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Developing Conceptual Fluency

Using Knowledge Organisers

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What are Knowledge Organisers?

Definition: A one-page document that establishes the essential knowledge that every pupil needs to know by the end of a topic, year or unit of work.

Knowledge Organisers provide **all the core information that you would expect a pupil to learn** at the end of a unit.

Their origins lie not in maths, but in the humanities and with schools who adopt a 'knowledge-rich' approach to curriculum.

What would be included in a knowledge organiser is subject dependent as every subject has different requirements in order to be successful; a 'universal' approach to Knowledge Organisers is unlikely to have the desired effect.

Some common information that may be found across Knowledge Organisers in all subjects would be:

- **key vocabulary** (this would include places, people or processes),
- some **useful diagrams** that demonstrate the processes,
- and other **key information**.

An important feature of a Knowledge Organiser is that they are rigidly **kept to one side of A4, focusing solely on the crucial information**.

It is also important to state what a knowledge organiser **is not**: they are **not a curriculum** and they will **never replace the expert teacher**. It's best to think of them as tools to help teachers enact a curriculum.

How Not to Use a Knowledge Organiser

There are lots of readymade Knowledge Organisers on the internet. As a piece of paper by themselves, they are completely meaningless. If they are just handed out to pupils with no explanation, or sent home to use to 'revise', they will have little benefit. **How a knowledge organiser is used is as important as what is included in it.**

Why Use Knowledge Organisers?

The information added to a Knowledge Organiser implies that there is an expectation that the pupils will need to learn it. The teacher needs to consider very carefully the information that will be added from schemes of work when creating a knowledge organiser. If it is not going to be used within a sequence of lessons, then there is no reason for that information to be in the organiser. This **thought process makes the intended learning explicit**. With an increase in the clarity of what is to be taught, there is also an increased likelihood that this information will be remembered by pupils, due to its vital nature.

Creating Knowledge Organisers will sometimes **highlight common maths misconceptions or problematic 'maths tricks'** used by pupils which may not have otherwise been previously considered.

Knowledge Organisers and the Development of Teachers

The construction of a Knowledge Organiser **makes teachers think hard about what information is being taught** and so can also **develop teachers' subject knowledge**.

"The process of creating Knowledge Organisers in a specific subject leads to a consideration of pedagogical content knowledge, the integration of subject expertise and an understanding of how that subject should be taught."

(Ball, 2008)

Knowledge Organisers can be **a valuable starting point for effective curriculum design.**

Knowledge Organisers and Closing Gaps

The use of Knowledge Organisers offers a **great tool for inclusion** as well as an **excellent way to help fill learning gaps**. For example, pupils who require more practice on 'shape' could be given a Knowledge Organiser that details some core knowledge: shape names and properties of that shape including angles. Teachers could then promote self-quizzing as a means of closing this knowledge gap.

Knowledge Organisers allow a pupil to **take responsibility for their own learning** and to **help themselves close gaps**. Once a pupil has learnt a fact, a **teacher can demonstrate how to use this information to solve more complex problems and deepen learning**.

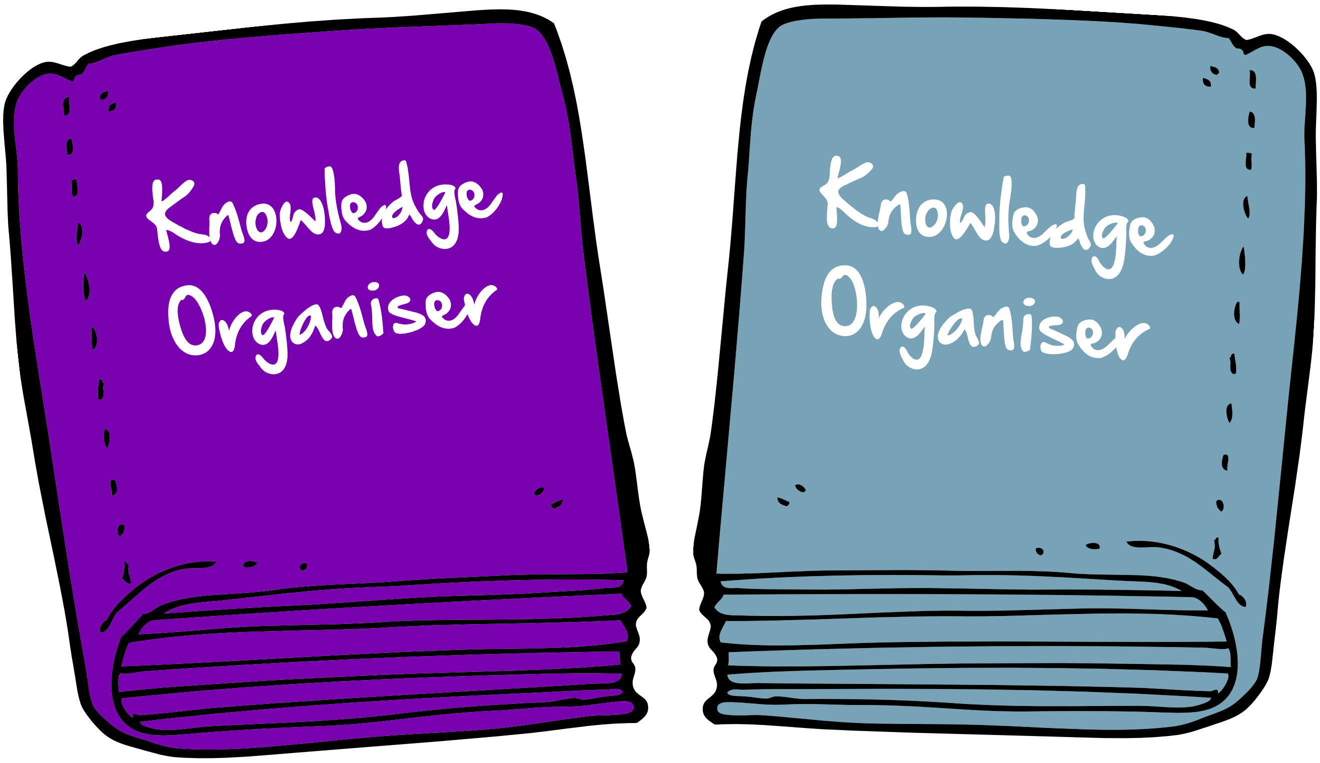
Knowledge Organisers and Learning Facts

The other benefit from learning key facts, is that this will also put **less of a burden on pupils' working memory**, making it more likely they will learn to apply those facts when solving problems. Our working memory is only able to process a finite amount of information at one time. For pupils to be successful in a range of subjects they need to have a large store of factual knowledge in their long-term memory..

