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**Mathematics Syllabus – Primary cycle**

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**Mathematics Syllabus - Primary (P1 - P5)**

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# **1. General Objectives**

The European Schools have the two objectives of providing formal education and of encouraging pupils’ personal development in a wider social and cultural context. Formal education involves the acquisition of competences (knowledge, skills and attitudes) across a range of domains. Personal development takes place in a variety of spiritual, moral, social and cultural contexts. It involves an awareness of appropriate behaviour, an understanding of the environment in which pupils live, and a development of their individual identity.

These two objectives are nurtured in the context of an enhanced awareness of the richness of European culture. Awareness and experience of a shared European life should lead pupils towards a greater respect for the traditions of each individual country and region in Europe, while developing and preserving their own national identities.

The pupils of the European Schools are future citizens of Europe and the world. As such, they need a range of competences if they are to meet the challenges of a rapidly changing world. In 2006 the European Council and European Parliament adopted a European Framework for Key Competences for Lifelong Learning. It identifies eight key competences[[1]](#footnote-1) which all individuals need for personal fulfilment and development, for active citizenship, for social inclusion and for employment:

1. Literacy competence
2. Multilingual competence
3. Mathematical competence and competence in science, technology and engineering
4. Digital competence
5. Personal, social and learning to learn competence
6. Civic competence
7. Entrepreneurship competence
8. Cultural awareness and expression competence

The European Schools’ syllabuses seek to develop all of these key competences in the pupils.

# **2. Didactic Principles**

## **2.1 General**

In the description of the learning objectives, competences, connected to contents, play an important role. This position in the learning objectives reflects the importance of competences acquisition in actual education. Exploratory activities by pupils support this acquisition of competences, such as in experimenting, designing, searching for explanations and discussing with peers and teachers. In science education, a teaching approach is recommended that helps pupils to get acquainted with concepts by having them observe, investigate and explain phenomena, followed by the step to have them make abstractions and models. In mathematics education, investigations, making abstractions and modelling are equally important. In these approaches, it is essential that children observe and manipulate with the teacher a maximum of activities: teacher guidance is an essential contribution to targeted stimulation of pupils' activities.

## **2.2 Mathematics**

Careful thought has been given to the contents and the structure to where topics are first met in a pupil’s time learning mathematics in primary education. It is believed that this is a journey and if too much contents is met at one point, there is a risk that it will not be adequately understood and thus a general mathematical concept will not be fully appreciated. By limiting the contents of this syllabus (found in section 4.) each year more time can be used to develop core mathematical concepts that may have been met before or new mathematical concepts introduced are given ample time for extension.

Furthermore, to this point it is believed that with a focus on competences this syllabus can encourage pupils to have a greater enjoyment of mathematics, as they not only understand the contents better but understand the historical context (where it is expected a history of mathematics can be told over the cycles) and how the mathematics can be applied in other subjects, cross cutting. As such the syllabuses have specifically been designed with reflection to the key competences (section 1) and the subject specific competences (section 3.1).

One of the tasks in the pupil’s learning process is developing inference skills, analytical skills and strategic thinking, which are linked to both the key and subject specific competences. This is the ability to plan further steps in order to succeed solving a problem as well as dividing the process of solving more complex problems into smaller steps. A goal of teaching mathematics is to develop pupil’s intuitions in mathematics appropriate for their age. The ability to understand and use mathematical concepts is much more important than memorising formal definitions.

To ensure pupils have a good understanding of the mathematics the courses from P1 to P5 have been developed linearly with each year the work from the previous year is used as a foundation to build onto. The teacher is in the best position to understand the specific needs of the class and before beginning a particular topic it is expected that pupils have the pre-required knowledge. A refresh is always a good idea when meeting a concept for the first time in a while. It should be noted that revision is not included in the syllabus, however, as mentioned earlier about limiting new contents, there is time to do this when needed.

The use of technology and digital tools plays an important role in mathematics, which is reflected in this syllabus. The pupils should get the opportunity to work and solve problems with different tools or software that are available in the respective schools. Technology and digital tools should be used to support and promote pupils’ understanding.

## **2.3 Problem solving**

## **2.3.1 What’s the nature of mathematics?**

Mathematics could be defined as a study of properties, relationships, operations, algorithms and applications of numbers and spaces at the very basic levels and of abstract objects and concepts at more advanced levels. Mathematical objects and concepts and related knowledge and methods are products of insight, logical reasoning and creative thinking and are often inspired by problems that seek solutions. Abstractions are what make mathematics a powerful tool for solving problems. Mathematics provides within itself a language for representing and communicating ideas and results of the discipline.

Problem solving is an integral part of mathematics and is not a separate chapter in this syllabus. In each of the five chapters of the syllabus: Numbers, Operations, Measurement, Shape and Space, Data handling, the pupils have the opportunity to discover, construct and apply an elaborate mathematical reasoning which they can use in each domain. The key actions for problem solving are:

**Understand** and **analyse** - consider, select and retain data and steps to resolve the problem

**Investigate** - ask relevant questions, generate ideas, formulate a reasoning process and take decisions

**Reason** - describe, interpret, explain and use information to obtain the expected result

**Verify** and **validate** - learn to check result and approach, reconsider and evaluate the whole process

**Communicate** - learn to express the way of thinking and compare the results and actions to the others

**Use technology** appropriately in a wide range of situations

## **2.3.2 Numbers**

Children’s interest in numbers comes early. Even in early childhood, children develop an ability to count, and use numbers within simple contexts, i.e. ‘I am 2 years old !’ Even though the background of the understanding of numbers may not be common place. Numbers impact on many aspects of the curriculum, and without strong number understanding will lead to issues in other contents areas.

As pupils move through the primary education, they will build their understanding of numbers encountering larger integers each year. Starting within 20 in P1, this knowledge extends to
1 000 000 and beyond by the pupil enters P5. However, the skills to attain this knowledge do not differ, and the grasping of these concepts come via similar methods year on year repeated in a spiral way. When faced with a problem, pupils often have to deal with numbers that are made up of digits. Understanding the status of each digit in the number is important in solving the problem.

By performing number variations, they understand the mechanics of decimal numbering. A large four digit number, for example, can be expressed as a sum of products of powers of ten. The verification of the representation of a number can be carried out using an abacus, a grid or even a calculator.

Finally, it is by mastering the value of the digits composing a number that the pupil will be able to communicate the answer to the problem that he will have personally developed.

## **2.3.3 Operations**

Mathematical operations are of primary importance in our daily lives. Life is punctuated by various mathematical operations. A thorough understanding of the four operations helps children to develop essential skills.

Using precise vocabulary, understanding the priority of operations, manipulating decomposition, listening, sharing and understanding the reasoning of others will help pupils develop a variety of strategies.

To solve a problem, the pupil must have a good command of the processes of operations and their properties. Neuroscience confirms that by automating mental arithmetic as far as possible, for example by memorising multiplication tables, long-term memory is used to a greater extent and free capacity in the working memory for reasoning.

It’s a question of discovering the most economical and shortest process to carry out an operation. Then, when the pupil has discovered the mathematical structure hidden in the statement of the problem, he must estimate the plausible answer in relation to the situation but also in relation to the mobilized numbers. The response will thus be validated by resorting to the reverse operation or in relation to the estimate. Each step of the problem can be controlled.

Finally, it will be a question of communicating the answer clearly to the other pupils while respecting the conventions of mathematical writing.

## **2.3.4. Measurement**

Measurement is an important human activity. It is an essential tool of science and provides a useful link between a real world and mathematics. Children should develop concepts about measurement using their own non-standard units (measuring length using hand spans, footsteps, elbows, straws etc). A discussion of the need for a standard unit arises after measuring the same objects and arriving at different answers. Historically, all units were developed in this way. For example, cubit was used to measure cloth. However, different people have different lengths for the parts of the body. In order to stop cheating, it was eventually decided that metric standard units should be used. It is also important to teach at a later stage that there are two systems of standard measurement units that are used in Europe. The metric system of units (SI, abbreviated from the French Système International d’Unités) is the official system however in some countries, the traditional imperial system is still in general use outside of school.

Measurements are an inexhaustible source of mathematical problems in real life. The first step is to become aware of what sort of object to be measured is present in the problematic situation. Choosing the right instrument and the right unit of measure is important. Once this done, it‘s a question of estimating the order of size of the object to be measured. We can also compare the different sizes of objects of the same category and order them in ascending order. These measurements must then be processed by applying a conversion to the common term or by combining them using an arithmetic operation. To check its measurement, it may be necessary to repeat the operation using another unit of measurement or by applying a formula. Finally, it will be necessary to adequately and precisely communicate to the other pupils the measurement process used and the answer using the correct unit.

## **2.3.5. Shape and Space**

This chapter includes the various perceptual skills that are important for solving mathematical tasks. Visual perception is the basis for mathematical thinking and action. It leads to spatial orientation, which enables children to grasp positional relationships, shapes and solids, lines and angles, patterns and mosaics, and symmetry.

Shape and space is an interesting area of ​​mathematics to explore because the problems that can arise often suggest reasoning without being hampered by a lack of mastery of numbers, operations and units of measurement. Identifying, classifying, tracing, reproducing, transforming shapes or spotting remarkable properties motivate the pupil's reasoning process. They must determine the characteristics of the observed shapes: polygon or not, regular or not, number of sides, isometric sides, parallel or perpendicular sides, base and height, angles, axes of symmetry.

They should be able to check their observations or constructions by associating it with a similar figure or by using measuring instruments. Finally, it will be a question of communicating their findings and approaches by using the mathematical vocabulary.

## **2.3.6. Data handling**

[Data handling](https://www.theschoolrun.com/data-handling) is an introduction to Primary School statistics. Thus, this chapter deals with an essential and quite common part of practical life. Indeed, we are frequently presented with data in various contexts which we need to analyse, evaluate, and interpret.

Children learn about how to collect, organise, present, interpret and discuss data in [pictograms](https://www.theschoolrun.com/pictograph), [tally charts](https://www.theschoolrun.com/what-is-a-tally-chart), [block diagrams](https://www.theschoolrun.com/what-is-a-block-graph), [bar charts](https://www.theschoolrun.com/what-is-a-bar-chart), Venn- and Carroll diagrams, [line graphs](https://www.theschoolrun.com/what-is-a-line-graph) and [pie charts](https://www.theschoolrun.com/what-is-a-pie-chart).

An important target of this section is about developing the ability to look for patterns and generalities or to make simple predictions.

Moreover, the chapter provides an ideal opportunity to practise critical thinking skills. At the end of primary school, children should be able to check the accuracy of information. In addition, the first notions of probability calculation, in particular the vocabulary of likelihood and chance, and the concept of the mean (average), should be understood. The chapter also offers good opportunities to work on online data and easy-to-use software. **on)1.3**

Data processing is the privileged chapter to exercise the logical thinking and structuring of concrete or abstract objects. This is the area where the communication dimension in problem solving is the most frequent because it allows to appreciate the way of sequencing, sorting, organizing the elements of a set of data in a consistent and presentable way. The pupils must understand that the situation needs criteria in order to group and arrange raw data. Once the criterion has been defined according to the particularity of the set of objects, pupils reorganize this set to avoid confusion, contradiction and ambiguity. In particular, they take care not to withhold superfluous data. They test the consistency of their approach by reviewing the quality or quantity of their data. Finally, they present their approaches in a form of a diagram or a table that can be read and evaluated by others.

# **3. Learning Objectives**

## **3.1 Competences**

The following are the list of subject specific competences for mathematics. Here the key vocabulary is listed so that when it comes to reading the tables in section 4.2. the competency being assessed can be quickly seen. Please note that the list of key vocabulary is not exhaustive, and the same word can apply to more than one competency depending on the context.

