Education Scotland
Foghlam Alba

National Numeracy and Mathematics Progression Framework

BEGIN

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MAIN MENU

Estimation and rounding

MAIN MENU

Estimation and rounding

Awareness of size and amount

Tolerance

X

Awareness of size and amount

Why is it important?

Comparing size and amount supports the development of appropriate language relating to quantities. This also supports an understanding of where numbers sit on a number line.

Awareness of size and amount

MAIN MENU

Estimation and rounding

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Awareness of size and amount

What is it?
Comparing different sizes and amounts (quantities) using appropriate vocabulary to describe them in relation to each other.

Previous knowledge and understanding

- Demonstrate an ability to compare items, shapes and groups
- In play, can group or sort items by own criteria
- Can talk about items, shapes or groups in own words, with some evidence of comparative language, e.g. taller, smaller, longer, shorter

Awareness of size and amount

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MAIN MENU

Estimation and rounding

Concept of estimation

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Why is it important?

Early estimation skills allow for more refined comparisons and for approximations to be made. Estimating is the interpretation of relative size and quantities.

Concept of estimation

Awareness of size and amount

Tolerance

MAIN MENU

Estimation and rounding

Concept of estimation

What is it?

As this skill becomes more refined, learners will be able to predict solutions and check the accuracy of calculations.

Previous knowledge and understanding

- Can apply knowledge of number in relation to quantities
- Is able to group or segregate items to a given criteria
- Can talk about items, shapes or groups and can use comparative language

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Concept of estimation

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MAIN MENU

Estimation and rounding

Awareness of size and amount

Concept of rounding

Why is it important?

The ability to round supports the development of mental agility. It also allows for quick estimations to be made in calculations and to check the reasonableness of a solution.

Concept of rounding

Tolerance

MAIN MENU

Estimation and rounding

Concept of rounding

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What is it?

The concept of rounding is the application of understanding of place value and knowing what is the most appropriate whole number (or decimal fraction) to round it to, within a given context.

Previous knowledge and understanding

- Have an understanding of place value
- Have an understanding of estimation and approximate values

Concept of rounding

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MAIN MENU

Estimation and rounding

Awareness of size and amount

Accuracy within rounding

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Why is it important?

Rounding accurately is an essential component of determining the reasonableness of a solution. In different contexts there will be different degrees of accuracy required.

Accuracy with rounding

Tolerance

MAIN MENU

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Accuracy within rounding

X

What is it?

As this skill becomes more refined, learners will be able to predict solutions and check the accuracy of calculations.

Previous knowledge and understanding

- Understand that a rounded value is not equal to the original value
- Can use knowledge of place value to make a decision on how a number should be rounded
- Can explain what rounding means using vocabulary of estimation, e.g. about, nearly, roughly
- Can select and apply appropriate rounding strategy in a given situation, e.g. measurement, time, money
- Using knowledge of number, is able to give an increasingly accurate estimation of the quantity of a given set
- Can determine the reasonableness of an outcome

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Accuracy with rounding

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MAIN MENU

Estimation and rounding

Awareness of size and amount

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Why is it important?

To understand that there are acceptable degrees of accuracy required in calculations, including with measurement and real-life contexts.

Tolerance

Tolerance

MAIN MENU

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Tolerance

What is it?

Tolerance intervals are the differences between the greatest and least acceptable values of the measurement. Tolerance is the maximum range of variation allowed within particular situations and contexts and supports the understanding of inaccuracy.

Previous knowledge and understanding

- Knows that depending on the situation, degrees of accuracy in rounding may differ, e.g. when measuring room for a carpet, rounding up should be applied to ensure enough carpet is purchased
- Display an awareness of appropriateness of rounding, e.g. when preparing to arrive for a train journey, rounding up would be inappropriate
- Understand that measurements are not always accurate to varying degrees

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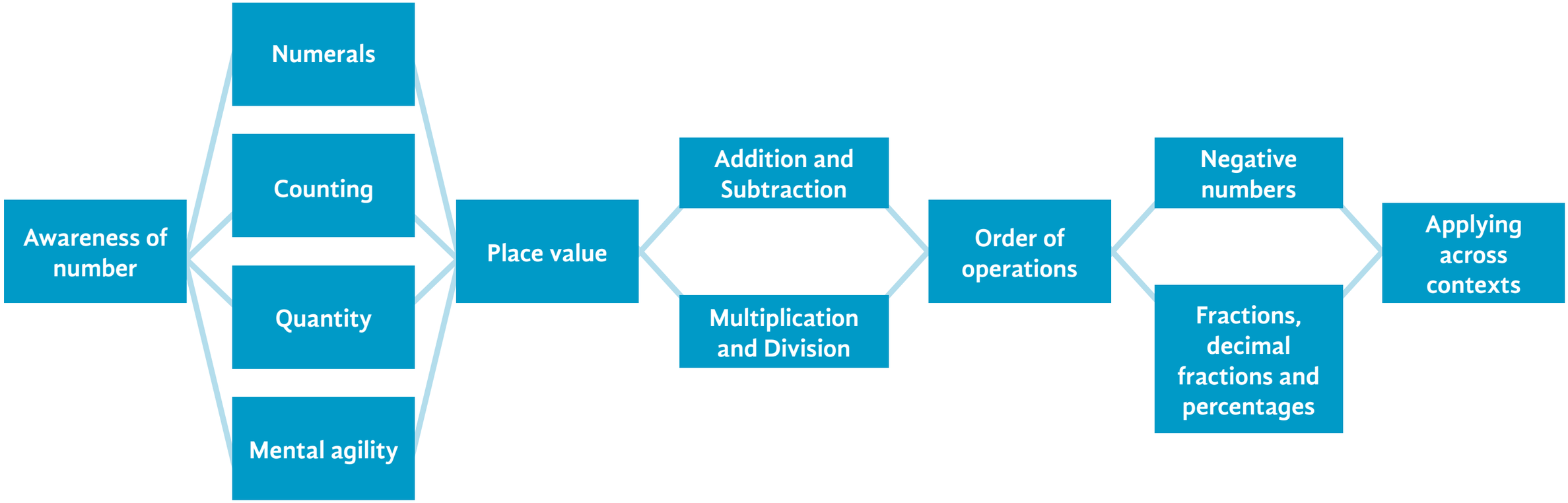
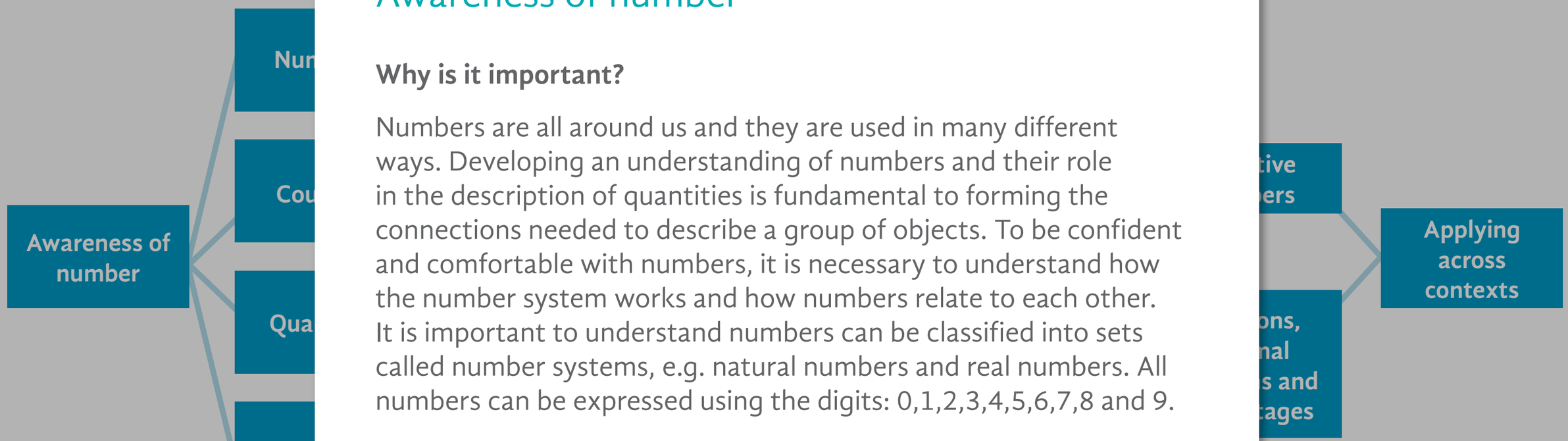
Number and number processes



MAIN MENU

Number and number processes



Awareness of number

Why is it important?

Numbers are all around us and they are used in many different ways. Developing an understanding of numbers and their role in the description of quantities is fundamental to forming the connections needed to describe a group of objects. To be confident and comfortable with numbers, it is necessary to understand how the number system works and how numbers relate to each other. It is important to understand numbers can be classified into sets called number systems, e.g. natural numbers and real numbers. All numbers can be expressed using the digits: 0,1,2,3,4,5,6,7,8 and 9.

Awareness of number

MAIN MENU

Number and number processes

Awareness of number

Awareness of number

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What is it?

Learners need to have an awareness of what numbers are through understanding and application of

- the meaning of numbers
- the relationship between numbers
- comparison and contrast between the relative size (magnitude of numbers)

Here are video exemplars:

http://www.educationscotland.gov.uk/video/n/nnpf/learnerstalkingaboutnumbersoutsideschool1.asp

http://www.educationscotland.gov.uk/video/n/nnpf/learnerstalkingaboutnumbersoutsideschool2.asp

http://www.educationscotland.gov.uk/video/n/nnpf/learnerstalkingaboutnumbers.asp

Awareness of number

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Awareness of number

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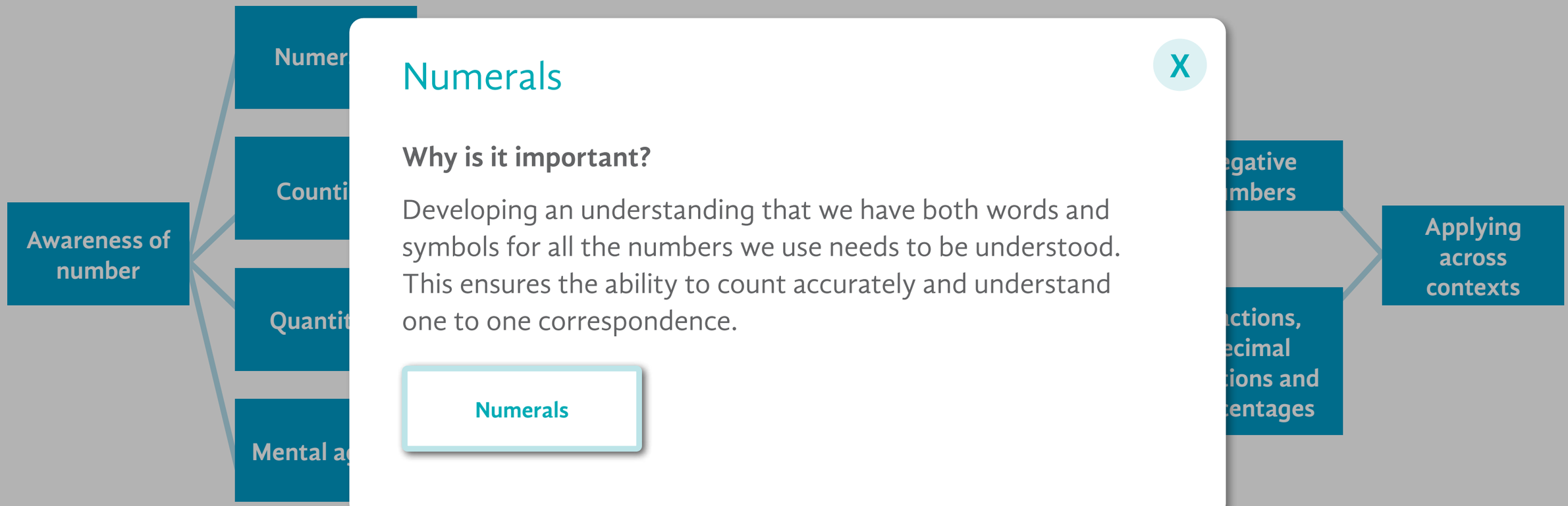
Number and number processes



Numerals

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Why is it important?

Developing an understanding that we have both words and symbols for all the numbers we use needs to be understood. This ensures the ability to count accurately and understand one to one correspondence.

Numerals

MAIN MENU

Number and number processes

Numerals

What is it?

A numeral is a symbol that represents a number. The move from the real object to the symbols of numbers is one of the first and most abstract concepts that learners meet. Digits make up numbers.