Our minds have adapted to take this information from our long-term memory into our working memory, without sacrificing much space, but this skill needs to be developed by pupils. When teaching for mastery, each pupil will need a different amount of time to master the content of the curriculum. **Providing high quality Knowledge Organisers ensures that pupils who need longer to process learning can use their own time productively** and the teacher's time more effectively as the key facts will have already been learnt.

Knowledge Organisers and Making Links

The interlinking relationship between concepts in maths is also supported using Knowledge Organisers. A child who is fluent in their multiplication tables is often able to use these facts to support work on equivalent fractions, as their working memory can attend to the fractions rather than the multiplicative content. A child who is not secure in these facts will have to process them in their working memory alongside their relationship to equivalent fractions. This can overload the working memory and prevent pupils from learning what they need to. A Knowledge Organiser supplies all these facts and, providing pupils use them correctly, can result in this information becoming part of long-term memory.



Knowledge Organisers in Supporting Organising Knowledge

Knowledge Organisers could be the first step in expanding our understanding of knowledge organisation and retrieval.

"Use regular retrieval practice, because active retrieval aids later retention.”

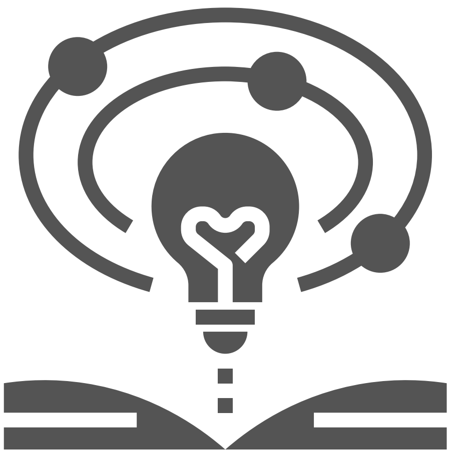
(Roediger, 2011)

This can take various forms:

- low-stakes quizzes during lessons
- free recall, where students write down everything that they can remember on the topic, before checking the Knowledge Organisers
- filling in a blank (or partially blank) knowledge organiser.

"Retrieval Practice “identifies gaps in knowledge, enables further learning on in future study and produces better organisation of knowledge.”

(Roediger, 2011)



Retrieval Practice Strategies to Use Everyday

'Do Now' Activities

This activity can be found in **'Teach Like a Champion' by Doug Lemov (2010)**

It is a starter activity that recalls learning from previous lessons that students do as soon as they enter the classroom. The learning might be from yesterday, a week ago, a month ago, or even from the very beginning of the year.

Questions included in a 'Do Now' should be completed independently with minimal support. In a Maths lesson, this could include a question on place value, the four operations, fractions and other key learning recently covered. If pupils struggled with a question in the previous lesson, a similar one could be added in the 'Do Now' activity so that pupils retrieve and practice that learning again.

Find activities here: https://mathsbot.com/starters/doNow

Cold Call Questioning

This idea also comes from **'Teach Like a Champion' by Doug Lemov (2010)**

After developing a knowledge organiser, plan a bank of questions that focus on the retrieval of key definitions, meanings of vocabulary words, 'true' or 'false' questions and facts. Use three minutes at the end of a lesson to ask pupils a question from the bank. This could be the same question asked multiple times to different pupils.

One key aspect of this skill is that if a pupil responds by saying 'I don't know', then bounce that question to someone else and ask the pupil who said 'I don't know' to listen in. The pupil who said 'I don't know' has to repeat what the other person has said. This means that every pupil finishes with the right answer.

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Quizzing

Evidence shows that when quizzing is used correctly, it is highly effective in Primary schools (Garner, 2018; McDaniel et al. 2011; Butler, 2010). One important aspect of this is the use of 'prompts' as this aids young learners' recall of knowledge learnt in previous lessons. Research also suggests that pupils' learning could be hindered if prompts and scaffolds are not provided during quizzes (Karpicke et al. 2014; Smith et al. (2016). For quizzes to be successful, it is important that they are low stakes and fun. Pupils should not feel pressured to achieve high scores in quizzes or compete against one another.

Different Types of Quizzes

- **Table Quizzes** don't test individual recall but instead encourages groups to discuss answers if the questions are multiple choice. This works well at the beginning of a topic as this puts less pressure on during early stages of learning.
- **Partner Quizzes/Flash Cards** are created with answers on the back and given to pairs. Pupils ask each other questions and check their understanding. This quiz can be extended by asking pupils to create their own flashcards.
- **Individual Multiple-Choice Quizzes** should be short with eight to ten questions that pupils answer individually. It is low stakes, and a record of scores is not kept but it gives an opportunity to focus on pupils who struggled and to support them with an extra activity.

Advice on Responding to Quizzes:

Teachers should help pupils to learn the knowledge that they get wrong in quizzes. Pupils who get things wrong, often gain stronger learning in the long term. This can be done in a variety of ways. Pupils could be given something to read, or teachers could sit with pupils in a brief intervention and explain the incorrect responses from the quiz.

Retrieval Practice; Sorting, Linking and Comparing

There are a range of methods to support the process of revisiting what was learned previously. These fall into three categories:
sorting, linking and comparing.

Sorting

Statements and ideas are cut up and pupils are asked to sort them into categories, according to what they know about them.
True or false statements can form the basis for questioning, for example:

Numbers that are products of 3.

Follow up questions can extend pupils:

Are you sure that 15 is a product of 3? How do you know that?
Can you tell me how you would explain this to a friend?

Linking

Through careful questioning, pupils then can begin to link knowledge to other concepts in mathematics.

Can you think of another number that is a factor of 15?
Give me an example.

How can knowing products of 3 help us when we are looking at fractions?

Comparing

Pupils could be encouraged to discuss and write a short response to a question. For example: ***Write down three differences between 2D and 3D shapes.***

Retrieval Practice: Brain Dumps

To aid retrieval, the beginnings of a mind map with few prompts are given to pupils. Completing the activity twice during a topic is beneficial in showing how much pupils remember about a topic but also a visual aid for pupils to see how much they have learned – use a different coloured pen/pencil at the start and end of the topic to show progress and where misconceptions have been revealed and tackled. This is a flexible strategy because it is easy to scaffold the support by adding prompt questions, pictures or vocabulary words to help children recall. The other benefit of this activity is that it is easy to plan and resource.