Further information about assessing the level of competences can be found in section 5.1. Attainment Descriptors. The key concepts here are those we expect the pupils to attain.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Competency** | **Key concepts** | **Key vocabulary** |
| **1.** | **Knowledge and comprehension** | Demonstrates satisfactory knowledge and understanding of straightforward mathematical terms, symbols and principles | Compare, identify, know, name, order, read, recall, recognise, round, simplify, understand, verify, write |
| **2.** | **Methods** | Carries out mathematical processes in straightforward contexts, but with some errors | Apply, calculate, construct, convert, draw, locate, manipulate, match, measure, place, plot, practise, record, represent, round, simplify, use |
| **3.** | **Problem solving** | Translates routine problems into mathematical symbols and attempts to reason to a result | Combine, develop, explore, find, investigate, partition, solve, study |
| **4.** | **Interpretation and evaluation** | Attempts to draw conclusions from information and shows limited understanding of the reasonableness of results | Calculate, conduct, create, develop, display, estimate, evaluate, interpret, investigate, justify |
| **5.** | **Communication** | Generally presents reasoning and results adequately using some mathematical terminology and notation | Conduct, describe, discover, discuss, display, explore, indicate, interpret, investigate, present, represent |
| **6.** | **Digital competence** | Uses technology satisfactorily in straightforward situations | Calculate, carry out, check, correct, display, draw, identify, manipulate, perform, present, record, represent, use, solve |

##

## **3.2 Cross-curricular concepts**

Cross-curricular concepts encourage pupils to explore the connections between different subjects. Their introduction develops deeper understanding and transferring pupils’ knowledge across subject boundaries and into the real world. Wherever possible, mathematics should be taught through the relevant, realistic context. Links to the transdisciplinary themes should be explicitly made and developing comprehension of these links will contribute to the pupils’ awareness of mathematics in the world and of the relationship with other subjects. These themes can enrich the curriculum without overloading it through the introduction of additional teaching subjects and facilitate interdisciplinary thinking and collaborative learning, i.e. within Discovery of the World.

# **4. Contents**

## **4.1 Topics**

This section contains the tables with the learning objectives and the mandatory contents for P1 to P5 in Mathematics.

## **4.2 Tables**

How to read the tables on the following pages? The mandatory contents are described in the second column. The third column describes the learning objectives which are the curriculum goals. These include the key vocabulary, highlighted in bold, that are linked to the specific mathematics competences found in section 3.1. of this syllabus.

**YEAR P1**

|  |  |
| --- | --- |
| **YEAR P1** | **TOPIC: NUMBERS**  |
| **Subtopic** | **Contents** | **Learning objectives** |
| Whole numbers | Counting | **Calculate** to 20 by counting forwards and backwards, starting at any point |
| **Count** to 100 in intervals of 1, 2, 5, 10 and 20  |
| **Count** a given number of objects  |
| **Write** whole numbers from 0-20 and to 100 in multiples of 10 and units |
| Representation of numbers | **Match** quantities to numbers to 20 |
| **Represent** numbers through illustrations and on a number line |
| Using and applying | **Use**numbers in real life contexts |
| Estimation | **Estimate** the number of objects before counting   |
| Odd and even numbers | **Discover**the concept of zero, odd and even numbers to 20 |
| Partitioning | **Manipulate**, **partition** and **combine** numbers to 20 |
| Comparing and ordering | Ordering numbers | **Use** the vocabulary of ordering numbers (smaller, bigger, less than, more than, the same, equal) |
| **Order** numbers (increasing and decreasing) using a number line and a number track to 20 |
| **Identify** and **place** a number to 20 on a number line |
| Ordinal numbers | **Use** the language of ordinal numbers, from first to tenth |
| Place value | Use of manipulatives | **Manipulate** and **explore** place value using base 10 to 20 |
| Tens and units | **Read** and **write** numbers on a place value chart |
| **Understand** the place value of each digit in a two digit number |
| Fractions, decimals and percentages | Mathematical vocabulary  | **Use** vocabulary of double and half in real life contexts |
| Doubling and halving | **Find** half of shapes and sets of objects  |
| **Discover** the relationship between halving and doubling  |
| Patterns and sequences | Patterns and sequences of numbers | **Explore, recognise** and **record** patterns and sequences using numbers to 20 with a variety of intervals |
| **YEAR P1** | **TOPIC: OPERATIONS** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Addition and subtraction | Mathematical vocabulary | **Explore** the concepts of addition and subtraction through play and practical tasks and by using concrete materials |
| **Use** the vocabulary and symbols of calculations (add, subtract, plus, minus, equals, +, -, =) |
| Operations | **Calculate** operations with answers to 20, with and without manipulatives |
| **Create** operations with answers to 20, using formal notation |
| Inverse operations | **Understand** that addition and subtraction are inverse operations |
| Number bonds | **Use** pairs of numbers with a total of 10 and **work out** the corresponding subtraction facts |
| **Use** the knowledge of pairs of 10 to learn the pairs to 20 |
| Doubles and halves  | **Determine** the doubles and corresponding halves of all numbers to 20 |
| Commutative law | **Recognise** the principle of the commutative law of addition |
| Multiplication and division | Modelling  | **Explore** the concepts of multiplication and division by grouping and sharing through play and practical tasks |
| **YEAR P1** | **TOPIC: MEASUREMENT** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Length and perimeter | Language of length | **Use** the vocabulary of length (wide, high, long, short, tall, equal) |
| Non-standard units of length | **Estimate,** **measure**, **compare** and **record** length using non-standard units  |
| **Recognise** non-standard measuring units and objects and **use** appropriately |
| Standard units of length | **Use** a ruler to draw lines and line segments |
| **Measure** lengthin centimetres |
| **Compare** lengths of line segments in centimetres |
| **Investigate** standard units in their environment (metre, centimetre) |
| Capacity and volume | Language of capacity | **Understand** and **use** the vocabulary of capacity (fill, pour, full, empty) |
| Non-standard units of capacity | **Estimate**, **measure**, **compare** and **record** capacity using non-standard units |
| **Identify** non-standard measuring units and objects and **use** appropriately |
| Standard units of capacity | **Be aware** of standard units in their environment (litre) |
| Mass(weight) | Language of weight | **Understand** and **use** the vocabulary of weight (heavier, lighter, balance, scales, weigh, equal) |
| Non-standard units of weight | **Identify** non-standard units of weight |
| **Estimate,** **measure**, **compare** and **record** weight using non-standard units |
| Standard units of weight | **Investigate** standard units in their environment (kilogram and gram) |
| Time | Non-standard units of time | **Estimate**, **measure** and **describe** the passage of time using non-standard units  |
| Language of time | **Understand** and **use** the vocabulary of time (hour, day, month, year) |
| Clocks | **Represent** the time to the hour and half hour on analogue clocks  |
| **Tell** the time to the hour and half hour |
| Calendar | **Name** the days of the week, months and the seasons of the year |
| **Order** familiar events in the cycle of a day and a week |
| **Explore** the calendar as a tool to read the date and **observe** how many nights/days remaining until a certain event within a short period |
| Money | Value of money | **Understand** and **use** the vocabulary of European monetary system (euro, cent) |
| **Distinguish** between euros and cents |
| **Recognise** all the coins and notes and **be aware** of their value |
| **Order** coins by value |
| **Manipulate** euros in play using replica coins and notes |
| **Manipulate** coins and notes to make different amounts to 20 euros |
| **YEAR P1** | **TOPIC: SHAPE and SPACE** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Spatial awareness | Mathematical vocabulary | **Understand** and **use** the vocabulary of spatial awareness, position and directions (left, right, over, under/ below, beside, between, etc.) |
| Direction and location | **Develop** their own sense of spatial awareness |
| **Follow** and **give** simple directions to move |
| **Locate** places or objects on a simple map |
| 2 D and 3 D shapes | Patterns and tessellation | **Recognise**, **describe, copy** and **extend** patterns in colour, shape and quantity |
| **Manipulate** shapes and objects to investigate patterns, symmetry and tessellation |
| 2 D shapes | **Understand, identify** and **use** the vocabulary of 2 D shapes (side, corner, square, rectangle, triangle, circle, semi-circle)  |
| **Sort, name** and **describe** 2 D shapes |
| **Identify** 2 D shapes in real life contexts |
| **Identify** the basic properties of 2 D shapes |
| **Construct** and **draw** 2 D shapes  |
| **Use** 2 D shapes to create other shapes |
| 3 D shapes | **Understand, identify** and **use** the vocabulary of 3 D shapes (cube, cuboid, cylinder, sphere, cone and pyramids) |
| **Identify** 3 D shapes in real life contexts |
| **Identify** the basic properties of 3 D shapes |
| Transformations | Symmetry | **Recognise** examples of symmetry in their environment |
| **Identify** reflective symmetry in simple 2 D shapes and letters |
| Symmetry lines | **Draw** a line of symmetry in simple 2 D shapes |
| **Complete** the missing half of a shape, picture or pattern, using either a vertical or a horizontal line of symmetry |
| **YEAR P1** | **TOPIC: DATA HANDLING** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Collection, interpretation and representation of data | Collecting data | **Collect** and **organise** data in a systematic way |
| **Describe** real life situations and pictures from a child’s environment to collect data |
| **Sort** and **classify** objects by one or two criteria |
| Bar graphs and pictograms | **Understand** that bar graphs and pictograms are simple ways to represent data |
| **Represent** data using bar graphs and pictograms |
| **Represent** and **interpret** bar graphs in both horizontal and vertical forms |
| **Create** a story using information from a bar graph or a pictogram |