Here are video exemplars:

http://www.educationscotland.gov.uk/video/n/nnpf/hiddennumbers.asp

http://www.educationscotland.gov.uk/video/n/nnpf/matchingnumberwithquantity.asp

http://www.educationscotland.gov.uk/video/n/nnpf/numeralsdotpatterns.asp

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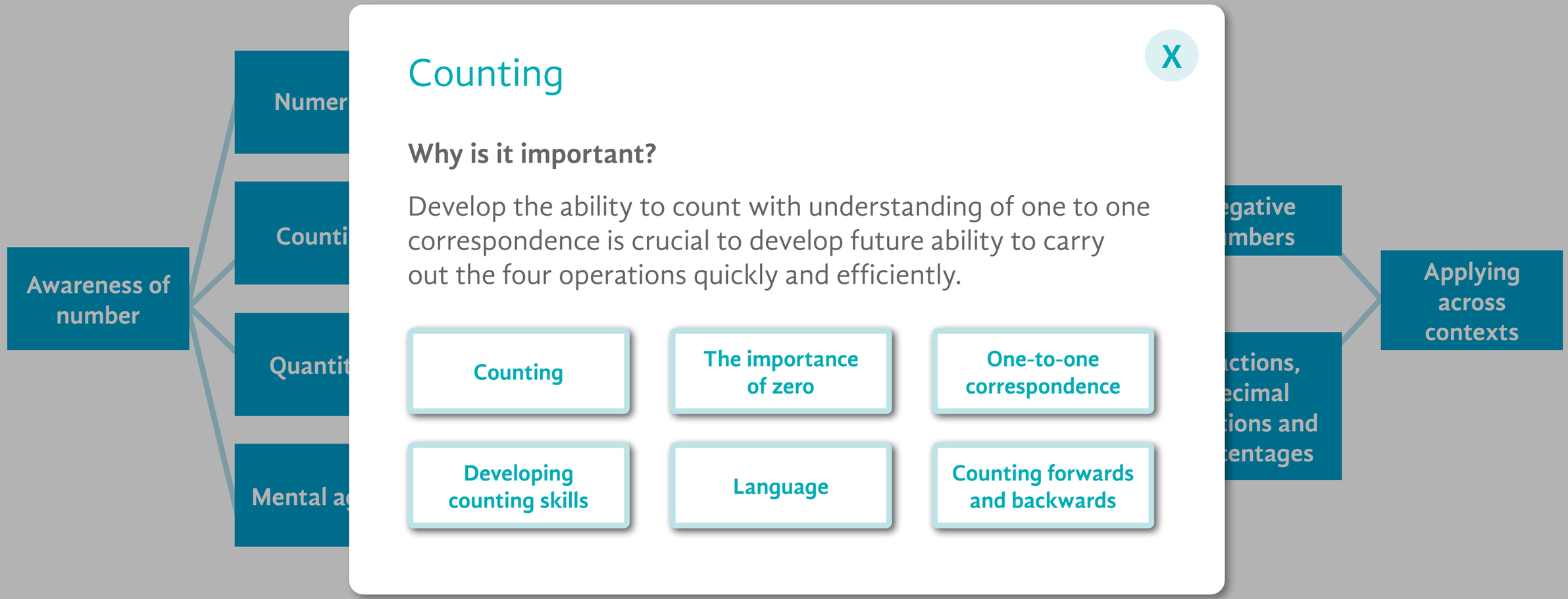

MAIN MENU

Number and number processes

Counting

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What is it?

Counting is more than reciting numbers in order. It involves understanding of the number system and being able to apply this knowledge. Using a one-to-one correspondence to link numbers to their amounts or quantities enables the development of counting with understanding. Zero should be included when learning about numbers, to build understanding for future work in developing understanding of place value and decimal fractions.

Here is a video exemplar:
http://www.educationscotland.gov.uk/video/n/nnpf/counting.asp

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The importance of zero

One-to-one correspondence

Developing counting skills

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The importance of zero

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What is it?

Leaners should be learners in counting from zero and understanding the importance of zero as a quantity and numeral digit used to represent that number (0). Leaners should also understand the value of zero.

Here are video exemplars:

http://www.educationscotland.gov.uk/video/n/nnpf/theimportanceofzero.asp

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Counting

The importance of zero

One-to-one correspondence

Developing counting skills

Language

Counting forwards and backwards

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Counting | The importance of zero | One-to-one correspondence

Developing counting skills | Language | Counting forwards and backwards

One-to-one correspondence

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What is it?

Learners need to understand that each object must be counted only once and as the number name is identified by the learner.

Here are video exemplars:

http://www.educationscotland.gov.uk/video/n/nnpf/countingonetoonevideo1.asp

http://www.educationscotland.gov.uk/video/n/nnpf/countingonetoonevideo2.asp

http://www.educationscotland.gov.uk/video/n/nnpf/countingonetoonevideo3.asp

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Applying across contexts

MAIN MENU

Number and number processes

Developing counting skills

What is it?

When counting a group of items, and then re-counting the same group starting with a different item, the total remains unchanged. This concept is the conservation of number-the arrangement of a group of items does not affect the total. The last number said in a count indicates how many items there are in a group; it does not describe the last item counted. As counting develops, within a known range of numbers and beyond, other techniques can be learned, e.g. counting in jumps, e.g. 2,4,6,8 or 5,10,15,20 etc.

Here are video exemplars:

http://www.educationscotland.gov.uk/video/n/nnpf/developingcountingskills.asp

http://www.educationscotland.gov.uk/video/n/nnpf/developingcountinginjumpsof3.asp

http://www.educationscotland.gov.uk/video/n/nnpf/developingcountingskillsalearnerusingjumpcountingskills1.asp

http://www.educationscotland.gov.uk/video/n/nnpf/developingcountingskillsalearnerusingjumpcountingskills2.asp

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What is it?
Language should be developed in order to compare size and quantity.

Here is a video exemplar:
http://www.educationscotland.gov.uk/video/n/nnpf/countinglanguage.asp

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Counting forwards and backwards

Counting forwards and backwards

What is it?

This enables learners to use the counting system to count forwards or backwards from any number (including zero).

Here are video exemplars:

http://www.educationscotland.gov.uk/video/n/nnpf/countingforwardsandbackwards1.asp

http://www.educationscotland.gov.uk/video/n/nnpf/countingforwardsandbackwards2.asp

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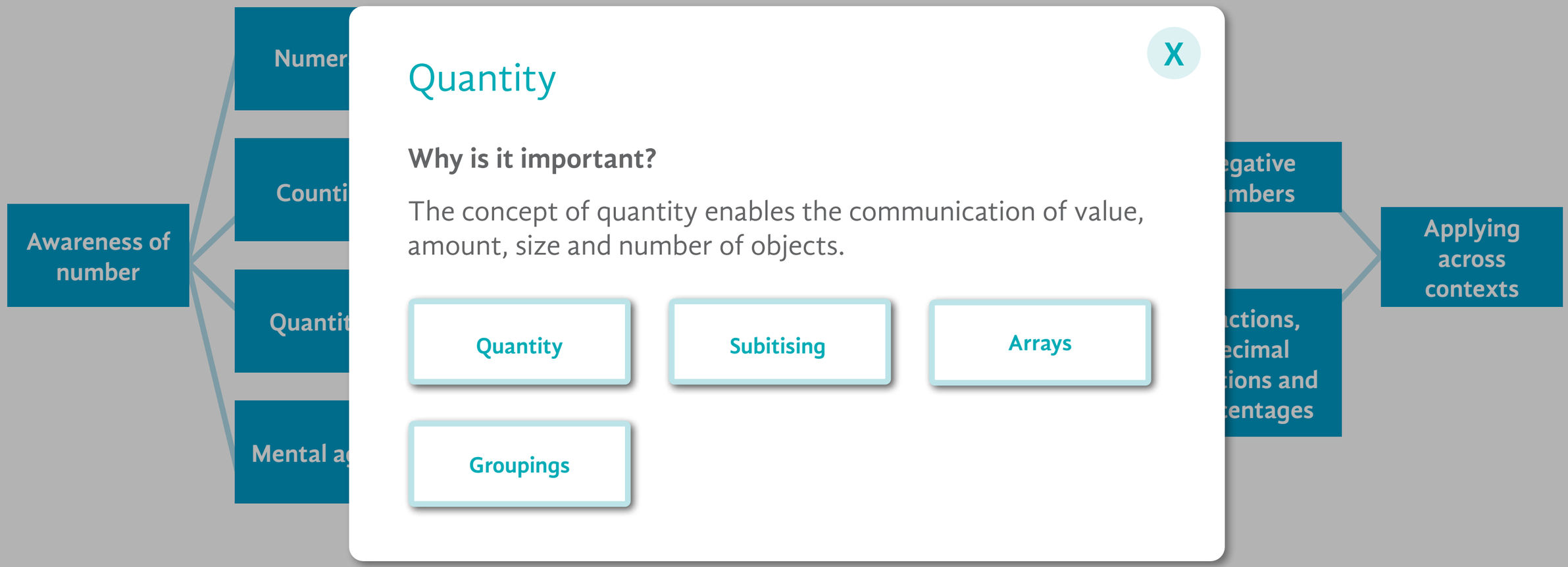
Number and number processes



Quantity

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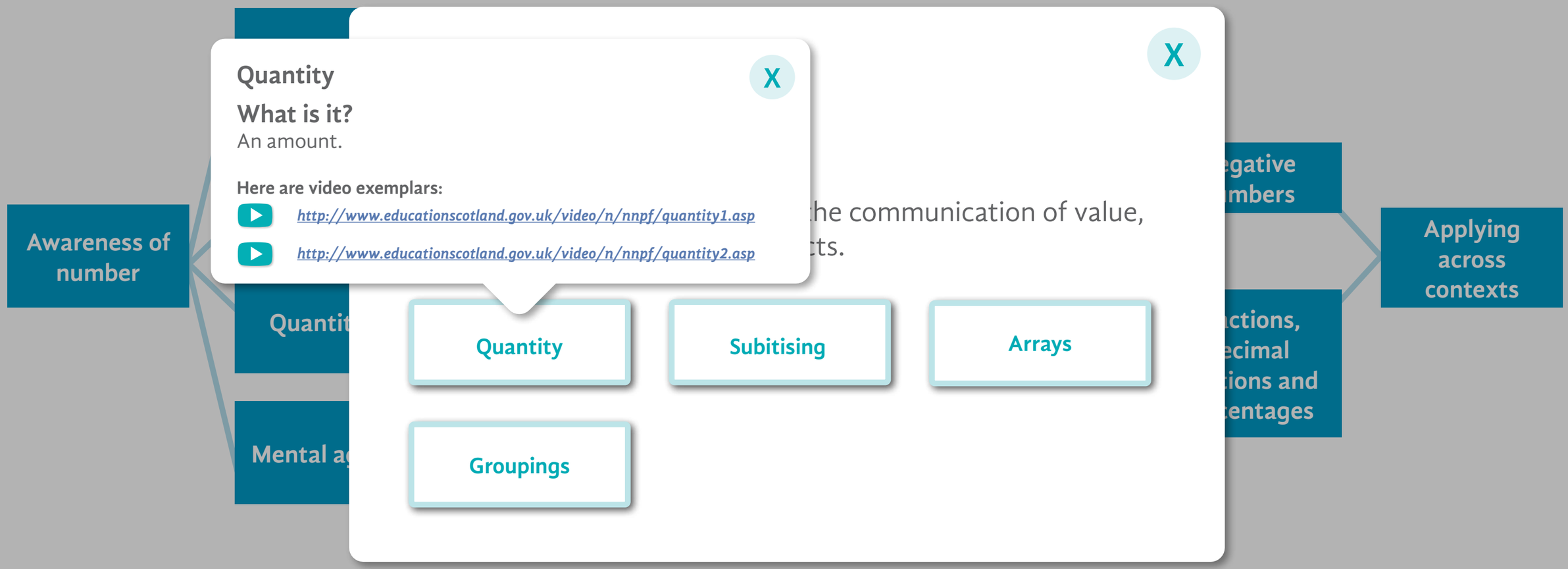
Why is it important?

The concept of quantity enables the communication of value, amount, size and number of objects.

- Quantity
- Subitising
- Arrays
- Groupings

MAIN MENU

Number and number processes



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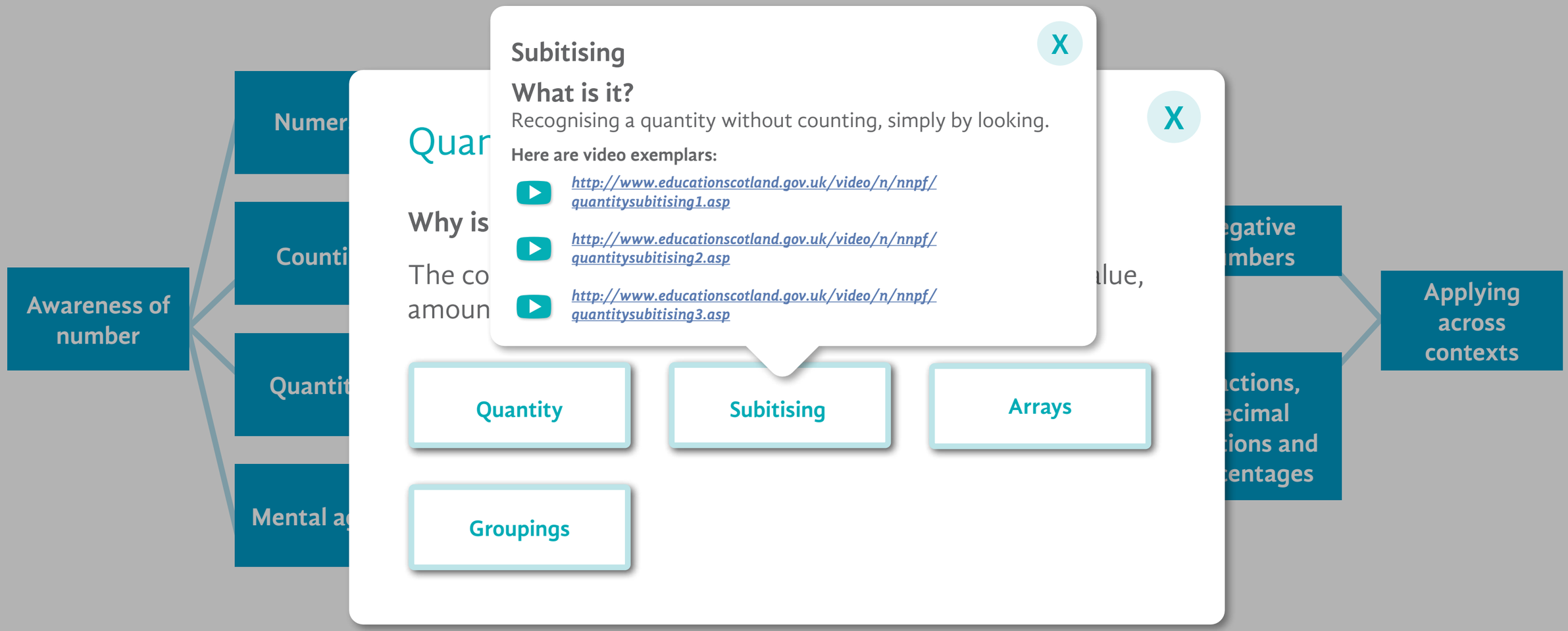

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Quantity

Why is it important?

