06 Detailed planning of the lesson

Duration	Phases	Focus	Social forms / Methods	Equipment / Supports	The learning process
First hour of teaching					
10'	Introduction I	The use of barcodes	Lively discussion, large group work	M1	Students... ... can recognise barcodes. ... know the usefulness of barcodes.
10'	Introduction II	Exploring barcodes	Working in small groups	M2 A tablet or smartphone	Students... ... know how to scan barcodes. ... know how to find codes in a database.
10'	Technical report	Scanning barcodes	Working in small groups	M3 A tablet or smartphone	Students... ... know how to scan barcodes. ... find that the barcodes are legible even if one of the digits is illegible.
15'	Mathematical concept I	Check digit	Plenary debate Individual work	M4	Students... ... are familiar with the concept of the check digit. ... know how to follow an algorithm to determine a check digit.
Second hour of teaching					
10'	Getting started In-depth I	Reminder Calculation	Plenary session Individual work	M5	Students... ... are familiar with the concept of the check digit. ... know how to find an unknown barcode value by trial and error.
10'	In-depth II	Solving equations	Working in small groups Plenary debate	M6	Students... ... can find an unknown value in a barcode by solving a simple equation.
	Reminder I	Euclidean division	Plenary session	M7	Students...

					... know how to do Euclidean division.
10'	Reminder II	Euclidean division	Working in small groups	M8 M9	Students... ... know how to calculate the remainders of Euclidean divisions. ... know that the same remainder can appear for several different Euclidean divisions.
	Investigation	Modular congruence	Working individually or in small groups	M10	Students ... know how to write modular arithmetic. ... know how to handle modular calculation.
13'	In-depth II Closure	Sum of remainders	Working in small groups Plenary debate	M11	Students... ... find that the remainder of a Euclidean division of a sum by a divisor is equal to the sum of the remainders of the Euclidean divisions by the same divisor. ... know and have understood that the remainder of a Euclidean division of a divisor by a number is equal to the sum of the remainders of the Euclidean divisions by the same divisor.
Third hour of teaching					
	Excursion	Combinatorics	Working individually or in small groups	M12	Students... ... know how to calculate the number of possibilities in a given situation.
20'	Mathematical concepts II	Choice of divisor	Working in small groups	M13	Students... ... know how to follow algorithms. ... know how to solve equations. ... find that equations do not always have a unique solution.
20'	Conclusion	Choice of divisor	Working in small groups	M14	Students...

					... know that the choice of divisor is important for finding unique solutions to equations.
5'	Pooling of results	Choice of divisor	Plenary session	M14	Students... ... know that the choice of divisor is important for finding unique solutions to equations.
Fourth hour of teaching					
10'	Reminder	Definition of a barcode and a check digit	Plenary session	M15	Students... ... repeat the definition of a check digit. ... repeat that a sum-based check digit works better than a product-based one. ... reiterate the importance of the divisor.
30'	Discover	EAN-13 barcode	Working in small groups	M16 M17 M18	Students... ... know the algorithm behind the EAN-13 barcode. ... can detect an error in a barcode. ... can find a missing digit by solving an equation.
	Exploration	Weighted sums	Work in small groups or individually	M19	Students... ... understand the interest of weighted sums in the algorithm of a check digit calculation.
5'	Closure	EAN-13 barcode	Plenary session	Table	Students... ... know the algorithm for calculating the check digit in EAN-13 barcodes. ... understand the different mathematical motivations behind the elements of this algorithm.