



Brussels, the 6th of June 2023

MEMORANDUM

Ref.: **2023-05-M-10-en**

Orig.: EN

Cancels and replaces Memorandum 2022-06-M-5 of the 16th of June 2022.

To: Directors, Deputy Directors for the secondary cycle of the European Schools and of the Accredited European Schools.

From: Manuel BORDOY VERCHILI – Deputy Secretary-General.

Subject: **Decision regarding the Technological support matching the characteristics required by the new Mathematics and Physics syllabuses. *Digital tools for learning, teaching and assessment.***

I hereby transmit **the decision of the group of experts responsible for the choice of the technological support to be implemented in the Mathematics and Physics syllabuses at the beginning of the school year 2023-2024**, as a follow-up of the approval by the Joint Teaching Committee on the 14th of June 2022 through the written procedure 2022/27 (Doc ref: "*A digital tool for teaching, learning and assessment in Mathematics and Physics*" 2022-05-D-45).

Decision

For the Mathematics and Physics syllabuses for the school year 2023-2024:

Year s4:

A scientific calculator with, at least, the “sin”, “cos” and “tan” trigonometric functions.

However, it is left to the discretion of the schools to anticipate the purchase of a model corresponding to the recommendations for year s5.

Years s5 and s6:

For classwork tests and examinations: A scientific calculator. The parameters/technical specifications of this scientific calculator are indicated in [appendix 1](#) of the present document.

For classwork only: Use of various **apps** in accordance with the syllabus (programming, spreadsheets, dynamic geometry, data processing, etc.)

No specific device should be purchased by the families¹. Apps will be used either in devices provided by the school (in IT or specific rooms, in trolleys), in pupils' personal devices within the framework of a BYOD project, or on personal smartphones. These devices may also be used during assessments which contribute to the A marks.

Year s7:

For classwork tests and examinations: A scientific calculator. The required parameters/technical specifications of the scientific calculator are indicated in [appendix 2](#) of the present document.

It will also be possible the use of a graphic calculator, but the teachers will take care to write test and examination questions for which the use of a graphic calculator will not provide any advantage.

- **For classwork only:** A **device** making the use of GeoGebra and other apps possible.

This device, which was probably bought when pupils were in s5, may also be used during assessments contributing to the A marks.

Please, feel free to use the text above in your school's list of books and materials for the school year 2023-2024.

In addition:

1.- The decisions taken in December 2021 (Memorandum 2021-12-M-1) are not changed and still apply to pupils entering s7 the next school year 2023-2024.

2.- In accordance with the syllabus for years s4 to s7, GeoGebra and other applications will be used in the classroom.

3.- It is the responsibility of the school to ensure that the technological tool (calculator) is used properly and fairly during examinations, for example by using test mode, memory reset or putting in place other relevant measures.

4.- It is recommended to have some spare technological tools (calculators) available for the pupils in the examination hall in case their own malfunctions. Pupils should be familiar with the spare technological tools available in the school before the examinations.

¹ The same would be applicable for years s1 to s4.

Projection for the next school years

Classwork

	2023-24	2024-25 and later
s1-s3	Scientific calculator <i>and apps</i>	Scientific calculator <i>and apps</i>
s4	Scientific calculator <i>and apps</i>	Scientific calculator <i>and apps</i>
s5	Graphic calculator <i>and apps</i>	Graphic calculator <i>and apps</i>
s6	Graphic calculator <i>and apps</i>	Graphic calculator <i>and apps</i>
s7	Scientific calculator, <i>GeoGebra and apps</i>	Graphic calculator <i>and apps</i>

Examinations

	2023-24	2024-25 and later
s1-s3	Scientific calculator	Scientific calculator
s4	Scientific calculator	Scientific calculator
s5	Graphic calculator	Graphic calculator
s6	Graphic calculator	Graphic calculator
s7	Scientific calculator	Graphic calculator



Manuel BORDOY VERCHILI
Deputy Secretary-General

Annex 1: Parameters/technical specifications of the calculator in s5/s6 for 2023-2024.

Annex 2: Parameters/technical specifications of the calculator in s7 for 2023-2024.

Annexes: Approved versions (FR, EN, DE) of the document "A digital tool for teaching, learning and assessment in mathematics and physics" 2022-05-D-45.

Copy: "Working group: Experts in charge of the choice of the technological support".

APPENDIX 1

PARAMETERS/TECHNICAL SPECIFICATIONS OF THE CALCULATOR IN s5 AND s6 . 2023-2024.

EN

Required functionalities:

- Trigonometric functions
- Exponential & logarithm
- Numerical equation(s) solving
- 1-Var & 2-Var Statistics
- Factorials & combinations
- Binomial distribution
- Normal distribution
- Functions: Table of values
- Numeric integration
- Numerical differentiation
- Graphing

Prohibited functionality:

- Computer Algebra System

FR

Fonctionnalités requises :

- Fonctions trigonométriques
- Exponentielle et logarithme
- Résolution d'équation(s) numérique(s)
- Statistiques à 1 et 2 variables
- Factorielles et combinaisons
- Distributions binomiales
- Distributions normales
- Fonctions: Tableau de valeurs
- Intégration numérique
- Différenciation numérique
- Graphiques

Fonctionnalités interdites :

- Calcul formel

APPENDIX 2

PARAMETERS/TECHNICAL SPECIFICATIONS OF THE CALCULATOR IN s7. 2023-2024.

EN

Required functionalities:

- Trigonometric functions
- Exponential & logarithm
- Numerical equation(s) solving
- 1-Var & 2-Var Statistics
- Factorials & combinations
- Binomial distribution
- Normal distribution
- Functions: table of values
- Numerical integration
- Numerical differentiation

Allowed functionality:

- Graphing (this part will not be assessed in the European Baccalaureate examinations)

Prohibited functionality:

- Computer Algebra System

FR

Fonctionnalités requises:

- Fonctions trigonométriques
- Exponentielle et logarithme
- Résolution d'équation(s) numérique(s)
- Statistiques à 1 et 2 variables
- Factorielles et combinaisons
- Distributions binomiales
- Distributions normales
- Fonctions: tableau de valeurs
- Intégration numérique
- Différenciation numérique

Fonctionnalité autorisée:

- Graphisme (cette partie ne sera pas évaluée au Bac)

Fonctionnalité interdite:

- Calcul formel