

Foreword

The OECD Programme for International Student Assessment (PISA) assesses the extent to which 15-year-old students near the end of their compulsory education have acquired the knowledge and skills that are essential for full participation in modern societies. The assessment does not just ascertain whether students can reproduce knowledge; it also examines how well students can extrapolate from what they have learned and can apply that knowledge in unfamiliar settings, both in and outside of school. This approach reflects the fact that modern economies reward individuals not for what they know, but for what they can do with what they know.

The assessment focuses on the core domains of reading, mathematics and science. Students' proficiency in an innovative domain is also assessed; in PISA 2022, this domain was creative thinking.

PISA is a triennial assessment that was launched in 1997 and implemented for the first time in 2000. For the eighth cycle of PISA, the PISA Governing Board (PGB) decided to postpone the assessment from 2021 to 2022 due to the COVID-19 pandemic. Thus, there was an exceptional four-year cycle between PISA 2018 and PISA 2022.

This publication presents the theory underlying the PISA 2022 assessment. It includes frameworks for assessing mathematics, the fourth assessment of students' financial literacy, and the framework for assessing the innovative domain, creative thinking. These chapters outline the content knowledge that students need to acquire in each domain, the processes that students need to be able to perform, and the contexts in which this knowledge and these skills are applied. The publication also discusses how each domain is assessed. Subsequently, the publication presents the frameworks for the various questionnaires distributed to students, school principals, parents, and teachers, including a new Global Crisis Module for students and school principals. It concludes with the framework for the Information and Communications Technology (ICT) familiarity questionnaire distributed to students.

In PISA 2022, mathematics was the major domain of assessment, as it was in 2003 and 2012. While appreciating and preserving the basic ideas of mathematical literacy developed in 2003 and 2012, the assessment in 2022 acknowledges a number of shifts in the world of the student which in turn signals a shift on how to assess mathematics in comparison to the approach used in previous frameworks. The new framework reflects a rapidly changing world driven by new technologies and trends in which citizens are creative and engaged, making judgements for themselves and the society in which they live.

PISA is the product of a collaborative effort between OECD and the governments of both OECD countries and its partner countries/economies. The assessments are developed co-operatively, agreed by participating countries/economies, and implemented by national organisations. The co-operation of students, teachers and principals in participating schools has been crucial to the success of PISA during all stages of development and implementation.

The mathematics framework was developed under the guidance of the 2022 mathematics expert group (MEG) chaired by Joan Ferrini-Mundy (University of Maine, United States) and Zbigniew Marciniak (University of Warsaw, Poland). Other experts who contributed to the mathematics framework are William Schmidt (Michigan State University, United States), Shuchi Grover (Stanford University, United States),

Takuya Baba (Hiroshima University, Japan), Jenni Ingram (University of Oxford, United Kingdom), Julián Mariño (University of the Andes, Colombia), and Stefania Bocconi (National Research Council of Italy (CNR) Institute for Educational Technology, Italy). The MEG was further supported by an extended MEG (eMEG) group, made up of ten experts acting as peer reviewers of the framework version created by the MEG. The eMEG included Michael Besser (Leuphana University of Lüneburg, Germany), Jean-Luc Dorier (University of Geneva, Switzerland), Iddo Gal (University of Haifa, Israel), Markku Hannula (University of Helsinki, Finland), Hannes Jukk (University of Tartu, Estonia), Christine Stephenson (University of Tennessee, United States), Tin Lam Toh (Nanyang Technological University, Singapore), Ödön Vancsó (Eötvös Loránd University, Hungary), David Weintrop (College of Information Studies, University of Maryland, United States), and Richard Wolfe (Ontario Institute for Studies in Education, University of Toronto, Canada). The work of the PISA 2022 MEG builds on previous versions of the PISA Mathematics framework and incorporates the recommendations of the Mathematics Strategic Advisory Group convened by OECD in 2017.

The financial literacy 2022 framework was revised by Chiara Monticone and Flore-Anne Messy of the OECD Secretariat with the Financial Literacy Expert Group (FLEG). The FLEG included Carmela Aprea (University of Mannheim, Germany), José Alexandre Cavalcanti Vasco (Securities and Exchange Commission, Brazil), Paul Gerrans (University of Western Australia, Australia), David Kneebone (Investor Education Centre, Hong Kong (China)), Sue Lewis (Financial Services Consumer Panel, United Kingdom), Annamaria Lusardi (George Washington University School of Business and Global Financial Literacy Excellence Center, United States), Olaf Simonse (Ministry of Finance, Netherlands), Anna Zelentsova (Ministry of Finance of the Russian Federation, Russia). The 2022 revision built on the initial PISA 2012 financial literacy framework developed by the FLEG, that at the time was composed of Annamaria Lusardi (The George Washington University School of Business, United States), Jean-Pierre Boisvion (Université de Paris II Panthéon-Assas, France), Diana Crossan (Commission for Financial Literacy and Retirement Income, New Zealand), Peter Cuzner (Australian Securities and Investments Commission, Australia), Jeanne Hogarth (Federal Reserve System, United States), Dušan Hradil, (Ministry of Finance, Czech Republic), Stan Jones (Consultant, Canada), and Sue Lewis, (Consultant, United Kingdom).