**YEAR P2**

|  |  |
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| **YEAR P2** | **TOPIC: NUMBERS**  |
| **Subtopic** | **Contents** | **Learning objectives** |
| Whole numbers | Counting | **Calculate** to 100 by counting forwards and backwards, starting at any point |
| **Count** to 100 in intervals of 1, 2, 5, 10 and 20 |
| **Count** within 1 000 in intervals of 100  |
| **Count** a given number of objects  |
| **Recall** and **write** whole numbers to 100  |
| Representation of numbers | **Match** quantities to numbers to 100  |
| **Represent** numbers through illustrations   |
| Using and applying | **Use**numbers in real life contexts |
| Estimation | **Estimate** the number of objects before counting  |
| Odd and even numbers | **Recall**the concept of zero and **discover** odd and even numbers to 100 |
| Partitioning | **Manipulate**, **partition** and **combine** numbers to 100 |
| Comparing and ordering | Ordering numbers | **Understand** and **use** the vocabulary of ordering numbers (smaller, bigger, less than, more than, the same, equal) |
| **Order** numbers (increasing and decreasing) using a number line and a number track to 100 |
| **Identify** and **place** a number to 100 on a number line |
| **Use** mathematical symbols (>, <, =) to comparenumbers |
| Ordinal numbers | **Use** the language of ordinal numbers, from first to tenth |
| Place value | Use of manipulatives | **Manipulate** and **explore** place value using base 10 to 100 |
| Hundreds, tens and units | **Read** and **write** numbers on a place value chart |
| **Understand** the place value of each digit in a three digit number |
| Partitioning | **Partition** numbers to 100  |
| Rounding | **Round** numbers to the nearest 10 |
| Fractions, decimals and percentages | Mathematical vocabulary | **Understand** and **use** the vocabulary of double, half and quarter in real life contexts |
| Doubling and halving | **Identify** half of shapes and sets of objects |
| **Discover** the relationship between halving and doubling |
| Patterns and sequences | Patterns and sequences of numbers  | **Explore, recognise** and **record** patterns and sequences usingnumbers to 100 with a variety of intervals |
| **YEAR P2** | **TOPIC: OPERATIONS** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Addition and subtraction | Mathematical vocabulary | **Understand** and **use** the vocabulary and symbols of addition and subtraction |
| **Explore** the concepts of addition and subtraction through play and practical tasks and by using concrete materials |
| Operations | **Create** addition and subtraction calculations with answers to 100 using formal notation |
| **Make** operations including those bridging multiples of ten |
| **Write** and **calculate** sums with two digit numbers with answers to 100 |
| **Write** and **calculate** differences with two digit numbers  |
| Inverse operations | **Recall** that addition and subtraction are inverse operations |
| Number bonds | **Discover** pairs of numbers that total 100 and **work out** the corresponding subtraction facts |
| **Use** the knowledge of pairs of 10 to learn the pairs to 100 |
| **Make** operations using doubling and halving  |
| Commutative law | **Apply** the principle of the commutative law of addition |
| Mental calculation | **Learn** and **apply** appropriate strategies to support mental calculations  |
| Multiplication and division | Mathematical vocabulary | **Explore** the concepts of multiplication and division by grouping and sharing through play and practical tasks |
| **Understand** and **use** the vocabulary and symbols of operations (multiply, divide, times, share equally, x, ÷) |
| Operations | **Understand** that multiplication is repeated addition |
| **Learn** multiplication tables to 10 by rote |
| **Explore** the relationship between multiplication tables (doubling, halving) |
| Inverse operations | **Understand** that multiplication and division are inverse operations |
| Doubles and halves | **Calculate** halve and double of a given number |
| Commutative law | **Recognise** the principle of the commutative law of multiplication |
| **YEAR P2** | **TOPIC: MEASUREMENT** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Length and perimeter | Language of length | **Extend** the vocabulary of length (wide, high, long, short, equal) |
| Non-standard units of length | **Estimate**, **measure**, **compare** and **record** length using non-standard units |
| **Recognise** non-standard measuring units and objects and **use** appropriately |
| Standard units of length | **Use** a ruler to **draw** lines and line segments |
| **Measure** length in centimetres |
| **Compare** lengths of line segments in centimetres |
| **Investigate** standard units in their environment (metre, centimetre) |
| Capacity and volume | Language of capacity | **Understand** and **use** the vocabulary of capacity (fill, pour, full, empty) |
| Standard units of capacity | **Estimate**, **measure**, **compare** and **record** capacity using non-standard units |
| **Identify** non-standard measuring units and objects and **use** appropriately |
| **Be aware** of standard units in their environment (litre) |
| Mass (weight) | Language of weight | **Understand** and **use** the vocabulary of weight (heavier, lighter, balance, scales, weigh, equal) |
| Standard units of weight | **Identify** non-standard units of weight |
| **Estimate**, **measure**, **compare** and **record** weight using non-standard units |
| **Investigate** standardunits in their environment (kilogram and gram) |
| Time | Standard units of time | **Estimate**, **measure** and **describe** the passage of time using non-standard units |
| **Understand** and **use** the vocabulary of time (hour, day, month, year) |
| Clocks | **Represent** the time to the hour and half hour on analogue clocks |
| **Review** the time to the hour and half hour |
| Calendar | **Name** the days of the week, months and the seasons of the year |
| **Order** familiar events in the cycle of a day and a week |
| **Explore** the calendar as a tool to read the date and **calculate** how many nights/days remaining until a certain event |
| Money | Value of money | **Understand** and **use** the vocabulary of European monetary system (euro, cent) |
| **Distinguish** between euros and cents |
| **Recognise** all the coins and notes and **be** **aware** of their value |
| **Order** coins by value |
| **Manipulate** euros in play using replica coins and notes |
| **Manipulate** coins and notes to make different amounts to 100 euros |
| **YEAR P2** | **TOPIC: SHAPE and SPACE**  |
| **Subtopic** | **Contents** | **Learning objectives** |
| Spatial awareness | Direction and location | **Consolidate** and **extend** the vocabulary of shapes (semi-circle, oval, curved, straight, sides, corners, round, flat, faces) |
| 2 D and 3 D shapes | Patterns and tessellation | **Recognise, describe, extend** and **create** patterns  |
| **Review** the manipulation ofshapes and objects to investigate patterns, symmetry and tessellation |
| Lines and angles | **Recognise** vertical and horizontal lines |
| **Recognise** forms, right angles and **relate** them to shape and the environment |
| 2 D shapes | **Sort, name** and **describe** the properties of 2 D shapes |
| **Identify** 2 D shapes in real life and **discuss** their use |
| 3 D shapes | **Sort, name** and **describe** the properties of 3 D shapes (cube, cuboid, cylinder, sphere, cone and pyramids) |
| **Introduce** the new shapes oval and semi-circle |
| **Identify** 3 D shapes in real life contexts and **discuss** their use  |
| Transformations | Symmetry | **Recognise** examples of symmetry in their environment and in drawings and objects |
| Symmetry lines | **Explore** and **recognize** reflective symmetry in shapes through practical activities (by folding, cutting and manipulating objects) |
| **Draw** a line of symmetry in 2 D shapes |
| **Complete** the missing half of a shape, picture or pattern, using either a vertical or a horizontal line of symmetry |
| **YEAR P2** | **TOPIC: DATA HANDLING**  |
| **Subtopic** | **Contents** | **Learning objectives** |
| Collection, interpretation, and representation of data | Tally charts, frequency tables, bar charts | **Recall** block graphs andpictograms |
| **Understand** and **use** tally charts, frequency tables and bar charts as a method of collecting data |
| **Read** and **interpret** data from bar charts |
| **Use** different scales on axis |
| **Describe** real life situations presented in tally charts, frequency tables or bar charts |
| Technological tool  | **Use** data from Internet to make a bar chart (Easy online data bases)  |

**YEAR P3**

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| **YEAR P3** | **TOPIC: NUMBERS**  |
| **Subtopic** | **Contents** | **Learning objectives** |
| Whole numbers | Counting | **Read, recall** and **write** whole numbers to 1 000  |
| **Calculate** to 1 000 by counting forwards and backwards, starting at any point |
| **Count** in multiples of 100 and 1 000 to 10 000 |
| **Count** to 1 000 in intervals of 1, 2, 5, 10, 50 and 100 |
| **Read** and **write** numbersto 10 using Roman Numerals  |
| **Match** quantities to numbers in a variety of situations |
| Representation of numbers | **Understand** how to matchnumbers to a variety of situations  |
| Using and applying | **Use** large numbers in real life contexts |
| Estimation | **Develop** and **use** estimation strategies (comparing and grouping) |
| Comparing and ordering | Ordering numbers | **Order** numbers (increasing and decreasing) on using a number line and a number track to 1 000 |
| Comparing numbers | **Compare, locate** and **place** numbers on a number line and in a hundred square |
| **Locate** and **identify** the multiples of 10 and 100 that lie either side of a number  |
| **Use** mathematical symbols (>, <, =) to comparenumbers |
| Place value | Use of manipulatives | **Manipulate, explore** and **identify** place value using base 10 to 1 000 |
| Thousands, hundreds, tens and units | **Understand** the place value of each digit in a four digit number  |
| **Partition, manipulate** and **combine** four digit numbers |
| Rounding | **Round** numbers to the nearest 10, 100 and 1 000 |
| Fractions, decimals and percentages | Mathematical vocabulary | **Understand** and **use** the vocabulary of fractions (numerator, denominator) |
| Fractions | **Read** and **write** proper fractions, using denominators to 10  |
| **Identify** and r**ecognise** fractions of different shapes |
| **Manipulate** and **use** the fraction wall to compare simple fractions and **understand** equivalence |
| Patterns and sequences | Patterns and sequences of numbers  | **Explore, recognise** and **record** patterns and sequences using numbers with a variety of intervals to 1 000  |
| **Discover** patterns within multiplication tables to 10 and **find** links between them  |
| **Recognise** multiples of 2, 5, 10 and 100 to 1 000 |
| **YEAR P3** | **TOPIC: OPERATIONS** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Addition and subtraction | Mathematical vocabulary | **Use** the vocabulary and symbols of addition and subtraction |
| Operations | **Add** and **subtract** three digit numbers  |
| **Calculate** combination of addition and subtraction calculations |
| **Write** addition and subtraction using informal and standard written methods including those bridging multiples of tens and hundreds |
| Mental calculation | **Apply** appropriate strategies to support mental addition and subtraction to 1 000 (bridging tens and hundreds, halving and doubling, partitioning) |
| Estimation | **Estimate** before calculating and checking the answer |
| Calculator | **Use** a calculator to check and correct answers |
| Multiplication and division | Mathematical vocabulary | **Use** the vocabulary and symbols of multiplication and division |
| Operations | **Apply** the understanding that multiplication is repeated addition |
| **Recall** multiplication tables to 10 and associated division facts at speed and in any order |
| **Determine** all factors of numbers within the multiplication tables |
| **Explore** the relationships between the multiplication tables |
| **Multiply** a two digit number by 10 or 100 and **understand** the impact on place value |
| **Divide** a three digit multiple of 10 by 10  |
| **Write** and **calculate** products (two digit or three digit numbers by a one digit number) |
| **Write** and **calculate** quotients (two and three digit numbers by a one digit number) |
| **Understand** what a remainder is when dividing |
| Inverse operations | **Apply** the understanding that multiplication and division are inverse operations |
| Commutative law | **Apply** the principle of the commutative law of multiplication |
| Mental calculation | **Develop** mental calculation strategies for multiplication and division (transposing the knowledge of simple multiplication and division facts to multiples of 10 and 100, partitioning) |
| **Calculate** the half and the double of a given number to 100 and of significant multiples to 1 000 |
| Estimation | **Estimate** beforecalculatingand **check** the validity of the estimate |
| Fractions | **Calculate** and **record** a simple fraction of a given quantity  |
| **Understand** the relationship between fractions and division |
| Calculator | **Check** and **correct** answers by usinga calculator  |
| **YEAR P3** | **TOPIC: MEASUREMENT** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Length and perimeter | Language of length | **Understand** and **use** the vocabulary of length (width, height, perimeter, near and far, scale, is equal to, distance) |
| Standard units of length | **Identify** kilometres and decimetres |
| **Understand** the relationships between km-m, m-dm, m-cm, m-mm, dm-cm, cm-mm |
| **Convert** km-m, m-dm, m-cm, m-mm, dm-cm, cm-mm |
| **Estimate**, **measure**, **compare** and **record** lengths of a wide variety of objects using appropriate instruments and metric units (m, dm, cm, mm) |
| **Use** a ruler to measure and **draw** line segments to the nearest millimetre |
| Perimeter as a length of a two-dimensional shape | **Measure** the perimeter of polygons |
| **Calculate** the perimeter of a square and a rectangle using formulae |
| Area | Non-standard units of area | **Estimate** and **measure** in squares the area of regular and irregular shapes |
| **Use** squares or part squares to draw shapes of a given area  |
| Capacity and volume | Language of capacity | **Consolidate** and **extend** the vocabulary of capacity (decilitre, centilitre, millilitre) |
| Standard units of capacity | **Estimate**, **measure**, **compare** and **record** the capacity of a wide variety of receptacles and metric units (l, dl, cl, ml) |
| **Understand** the relationships between l-dl, l-cl, l-ml |
| **Convert** l-dl, l-cl, l-ml |
| Mass (weight) | Language of weight | **Extend** the vocabulary of weight (tonne) |
| Standard units of weight | **Estimate**, **measure**, **compare** and **record** the weight of a variety of objects using appropriate instruments and metric units (t, kg, g) |
| **Understand** the relationships between t-kg, kg-g |
| **Convert** kg-g and t-kg |
| Time | Standard units of time | **Understand** and **use** units of time and know the relationships between them (second, minute, hour, day, week, month, year and century) |
| **Convert** seconds into minutes and seconds, minutes into hours and minutes, days into weeks and days |
| Clocks | **Read** and **record** the time to the exact minute on analogue and digital clocks |
| **Read** and r**ecord** thetime using the 24-hour clock |
| Calendar | **Read** a calendar, **know** what a leap year is and **recognise** the number of days in each month |
| Timetables | **Read** a simple timetable  |
| **Calculate** finish time, duration and start time  |
| Money | Value of money | **Conver**t euros into cents and vice versa |
| **Combine** coins and notes to make exact amounts |
| **Record** amounts of money using symbols and decimal notation |
| **Give** change in multiples of 10 cents |
| Currencies | **Discover** different monetary systems in Europe |
| **YEAR P3** | **TOPIC: SHAPE and SPACE** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Spatial awareness | Direction and location | **Follow** and **give** instructions involving position, direction and movement |
| **Locate** a position on a plan or map including using simple grid references  |
| **Describe** movement or position usingthe four points of the compass |
| 2 D and 3 D shapes | Patterns and tessellation | **Consolidate** and **extend** the vocabulary (2 D shape surface polygon pattern, fit together without gaps or spaces without overlapping combination) |
| **Recognise,** **describe, extend** and **create** tessellated patterns |
| Lines and angles | **Identify** and **describe** vertical, horizontal, parallel, perpendicular and intersecting lines |
| **Classify** angles as greater than, less than or equal to a right angle and **relate** them to shape and the environment  |
| **Recognise** acute, right and obtuse angles and **relate** them to real life situations |
| Mathematical vocabulary | **Consolidate** and **extend** the vocabulary of 2 D shapes (parallel, perpendicular, angle, right angle, vertices, regular, irregular) |
| **Consolidate** and **extend** the vocabulary of 3 D shapes (parallel, perpendicular, angle, right angle, vertices, edges, faces, regular, irregular) |
| 2 D shapes | **Review, sort,** **name** and **describe** the properties of 2 D regular shapes as well as irregular shapes (parallelogram, rhombus, trapezium and other quadrilaterals, right angled triangle)  |
| 3 D shapes | **Review, sort, name** and **describe** the properties of 3 D shapes (cube, cuboid, and pyramids) |
| **Explore** 3 D shapes and **investigate** their relationship with 2 D shapes |
| Transformations | Symmetry | **Identify** reflective symmetry in 2 D shapes and in the environment |
| **Complete** the missing half of a shape, picture or pattern, usingvertical and horizontal lines of symmetry |
| **Discover** and **draw** alllines of symmetry in 2 D shapes |
| Translation and rotation | **Translate** a simple shape horizontally or vertically on a grid |
| **Rotate** a simple shape around one of its vertices |
| **YEAR P3** | **TOPIC: DATA HANDLING**  |
| **Subtopic** | **Contents** | **Learning objectives** |
| Collection, interpretation, and representation of data | Venn and Carroll diagrams  | **Know** and **apply** Venn and Carroll diagrams (two-way tables) to sort data and objects  |
| Pictograms and bar graphs  | **Recall** pictograms, bar graphs as methods to present data |
| **Identify** and **interpret** data shown on pictograms, bar graphs (including bar graphs with scales of different amplitudes)  |
| **Collect**, **organise**, and **represent** data using pictograms and bar graphs (including bar graphs with scales of different amplitudes) |
| **Create** mathematical representations from real-life and play situations |
| **Recall** using different scales on axis |
| Technological tool | **Collect** data to make a data table on a software program |
| **Construct** a bar graph using a software program |
| **Explain** and **conclude** data constructed using a software program |