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Arrays

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What is it?

Identify quantities and patterns to make quick estimates.

Here are video exemplars:

http://www.educationscotland.gov.uk/video/n/nnpf/quantityarrays1.asp

http://www.educationscotland.gov.uk/video/n/nnpf/quantityarrays2.asp

MAIN MENU

Number and number processes

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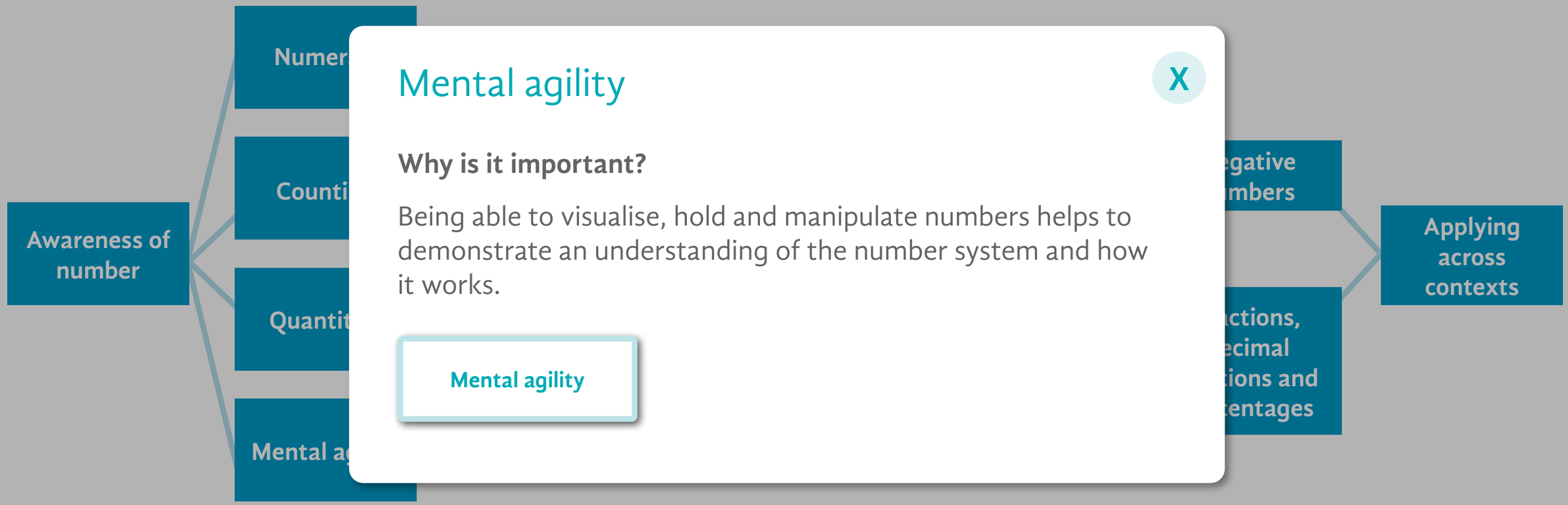

Mental agility

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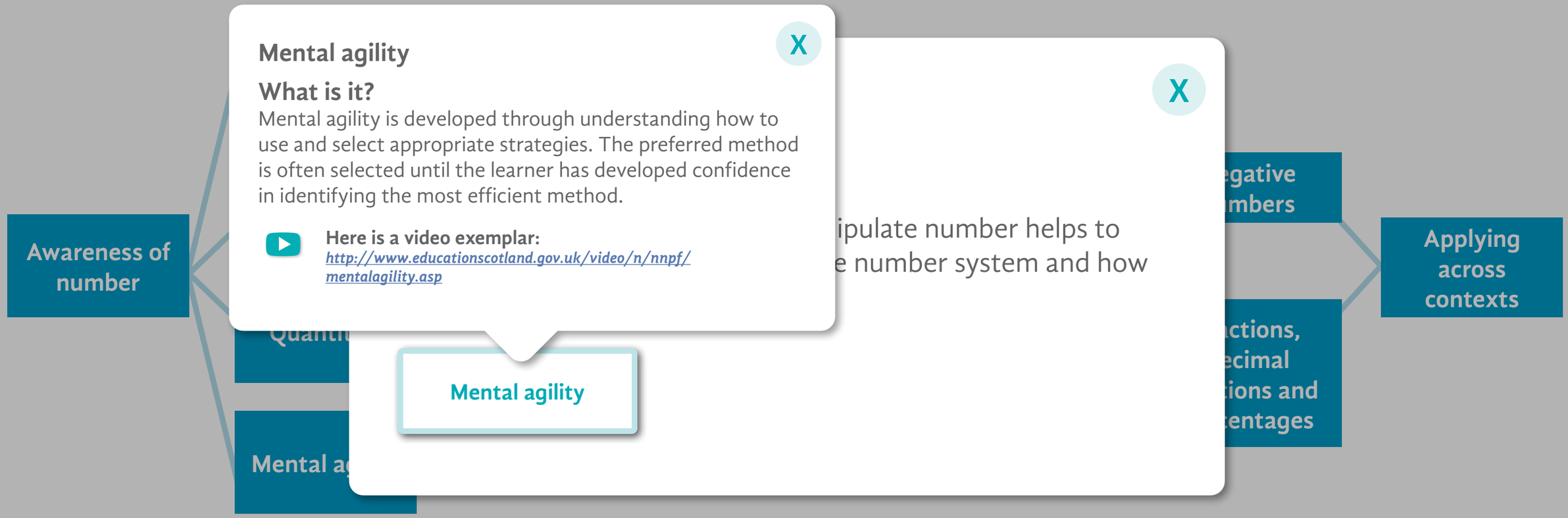
Why is it important?

Being able to visualise, hold and manipulate numbers helps to demonstrate an understanding of the number system and how it works.

Mental agility

MAIN MENU

Number and number processes



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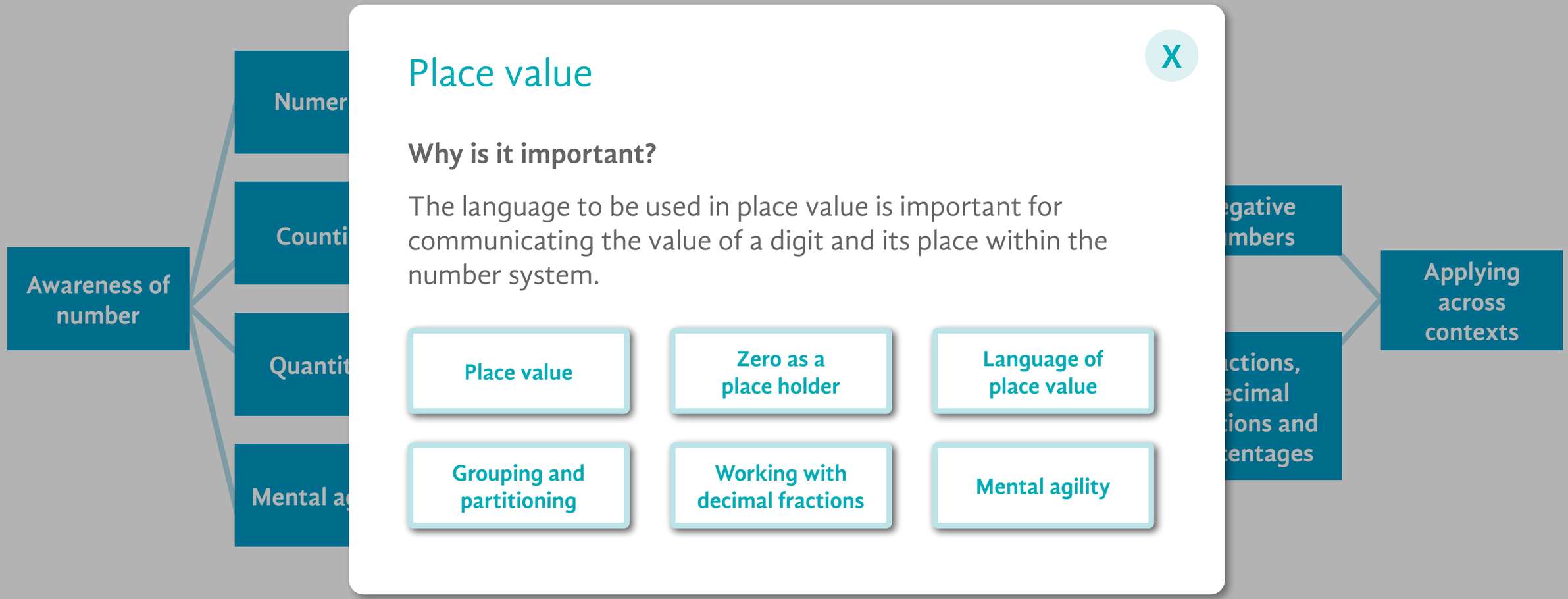

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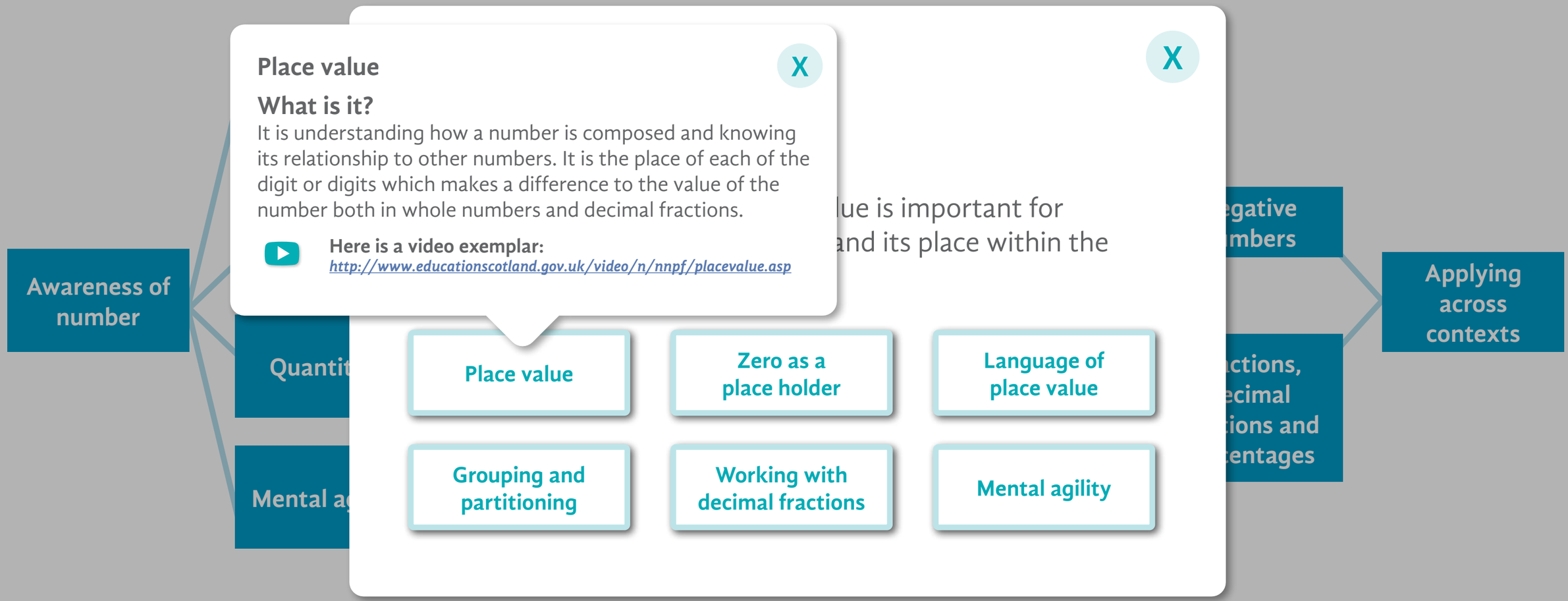

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Zero as a place holder

What is it?
The position of a digit gives its value and zero acts as a place holder and determines the value of the number.