Discussions for Retrieval Practice

There are two approaches to use discussions specifically for retrieval practice:

Articulating Explanations

Pupils are asked to think carefully about using accurate definitions for key terms, using vocabulary words or phrases in sentences, or clarifying learning from previous lessons by working in pairs or groups. They write this down as a group and then feedback to the class.

To ensure that all pupils learn to speak clearly using this newly learned vocabulary, each member of the group is given roles (for example: scribe, leader, speaker, grammarian). Each one will work specifically in role. The chosen 'speaker' could be a pupil who is normally reluctant to speak or struggles with using new vocabulary accurately.

Used in this way, retrieval practice enables pupils who may have learned the content but lack confidence the opportunity to speak.

Applying Knowledge to Extending Thinking

This discussion is similar to the sorting, linking and comparing activities with the focus on improving pupils speaking skills. These discussions involve open-ended

tasks and builds on knowledge that pupils already know.
For example: ***Select the appropriate operation for word problems and explain which strategy is the most suitable for this type of calculation***.

The Best Conditions for Discussions Within the Classroom

1. All those involved in the discussion are well trained in active listening and speaking and have specific roles. This is essential so that pupils get the most out of discussion time.
2. Pupils use key vocabulary and begin with discussion phrases that are given to them. Praise pupils' responses to each other based on whether they are using these scaffolds.
3. End each discussion time with journaling. By this time, they've hopefully retrieved key information, spoken in high quality sentences and have the support of hearing other ideas.

Using Knowledge Organisers to Link to Additional Knowledge

The most effective use of Knowledge Organisers is to elaborate upon the material included in them to additional knowledge associated with it. This can be in the form of 'why' questions.

The element of retrieval practice contained in this strategy is known as **Elaborative Interrogation**- students explore their schema by answering ***How and Why*** questions.

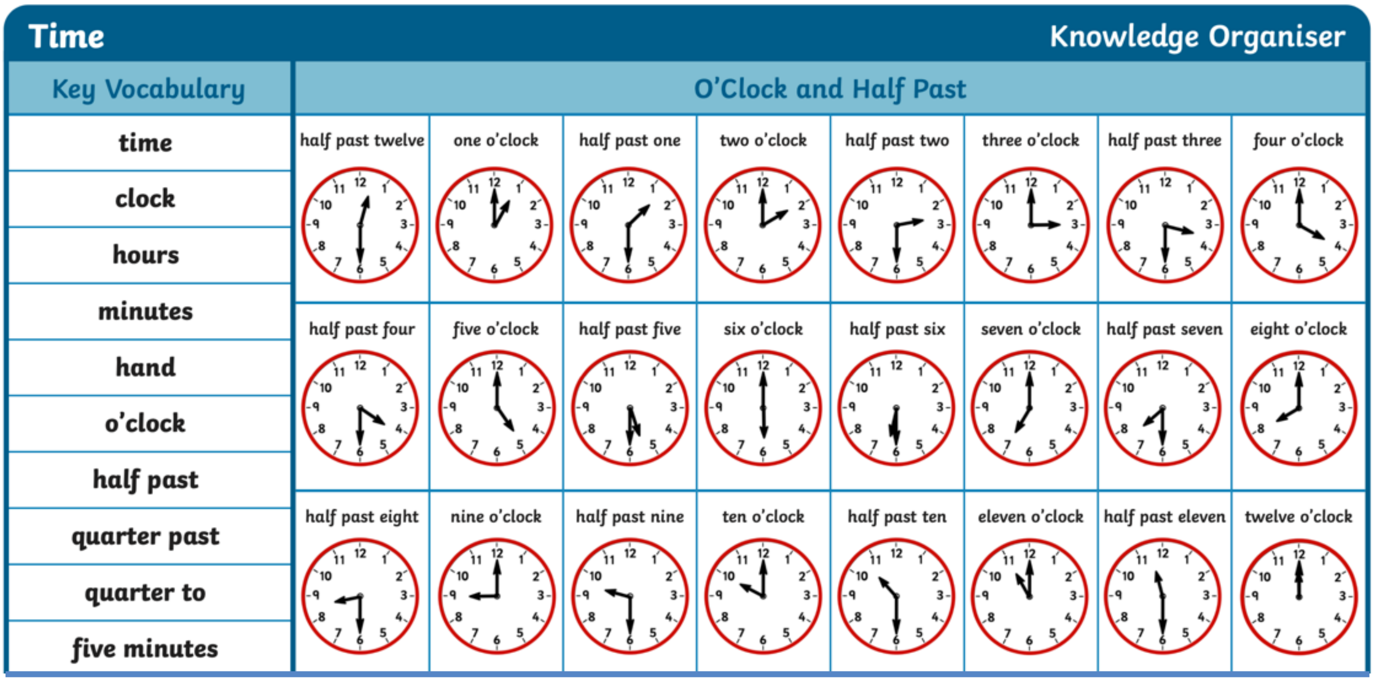
It works by ensuring that there is active understanding and meaningful consideration of what is being learnt (Willingham, 2014). Building complex schemas requires knowledge to be connected. This can happen when asking questions such as...

"Why does this happen? How does it work? Why does it work? Why do you use that structure? Why is that the most important reason? How do you know?"."

(Willingham, 2014)

Knowledge Organisers in Supporting Organising Knowledge

One criticism of **Knowledge Organisers** is they are less effective than other **knowledge organisation** due to learners taking more time to commit the facts to long-term memory. This is due to Knowledge Organisers predominately using lists to show information, which has less storage strength, as well as the relationships between the facts being weaker than other knowledge organisation structures. For this reason, students should organise the knowledge contained on the Knowledge Organiser into different organisational structures in order to help recall and further understanding.



Time — Knowledge Organiser

Key Vocabulary
time
clock
hours
minutes
hand
o'clock
half past
quarter past
quarter to
five minutes

O'Clock and Half Past							
half past twelve	one o'clock	half past one	two o'clock	half past two	three o'clock	half past three	four o'clock
half past four	five o'clock	half past five	six o'clock	half past six	seven o'clock	half past seven	eight o'clock
half past eight	nine o'clock	half past nine	ten o'clock	half past ten	eleven o'clock	half past eleven	twelve o'clock

Year 2 Maths Time Knowledge Organiser - Twinkl

Knowledge Organisation Structures

Frederick Reif defines three kinds of knowledge organisation structures:

1. Associative network
2. Lists
3. Hierarchy.

Hierarchies can be seen as the most desirable structure – **associative networks** can be difficult to mentally navigate and **lists** have little organising structure as they are often a single grouping.