**YEAR P4**

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| **YEAR P4** | **TOPIC: NUMBERS**  |
| **Subtopic** | **Contents** | **Learning objectives** |
| Whole numbers | Counting | **Read** and **write** whole numbers from 0 to 100 000  |
| Representation of numbers | **Match quantities to numbers in a variety of situations** (on a number line, a hundred square) |
| **Read** and **write** numbersto 2 000 using Roman Numerals  |
| **Use** large numbers in real life contexts |
| Estimation | **Use** and **apply** estimation strategies (comparing and grouping) |
| Partitioning | **Partition**, **manipulate** and **combine** numbers to 100 000  |
| Comparing and ordering | Ordering numbers | **Order** numbers (increasing and decreasing) on a number line and a number track to 100 000 |
| Comparing numbers | **Compare, locate** and **place** numbers on a number line and in a hundred square |
| **Identify** the significant multiples of 10, 100, and 1000 that lie either side of a number |
| Place value | Use of manipulatives | **Manipulate, explore** and **identify** place value using 10 to 100 000 |
| Ten thousands, thousands, hundreds, tens, units and tenths | **Understand**the place value of each digit in a five digit number  |
| **Partition, manipulate** and **combine** numbers to 100 000  |
| **Identify** place value in decimal numbers to one decimal place |
| Rounding | **Round** numbers to the nearest 10, 100, 1000 and 10 000  |
| Fractions, decimals and percentages | Mathematical vocabulary | **Use** the vocabulary of fractions (numerator, denominator, proper fraction, improper fraction, mixed number) |
| Fractions and decimals | **Read** and **write** proper fractions, improper fractions, mixed numbers and decimal numbers (up to one decimal place) |
| **Identify** and **represent** proper fractions, improper fractions and mixed numbers in shapes and diagrams |
| **Locate** and **place** mixed numbers on a number line  |
| **Manipulate** and **use** the fraction wall to compare fractions and **understand** equivalence |
| **Simplify** fractions to the lowest form |
| **Recognise** decimal numbers in real life contexts  |
| **Understand** the equivalence between the decimal and fraction forms of half, quarter, three quarters and tenths  |
| Patterns and sequences | Patterns and sequences of numbers | **Explore, recognise and record** patterns and sequences using numbers with a variety of intervals, and that use more than one operation  |
| **Discover** patterns within multiplication tables to 10 and **find** links between them.  |
| **Recognise** and **count** multiples of 2, 5, 10, 100 and 1 000 to 10 000 |
| **YEAR P4** | **TOPIC: OPERATIONS** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Addition and subtraction | Mathematical vocabulary | **Understand** and **use** the vocabulary and symbols of addition and subtraction |
| Operations | **Add** and **subtract** whole numbers and numbers to one decimal place  |
| **Combine** addition and subtraction calculation |
| **Write** addition and subtraction calculations using standard and informal written methods |
| Mental calculation | **Apply** appropriate strategies to support mental calculation |
| Estimation | **Estimate** before calculating and **check** the exact result found by sums and differences |
| Fractions | **Add** and **subtract** fractions with the same denominator  |
| Calculator | **Perform** calculations with large numbers |
| Multiplication and division | Mathematical vocabulary | **Understand** and **use** the vocabulary and symbols of multiplication and division |
| Operations | **Determine** all factors of numbers within the multiplication tables |
| **Write** multiplication calculations using standard and informal written methods (two digit/ three digit by a one digit/ two digit number) |
| **Write** simple division calculations using informal methods with and without remainders (two and three digit numbers by a one digit number) |
| **Calculate** the remainder when dividing |
| **Be aware** of simple algebraic equations |
| Mental calculation | **Use, compare** and **discuss** various mental strategies  |
| Estimation | **Estimate** before calculating and then **check** the exact result found by products and quotients |
| Fractions | **Calculate** a fraction of a given quantity  |
| Calculator | **Perform** multiplications and divisions with large numbers |
| **YEAR P4** | **TOPIC: MEASUREMENT** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Length and perimeter | Language of length | **Understand** and **use** the vocabulary of length  |
| Standard units of length | **Estimate**, **measure**, **compare** and **record** lengths of a wide variety of objects, using appropriate instruments and metric units |
| **Understand** the relationship between mm, cm, dm, m, dam, hm and km |
| **Convert** between mm, cm, m and km |
| Perimeter as a length of a two-dimensional shape | **Measure** and **calculate** the perimeter of polygons |
| Scale | **Understand** and **use** the vocabulary of scale (scale, scale length, actual length) |
| **Find** actual length when given a corresponding scale length |
| Area | Standard units of area | **Draw** shapes of a given area |
| **Understand** the relationships between units of area km2 , ha, a, m2, dm2 , cm2, mm2 |
| **Convert** km2 , ha, a, m2, dm2 , cm2, mm2 |
| Area of a rectangle | **Discove**r the formula for the area of a rectangle |
| **Calculate** the area of rectangles and compound shapes using mm2, cm2 , dm2 and m2 |
| Capacity and volume | Language of capacity | **Consolidate** and **extend** the vocabulary of capacity ( decilitre, centilitre, millilitre) |
| Standard units of capacity | **Estimate**, **measure**, **compare** and **record** the capacity of a wide variety of receptacles and metric units (l, dl, cl, ml) |
| **Understand** the relationships between l-dl, l-cl, l-ml, dl-cl, cl-ml |
| **Convert** l-dl, l-cl, l-ml, dl-cl, dl-ml, cl-ml |
| Mass (weight) | Language of weight | **Consolidate** the vocabulary of weight (gram, decagram, kilogram, tonne) |
| Standard units of weight | **Estimate**, **measure**, **compare** and **record** the weight of a wide variety of objects using appropriate instruments and metric units (t, kg, dag, g) |
| **Discover** milligrams |
| **Convert** t-kg, kg-dag, kg-g, dag-g and g-mg |
| Time | Standard units of time | **Understand** and **use** units of measurement of time (second, minute, hour, day, week, month, year, century and millennium) |
| **Convert** seconds into minutes and seconds, minutes into hours and minutes, days into weeks and days, months into years and months |
| **YEAR P4** | **TOPIC: SHAPE and SPACE** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Spatial awareness | Direction and location | **Read,** **follow** and **give** instructions involving position, direction and movement |
| **Visualise**, **locate** and **plot** a position using grid references and coordinates in the first quadrant, naming the x and y axis |
| **Use** the eight points of the compass to describe movement or position  |
| 2 D and 3 D shapes | Patterns and tessellation | **Recognise, describe, extend** and **create** tessellated patterns, combining regular and irregular polygons |
| Lines and angles | **Identify, describe** and **use** a ruler/squared paper to draw vertical, horizontal, parallel, perpendicular and intersecting lines |
| **Know** that angles are measured in degrees and that one whole turn is 360°, a straight angle is 180°, a right angle is 90° |
| **Recognise** and **draw** acute, right and obtuse angles and **relate** them to shape and the environment |
| **Estimate, measure** and **construct** angles to the nearest 5°, using a protractor and a ruler |
| **Use** notation of angles (*α, β, γ*) |
| **Consolidate** and **extend** the vocabulary of lines and angles |
| 2 D shapes | **Consolidate** and **extend** the vocabulary of 2 D shapes |
| **Sort, name, describe** and **classify** regular and irregular 2 D shapes |
| 3 D shapes | **Consolidate** and **extend** the vocabulary of 3 D shapes (cube, cuboid, cylinder, sphere, cone and pyramid) |
| **Explore** the main characteristics of 3 D shapes  |
| **Sort**, **name, describe** and **classify** regular and irregular 3 D shapes  |
| **Explore** the relationships between 3 D shapes (perpendicular, parallel faces and edges) |
| **Identify** and **make** nets of common 3 D shapes |
| **Use** a set square and compasses to creategeometrical drawings |
| Transformations | Symmetry | **Investigate** symmetry in art, architecture and nature |
| **Draw** all lines of symmetry in polygons |
| **Complete** the missing half of a shape, picture or pattern, using vertical, horizontal and diagonal lines of symmetry |
| Translation, rotation and enlargement | **Draw** the position of a shape after rotation around one of its vertices |
| **Translate** a shape horizontally and vertically on a grid |
| **Enlarge** or **reduce** a shape using a grid |
| **YEAR P4** | **TOPIC: DATA HANDLING**  |
| **Subtopic** | **Contents** | **Learning objectives** |
| Collection, interpretation and representation of data | Pie charts, line graphs, Venn and Caroll diagrams | **Read** and **interpret** data from pie charts and line graphs |
| **Recall** pictograms, block graphs, bar graphs, Venn and Caroll diagrams as methods to present data |
| **Connect** between bar graphs and line graphs |
| **Explain** which type of representation should be used, or if more can be used to present data |
| Technological tool | **Use** data from Internet to make a line graph and a pie chart |
| **Explain, organise,** and **present** data |
| Probability and chance | Likelihood and chance | **Identify** and **record** outcomes of random processes |
| **Use** vocabulary of likelihood and chance: impossible, unlikely, even chance, likely, certain |
| **Order** events in terms of likelihood of occurrence |