Here are video exemplars:

http://www.educationscotland.gov.uk/video/n/nnpf/zeroplaceholder1.asp

http://www.educationscotland.gov.uk/video/n/nnpf/zeroplaceholder2.asp

http://www.educationscotland.gov.uk/video/n/nnpf/zeroasaplaceholder3.asp

Place value

Zero as a place holder

Language of place value

Grouping and partitioning

Working with decimal fractions

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Place value

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Place value

Zero as a place holder

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Mental agility

Language of place value

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What is it?

It is the place of the digit or digits which indicates the value of the number, whether a whole number or a decimal fraction. Learners need to be able to work with ones, tens, hundreds etc and tenths, hundredths and thousandths etc.

Here are video exemplars:

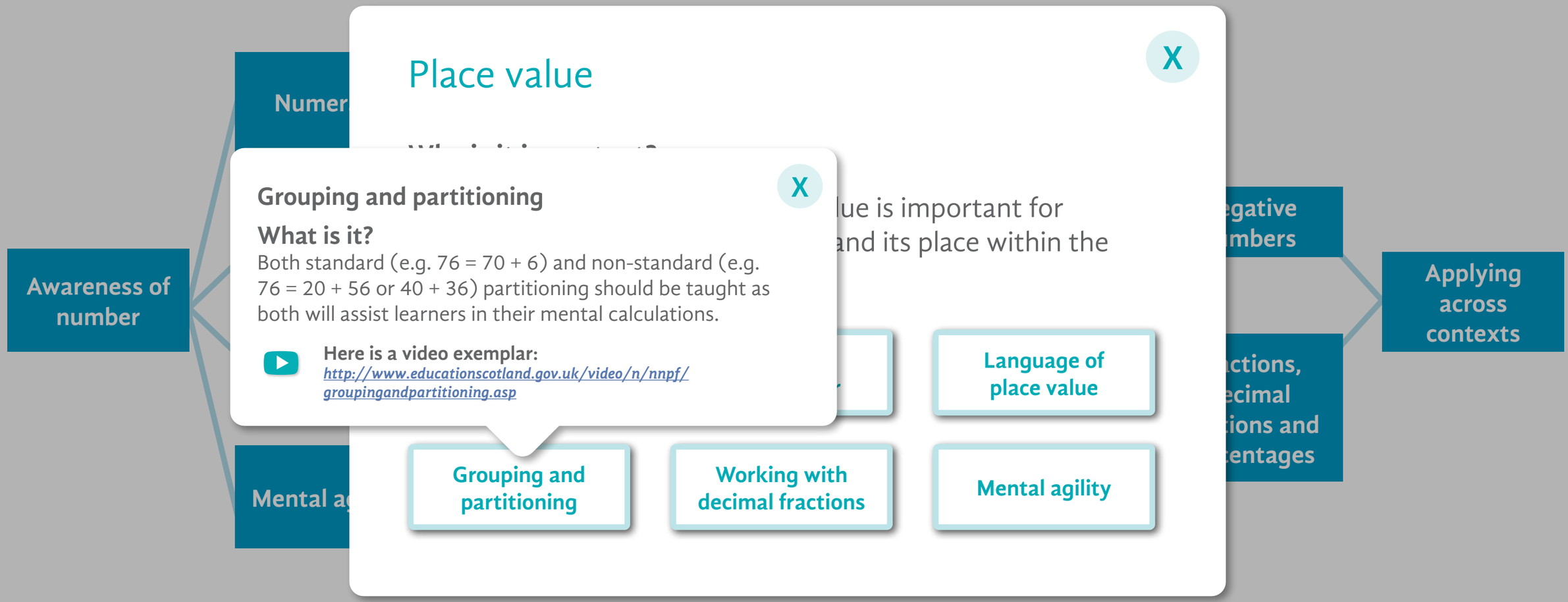
http://www.educationscotland.gov.uk/video/n/nnpf/languageofplacevalue1.asp

http://www.educationscotland.gov.uk/video/n/nnpf/languageofplacevalue2.asp

http://www.educationscotland.gov.uk/video/n/nnpf/languageofplacevalue3.asp

MAIN MENU

Number and number processes



Grouping and partitioning

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What is it?

Both standard (e.g. 76 = 70 + 6) and non-standard (e.g. 76 = 20 + 56 or 40 + 36) partitioning should be taught as both will assist learners in their mental calculations.

Here is a video exemplar:
http://www.educationscotland.gov.uk/video/n/nnpf/groupingandpartitioning.asp

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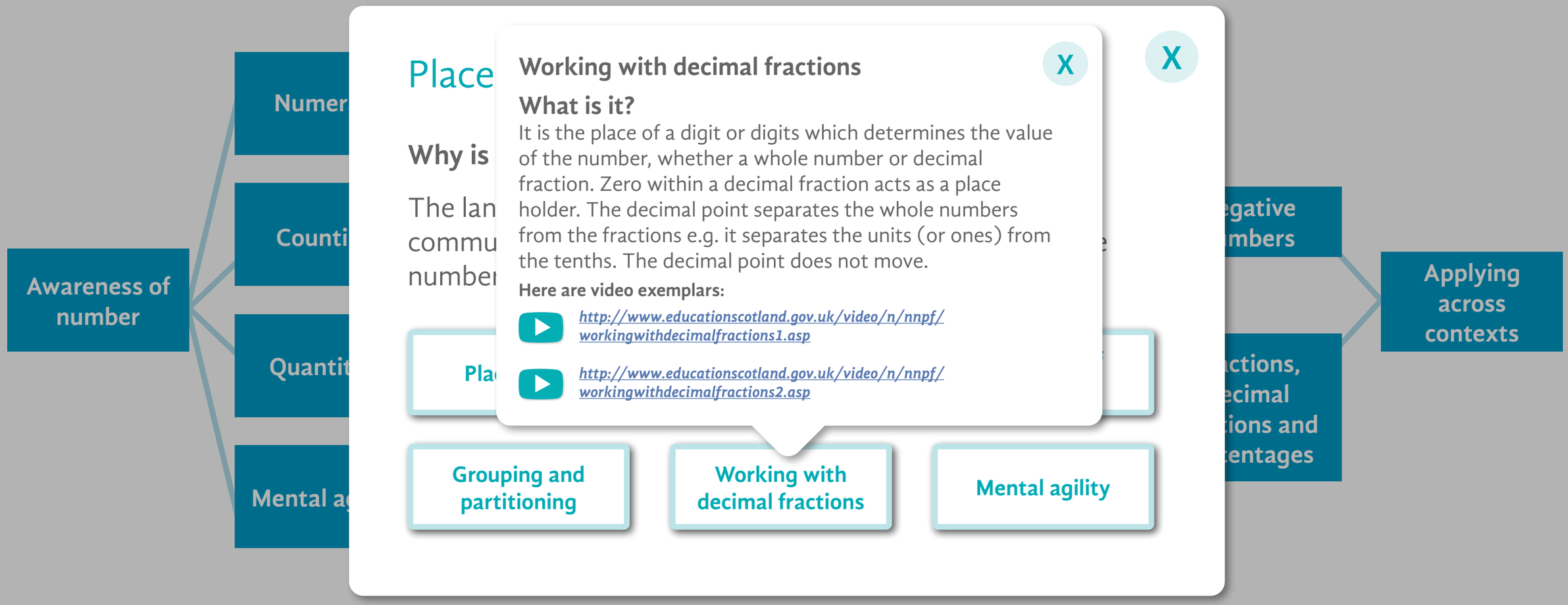
Number and number processes



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Mental agility

What is it?

Developing the ability to use efficient methods to calculate mentally and confidently using knowledge of place value within their mental calculations.

Here are video exemplars:

http://www.educationscotland.gov.uk/video/n/nnpf/pvmentalagility1.asp

http://www.educationscotland.gov.uk/video/n/nnpf/pvmentalagility2.asp

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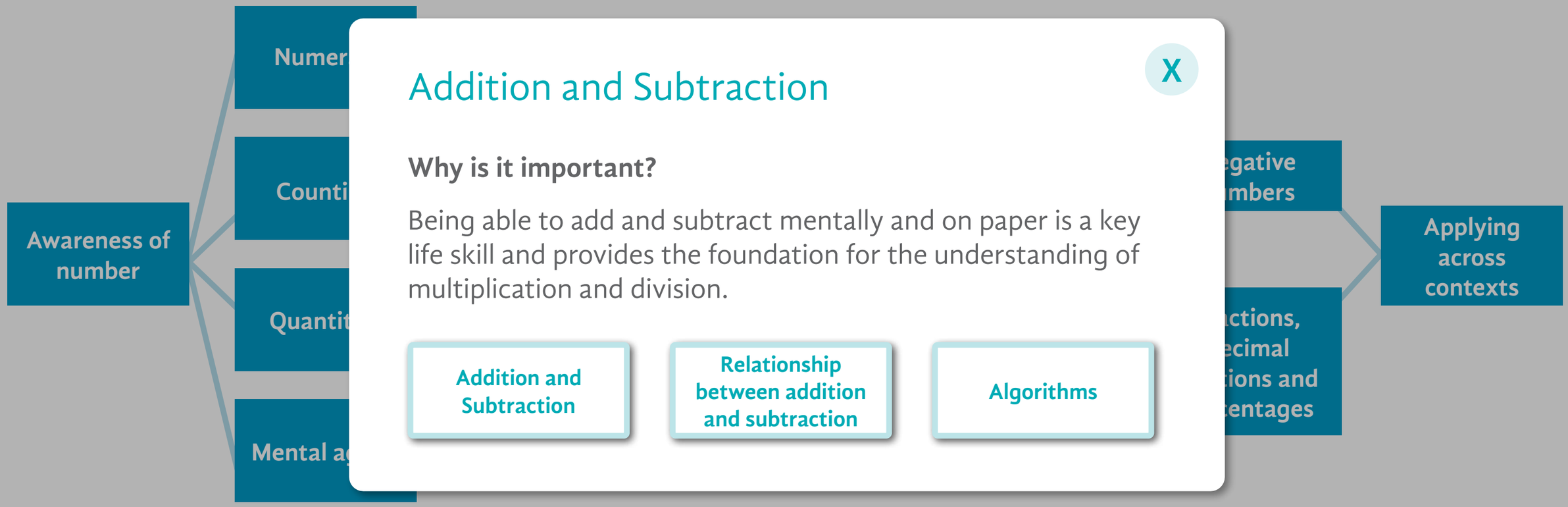

Addition and Subtraction

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Why is it important?

Being able to add and subtract mentally and on paper is a key life skill and provides the foundation for the understanding of multiplication and division.

- Addition and Subtraction
- Relationship between addition and subtraction
- Algorithms

MAIN MENU

Number and number processes

Addition and subtraction

What is it?

These are inverse operations and must be taught together. Addition is the process of combining two or more quantities to calculate their sum or total. Subtraction is the difference between two quantities. Learners should carry out calculations to solve real life problems in familiar practical contexts and become increasingly fluent in addition and subtraction.

Here is a video exemplar:
http://www.educationscotland.gov.uk/video/n/nnpf/additionandsubtraction.asp

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Relationship between addition and subtraction

What is it?

Exploring the relationship between addition and subtraction. Addition and subtraction need to be taught together e.g. highlighting that subtraction can be calculated by adding on. Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Here are video exemplars:

http://www.educationscotland.gov.uk/video/n/nnpf/relationshipbetweenadditionandsubtraction1.asp

http://www.educationscotland.gov.uk/video/n/nnpf/relationshipbetweenadditionandsubtraction2.asp

http://www.educationscotland.gov.uk/video/n/nnpf/relationshipbetweenadditionandsubtraction3.asp

Addition and subtraction

Relationship between addition and subtraction

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Addition and subtraction

Relationship between addition and subtraction

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What is it?

Algorithms should be introduced after practical experiences and understanding the concepts of addition and subtraction. Reading, writing and interrogating mathematical statements involving +, -, = signs. This includes working out the missing number in a mathematical statement. Written methods support place value and working with larger numbers.

