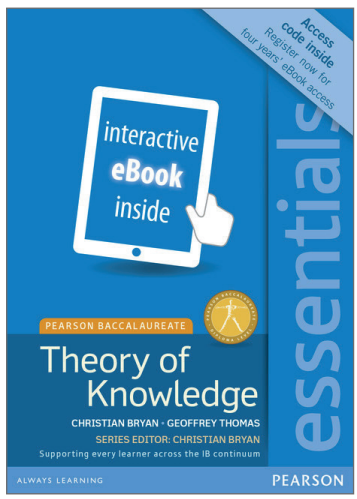

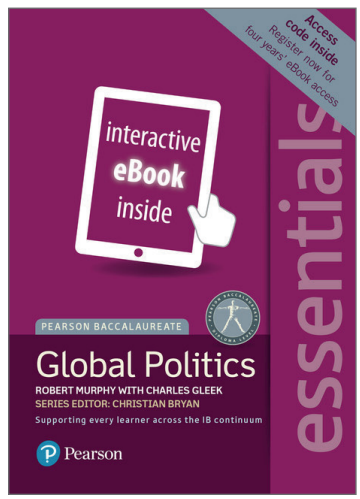

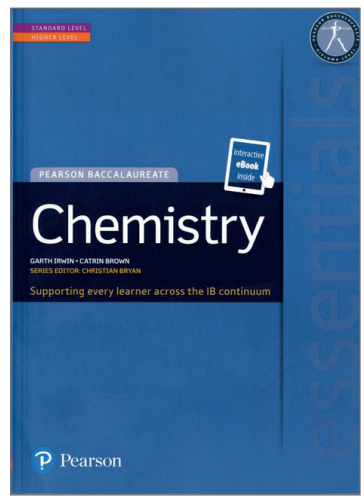

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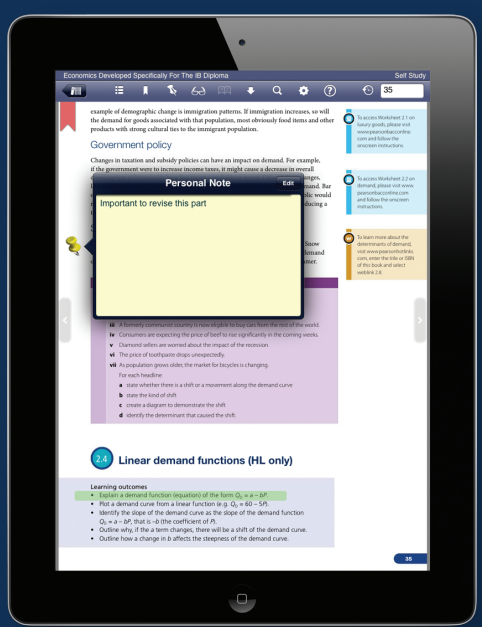

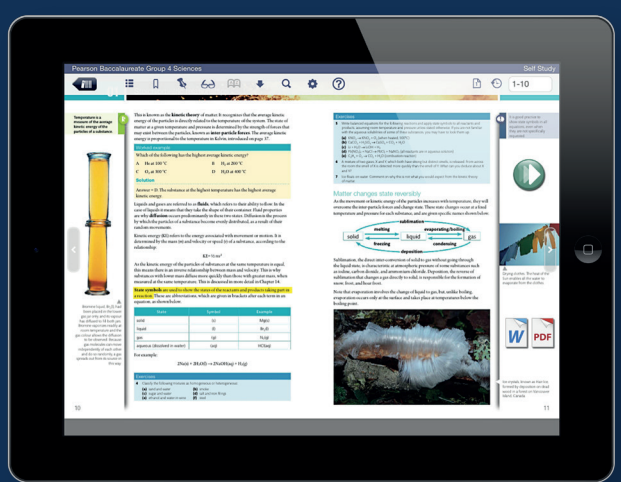

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