**YEAR P5**

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| **YEAR P5** | **TOPIC: NUMBERS**  |
| **Subtopic** | **Contents** | **Learning objectives** |
| Whole numbers | Representation of numbers | **Read** and **write** whole numbers to and beyond 1 000 000 |
| **Use** and **apply** numbers to and beyond 1 000 000 in real life contexts |
| **Discover** the concept of negative numbers through real life examples  |
| **Recall** numbersto 2000 using Roman Numerals  |
| Estimation | **Use** and **apply** various estimation strategies  |
| Comparing and ordering | Ordering numbers | **Order** numbers (increasing and decreasing) irrespective of size |
| Comparing numbers | **Compare, locate** and **place** numbers on a number line and in a hundred square |
| **Identify** the whole numbers that lie either side of a decimal number to two decimal places |
| **Identify** the significant multiples of 10, 100, 1000, 10 000 and 100 000 that lie either side of a decimal number to two decimal places |
| Place value | Use of manipulatives | **Manipulate, explore** and **identify** place value using base 10 to 1 000 000 and beyond. |
| Millions, hundred thousands, ten thousands, thousands, hundreds, tens, units, tenths and hundredths | **Understand**the place value of each digit in a six digit number and beyond, and in decimal numbers to two decimal places  |
| **Partition** numbers into multiples of 10 000, 1 000, 10 and 1, 1/10 and 1/100 |
| **Identify** place value in decimal numbers to two decimal places  |
| Rounding | **Round** whole numbers and decimals to the nearest whole number 10, 100, 1 000, 10 000, 100 000 and 1 000 000  |
| Fractions, decimals and percentages | Mathematical vocabulary | **Use** the vocabulary of fractions  |
| Fractions and decimals | **Read** and **write** proper fractions, improper fractions, mixed numbers and decimal numbers (to two decimal places)  |
| **Convert** improper fractions to mixed numbers and vice-versa  |
| **Find** equivalent fractions |
| **Simplify** fractions to the lowest term |
| **Recognise** and **use** decimal numbers in real life contexts  |
| **Understand** the equivalence between the decimal and fraction forms of half, third, quarter, three quarters, tenths and hundredths |
| **Identify** the whole numbers that lie either side of a decimal number up to two decimal places |
| Percentages | **Identify** percentages in real life (limited to 100%, 75%, 50%, 25%, 10% and 1%) |
| **Understand** the relationships between fractions, decimals and percentages(limited to 100%, 75%, 50%, 25%, 10% and 1%) |
| Patterns and sequences. | Patterns and sequences of numbers | **Explore, recognise and record** patterns and sequences using numbers with a variety of intervals, including with fractions and decimal numbers  |
| **Explore** and **understand** triangular and square numbers |
| **YEAR P5** | **TOPIC: OPERATIONS** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Addition and subtraction | Mathematical vocabulary | **Consolidate** and **use** the vocabulary and symbols of addition and subtraction  |
| Operations | **Add** and **subtract** whole numbers and numbers to two decimal places |
| **Write** addition and subtraction calculations using standard and informal written methods |
| **Use** and **develop** simple algebraic equations using addition and subtraction |
| **Perform** addition and subtraction with brackets  |
| **Apply** the rules of the order of addition and subtraction and brackets |
| Mental calculation | **Use** mental strategies for addition and subtraction |
| Estimation | **Estimate** before calculating and **check** the exact result found by sums and differences |
| Fractions | **Add** and **subtract** fractions and mixed numbers |
| Calculator | **Carry out** one-step and two-step calculations involving addition and subtraction |
| Multiplication and division | Mathematical vocabulary | **Consolidate** and **use** the vocabulary and symbols of multiplication and division |
| Operations | **Determine** factors of larger numbers |
| **Identify** prime numbers to 100 |
| **Write** multiplication and division calculations using informal and standard written method |
| **Understand** and **use** simple ratios, proportions and scales |
| **Use** and **develop** simple algebraic equations using multiplication and division |
| **Perform** multiplications and divisions with brackets |
| **Apply** the rules of the order of multiplication and division and brackets |
| Mental calculation | **Use** mental strategies including multiplying and dividing by 10 and 100 and 1000 |
| Estimation | **Estimate** before calculating and **check** the exact result found by products and quotients |
| Fractions | **Calculate** a fraction of a given quantity  |
| **Calculate** simple percentages of a given quantity (100%, 75%, 50%, 25%,10%,1%) |
| **Multiply** a fraction by a one digit number  |
| **Divide** a simple fraction by a one digit number using diagrams  |
| Calculator | **Carry out** one-step and two-step calculations involving all four operations |
| **YEAR P5** | **TOPIC: MEASUREMENT**  |
| **Subtopic** | **Contents** | **Learning objectives** |
| Length and perimeter | Language of length | **Consolidate** the vocabulary of length  |
| Standard units of length | **Estimate, measure, compare** and **record** lengths of a wide variety of objects, using appropriate instruments and metric units (including fractions and decimal numbers) |
| **Convert** mm, cm, m, dam, hm and km |
| Perimeter as a length of a two-dimensional shape | **Estimate** and **measure** the perimeter of regular and irregular polygons  |
| Scale | **Consolidate** the vocabulary of scale (scale, scale length, actual length) |
| **Create** scale drawings |
| **Read** and **interpret** maps using scale |
| Area | Standard units of area | **Convert** units of area km2, ha, a, m2, dm2, cm2, mm2 |
| Area of a rectangle | **Calculate** the area of compound shapes consisting of rectangles and right-angled triangles using m2 and cm2 |
| Capacity and volume | Language of capacity | **Consolidate** the vocabulary of capacity  |
| **Estimate, measure, compare** and **record** the capacity of a wide variety of receptacles and metric units (l, dl, cl, ml) |
| Standard units of capacity and volume | **Convert** hl, l, dl, cl, ml  |
| **Introduce** the vocabulary of volume **(**cubic centimetre, cubic decimetre, cubic metre) |
| **Understand** the relationship between volume and capacity (dm³-l) |
| **Calculate** the volume of cubes and cuboids using m³, dm³, cm³ |
| Mass (weight) | Language of weight | **Consolidate** the vocabulary of weight |
| Standard units of weight | **Estimate, measure, compare** and **record** the weight of a wide variety of objects using appropriate instruments and metric units (t, kg, dag, g, mg) |
| **Convert** t, kg, dag, g, mg |
| Time | Standard units of time | **Convert** and **calculate** with units of time |
| Clocks | **Practise** reading and recording the time to the exact minute on analogue, digital and 24-hour clocks |
| **Explore** international time zones |
| Timetables | **Practise** the calculation ofduration, start time and finish time including using data from timetables |
| Time, distance and speed | **Knowing** two quantities out of three (time, distance or speed), **calculate** the third quantity |
| Money | Value of money | **Calculate** change |
| Currencies | **Convert** the euro and other currencies |
| **YEAR P5** | **TOPIC: SHAPE and SPACE** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Spatial awareness | Direction | **Read**, **follow** and **give** instructions and directions using coordinates  |
| Location | **Visualise**, **locate** and **plot** a position using integer coordinates in the first quadrant as well as other grid reference systems (longitude and latitude) |
| 2 D and 3 D shapes | Patterns and tessellation | **Investigate** the geometric properties of tessellations |
| **Recognise, describe, extend** and **create** tessellated patterns and other designs which combine regular and irregular 2 D shapes |
| Lines and angles | **Identify,** **describe** and **use** instruments to draw parallel, perpendicular and intersecting lines |
| **Name** and **classify** all kinds of angles and **relate** them to shape and the environment |
| **Estimate**, **measure** and **construct** angles to the nearest degree, using a protractor and a ruler |
| **Use** a set square and compasses to create geometrical drawings |
| 2 D shapes | **Sort,** **name, describe** and **classify** regular and irregular 2 D shapes, including equilateral, scalene, isosceles triangles, and identify their properties |
| **Explore** the relationships between 2 D shapes (lines of symmetry and angles) |
| **Identify** the properties of a circle and **construct** a circle of a given radius/diameter |
| 3 D shapes | **Consolidate** and **extend** the vocabulary of 3 D shapes (cube, cuboid, cylinder, sphere, cone, pyramid and prism, hollow, solid) |
| **Sort,** **name, describe** and **classify** regular and irregular 3 D shapes and **identify** their properties |
| **Visualise**, **identify** and **make** nets of common 3 D shapes |
| Transformations | Symmetry | **Investigate** symmetry in art, architecture and nature |
| **Draw** all lines of symmetry in polygons |
| **Draw** the position of a shape after reflection using vertical, horizontal, diagonal and multiple lines of symmetry |
| Translation, rotation and enlargement | **Draw** the position of a shape after translation |
| **Draw** the position of a shape after rotation using different centres of rotation |
| **Enlarge** or **reduce** a shape by measurement |
| **YEAR P5** | **TOPIC: DATA HANDLING** |
| **Subtopic** | **Contents** | **Learning objectives** |
| Collection, interpretation and representation of data | Pie charts and line graphs | **Apply** the concept of proportionalityto interpretdata presented in pie charts in terms of percentages or fractions |
| **Interpret** line graphs (distance/time, a graph of pairs of numbers adding to a given number) |
| Summary on representations | **Use** data and representations to make informed decisions and predictions |
| **Discuss** examples of inappropriate representations of data from newspaper, whether certain representations are misleading |
| Technological tool | **Construct** line graphs and pie charts from real life situations,using a spreadsheet (Excel and other online tools) |
| Probability and chance | Mean (average) of a set of data | **Study** the meaning ofaverage in real-life situations |
| **Recognise** the three related quantitiesin a set of data: average, total value, number of data |
| **Understand** and **apply** the formula to determine the mean |
| **Knowing** two quantities out of three (average, total value, number of data), **calculate** the third quantity |
| Technological tool | **Calculate** and **interpret** the meanmanipulating data in real life-situations,using a spreadsheet, (Excel and other online tools)  |

##

## **4.3 Suggested time frame**

The following topics are given only an estimated number of weeks to be reviewed by the teacher depending on the class.

The designated weeks include assessments, time needed for practice and revision, mathematics projects, school projects, and so on.

|  |  |
| --- | --- |
| **Class** | **P1 – P5**  |
| **Topic** | **Weeks** |
| Numbers | 12 |
| Operations | 12 |
| Measurement | 5 |
| Shape and Space | 5 |
| Data handling | 2 |
| **Total** | **36** |

# **5. Assessment**

Assessment is not something you do at fixed moments in time, but it’s an on-going process which involves different stakeholders: teachers, pupils and parents, and which reflects pupils’ progression over time. Together, the stakeholders use a wide range of tools. These tools are important because they guarantee a certain level of objectivity. The different stakeholders use different tools, corresponding to their role in education and the needs of the pupils.

Assessment is formative when either formal or informal procedures are used to gather evidence of learning during the learning process and are used to adapt teaching to meet pupil’s needs. The process permits teachers and pupils to collect information about pupil’s progress and to suggest adjustments to the teacher’s approach to instruction and the pupil’s approach to learning.

Assessment is summative when it is used to evaluate pupil’s learning at the end of the instructional process or of a period of learning. The purpose is to summarise the pupil’s achievements and to determine whether, and to what degree, the pupil has demonstrated understanding of that learning.

Pupils’ self-assessment is a fundamental part of formative assessment to help children to develop their learning to learn competence.

Systematic communication with parents and official meetings are important aspects of the assessment process. Sharing information about a pupil’s development through parents/teacher meetings is very important. The pupil ́s presence at the request of the teacher is highly recommended.

For each level there are attainment descriptors linked to the competences, which give an idea of the level that pupils should reach at the end of the respective school year.

With the competences are verbs that give an idea of what kind of assessment can be used to assess that goal. In the table with learning objectives these verbs are used and put bold, so there is a direct link between the competences and the learning objectives.

Assessing knowledge, skills and learning attitude, can be done by oral and written questions where the pupils should respond on. Competences as constructing explanations and engaging in argument as well as the key competences as communication and mathematical competence need open questions or other ways of assessing.

Pupils have to be able to do an experimental inquiry. An inquiry should be part of the assessments. Assessing designing and inquiry can be combined with other subjects, i.e. Discovery of the World.

Digital competence can be assessed by gathering information from internet, measuring data, or comparing the outcomes of a model with measured data. It is recommended to combine this with other assessments where this competence is needed.

A portfolio is an integral part of assessment in the Primary School and is a systematic compilation of pupil’s works that exhibit the pupil’s efforts, progress, and achievements. It is essential that the teacher leads pupils through the recording of their mathematical development through the respective school year. The portfolio should be evidence of the learning journey taken through mathematics in line with the key competencies and attainment descriptors. A portfolio helps a pupil set goals for learning, review their goals periodically and assume responsibility for their own learning.

The pupil chooses material to be put in the portfolio. This process is fundamental for the development of self-evaluation. It would be recommended that a teacher asks pupils why they choose a specific piece of work. The pupil’s developing ability to self-assess requires the support of the teacher, who, will sensitively provide guidance and support.