Here is a video exemplar:
http://www.educationscotland.gov.uk/video/n/nnpf/algorithms.asp

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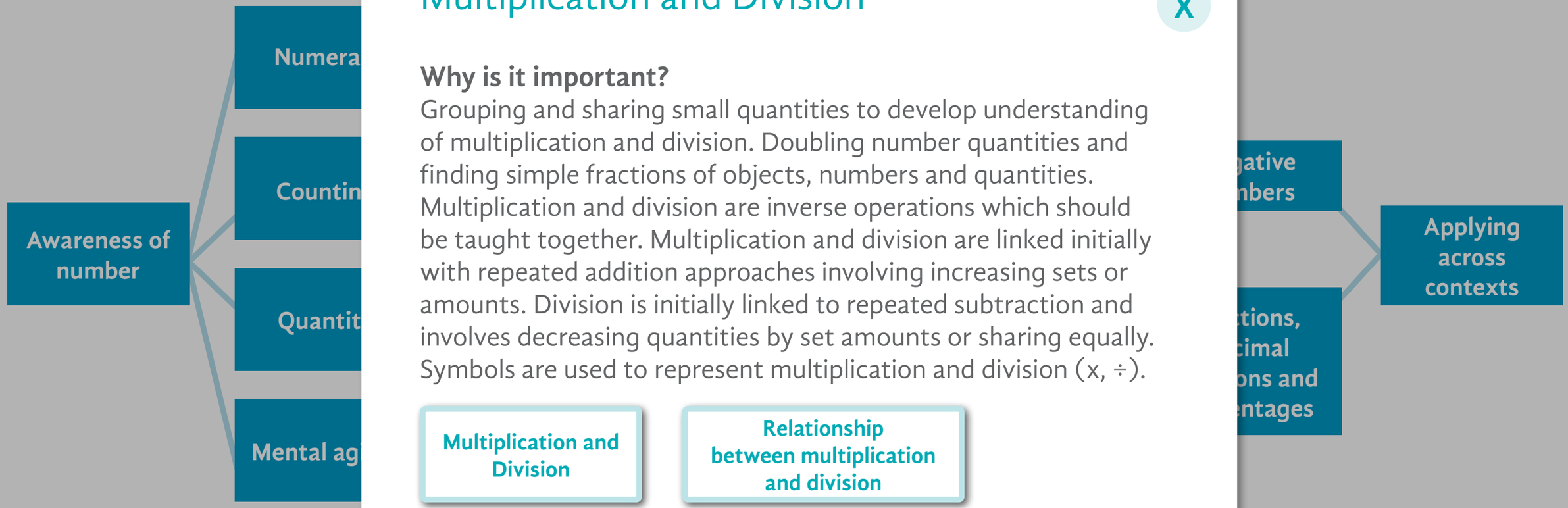
Number and number processes



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Multiplication and Division

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What is it?

Grouping and sharing small quantities to develop understanding of multiplication and division. Doubling number quantities and finding simple fractions of objects, numbers and quantities. Multiplication and division are inverse operations which should be taught together. Multiplication and division is linked initially with repeated addition approaches involving increasing sets or amounts. Division is initially linked to repeated subtraction and involves decreasing quantities by set amounts or sharing equally. Symbols are used to represent multiplication and division (x, ÷).

Here is a video exemplar:
http://www.educationscotland.gov.uk/video/n/nnpf/multiplicationanddivision.asp

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Multiplication and Division

Relationship between multiplication and division

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Multiplication and Division

Relationship between multiplication and division

Relationship between multiplication and division

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What is it?

Knowing how to find multiplication and division facts, including use of partitioning and the inverse operation. Being able to recall a particular multiplication fact and being able to use this to solve related multiplication and division tasks. The set of related facts is known as a fact family. Using relationships to support recall and being able to manipulate numbers facts mentally, accurately and confidently. Using knowledge of division when working with fractions e.g. ½ of 40. The relationship between digits in the decimals system should be highlighted when multiplying and dividing by 10, 100, 1000 etc.

Here are video exemplars:

- *http://www.educationscotland.gov.uk/video/n/nnpf/relationshipbetweenmultiplicationanddivisionmandd.asp*
- *http://www.educationscotland.gov.uk/video/n/nnpf/relationshipbetweenmultiplicationanddivision1.asp*
- *http://www.educationscotland.gov.uk/video/n/nnpf/relationshipbetweenmultiplicationanddivision2.asp*
- *http://www.educationscotland.gov.uk/video/n/nnpfrelationshipbetweenmultiplicationanddivision3.asp*
- *http://www.educationscotland.gov.uk/video/n/nnpf/relationshipbetweenmultiplicationanddivision4.asp*
- *http://www.educationscotland.gov.uk/video/n/nnpf/relationshipbetweenmultiplicationanddivision5.asp*

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Applying across contexts

MAIN MENU

Number and number processes

Order of operations

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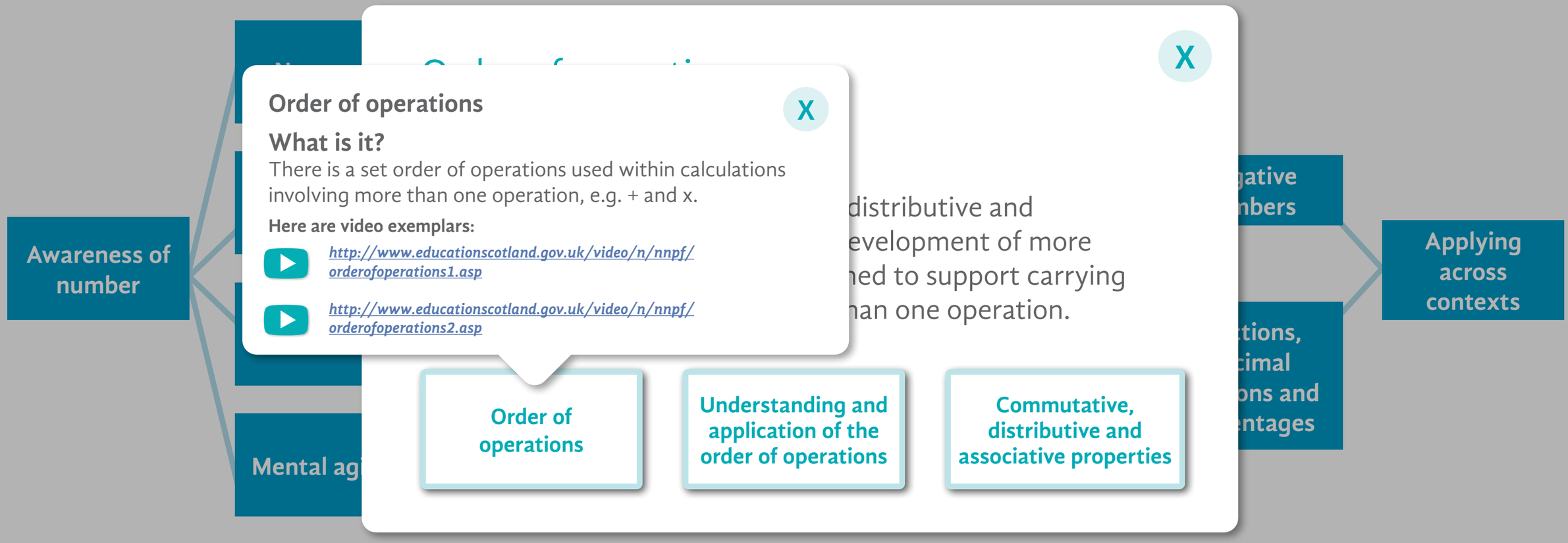
Why is it important?

An understanding of commutative, distributive and associative properties enables the development of more efficient calculations. Rules established to support carrying out calculations that involve more than one operation.

- Order of operations
- Understanding and application of the order of operations
- Commutative, distributive and associative properties

MAIN MENU

Number and number processes



MAIN MENU

Number and number processes

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Applying across contexts

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Understanding and application of the order of operations

What is it?

At the introductory stage the order of operations applies to the four basic operations, where multiplication and division have equal priority and addition and subtraction have equal priority. This can then be extended to include brackets and indices. The use of mnemonics such as BODMAS, BIDMAS and BOMDAS are often used when deciding on the order of operations.

Here are video exemplars:

http://www.educationscotland.gov.uk/video/n/nnpf/numeracyacrosslearningapplication.asp

http://www.educationscotland.gov.uk/video/n/nnpf/understandingandapplication1.asp

http://www.educationscotland.gov.uk/video/n/nnpf/understandingandapplication2.asp

Order of operations

Understanding and application of the order of operations

Commutative, distributive and associative properties

MAIN MENU

Number and number processes

Awareness of number

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Order of operat

Why is it important?

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Order of operations

Understanding and application of the order of operations

Commutative, distributive and associative properties

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Commutative, distributive and associative properties

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What is it?

The commutative law states that you can swap numbers around (within a calculation) and still get the correct answer. The commutative law and inverse relationship develops multiplicative reasoning. The distributive law states that multiplying a number by a group of numbers added together is the same as doing each multiplication separately.

The associative law states:

- It doesn't matter how you group the numbers when you add
- It doesn't matter how you group the numbers when you multiply

Here are video exemplars:

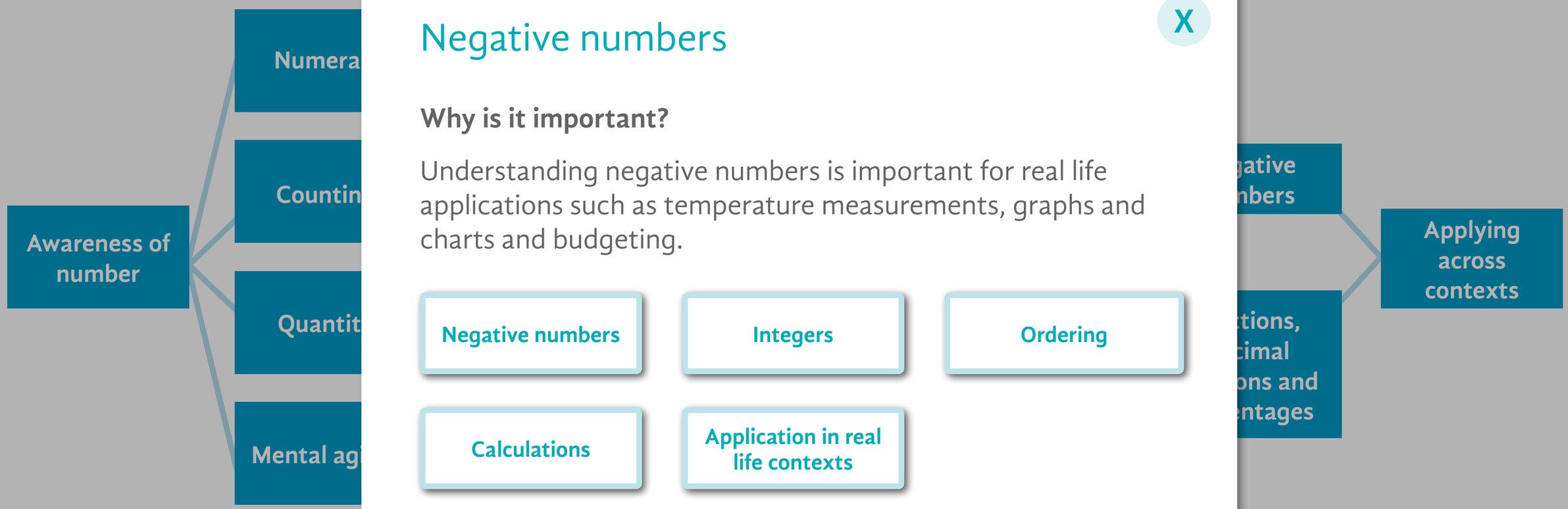
http://www.educationscotland.gov.uk/video/n/nnpf/oofocdap.asp

http://www.educationscotland.gov.uk/video/n/nnpf/oofodistributivelaw.asp

http://www.educationscotland.gov.uk/video/n/nnpf/oofocommutativelaw.asp

MAIN MENU

Number and number processes



Negative numbers

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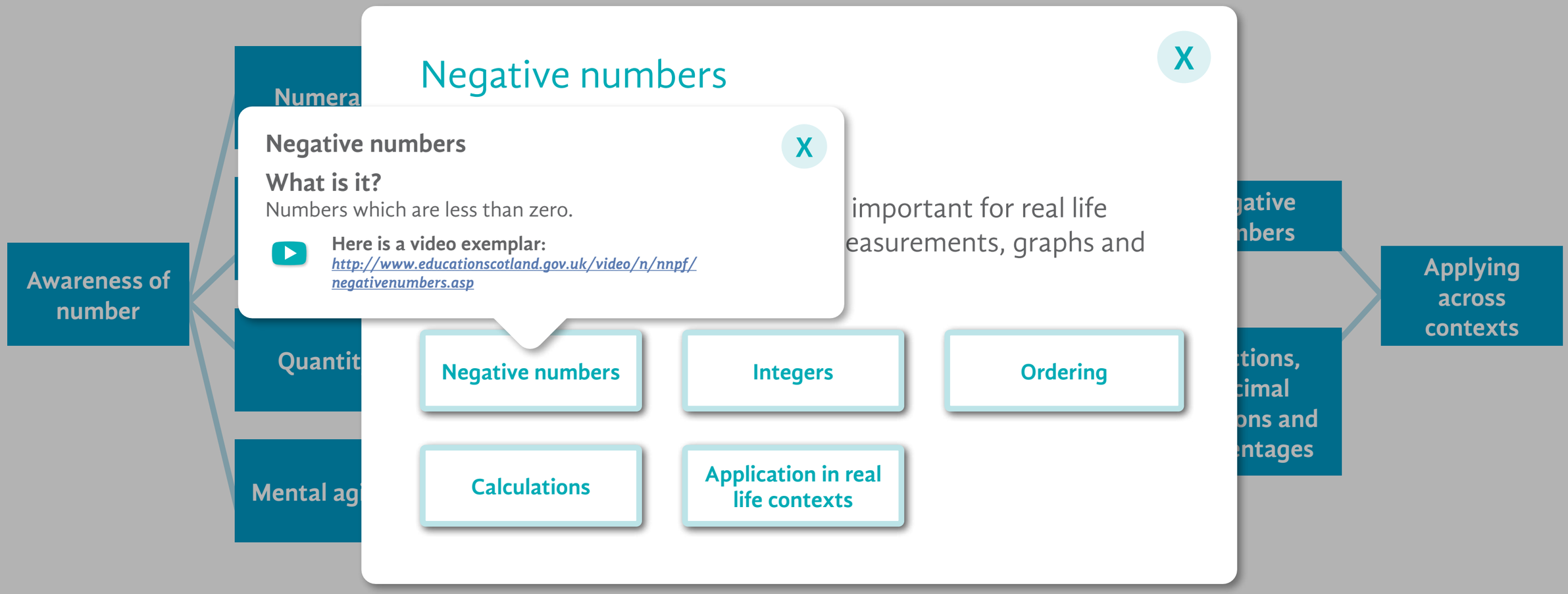
Why is it important?