The creative thinking framework was developed by Natalie Foster and Mario Piacentini of the OECD Secretariat, under the guidance of the creative thinking expert group (CTEG). The CTEG included Ido Roll (Technion – Israel Institute of Technology, Israel), Baptiste Barbot (Université Catholique de Louvain, Belgium), Lene Tanggaard (Aalborg University, Denmark), Nathan Zoanetti (Australian Council for Educational Research, Australia), James Kaufman (University of Connecticut, United States), Marlene Scardamalia (University of Toronto, Canada) and Valerie Shute (Florida State University, United States). Natalie Laechelt (OECD Secretariat) also contributed to the research for the creative thinking framework. Bill Lucas (University of Winchester, United Kingdom), Jack Buckley (Roblox, United States), and Bo Stjerne Thomsen (LEGO Foundation, Denmark) provided precious advice and reviewed the drafts of the framework.

The framework for the PISA 2022 questionnaires was developed by Jonas Bertling, Jan Alegre, and Katie Faherty (Educational Testing Service, United States) with the guidance of and input from the questionnaire expert group. The questionnaire expert group was chaired by Nina Jude (Leibniz Institute for Research and Information in Education (DIPF) until 2020, then Heidelberg University, Germany). This group included Hunter Gehlbach (University of California, Santa Barbara until 2019, then Johns Hopkins University, United States), Kit-Tai Hau (The Chinese University of Hong Kong, Hong Kong (China)), Therese Hopfenbeck (University of Oxford, United Kingdom until 2022, then University of Melbourne, Australia), David Kaplan (University of Wisconsin-Madison, United States), Jihyun Lee (University of New South Wales, Australia), Richard Primi (Universidade São Francisco, Brazil), and Wilima Wadhwa (ASER Centre, India).

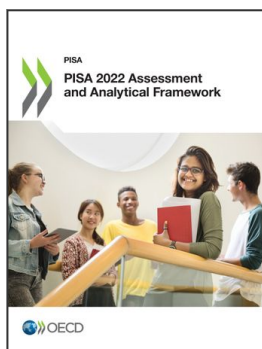
The framework for the PISA 2022 ICT familiarity questionnaire was developed by Adrien Lorenceau, Camille Marec and Tarek Mostafa (OECD) with the guidance of and input from the ICT expert group. The ICT expert group was chaired by Michael Trucano (World Bank, United States). This expert group included

Jepe Bundsgaard (University of Aarhus, Denmark), Cindy Ong (Ministry of Education, Singapore), Patricia Wastiau (European Schoolnet, Belgium) and Pat Yongpradit (Code.org, United States). The work on developing the PISA 2022 ICT framework was co-funded by the European Commission.

The Research Triangle Institute (RTI International) and its subcontractor, Pearson Education Limited, facilitated the development of the framework for mathematics. Educational Testing Service (ETS) had responsibility for the revision and development of the framework for questionnaires (non-cognitive outcomes and contextual information) using the existing frameworks as a base. ETS was also responsible for managing and overseeing this survey, developing the instruments, scaling, analysis, and developing the PISA computer platform and the communication portal. Other partners or subcontractors involved with ETS include the University of Luxembourg, the consultant Béatrice Halleux, the Centre for the Analysis of Systems and Practices in Education (aSPe) at the University of Liege, and Westat. ACT, Inc. had the responsibility for the instrument development of the PISA 2021 innovative domain: creative thinking. The responsibility for sampling was assumed by Westat as an independent contractor. cApStAn was responsible for linguistic quality assurance and management, and linguistic quality control, ensuring the linguistic equivalence of all language versions. The Australian Council for Educational Research (ACER) oversaw the optional programme for preparation and implementation support to countries.

The publication was prepared by the OECD Secretariat. Juliana González Rodríguez co-ordinated the production of the framework with Tue Halgreen and Catalina Covacevich, and contributions from Miyako Ikeda and Tiago Fragoso. Cassandra Morley and Charlotte Baer provided communications assistance, and Ricardo Sanchez Torres provided editorial and administrative support.

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