Teachers will need to help the pupil to build their own portfolio, acting as a guide and critical friend, helping the pupil make reasoned choices about what to include.

## **5.1. Attainment Descriptors**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **P1 – P5** | **+** | **++** | **+++** | **++++** |
| **Knowledge and comprehension** | Shows little or no knowledge and understanding of mathematical terms, symbols, and principles | Shows sufficient knowledge and understanding of straightforward mathematical terms, symbols, and principles | Shows good knowledge and understanding of mathematical terms, symbols, and principles in all areas of the syllabus | Shows comprehensive knowledge and understanding of mathematical terms, symbols, and principles in all areas of the syllabus |
| **Methods** | Does not carry out or carries out mathematical processes in straightforward contexts, but makes frequent errors  | Carries out mathematical processes in straightforward contexts, but with some errors | Successfully carries out mathematical processes in a variety of contexts | Successfully carries out mathematical processes in all areas of the syllabus |
| **Problem solving** | Does not translate or translates routine problems into mathematical symbols and attempts to reason to a result only with help  | Translates routine problems into mathematical symbols and attempts to reason to a result | Translates routine problems into mathematical symbols and reasons to a correct result | Translates complex non-routine problems into mathematical symbols and reasons to a correct result; makes and uses connections between different parts of the syllabus |
| **Interpretation and evaluation** | Makes little or no attempt to interpret an information and evaluate a result  | Attempts to draw conclusions from information and shows limited capacity to evaluate the reasonableness of results | Draws relevant conclusions from information and attempts to evaluate reasonableness of results | Draws full and relevant conclusions from information; evaluates reasonableness of results and recognises own errors |
| **Communication** | Displays insufficient reasoning and use of mathematical terms | Generally, presents reasoning and results adequately, using some mathematical terminology and notation | Generally, presents reasoning and results clearly using mathematical terminology and notation correctly | Consistently presents reasoning and results in a clear, effective, and concise manner, using mathematical terminology and notation correctly |
| **Digital competence** | Does not use technology sufficiently or uses it only to a very limited extent | Uses technology sufficiently in straightforward situations | Uses technology appropriately most of the time | Uses technology appropriately and creatively in a wide range of situations |

## **Annex 1**

**Examples of learning objectives related to competences**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Numbers | Operations | Measurement | Shape and Space | Data handling |
| Understand and analyze | **Represent** a large number with an abacus | **Represent** a division with remainder (Euclidian division) | **Choose** the most appropriate units to express an area | **Classify** triangles | **Organise** data in increasing order |
| Investigate | **Investigate** if all multiples of 3 are multiples of 6  | **Simplify** a mental calculation  | **Measure** a perimeter of regular polygon  | **Identify** axis of symmetry of 2D-shape | **Record** daily temperatures and represent them on diagram |
| Reason | **Check** if a number is a multiple of 9 without dividing  | **Use** borrowing / regrouping in a mental subtraction  | **Convert** units of lengths, areas, volume | **Calculate** surface area of a solid | **Use** different processes to calculate the average (mean) of simple data  |
| Verify and validate | **Compare** 2 numbers using a number line | **Verify** result of an operation | **Verify** and **validate** the perimeter of a rectangle using formulae | **Check** that the net corresponds to a 3D-shape  | **Choose** useful data to solve a problem having a lot of information including irrelevant data  |
| Communicate | **Find** all integer sided rectangles with the area 48 | **Estimate** a result before performing operation | **Draw** to scale  | **Compare** the properties of 2 quadrilaterals  | **Use** a table to represent a set of data  |

The concept of *inquiry-based learning* (IBL) refers to these approaches. An overview of useful literature on this can be found in the *PRIMAS guide for professional development providers*.

<http://primas-project.eu/wp-content/uploads/sites/323/2017/10/PRIMAS_Guide-for-Professional-Development-Providers-IBL_110510.pdf>

## **Annex 2**

**List of learning objectives divided into chapters and grades P1 – P5**

|  |  |  |
| --- | --- | --- |
| **YEAR P1** |  |  |
| **NUMBERS** | **OPERATIONS** | **MEASURMENT and UNITS** |
| **Calculate** to 20 by counting forwards and backwards, starting at any point**Count** to 100 in intervals of 1, 2, 5, 10 and 20 **Count** a given number of objects **Write** whole numbers from 0-20 and to 100 in multiples of 10**Match** quantities to numbers to 20**Represent** numbers through illustrations and on a number line**Use**numbers in real life contexts**Estimate** the number of objects before counting  **Discover**the concept of zero, odd and even numbers to 20 **Manipulate**, **partition** and **combine** numbers to 20**Use** the vocabulary of ordering numbers (smaller, bigger, less than, more than, the same, equal)**Order** numbers (increasing and decreasing) using a number line and a number track to 20**Identify** and **place** a number to 20 on a number line**Use** the language of ordinal numbers, from first to tenth**Manipulate** and **explore** place value using base 10 to 20**Read** and **write** numbers on a place value chart**Understand** the place value of each digit in a two digit number**Use** vocabulary of double and half in real life contexts**Find** half of shapes and sets of objects **Discover** the relationship between halving and doubling **Explore, recognise** and **record** patterns and sequences using numbers to 20 with a variety of intervals | **Explore** the concepts of addition and subtraction through play and practical tasks and by using concrete materials**Use** the vocabulary and symbols of calculations (add, subtract, plus, minus, equals, +, -, =)**Calculate** operations with answers to 20, with and without manipulatives**Create** operations with answers to 20, using formal notation**Understand** that addition and subtraction are inverse operations**Use** pairs of numbers with a total of 10 and **work out** the corresponding subtraction facts**Use** the knowledge of pairs of 10 to learn the pairs to 20**Determine** the doubles and corresponding halves of all numbers to 20**Recognise** the principle of the commutative law of addition**Explore** the concepts of multiplication and division by grouping and sharing through play and practical tasks | **Use** the vocabulary of length (wide, high, longer, shorter, taller, equal)**Estimate,** **measure**, **compare** and **record** length using non-standard units **Recognise** non-standard measuring units and objects and **use** appropriately**Use** a ruler to draw lines and line segments**Measure** lengthin centimetres**Compare** lengths of line segments in centimetres**Investigate** standard units in their environment (metre, centimetre)**Understand** and **use** the vocabulary of capacity (fill, pour, full, empty)**Estimate**, **measure**, **compare** and **record** capacity using non-standard units**Identify** non-standard measuring units and objects and **use** appropriately**Be aware** of standard units in their environment (litre)**Understand** and **use** the vocabulary of weight (heavier, lighter, balance, scales, weigh, equal)**Identify** non-standard units of weight**Estimate,** **measure**, **compare** and **record** weight using non-standard units**Investigate** standard units in their environment (kilogram and gram)**Estimate**, **measure** and **describe** the passage of time using non-standard units **Understand** and **use** the vocabulary of time (hour, day, month, year)**Represent** the time to the hour and half hour on analogue clocks **Tell** the time to the hour and half hour**Name** the days of the week, months and the seasons of the year**Order** familiar events in the cycle of a day and a week**Explore** the calendar as a tool to read the date and **observe** how many nights/days remaining until a certain event within a short period**Understand** and **use** the vocabulary of European monetary system (euro, cent)**Distinguish** between euros and cents**Recognise** all the coins and notes and **be aware** of their value**Order** coins by value**Manipulate** euros in play using replica coins and notes**Manipulate** coins and notes to make different amounts to 20 euros |

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| **YEAR P1** |  |  |
| **SHAPE and SPACE** | **DATA HANDLING** |  |
| **Understand** and **use** the vocabulary of spatial awareness, position and directions (left, right, over, under/ below, beside, between, etc.)**Develop** their own sense of spatial awareness**Follow** and **give** simple directions to move**Locate** places or objects on a simple map**Recognise**, **describe, copy** and **extend** patterns in colour, shape and quantity**Manipulate** shapes and objects to investigate patterns, symmetry and tessellation**Understand, identify** and **use** the vocabulary of 2 D shapes (side, circle, semi-circle, square, rectangle, triangle, sphere, square, cuboid, sides, corners) **Sort, name** and **describe** 2 D shapes**Identify** 2 D shapes in real life contexts**Identify** the basic properties of 2 D shapes**Construct** and **draw** 2 D shapes **Use** 2 D shapes to create other shapes**Understand, identify** and **use** the vocabulary of 3 D shapes (cube, cuboid, cylinder, sphere, cone and pyramids)**Identify** 3 D shapes in real life contexts**Identify** the basic properties of 3 D shapes**Recognise** examples of symmetry in their environment**Identify** reflective symmetry in simple 2 D shapes and letters**Draw** a line of symmetry in simple 2 D shapes**Complete** the missing half of a shape, picture or pattern, using either a vertical or a horizontal line of symmetry | **Collect** and **organise** data in a systematic way**Describe** real life situations and pictures from a child’s environment to collect data**Sort** and **classify** objects by one or two criteria**Understand** that bar graphs and pictograms are simple ways to represent data**Represent** data using bar graphs and pictograms**Represent** and **interpret** bar graphs in both horizontal and vertical forms**Create** a story using information from a bar graph or a pictogram |  |

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| **YEAR P2** |  |  |
| **NUMBERS** | **OPERATIONS** | **MEASURMENT and UNITS** |
| **Calculate** to 100 by counting forwards and backwards, starting at any point**Count** to 100 in intervals of 1, 2, 5, 10 and 20**Count** within 1 000 in intervals of 100 **Count** a given number of objects **Recall** and **write** whole numbers to 100 **Match** quantities to numbers to 100**Represent** numbers through illustrations  **Use**numbers in real life contexts**Estimate** the number of objects before counting **Recall** the concept of zero and **discover**odd and even numbers to 100**Manipulate**, **partition** and **combine** numbers to 100**Understand** and **use** the vocabulary of ordering numbers (smaller, bigger, less than, more than, the same, equal)**Order** numbers (increasing and decreasing) using a number line and a number track to 100**Identify** and **place** a number to 100 on a number line**Use** mathematical symbols (>, <, =) to comparenumbers**Use** the language of ordinal numbers, from first to tenth**Manipulate** and **explore** place value using base 10 to 100**Read** and **write** numbers on a place value chart**Understand** the place value of each digit in a three digit number**Partition** numbers to 100 **Round** numbers to the nearest 10 **Understand** and **use** the vocabulary of double, half and quarter in real life contexts**Identify** half of shapes and sets of objects**Discover** the relationship between halving and doubling**Explore, recognise** and **record** patterns and sequences usingnumbers to 100 with a variety of intervals | **Understand** and **use** the vocabulary and symbols of addition and subtraction**Explore** the concepts of addition and subtraction through play and practical tasks and by using concrete materials**Create** addition and subtraction calculations with answers to 100 using formal notation**Make** operations including those bridging multiples of ten**Write** and **calculate** sums with two digit numbers with answers to 100**Write** and **calculate** differences with two digit numbers **Recall** that addition and subtraction are inverse operations**Discover** pairs of numbers that total 100 and **work out** the corresponding subtraction facts**Use** the knowledge of pairs of 10 to learn the pairs to 100**Make** operations using doubling and halving **Apply** the principle of the commutative law of addition**Learn** and **apply** appropriate strategies to support mental calculations **Explore** the concepts of multiplication and division by grouping and sharing through play and practical tasks**Understand** and **use** the vocabulary and symbols of operations (multiply, divide, times, share equally, x, ÷)**Understand** that multiplication is repeated addition**Learn** multiplication tables to 10 by rote**Explore** the relationship between multiplication tables (doubling, halving)**Understand** that multiplication and division are inverse operations**Recognise** the principle of the commutative law of multiplication**Calculate** halve and double of a given number | **Extend** the vocabulary of length (wide, high, longer, shorter, taller, equal)**Estimate,** **measure**, **compare** and **record** length using non-standard units **Recognise** non-standard measuring units and objects and **use** appropriately**Use** a ruler to draw lines and line segments**Measure** lengthin centimetres**Compare** lengths of line segments in centimetres**Investigate** standard units in their environment (metre, centimetre)**Understand** and **use** the vocabulary of capacity (fill, pour, full, empty)**Estimate**, **measure**, **compare** and **record** capacity using non-standard units**Identify** non-standard measuring units and objects and **use** appropriately**Be aware** of standard units in their environment (litre)**Understand** and **use** the vocabulary of weight (heavier, lighter, balance, scales, weigh, equal)**Identify** non-standard units of weight**Estimate,** **measure**, **compare** and **record** weight using non-standard units**Investigate** standard units in their environment (kilogram and gram)**Estimate**, **measure** and **describe** the passage of time using non-standard units **Understand** and **use** the vocabulary of time (hour, day, month, year)**Represent** the time to the hour and half hour on analogue clocks **Review** the time to the hour and half hour**Name** the days of the week, months and the seasons of the year**Order** familiar events in the cycle of a day and a week**Explore** the calendar as a tool to read the date and **calculate** how many nights/days remaining until a certain event**Understand** and **use** the vocabulary of European monetary system (euro, cent)**Distinguish** between euros and cents**Recognise** all the coins and notes and **be aware** of their value**Order** coins by value**Manipulate** euros in play using replica coins and notes**Manipulate** coins and notes to make different amounts to 100 euros |