Understanding negative numbers is important for real life applications such as temperature measurements, graphs and charts and budgeting.

- Negative numbers
- Integers
- Ordering
- Calculations
- Application in real life contexts

MAIN MENU

Number and number processes



Negative numbers

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What is it?

Numbers which are less than zero.

Here is a video exemplar:
http://www.educationscotland.gov.uk/video/n/nnpf/negativenumbers.asp

MAIN MENU

Number and number processes

Awareness of number

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Integers

What is it?

The term integer is used when working with positive and negative whole numbers. Integer calculations set in a context involve an understanding of how to deal with negative numbers within the 4 operations.

Here is a video exemplar:
http://www.educationscotland.gov.uk/video/n/nnpf/integers.asp

Negative numbers

Integers

Ordering

Calculations

Application in real life contexts

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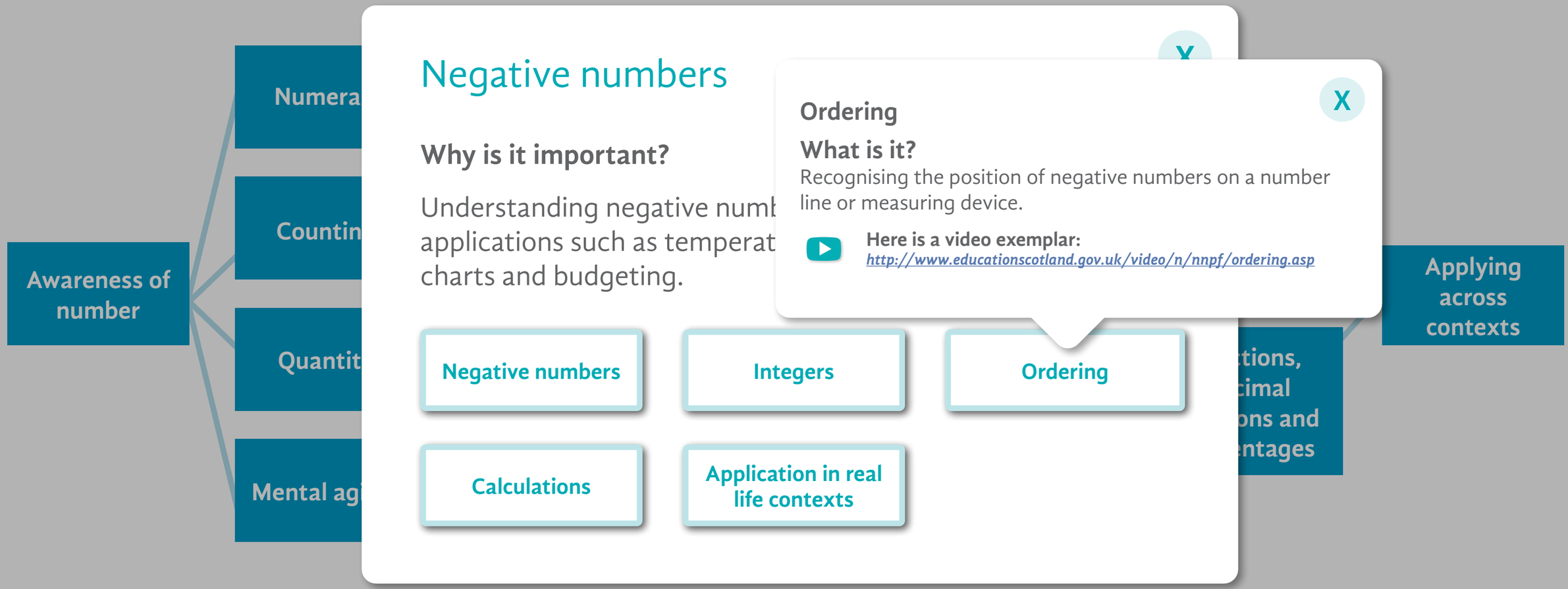
Applying across contexts

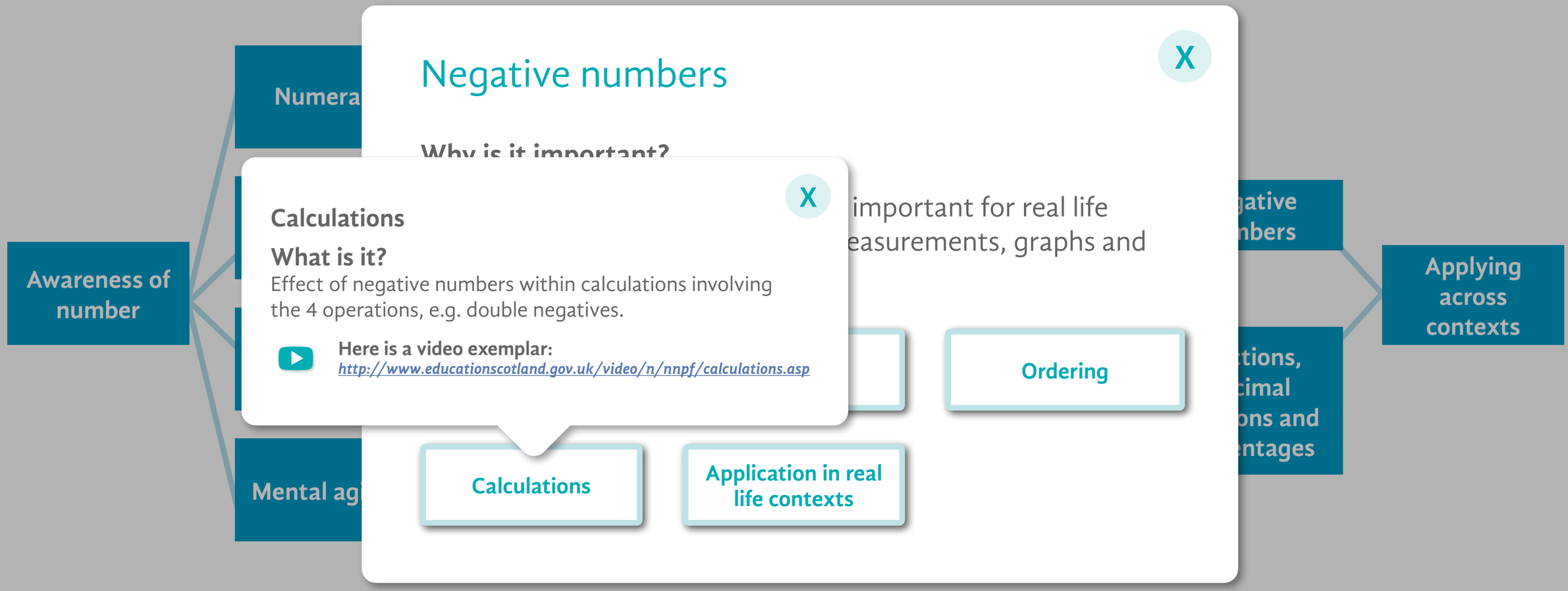
MAIN MENU

Number and number processes



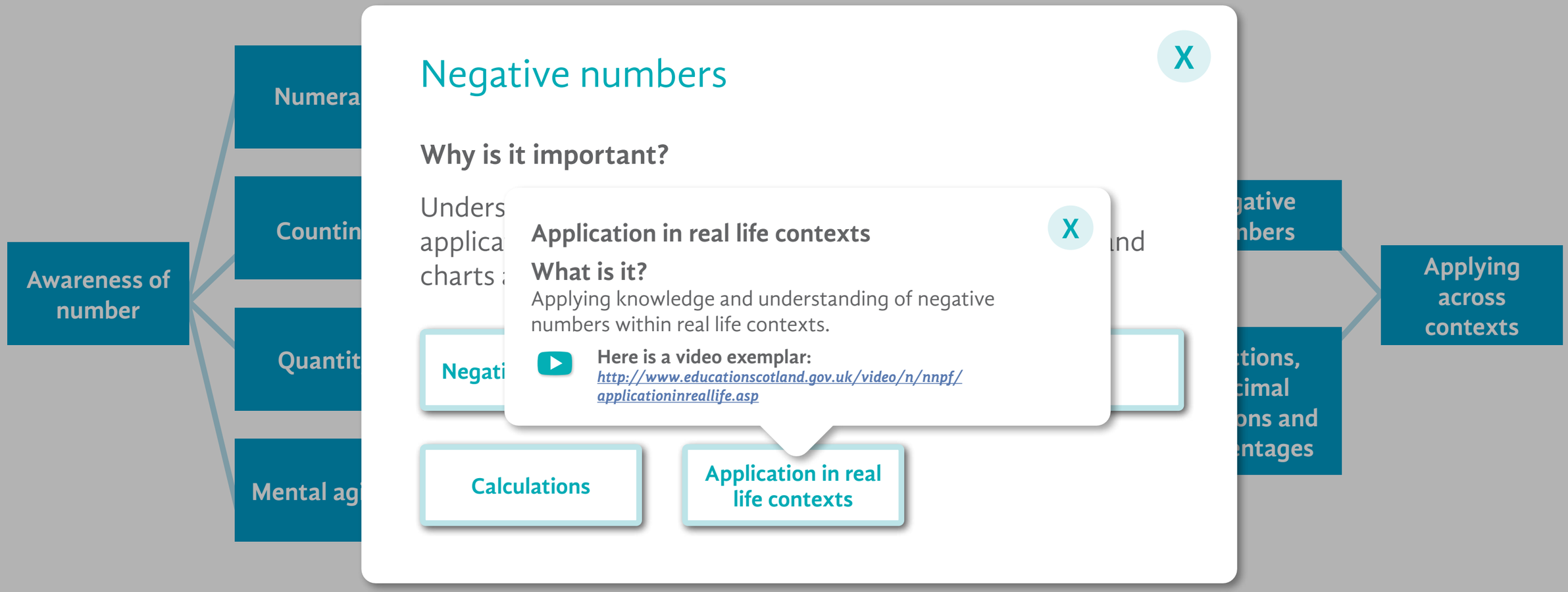
MAIN MENU

Number and number processes



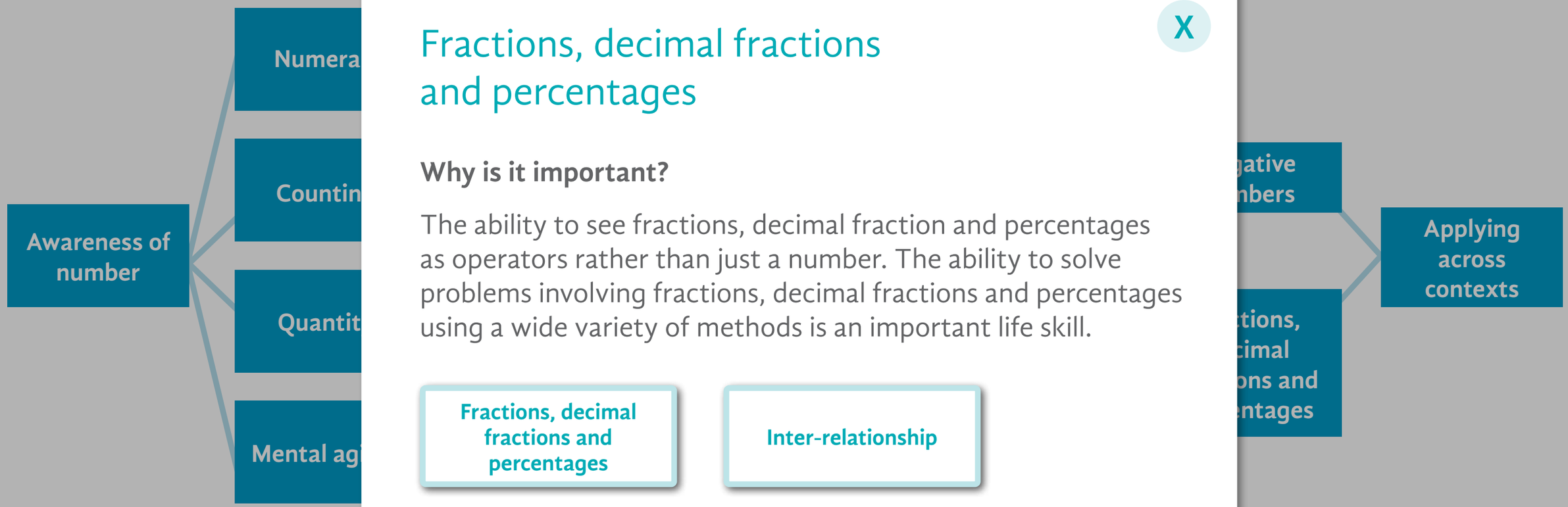
MAIN MENU

Number and number processes



MAIN MENU

Number and number processes



Fractions, decimal fractions and percentages

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Why is it important?