Associative Network

This is associated to how our mind works. Concepts are associated with other concepts through some relationship. This can often be represented through a **mind map**.

Lists

A list has a heading, and then its sub-points simply continue in length. If there is more than one list, the assumption is that there is no real relationship between them.

1x
- 1 x 1 = 1
- 1 x 2 = 2
- 1 x 3 = 3
- 1 x 4 = 4
- 1 x 5 = 5
- 1 x 6 = 6
- 1 x 7 = 7
- 1 x 8 = 8
- 1 x 9 = 9
- 1 x 10 = 10
- 1 x 11 = 11
- 1 x 12 = 12

2x
- 2 x 1 = 2
- 2 x 2 = 4
- 2 x 3 = 6
- 2 x 4 = 8
- 2 x 5 = 10
- 2 x 6 = 12
- 2 x 7 = 14
- 2 x 8 = 16
- 2 x 9 = 18
- 2 x 10 = 20
- 2 x 11 = 22
- 2 x 12 = 24

3x
- 3 x 1 = 3
- 3 x 2 = 6
- 3 x 3 = 9
- 3 x 4 = 12
- 3 x 5 = 15
- 3 x 6 = 18
- 3 x 7 = 21
- 3 x 8 = 24
- 3 x 9 = 27
- 3 x 10 = 30
- 3 x 11 = 33
- 3 x 12 = 36

4x
- 4 x 1 = 4
- 4 x 2 = 8
- 4 x 3 = 12
- 4 x 4 = 16
- 4 x 5 = 20
- 4 x 6 = 24
- 4 x 7 = 28
- 4 x 8 = 32
- 4 x 9 = 36
- 4 x 10 = 40
- 4 x 11 = 44
- 4 x 12 = 48

5x
- 5 x 1 = 5
- 5 x 2 = 10
- 5 x 3 = 15
- 5 x 4 = 20
- 5 x 5 = 25
- 5 x 6 = 30
- 5 x 7 = 35
- 5 x 8 = 40
- 5 x 9 = 45
- 5 x 10 = 50
- 5 x 11 = 60
- 5 x 12 = 65

6x
- 6 x 1 = 6
- 6 x 2 = 12
- 6 x 3 = 18
- 6 x 4 = 24
- 6 x 5 = 30
- 6 x 6 = 36
- 6 x 7 = 42
- 6 x 8 = 48
- 6 x 9 = 54
- 6 x 10 = 60
- 6 x 11 = 66
- 6 x 12 = 72

7x
- 7 x 1 = 7
- 7 x 2 = 14
- 7 x 3 = 21
- 7 x 4 = 28
- 7 x 5 = 35
- 7 x 6 = 42
- 7 x 7 = 49
- 7 x 8 = 56
- 7 x 9 = 63
- 7 x 10 = 70
- 7 x 11 = 77
- 7 x 12 = 84

8x
- 8 x 1 = 8
- 8 x 2 = 16
- 8 x 3 = 24
- 8 x 4 = 32
- 8 x 5 = 40
- 8 x 6 = 48
- 8 x 7 = 56
- 8 x 8 = 64
- 8 x 9 = 72
- 8 x 10 = 80
- 8 x 11 = 88
- 8 x 12 = 96

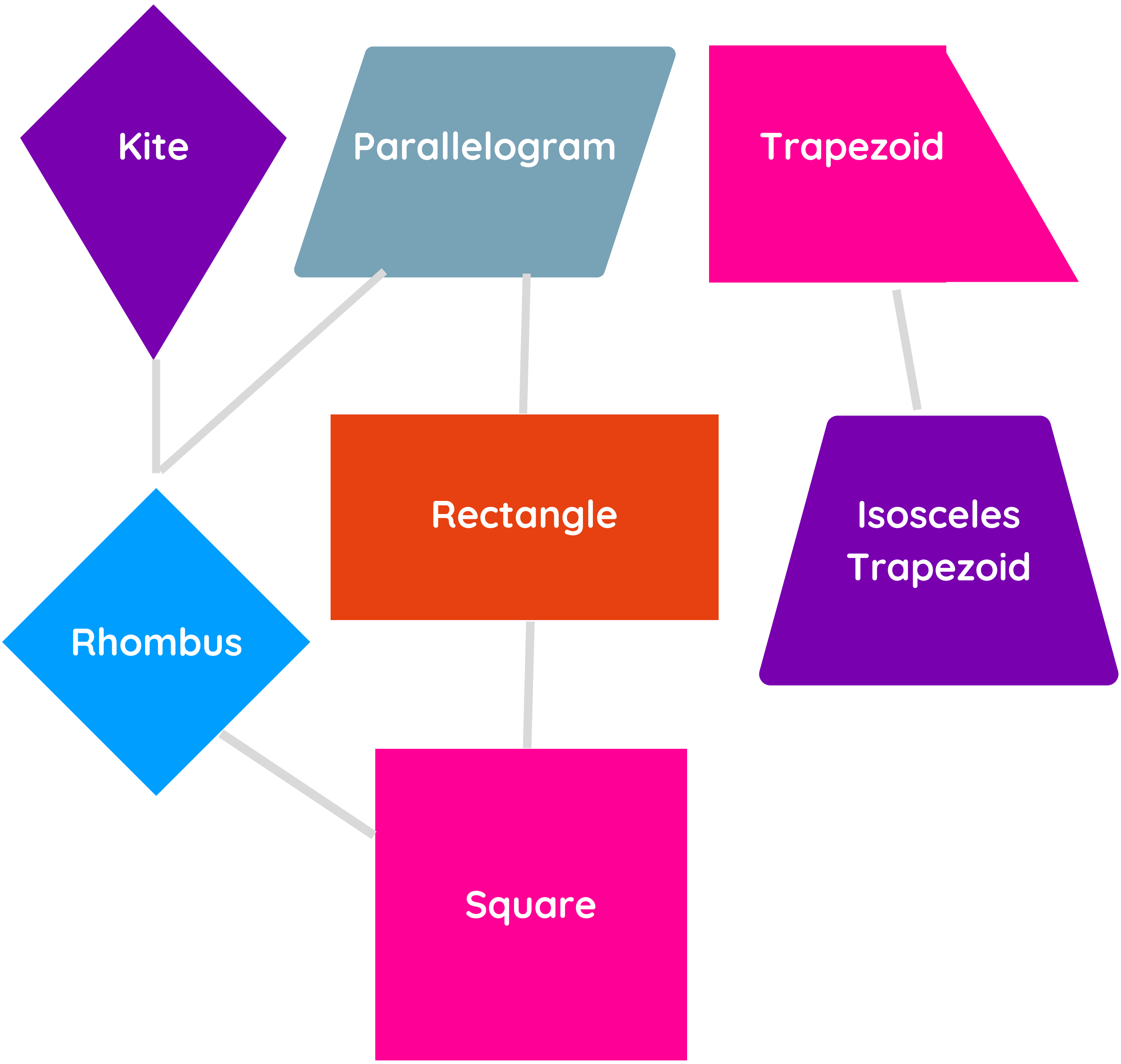
9x
- 9 x 1 = 9
- 9 x 2 = 18
- 9 x 3 = 27
- 9 x 4 = 36
- 9 x 5 = 45
- 9 x 6 = 54
- 9 x 7 = 63
- 9 x 8 = 72
- 9 x 9 = 81
- 9 x 10 = 90
- 9 x 11 = 99
- 9 x 12 = 108