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| --- | --- | --- |
| **YEAR P2** |  |  |
| **SHAPE and SPACE** | **DATA HANDLING** |  |
| **Consolidate** and **extend** the vocabulary of shapes (semi-circle, oval, curved, straight, sides, corners, round, flat, faces)**Recognise, describe, extend** and **create** patterns **Review** the manipulation ofshapes and objects to investigate patterns, symmetry and tessellation**Recognise** vertical and horizontal lines**Recognise** forms, right angles and **relate** them to shape and the environment**Sort, name** and **describe** the properties of 2 D shapes**Identify** 2 D shapes in real life and **discuss** their use**Sort, name** and **describe** the properties of 3 D shapes (cube, cuboid, cylinder, sphere, cone and pyramids)**Introduce** the new shapes oval and semi-circle**Identify** 3 D shapes in real life contexts and **discuss** their use **Recognise** examples of symmetry in their environment and in drawings and objects**Explore** and **recognize** reflective symmetry in shapes through practical activities (by folding, cutting and manipulating objects)**Draw** a line of symmetry in 2 D shapes**Complete** the missing half of a shape, picture or pattern, using either a vertical or a horizontal line of symmetry | **Recall** block graphs andpictograms**Understand** and **use** tally charts, frequency tables and bar charts as a method of collecting data**Read** and **interpret** data from bar charts**Use** different scales on axis**Describe** real life situations presented in tally charts, frequency tables or bar charts**Use** data from Internet to make a bar chart (Easy online data bases) |  |

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| **YEAR P3** |  |  |
| **NUMBERS** | **OPERATIONS** | **MEASURMENT and UNITS** |
| **Read, recall** and **write** whole numbers to 1 000 **Calculate** to 1 000 by counting forwards and backwards, starting at any point **Count** in multiples of 100 and 1 000 to 10 000**Count** to 1 000 in intervals of 1, 2, 5, 10, 50 and 100**Read** and **write** numbers to 10 using Roman Numerals**Match quantities to numbers in a variety of situations** **Understand** how to match numbers to a variety of situations**Use** large numbers in real life contexts**Develop** and **use** estimation strategies (comparing and grouping)**Order** numbers (increasing and decreasing) using a number line and a number track to 1 000**Compare, locate** and **place** numbers on a number line and in a hundred square**Locate** and **identify** the multiples of 10 and 100 that lie either side of a number. **Use** mathematical symbols (>, <, =) to comparenumbers**Manipulate, explore** and **identify** place value using base 10 to 1 000**Understand** the place value of each digit in a four digit number **Partition, manipulate** and **combine** four digit numbers**Round** numbers to the nearest 10, 100 and 1 000**Understand** and **use** the vocabulary of fractions (numerator, denominator)**Read** and **write** proper fractions, using denominators to 10 **Identify** and r**ecognise** fractions of different shapes**Manipulate** and **use** the fraction wall to compare simple fractions and **understand** equivalence**Explore, recognise** and **record** patterns and sequences using numbers with a variety of intervals to 1 000 **Discover** patterns within multiplication tables to 10 and **find** links between them**Recognise** multiples of 2, 5, 10 and 100 to 1 000 | **Use** the vocabulary and symbols of addition and subtraction**Add** and **subtract** three digit numbers **Calculate** combination of addition and subtraction calculations**Write** addition and subtraction using informal and standard written methods including those bridging multiples of tens and hundreds**Apply** appropriate strategies to support mental addition and subtraction to 1 000 (bridging tens and hundreds, halving and doubling, partitioning)**Estimate** before calculating and checking the answer**Use** a calculator to check and correct answers**Use** the vocabulary and symbols of multiplications and divisions**Apply** the understanding that multiplication is repeated addition**Recall** multiplication tables to 10 and associated division facts at speed and in any order**Determine** all factors of numbers within the multiplication tables**Explore** the relationships between the multiplication tables**Multiply** a two digit number by 10 or 100 and **understand** the impact on place value**Divide** a three digit multiple of 10 by 10 **Write** and **calculate** products (two digit or three digit numbers by a one digit number)**Write** and **calculate** quotients (two and three digit numbers by a one digit number)**Understand** what a remainder is when dividing**Apply** the understanding that multiplication and division are inverse operations**Apply** the principle of the commutative law of multiplication**Develop** mental calculation strategies for multiplication and division (transposing the knowledge of simple multiplication and division facts to multiples of 10 and 100, partitioning)**Calculate** the half and the double of a given number to 100 and of significant multiples up to 1 000**Estimate** before calculating and **check** the validity of the estimate**Calculate** and **record** a simple fraction of a given quantity **Understand** the relationship between fractions and division**Check** and **correct** answers by usinga calculator | **Understand** and **use** the vocabulary of length (width, height, perimeter, near and far, scale, is equal to, distance)**Identify** kilometres and decimetres**Understand** the relationships between km-m, m-dm, m-cm, m-mm, dm-cm, cm-mm**Convert** km-m, m-dm, m-cm, m-mm, dm-cm, cm-mm**Estimate**, **measure**, **compare** and **record** lengths of a wide variety of objects using appropriate instruments and metric units (m, dm, cm, mm)**Use** a ruler to measure and **draw** line segments to the nearest millimetre**Measure** the perimeter of polygons**Calculate** the perimeter of a square and a rectangle using formulae**Estimate** and **measure** in squares the area of regular and irregular shapes **Use** squares or part squares to **draw** shapes of a given area**Consolidate** and **extend** the vocabulary of capacity (decilitre, centilitre, millilitre)**Estimate**, **measure**, **compare** and **record** the capacity of a wide variety of receptacles and metric units (l, dl, cl, ml)**Understand** the relationships between l-dl, l-cl, l-ml**Convert** l-dl, l-cl, l-ml**Extend** the vocabulary of weight (tonne)**Estimate**, **measure**, **compare** and **record** the weight of a variety of objects using appropriate instruments and metric units (t, kg, g)**Understand** the relationships between t-kg, kg-g**Convert** kg-g and t-kg**Understand** and **use** units of time and know the relationships between them (second, minute, hour, day, week, month, year and century)**Convert** seconds into minutes and seconds, minutes into hours and minutes, days into weeks and days**Read** and **record** the time to the exact minute on analogue and digital clocks**Read** and **record** the time using the 24-hour clock**Read** a calendar, **know** what a leap year is and **recognise** the number of days in each month**Read** a simple timetable **Calculate** finish time, duration and start time **Conver**t euros into cents and vice versa**Combine** coins and notes to make exact amounts**Record** amounts of money using symbols and decimal notation**Give** change in multiples of 10 cents**Discover** different monetary systems in Europe |

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| **YEAR P3** |  |  |
| **SHAPE AND SPACE** | **DATA HANDLING** |  |
| **Follow** and **give** instructions involving position, direction and movement**Locate** a position on a plan or map including using simple grid references **Describe** movement or position usingthe four points of the compass**Consolidate** and **extend** the vocabulary (2 D shape surface polygon pattern, fit together without gaps or spaces without overlapping combination)**Recognise,** **describe, extend** and **create** tessellated patterns**Identify** and **describe** vertical, horizontal, parallel, perpendicular and intersecting lines**Classify** angles as greater than, less than or equal to a right angle and **relate** them to shape and the environment **Recognise** acute, right and obtuse angles and **relate** them to real life situations**Consolidate** and **extend** the vocabulary of 2 D shapes (parallel, perpendicular, angle, right angle, vertices, regular, irregular)**Consolidate** and **extend** the vocabulary of 3 D shapes (parallel, perpendicular, angle, right angle, vertices, edges, faces, regular, irregular)**Review, sort,** **name** and **describe** the properties of 2 D regular shapes (parallelogram, rhombus, trapezium, right angled triangle, quadrilateral) as well as irregular shapes **Review, sort, name** and **describe** the properties of 3 D shapes (cube, cuboid, cylinder, sphere, cone and pyramids)**Explore** 3 D shapes and **investigate** their relationship with 2 D shapes**Identify** reflective symmetry in 2 D shapes and in the environment**Complete** the missing half of a shape, picture or pattern, usingvertical and horizontal lines of symmetry**Discover** and **draw** alllines of symmetry in 2 D shapes**Translate** a simple shape horizontally or vertically on a grid**Rotate** a simple shape around one of its vertices | **Know** and **apply** Venn and Carroll diagrams (two-way tables) to sort data and objects **Recall** pictograms, bar graphs as methods to present data**Identify** and **interpret** data shown on pictograms, bar graphs (including bar graphs with scales of different amplitudes) **Collect**, **organise**, and **represent** data using pictograms and bar graphs (including bar graphs with scales of different amplitudes)**Create** mathematical representations from real life and play situations**Recall** using different scales on axis**Collect** data to make a data table on a software program**Construct** a bar graph using a software program**Explain** and **conclude** data constructed using a software program |  |

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| --- | --- | --- |
| **YEAR P4** |  |  |
| **NUMBERS** | **OPERATIONS** | **MEASURMENT and UNITS** |
| **Read** and **write** whole numbers from 0 to 100 000 **Match quantities to numbers in a variety of situations** (on a number line, a hundred square)**Read** and **write** numbersto 2 000 using Roman Numerals **Use** large numbers in real life contexts**Use** and **apply** estimation strategies (comparing and grouping)**Partition**, **manipulate** and **combine** numbers to 100 000 **Order** numbers (increasing and decreasing) on a number line and a number track to 100 000**Compare, locate** and **place** numbers on a number line and in a hundred square**Identify** the significant multiples of 10, 100, and 1000 that lie either side of a number**Manipulate, explore** and **identify** place value using 10 to 100 000**Understand**the place value of each digit in a five digit number **Partition, manipulate** and **combine** numbers to 100 000 **Identify** place value in decimal numbers to one decimal place**Round** numbers to the nearest 10, 100, 1000 and 10 000 **Use** the vocabulary of fractions (numerator, denominator, proper fraction, improper fraction, mixed number)**Read** and **write** proper fractions, improper fractions, mixed numbers and decimal numbers (up to one decimal place)**Identify** and **represent** proper fractions, improper fractions and mixed numbers in shapes and diagrams**Locate** and **place** mixed numbers on a number line **Manipulate** and **use** the fraction wall to compare fractions and **understand** equivalence**Simplify** fractions to the lowest common term**Recognise** decimal numbers in real life contexts **Understand** the equivalence between the decimal and fraction forms of half, quarter, three quarters and tenths **Explore, recognise and record** patterns and sequences using numbers with a variety of intervals, and that use more than one operation **Discover** patterns within multiplication tables to 10 and **find** links between them. **Recognise** and **count** multiples of 2, 5, 10, 100 and 1 000 to 10 000 | **Understand** and **use** the vocabulary and symbols of addition and subtraction**Add** and **subtract** whole numbers and numbers to one decimal place **Combine** addition and subtraction calculation**Write** addition and subtraction calculations using standard and informal written methods**Apply** appropriate strategies to support mental calculation**Estimate** before calculating and **check** the exact result found by sums and differences**Add** and **subtract** fractions with the same denominator **Perform** addition and subtraction with large numbers**Understand** and **use** the vocabulary and symbols of multiplication and division**Determine** all factors of numbers within the multiplication tables**Write** multiplication calculations using standard and informal written methods (two digit/ three digit by a one digit/ two digit number)**Write** simple division calculations using informal methods with and without remainders (two and three digit numbers by a one digit number)**Calculate** the remainder when dividing**Be aware** of simple algebraic equations**Use, compare** and **discuss** various mental strategies **Estimate** before calculating and **check** the exact result found by products and quotients**Calculate** a fraction of a given quantity **Perform** multiplications and divisions with large numbers | **Understand** and **use** the vocabulary of length **Estimate**, **measure**, **compare** and **record** lengths of a wide variety of objects, using appropriate instruments and metric units**Understand** the relationship between mm, cm, dm, m, dam, hm and km**Convert** mm, cm, m and km**Measure** and **calculate** the perimeter of polygons**Understand** and **use** the vocabulary of scale (scale, scale length, actual length)**Find** actual length when given a corresponding scale length**Draw** shapes of a given area**Understand** the relationships between units of area km2 , ha, a, m2, dm2 , cm2, mm2**Convert** km2, ha, a, m2, dm2, cm2, mm2**Discove**r the formula for the area of a rectangle**Calculate** the area of rectangles and compound shapes using mm2, cm2, dm2 and m2**Consolidate** and **extend** the vocabulary of capacity (decilitre, centilitre, millilitre)**Estimate**, **measure**, **compare** and **record** the capacity of a wide variety of receptacles and metric units (l, dl, cl, ml)**Understand** the relationships between l-dl, l-cl, l-ml, dl-cl, cl-ml**Convert** l-dl, l-cl, l-ml, dl-cl, dl-ml, cl-ml**Consolidate** the vocabulary of weight (gram, decagram, kilogram, tonne)**Estimate**, **measure**, **compare** and **record** the weight of a wide variety of objects using appropriate instruments and metric units (t, kg, dag, g)**Discover** milligrams**Convert** t-kg, kg-dag, kg-g, dag-g and g-mg**Understand** and **use** units of measurement of time (second, minute, hour, day, week, month, year, century and millennium)**Convert** seconds into minutes and seconds, minutes into hours and minutes, days into weeks and days, months into years and months |