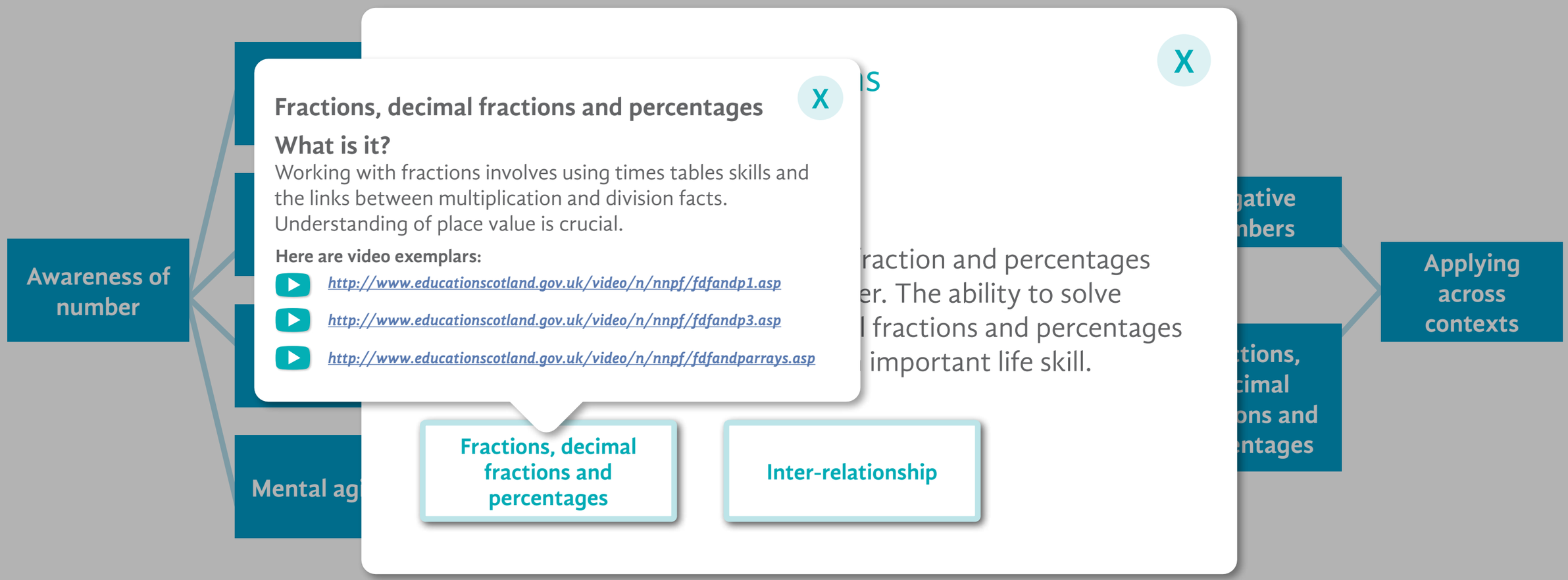
The ability to see fractions, decimal fraction and percentages as operators rather than just a number. The ability to solve problems involving fractions, decimal fractions and percentages using a wide variety of methods is an important life skill.

Fractions, decimal fractions and percentages

Inter-relationship

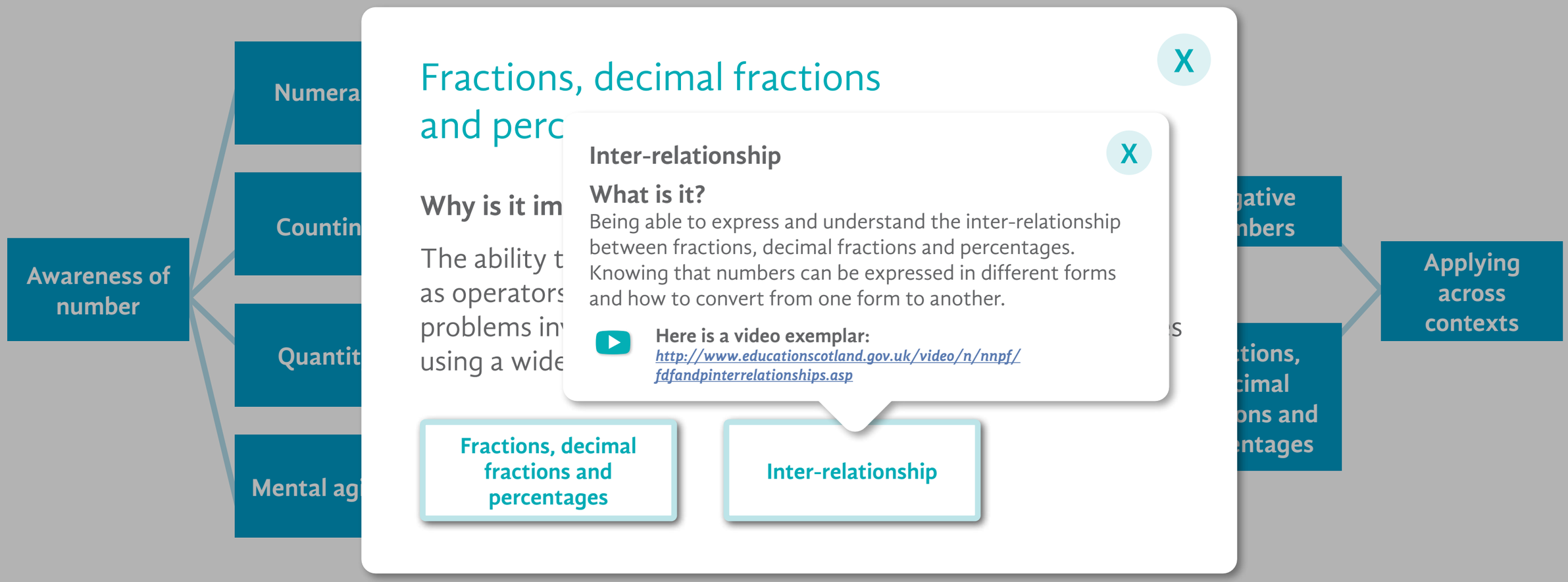
MAIN MENU

Number and number processes



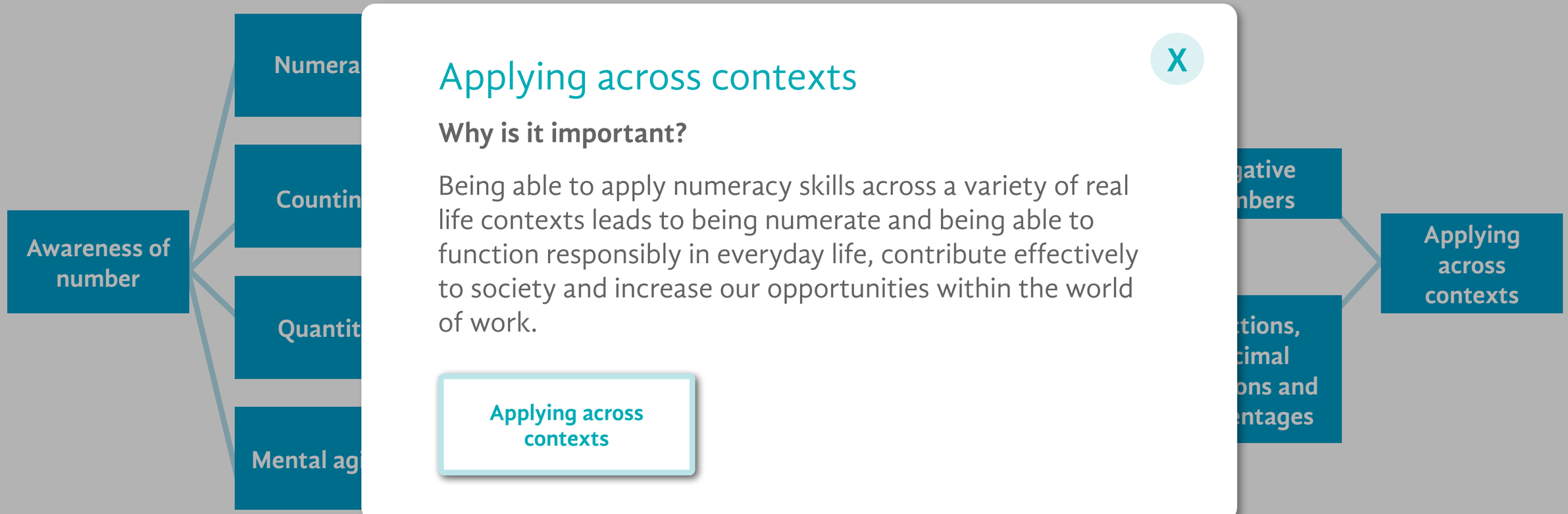
MAIN MENU

Number and number processes



MAIN MENU

Number and number processes



Applying across contexts

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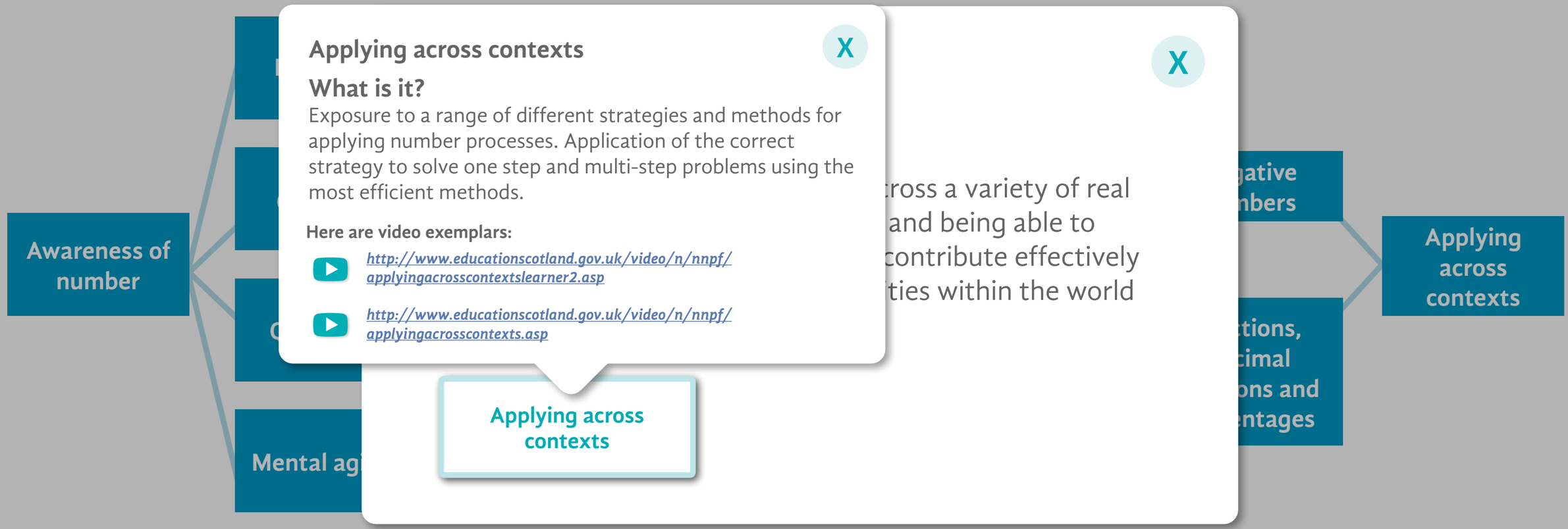
Why is it important?

Being able to apply numeracy skills across a variety of real life contexts leads to being numerate and being able to function responsibly in everyday life, contribute effectively to society and increase our opportunities within the world of work.

Applying across contexts

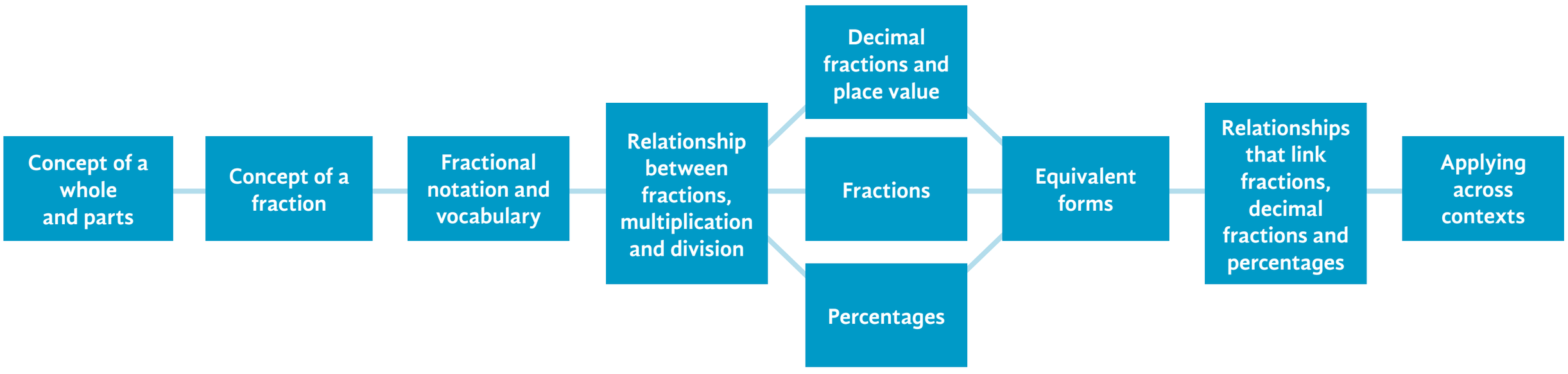
MAIN MENU

Number and number processes



MAIN MENU

Fractions, decimal fractions and percentages



MAIN MENU

Fractions, decimal fractions and perc

Concept of a whole and parts

Why is it important?