10x
- 10 x 1 = 10
- 10 x 2 = 20
- 10 x 3 = 30
- 10 x 4 = 40
- 10 x 5 = 50
- 10 x 6 = 60
- 10 x 7 = 70
- 10 x 8 = 80
- 10 x 9 = 90
- 10 x 10 = 100
- 10 x 11 = 110
- 10 x 12 = 120

Hierarchy

A hierarchy can be thought of as a series of lists connected by grouping or categorisation.

Hierarchy of Quadrilaterals



Knowledge Organisers in Supporting Organising Knowledge

Teachers should regularly use the previous strategies and structures on **Knowledge Organisation and Retrieval** but students need to be aware of how and when to use these strategies themselves.

"This needs explicit instruction."

(Zimmerman, 2010)

Class teachers should articulate what particular retrieval strategy is being used, highlighting why it is effective and model how to use this with the Knowledge Organiser.

Using a Metacognitive Regulation Cycle

Students can use a **Metacognitive Regulation Cycle** to support their use of Knowledge Organisers.

This Metacognitive Regulation Cycle could follow the process of:

"planning how to undertake a task; monitoring the effectiveness of a strategy; evaluating the overall success."

(Education Endowment Foundation, 2018)

For example, students might wish to learn about shape so they might use the Knowledge Organiser in several ways:

- **Retrieval practice** is effective so they self-quiz
- **Elaborative interrogation** is important so they may consider how they would find how many lines of symmetry each shape has.
- They understand that knowledge may stick better if organised in different ways, so they organise the shapes by number of sides. They create a mind map grouping all of the shapes. Finally, they make a diagram showing the Hierarchy of the shapes.

How to Create a Knowledge Organiser

Features Common to All Knowledge Organisers - Not Maths Specific

There is some information that may be found across Knowledge Organisers in all subjects:

- key vocabulary (use appropriate mathematical language and maths vocabulary list)
- key places and people
- useful diagrams (as required for the topic)
- key dates for a subject like history (e.g. when the two World Wars were) would clearly also be included
- key themes – essential for any Key Stage 2 reading work
- important quotes (that demonstrate those themes)
- stem sentences for a subject like Maths.

How to Write a Knowledge Organiser

The term 'knowledge' does not simply mean facts. There are two types of knowledge – **declarative and procedural**. Knowing the difference between these two helps in understanding which knowledge should go into a knowledge organiser.

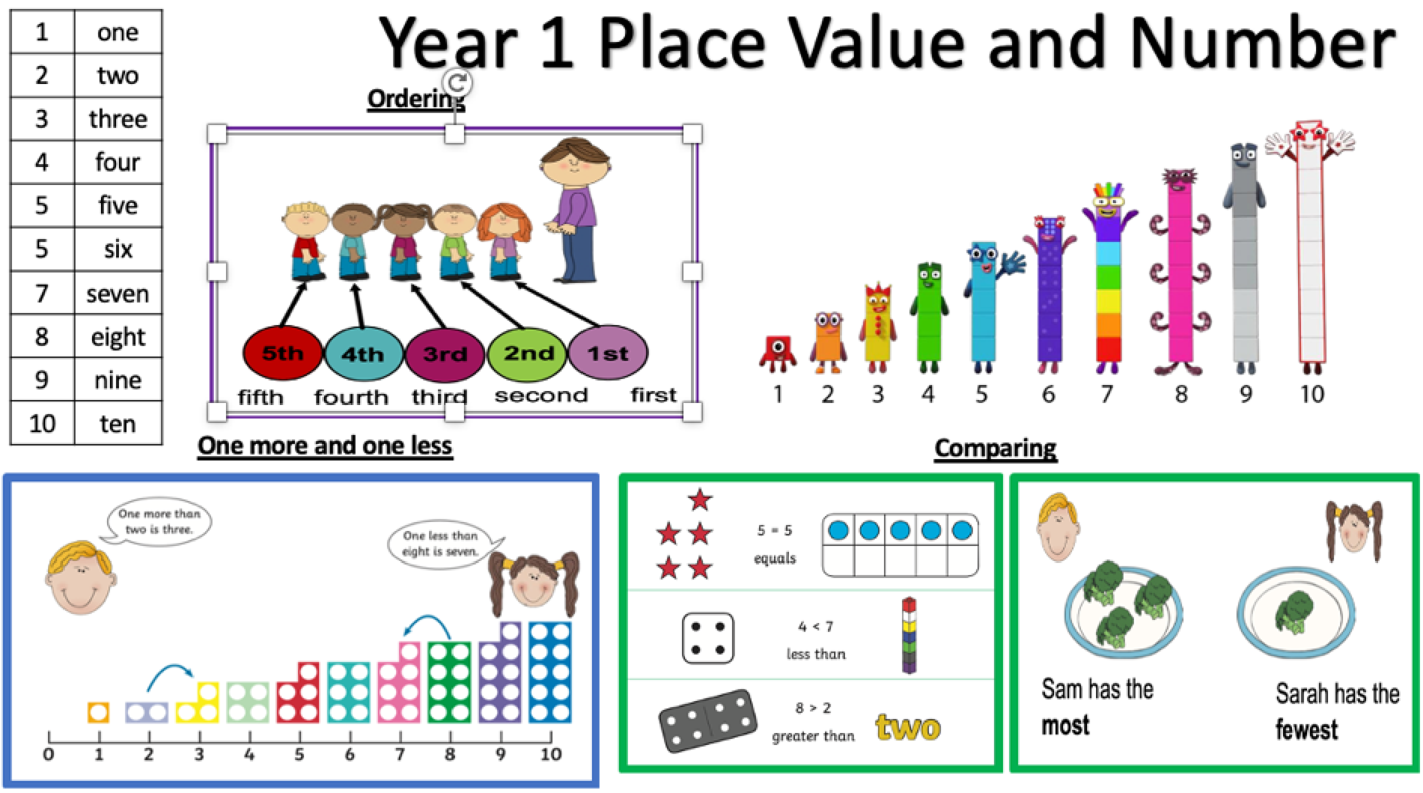
Declarative knowledge is factual knowledge. In the maths, this would be number bonds, times tables, or angles in a triangle add to 180 degrees.