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| **YEAR P4** |  |  |
| **SHAPE and SPACE** | **DATA HANDLING** |  |
| **Read,** **follow** and **give** instructions involving position, direction and movement**Visualise**, **locate** and **plot** a position using grid references and coordinates in the first quadrant, naming the x and y axis**Use** the eight points of the compass to describe movement or position **Recognise, describe, extend** and **create** tessellated patterns, combining regular and irregular polygons**Identify, describe** and **use** a ruler/squared paper to draw vertical, horizontal, parallel, perpendicular and intersecting lines**Know** that angles are measured in degrees and that one whole turn is 360°, a straight angle is 180°, a right angle is 90°**Recognise** and **draw** acute, right and obtuse angles and **relate** them to shape and the environment**Estimate**, **measure** and **construct** angles to the nearest 5°, using a protractor and a ruler**Use** notation of angles (*α, β, γ*)**Consolidate** and **extend** the vocabulary of lines and angles **Consolidate** and **extend** the vocabulary of 2 D shapes**Sort, name, describe** and **classify** regular and irregular 2 D shapes **Consolidate** and **extend** the vocabulary of 3 D shapes (cube, cuboid, cylinder, sphere, cone and pyramid)**Explore** the main characteristics of 3 D shapes **Sort**, **name, describe** and **classify** regular and irregular 3 D shapes **Explore** the relationships between 3 D shapes (perpendicular, parallel faces and edges)**Identify** and **make** nets of common 3 D shapes**Use** a set square and compasses to creategeometrical drawings**Investigate** symmetry in art, architecture and nature**Draw** all lines of symmetry in polygons**Complete** the missing half of a shape, picture or pattern, using vertical, horizontal and diagonal lines of symmetry**Draw** the position of a shape after rotation around one of its vertices**Translate** a shape horizontally and vertically on a grid**Enlarge** or **reduce** a shape using a grid | **Read** and **interpret** data from pie charts and line graphs**Recall** pictograms, block graphs, bar graphs, Venn and Caroll diagrams as methods to present data**Connect** between bar graphs and line graphs**Explain** which type of representation should be used, or if more can be used to present data**Use** data from Internet to make a line graph and a pie chart **Explain, organise,** and **present** data**Identify** and **record** outcomes of random processes**Use** vocabulary of likelihood and chance: impossible, unlikely, even chance, likely, certain**Order** events in terms of likelihood of occurrence |  |

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| **YEAR P5** |  |  |
| **NUMBERS** | **OPERATIONS** | **MEASURMENT and UNITS** |
| **Read** and **write** whole numbers to and beyond 1 000 000**Use** and **apply** numbers to and beyond 1 000 000 in real life contexts**Discover** the concept of negative numbers through real life examples **Recall** numbersto 2 000 using Roman Numerals **Use** and **apply** various estimation strategies **Order** numbers (increasing and decreasing) irrespective of size**Compare, locate** and **place** numbers on a number line and in a hundred square**Identify** the whole numbers that lie either side of a decimal number to two decimal places**Identify** the significant multiples of 10, 100, 1 000, 10 000 and 100 000 that lie either side of a decimal number to 2 decimal places**Manipulate, explore** and **identify** place value using base 10 to 1 000 000 and beyond**Understand**the place value of each digit in a six digit number and beyond, and in decimal numbers to two decimal places **Partition** numbers into multiples of 10 000, 1 000, 10 and 1, 1/10 and 1/100**Identify** place value in decimal numbers to two decimal places **Round** whole numbers and decimals to the nearest whole number 10, 100, 1 000, 10 000, 100 000 and 1 000 000 **Use** the vocabulary of fractions **Read** and **write** proper fractions, improper fractions, mixed numbers and decimal numbers (to two decimal places) **Convert** improper fractions to mixed numbers and vice-versa **Find** equivalent fractions**Simplify** fractions to the lowest common term**Recognise** and **use** decimal numbers in real life contexts **Understand** the equivalence between the decimal and fraction forms of half, third, quarter, three quarters, tenths and hundredths**Identify** the whole numbers that lie either side of a decimal number up to two decimal places**Identify** percentages in real life (limited to 100%, 75%, 50%, 25%, 10% and 1%)**Understand** the relationships between fractions, decimals and percentages(limited to 100%, 75%, 50%, 25%, 10% and 1%)**Explore, recognise** and **record** patterns and sequences using numbers with a variety of intervals, including with fractions and decimal numbers **Explore** and **understand** triangular and square numbers | **Consolidate** and **use** the vocabulary and symbols of addition and subtraction**Add** and **subtract** whole numbers and numbers to two decimal places**Write** addition and subtraction calculations using standard and informal written methods**Use** and **develop** simple algebraic equations using addition and subtraction **Perform** addition and subtraction with brackets **Apply** the rules of the order of addition and subtraction and brackets**Use** mental strategies for addition and subtraction**Estimate** before calculating and **check** the exact result found by sums and differences**Add** and **subtract** fractions and mixed numbers**Carry out** one-step and two-step calculations involving all four operations**Consolidate** and **use** the vocabulary and symbols of multiplication and division**Determine** factors of larger numbers**Identify** prime numbers to 100**Write** multiplication and division calculations using informal and standard written methods**Understand** and **use** simple ratios, proportions and scales**Use** and **develop** simple algebraic equations using multiplication and division**Perform** multiplications and divisions with brackets**Apply** the rules of the order of multiplication and division and brackets**Use** mental strategies including multiplying and dividing by 10 and 100 and 1 000**Estimate** before calculating and **check** the exact result found by products and quotients**Calculate** a fraction of a given quantity **Calculate** simple percentages of a given quantity (100%, 75%, 50%, 25%, 10% and 1%)**Multiply** a fraction by a one digit number **Divide** a simple fraction by a one digit number using diagrams **Carry out** one-step and two-step calculations involving all four operations | **Consolidate** the vocabulary of length **Estimate, measure, compare** and **record** lengths of a wide variety of objects, using appropriate instruments and metric units (including fractions and decimal numbers)**Convert** mm, cm, m, dam, hm and km**Estimate** and **measure** the perimeter of regular and irregular polygons **Consolidate** the vocabulary of scale (scale, scale length, actual length)**Create** scale drawings**Read** and **interpret** maps using scale**Convert** units of area km2, ha, a, m2, dm2, cm2, mm2**Calculate** the area of compound shapes consisting of rectangles and right-angled triangles using m2 and cm2**Consolidate** the vocabulary of capacity **Estimate, measure, compare** and **record** the capacity of a wide variety of receptacles and metric units (l, dl, cl, ml)**Convert** hl, l, dl, cl, ml **Introduce** the vocabulary of volume (cubic centimetre, cubic decimetre, cubic metre)**Understand** the relationship between volume and capacity (dm³-l)**Calculate** the volume of cubes and cuboids using m³, dm³, cm³**Consolidate** the vocabulary of weight**Estimate, measure, compare** and **record** the weight of a wide variety of objects using appropriate instruments and metric units (t, kg, dag, g, mg)**Convert** t, kg, dag, g, mg**Convert** and **calculate** with units of time**Practise** reading and recording the time to the exact minute on analogue, digital and 24-hour clocks**Explore** international time zones**Practise** the calculation ofduration, start time and finish time including using data from timetables**Knowing** two quantities out of three (time, distance or speed), **calculate** the third quantity**Calculate** change**Convert** the euro and other currencies |

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| **YEAR P5** |  |  |
| **SHAPE and SPACE** | **DATA HANDLING** |  |
| **Read**, **follow** and **give** instructions and directions using coordinates **Visualise**, **locate** and **plot** a position using integer coordinates in the first quadrant as well as other grid reference systems (longitude and latitude)**Investigate** the geometric properties of tessellations**Recognise**, **describe**, **extend** and **create** tessellated patterns and other designs which combine regular and irregular 2 D shapes**Identify**, **describe** and **use** instruments to draw parallel, perpendicular and intersecting lines**Name** and **classify** all kinds of angles and **relate** them to shape and the environment**Estimate**, **measure** and **construct** angles to the nearest degree, using a protractor and a ruler**Use** a set square and compasses to create geometrical drawings**Sort**, **name**, **describe** and **classify** regular and irregular 2 D shapes, including equilateral, scalene, isosceles triangles, and identify their properties**Explore** the relationships between 2 D shapes (lines of symmetry and angles)**Identify** the properties of a circle and construct a circle of a given radius/diameter**Consolidate** and **extend** the vocabulary of 3 D shapes (cube, cuboid, cylinder, sphere, cone, pyramid and prism, hollow, solid)**Sort**, **name**, **describe** and **classify** regular and irregular 3 D shapes and identify their properties **Visualise**, **identify** and **make** nets of common 3 D shapes**Investigate** symmetry in art, architecture and nature**Draw** all lines of symmetry in polygons**Draw** the position of a shape after reflection using vertical, horizontal, diagonal and multiple lines of symmetry**Draw** the position of a shape after translation**Draw** the position of a shape after rotation using different centres of rotation**Enlarge** or **reduce** a shape by measurement | **Apply** the concept of proportionalityto interpretdata presented in pie charts in terms of percentages or fractions**Interpret** line graphs (distance/time, a graph of pairs of numbers adding to a given number)**Use** data and representations to make informed decisions and predictions**Discuss** examples of inappropriate representations of data from newspaper, whether certain representations are misleading**Construct** line graphs and pie charts from real life situations,using a spreadsheet (Excel and other online tools)**Study** the meaning ofaverage in real life situations**Recognise** the three related quantitiesin a set of data: average, total value, number of data**Understand** and **apply** the formula to determine the mean**Knowing** two quantities out of three (average, total value, number of data), **calculate** the third quantity**Calculate** and **interpret** the meanmanipulating data in real life-situations,using a spreadsheet, (Excel and other online tools) |  |

1. The eight key competences referenced here take part of the recommendation on key competences for lifelong learning adopted by the Council of the European Union in May 2018 [↑](#footnote-ref-1)