Procedural knowledge involves knowing procedures. In maths this would be "3-digit by 2-digit long multiplication" or "how to find the missing angle of a triangle if two are known".

Knowledge Organisers should avoid procedural knowledge as pupils would need teacher support to understand this. Instead Knowledge Organisers should focus on declarative knowledge. This knowledge will unlock the procedural knowledge and make that learning much richer in the classroom. Knowledge Organisers should not follow a format and should be adapted to the needs of a unit of work.

To create a knowledge organiser, it is best to **look at the national curriculum objectives for each domain and year group and decide which knowledge is declarative.**

In this example of a Knowledge Organiser, key information has been collated to support Year 1 pupils in Place Value and Numbers to 10.



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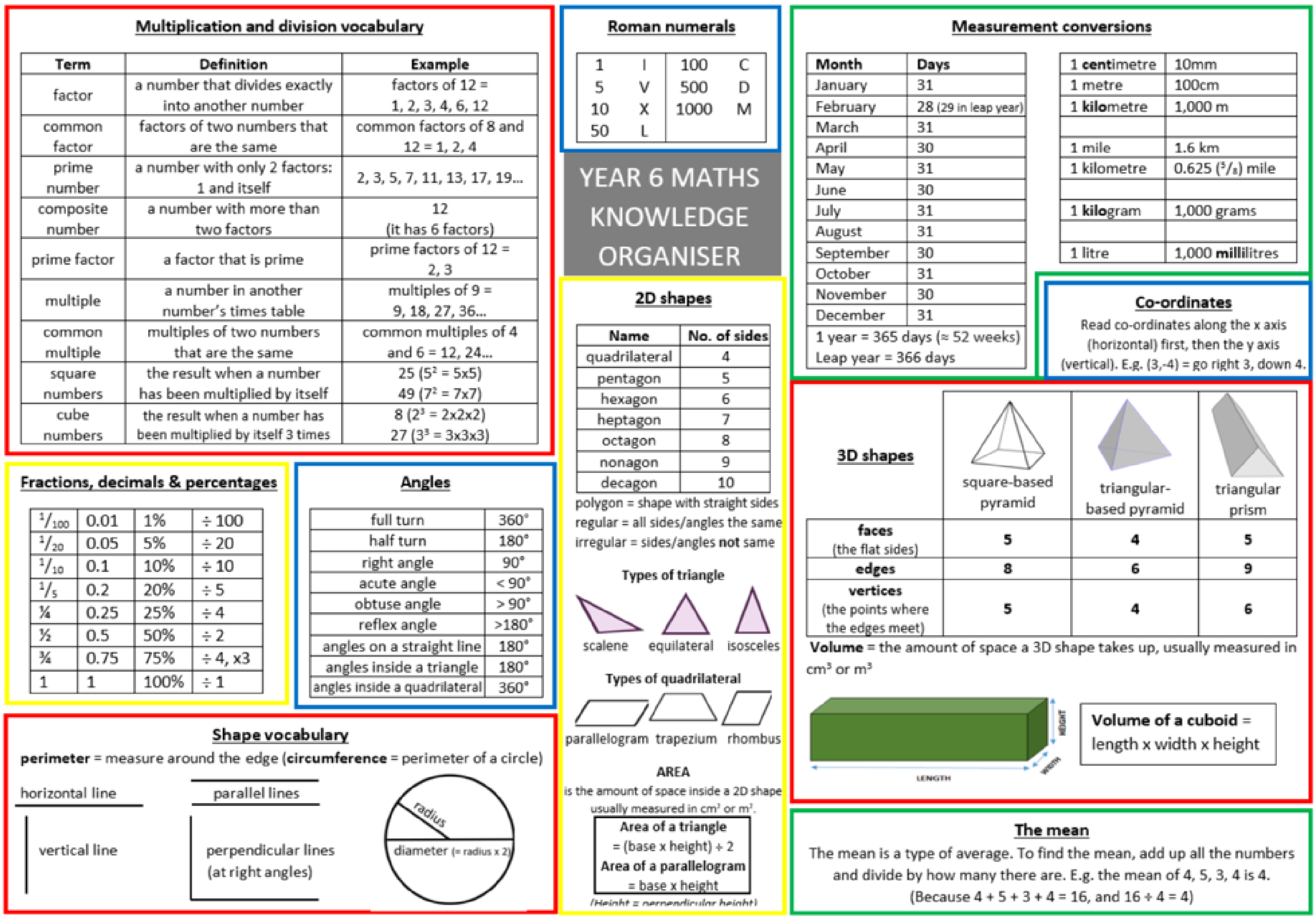
In this example of a Knowledge Organiser, key information has been collated to support Year 6 pupils in revising for their SATs:



YEAR 6 MATHS KNOWLEDGE ORGANISER

Multiplication and division vocabulary

Term	Definition	Example
factor	a number that divides exactly into another number	factors of 12 = 1, 2, 3, 4, 6, 12
common factor	factors of two numbers that are the same	common factors of 8 and 12 = 1, 2, 4
prime number	a number with only 2 factors: 1 and itself	2, 3, 5, 7, 11, 13, 17, 19…
composite number	a number with more than two factors	12 (it has 6 factors)
prime factor	a factor that is prime	prime factors of 12 = 2, 3
multiple	a number in another number's times table	multiples of 9 = 9, 18, 27, 36…
common multiple	multiples of two numbers that are the same	common multiples of 4 and 6 = 12, 24…
square numbers	the result when a number has been multiplied by itself	25 (5^2 = 5x5) 49 (7^2 = 7x7)
cube numbers	the result when a number has been multiplied by itself 3 times	8 (2^3 = 2x2x2) 27 (3^3 = 3x3x3)

Roman numerals

1	I	100	C
5	V	500	D
10	X	1000	M
50	L		

Measurement conversions

Month	Days
January	31
February	28 (29 in leap year)
March	31
April	30
May	31
June	30
July	31
August	31
September	30
October	31
November	30
December	31

1 year = 365 days (≈ 52 weeks)
Leap year = 366 days

1 **centi**metre	10mm
1 metre	100cm
1 **kilo**metre	1,000 m
1 mile	1.6 km
1 kilometre	0.625 ($^5/_8$) mile
1 **kilo**gram	1,000 grams
1 litre	1,000 **milli**litres

Co-ordinates

Read co-ordinates along the x axis (horizontal) first, then the y axis (vertical). E.g. (3,-4) = go right 3, down 4.

Fractions, decimals & percentages

$^1/_{100}$	0.01	1%	÷ 100
$^1/_{20}$	0.05	5%	÷ 20
$^1/_{10}$	0.1	10%	÷ 10
$^1/_5$	0.2	20%	÷ 5
¼	0.25	25%	÷ 4
½	0.5	50%	÷ 2
¾	0.75	75%	÷ 4, x3
1	1	100%	÷ 1

Angles

full turn	360°
half turn	180°
right angle	90°
acute angle	< 90°
obtuse angle	> 90°
reflex angle	>180°
angles on a straight line	180°
angles inside a triangle	180°
angles inside a quadrilateral	360°

2D shapes

Name	No. of sides
quadrilateral	4
pentagon	5
hexagon	6
heptagon	7
octagon	8
nonagon	9
decagon	10

polygon = shape with straight sides
regular = all sides/angles the same
irregular = sides/angles **not** same

Types of triangle

scalene equilateral isosceles

Types of quadrilateral

parallelogram trapezium rhombus

AREA

is the amount of space inside a 2D shape usually measured in cm^2 or m^2.

Area of a triangle = (base x height) ÷ 2
Area of a parallelogram = base x height
(Height = perpendicular height)

3D shapes

	square-based pyramid	triangular-based pyramid	triangular prism
faces (the flat sides)	**5**	**4**	**5**
edges	**8**	**6**	**9**
vertices (the points where the edges meet)	**5**	**4**	**6**

Volume = the amount of space a 3D shape takes up, usually measured in cm^3 or m^3

HEIGHT LENGTH WIDTH

Volume of a cuboid = length x width x height

Shape vocabulary

perimeter = measure around the edge (**circumference** = perimeter of a circle)

horizontal line
parallel lines
vertical line
perpendicular lines (at right angles)
radius
diameter (= radius x 2)

The mean

The mean is a type of average. To find the mean, add up all the numbers and divide by how many there are. E.g. the mean of 4, 5, 3, 4 is 4. (Because 4 + 5 + 3 + 4 = 16, and 16 ÷ 4 = 4)

Creating a Knowledge Organiser: Examples of the Process

Year 2 Maths: Properties of Shapes

National Curriculum objectives for shape for Year 2:

- identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
- identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
- identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]
- compare and sort common 2-D and 3-D shapes and everyday objects.

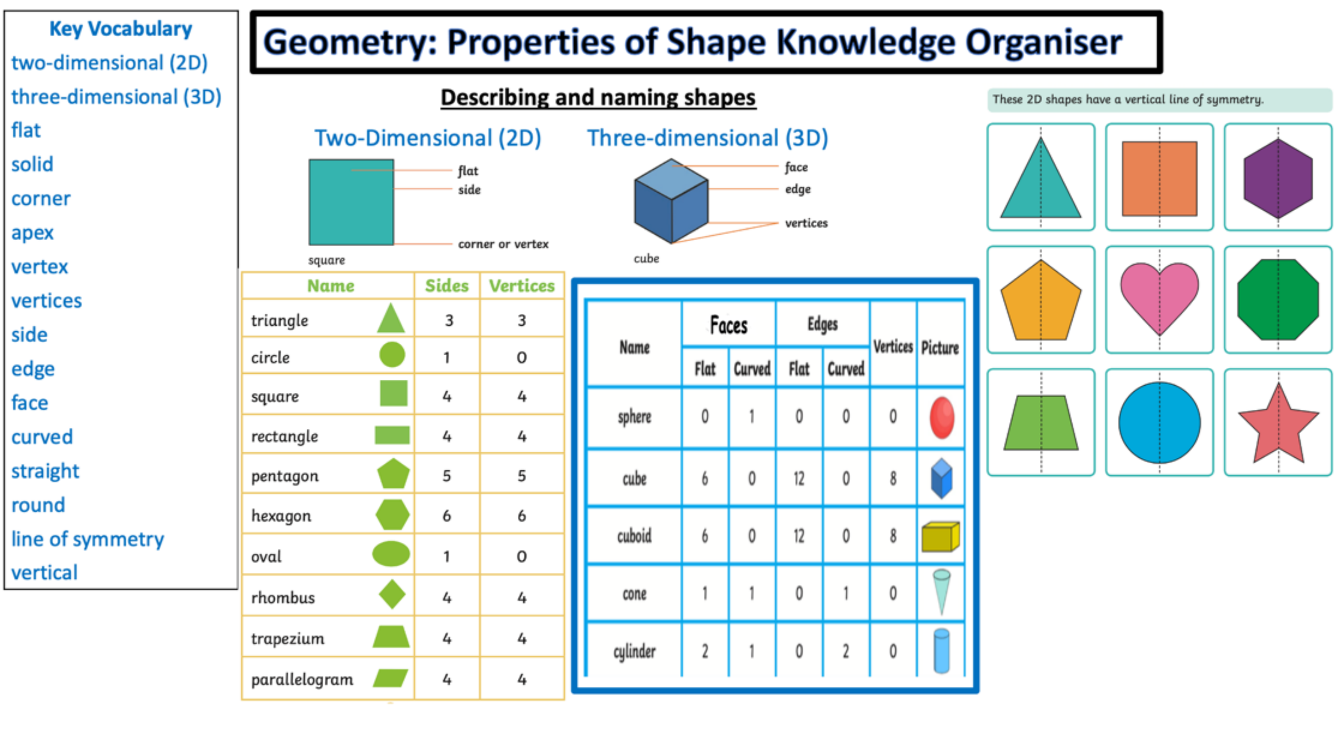
A knowledge organiser for Year 2 shape, would include the most common 2D and 3D shapes. This would be shown in the format of:

- picture
- name
- the number of sides
- the number of lines of symmetry
- the number of edges, vertices and faces etc.

The other two National curriculum objectives are procedural knowledge.

The success of these objectives happens when pupils know the declarative knowledge from the first two objectives.

If pupil know the shape names and their properties, they will be able to identify the 2D shapes on the surface of 3D shapes and easily compare them.



Key Vocabulary
two-dimensional (2D)
three-dimensional (3D)
flat
solid
corner
apex
vertex
vertices
side
edge
face
curved
straight
round
line of symmetry
vertical

Geometry: Properties of Shape Knowledge Organiser

Describing and naming shapes

Name	Sides	Vertices
triangle	3	3
circle	1	0
square	4	4
rectangle	4	4
pentagon	5	5
hexagon	6	6
oval	1	0
rhombus	4	4
trapezium	4	4
parallelogram	4	4

Name	Faces		Edges		Vertices	Picture
	Flat	Curved	Flat	Curved		
sphere	0	1	0	0	0	
cube	6	0	12	0	8	
cuboid	6	0	12	0	8	
cone	1	1	0	1	0	
cylinder	2	1	0	2	0	

Year 3 Maths: Number and Place Value

National Curriculum objectives for number and place value in Year 3:

- count from 0 in multiples of 4, 8, 50 and 100
- find 10 or 100 more or less than a given number
- recognise the place value of each digit in a three-digit number (hundreds, tens, ones) compare and order numbers up to 1000
- identify, represent and estimate numbers using different representations
- read and write numbers up to 1000 in numerals and in words
- solve number problems and practical problems involving these ideas.

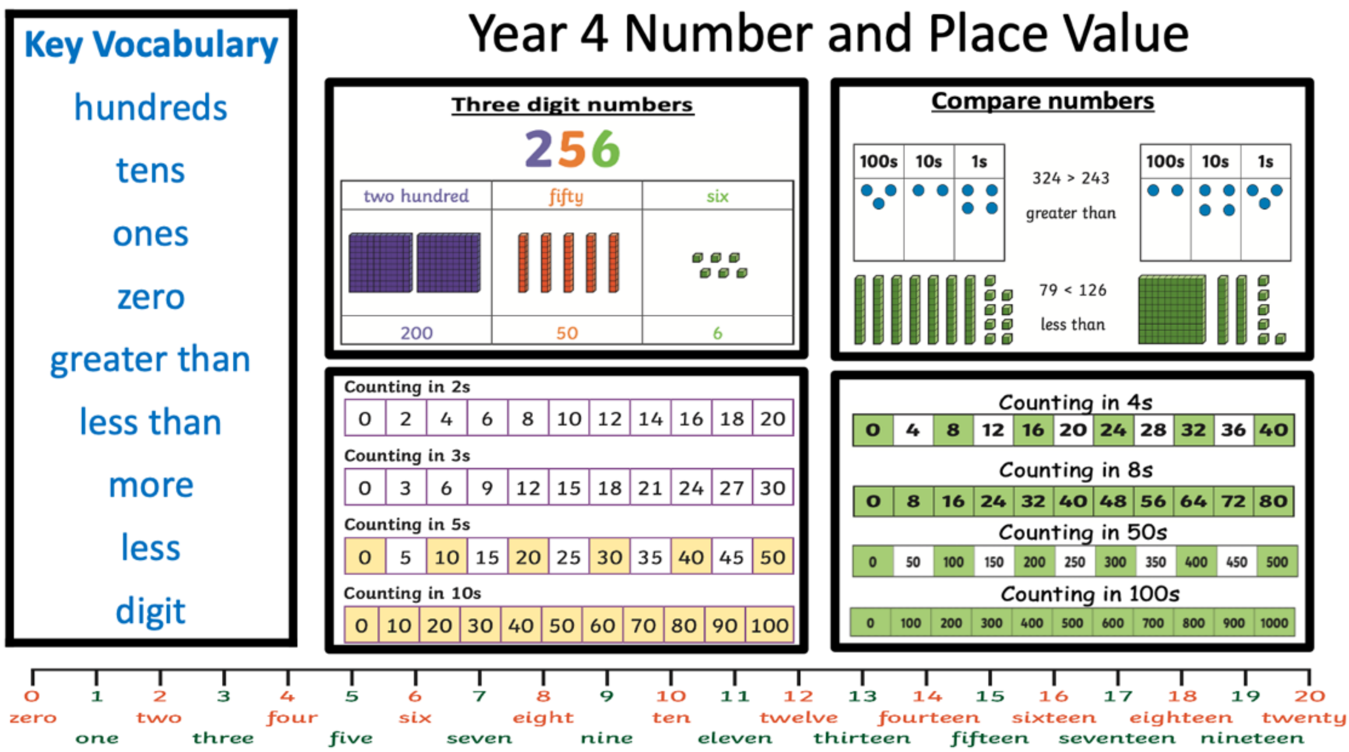
A knowledge organiser for this topic would include:

- The 2, 3, 5 (from the Year 2 curriculum) times tables
- The 4, 8, 50 and 100 times tables

This would follow the concrete pictorial abstract approach to include visual representations

- The greater than, less than and equal signs, and a suitable definition, along with a place value chart with a 3 digit number written in both numerals and words.
- Spellings for the numbers 1-19 and the multiples of 10 up to 100.

Pupils will be successful if they have this knowledge in their long-term memories. The last national curriculum objective is procedural knowledge and would not be shown on the Knowledge Organiser. It relies on the declarative and procedural knowledge of the other objectives.



Potential Weaknesses with Knowledge Organisers

Before starting to create a Knowledge Organiser, we should be aware of the potential weaknesses, which are mostly around the way they are used. Knowledge Organisers should be another tool in a teacher's resource kit, and not an entity in themselves. The knowledge that children gain at the end of a topic should be deeper and wider than what is on the knowledge organiser.

If a school doesn't have a coherent curriculum, with the larger concepts and key knowledge mapped out first, then it's hard to create Knowledge Organisers that build upon each other across year groups.

This might create overlaps or gaps in knowledge. For this reason, a school should have a clear curriculum intent which highlights the key knowledge children will attain throughout the school.

Another weakness of Knowledge Organisers is that creating them can be time consuming and teachers need to have secure subject knowledge. Good practice would also mean that children may need another mode of making knowledge more explicit, for example, recording an audio version, or asking children to role-play or present the information in their own way.