To develop an understanding of fractions learners must have knowledge and understanding of what is meant by a whole or a part.

- Concept of a whole and parts
- One object, shape or quantity can be shared into parts
- A group of items can be shared out
- Equal parts

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and p

Concept of a whole and parts

Concept of fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

X

Concept of a whole or a part

What is it?
A whole can represent one item or a group of items.

Previous knowledge and understanding
- Awareness of vocabulary related to wholes and parts
- Awareness that a part of an object, shape or group is less than the whole

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…t is meant by a whole

Concept of a whole or a part

One object, shape or quantity can be shared into parts

A group of items can be shared out

Equal parts

MAIN MENU

Fractions and perc

One object, shape or quantity can be shared into equal parts

X

What is it?

When an object, shape or quantity is split into two equal parts then each part is one half. When an item is split into two unequal parts then these two parts are not halves. This principle applies to all unitary fractions, e.g. splitting into tenths and each part is an equal 10th.

Previous knowledge and understanding

- Awareness that a part of an object, shape or group is less than the whole
- Understand and demonstrate the concept of sharing
- Understand and demonstrate the concept of sharing fairly
- Have experience of sharing in real life situations, e.g. with siblings, in play situations

Concept of a whole and parts

Concept of a fraction

Concept of a whole or a part

One object, shape or quantity can be shared into parts

A group of items can be shared out

Equal parts

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fr… and perc…

Concept of a whole

Why is it important?

To develop an understandin… knowledge and understandi… or a part.

Concept of a whole and parts

Concept of … fraction

Concept of a whole or a part

One object, shape or quantity can be shared into parts

A group of items can be shared out

Equal parts

A group of items can be shared out X

What is it?
Sharing a collection of items into equal groups and into groups which are not equal.

Previous knowledge and understanding
- Awareness of sharing fairly and splitting a group of items
- Have experience of sharing out items in a variety of contexts

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and perc

Concept of a whole and parts

Why is it important?

fractions learners must have
f what is meant by a whole

Equal parts

What is it?
Equal parts can form a whole.

Previous knowledge and understanding
Is able to identify and explain when an object, shape or quantity has not been split/shared equally.

Concept of a whole and parts

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A group of items can be shared out

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and perc

Concept of a fraction

Why is it important?

Understanding this concept is needed to appreciate the notation of fractions. When working with a fraction it is essential to understand that the denominator denotes the number of equal parts.

- Concept of a fraction
- Fractions with equal parts
- Sharing with a remainder
- Equal sharing

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and p

Concept of a fraction

X

What is it?
That a whole can be separated into equal parts. These parts are called fractions.

Previous knowledge and understanding
- Understand that a whole can be split into smaller parts
- Understand the term equal

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Concept of a whole and parts

Concept of a fraction

Concept of a fraction

Fractions with equal parts

Sharing with a remainder

Equal sharing

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and perc

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

Fractions with equal parts

What is it?

Understanding that fractions of a whole are equal parts.

Previous knowledge and understanding

- Understand that a whole can be split into smaller parts
- Understand the term ‘equal’
- Is aware of the relationship between equal fractions and the whole

Concept of a fraction

Fractions with equal parts

Sharing with a remainder

Equal sharing

MAIN MENU

Fractions, decimal fr
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Concept of a fractic

Why is it important?

Understanding this concept
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number of equal parts.

Concept of a fraction | Fractions with equal parts | Sharing with a remainder | Equal sharing

Sharing with a remainder

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What is it?

Awareness that when a group of items is shared equally there may be some ‘left over.’ This is known as the remainder.

Previous knowledge and understanding

- Experience of one to one correspondence
- Understand equal sharing
- Experience of sharing out items in a variety of contexts

Concept of a whole and parts → Concept of a fraction → Relationships that link fractions, decimal fractions and percentages → Applying across contexts

MAIN MENU

Fractions, decimal fractions and perc

Concept of a fraction

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Equal sharing

What is it?
Splitting a group of items equally into a number of smaller groups. This underpins the concept of fractions.

Previous knowledge and understanding
- Understand the term ‘equal’
- Have experience of sharing out items in a variety of contexts

Concept of a whole and parts

Equal sharing

Sharing with no remainder

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and perc

Fractional notation and vocabulary

X

Why is it important?

Understanding fractional notation aids communication, reinforces the concept of equal sharing and can be developed further to investigate equivalent fractions. Understanding what the two numbers that make up a fraction represent, allows for calculations to be made.

Fractional notation and vocabulary

Numerator and denominator

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and pe

Fractional notation and vocabulary

What is it?
Fractional notation is used to find, name and write fractions of a length, shape, object or quantity.

Previous knowledge and understanding
- Awareness that fractional notation has a top and bottom number, e.g. 1/2

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Concept of a whole and parts

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Fractional notation and vocabulary

Numerator and denominator

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and perc

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Numerator and denominator

What is it?

Numerator indicates the number of equal parts. Denominator indicates the number of equal parts the unit is divided into. The greater the numerator the more parts there are. The greater the denominator the more parts the whole has been divided into.

Previous knowledge and understanding

- Understand that the top and bottom number of a fraction mean different things

Fractional notation and vocabulary

Numerator and denominator

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and perc

Relationship between fractions, multiplication and division

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Why is it important?

Understanding the link between fractions and multiplication leads to an understanding of percentages and the application of multiplication and division in calculations such as those involving ratio.

Relationship between fractions, multiplication and divisions

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and pe

Relationship between fractions, multiplication and division

What is it?
There is a direct link between finding a fraction of an object or a quantity and multiplication and division.

Previous knowledge and understanding
- Apply multiplication facts and corresponding division facts (inverse operations) to whole numbers
- Understand the role of numerator and denominator in a fraction

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Concept of a whole and parts

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Relationship between fractions, multiplication and divisions

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and perc

Decimal fractions and place value

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Why is it important?

Understanding decimal fractions is important for conversion in measurement and understanding what proportion of a whole is represented. It is also important relative to interpreting answers generated through the use of calculators.

Decimal fractions and place value

The decimal point

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

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Decimal fractions and place value

X

What is it?

Learning and teaching about decimal fractions is an extension of learners' understanding of place value. There is a multiplicative relationship between the decimal places and the value of the positions increases in powers of 10 from right to left. Moving left from the decimal point the powers of 10 increase and moving right from the decimal point the powers of 10 decrease. There are many contexts for learning about decimal fractions, e.g. money and measurement.

Previous knowledge and understanding

- Have a knowledge of place value and its role in calculation
- Have an awareness that not all numbers are whole numbers

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Concept of a whole and parts

Concept of a fraction

Decimal fractions and place value

The decimal point

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, d
and perc

The decimal point

What is it?

In order to successfully manipulate numbers, learners need to have a conceptual understanding of place value, including the role of the decimal point. The decimal point separates the whole numbers from the fractions and is placed between the units (or ones) and the tenths. It is important to ensure that when multiplying or dividing by multiples of 10, learners understand that the decimal point does not move.

Previous knowledge and understanding

- Can talk about the multiplicative relationship between the digits in whole numbers
- Can give examples of where the decimal point can be seen in real life contexts, e.g. money £2.39, measurement 2.5l of paint

Concept of a whole and parts

Concept of a fraction

Decimal fractions and place value

The decimal point

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and percentages

Fractions

Why is it important?

Working with fractions is an important skill in the world of work and daily life.

Concept of a whole and parts

Concept of a fraction

Fractions

Percentages

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions

What is it?

A proper fraction is when the numerator is less than the denominator e.g ½. An improper fraction is when the numerator is more than the denominator, e.g. ³⁄₂. A fraction expresses a part of a whole. When carrying out calculations, the most appropriate form of a fraction should be used, e.g. ⁶⁄₁₀₀ of 500 (calculate ¹⁄₁₀₀ then multiply by 6, rather than ³⁄₅₀ which is the fraction in its simplest form).

Previous knowledge and understanding

- Apply multiplication facts and corresponding division facts (inverse operations) to whole numbers
- Know that the numerator is the number on the top of a fraction
- Know that the denominator is the number on the bottom of a fraction
- Know that the numerator shows the number of equal parts
- Know that the denominator shows the total number of parts the whole has been split into
- Understand that the larger the denominator is, the greater the number of parts the whole has been split into

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Concept of a whole and parts

Concept of a fraction

Fractions

Percentages

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and perc

Percentages

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Why is it important?

Percentages are used in a wide variety of contexts, many of which are used in everyday life. Understanding that percentages are a specific way of representing fractions with a denominator of 100 can support understanding of the relationships between fractions, decimal fractions.

Percentages

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and p

Concept of a whole and parts

Concept of fraction

Percentages

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

Percentages

What is it?

Percent means out of 100 therefore 100% is equivalent to one whole.

Previous knowledge and understanding

- Have a knowledge of fractions and decimal fractions
- Can give examples of where they have experienced percentages in real life, e.g. 2% battery left, 50% off sale
- Have a knowledge of place value and its role in calculation

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MAIN MENU

Fractions, decimal fractions and perc

Equivalent forms

Why is it important?
This understanding leads to confidence when using fractions in calculations and in relation to decimal fractions and percentages. Knowledge and understanding of equivalences can help to make calculations simpler when carrying out calculations in relation to fractions, decimal fractions and percentages.

Equivalent forms

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fracti and p

Equivalent forms

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What is it?
Fractions which have the same value, even though they may look different, e.g. ½ and ¾ are equivalent, because they are both equal to a half. The simplest form of a fraction can be used to support efficient calculation skills.

Previous knowledge and understanding

- Apply multiplication facts and corresponding division facts (inverse operations) to whole numbers
- Know that 'equivalent' means an equal value
- Know and understand fractional notation and know the relationship between fractions, decimal fractions and percentages, e.g. ¾= 3 divided by 4 = 0.75 = 75%

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Concept of a whole and parts

Equivalent forms

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decimal fractions and perc

Relationships that link fractions, decimal fractions and percentages

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Why is it important?

The ability to interchange between a fraction, decimal fraction and percentage is a skill that allows for different ways to solve problems efficiently, including mental calculations.

Relationships that link fractions, decimal fractions and percentages

Comparisons between fractions, decimal fractions and percentages

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

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Relationships that link fractions, decimal fractions and percentages

What is it?
Understand the relationship between fractions, decimal fractions and percentages. Ability to change between the different forms for the most efficient ways of carrying out calculations, in different contexts.

Previous knowledge and understanding
- Is aware that hundredths can be written as a fraction, decimal fraction or a percentage
- Can multiply and divide whole numbers and decimal fractions by multiples of 10
- Be able to place fractions, decimal fractions and percentages on a number line
- Know and understand fractional notation specifically that e.g. ¾ = 3 divided by 4 = 0.75 etc.

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Comparisons between fractions, decimal fractions and percentages

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, dec and perc

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Concept of a whole and parts

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Relationships that link fractions, decimal fractions and percentages

Comparisons between fractions, decimal fractions and percentages

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Applying across contexts

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Comparisons between fractions, decimal fractions and percentages

What is it?
Being able to place different forms in order on a number line and know the relative value of each one.

Previous knowledge and understanding

- When given different representations can convert to most appropriate form
- Have a knowledge of place value with decimals and whole numbers
- Be able to order decimals on a number line
- Knowledge of the concept of hundredths and its equivalent forms
- Can place examples of the same form in order

MAIN MENU

Fractions, decimal fractions and perc

Applying across contexts

X

Why is it important?

Being able to carry out calculations and move between different forms is an important skill. Choosing the most important form to display the answer depends on context.

Applying across contexts

Linking fractions and ratio

Proportion

Concept of a whole and parts

Concept of a fraction

Percentages

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

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Applying across contexts

X

What is it?

Being able to carry out calculations and move between different forms is an important skill. Choosing the most important form to display the answer depends on context.

Previous knowledge and understanding

- Has experience of fractions, decimal fractions and percentages in a range of contexts including new and unfamiliar situations
- Can place examples of the same form in order
- Can convert between forms to assist ordering a variety of fractions, decimal fractions and percentages
- Can select the most appropriate strategy when approaching a calculation
- Can convert between fractions, decimal fractions and percentages to assist ordering when written in different forms

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Concept of a whole and parts

Concept of a fraction

Applying across contexts

Linking fractions and ratio

Proportion

Percentages

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, and perc

Linking fractions and ratios

X

What is it?

Understanding how ratio links to fractions. Numbers in a given ratio can be expressed in fractional form. In its fractional form it is easier to make comparisons and carry out calculations.

Previous knowledge and understanding

- Apply multiplication facts and corresponding division facts (inverse operations) to whole numbers
- Know how to construct a ratio from a problem in context
- Apply knowledge of fractions to problems in context
- Awareness of real life examples of ratio vocabulary, e.g. diluting juice
- Knowledge and role of numerator and denominator

Applying across contexts | Linking fractions and ratio | Proportion

Concept of a whole and parts

Concept of a fraction

Relationships that link fractions, decimal fractions and percentages

Applying across contexts

MAIN MENU

Fractions, decima
and perc

Applying acros

Why is it important

Being able to carry
different forms is an
important form to d

Concept of a whole and parts

Concept of a fraction

that link fractions, decimal fractions and percentages

Applying across contexts

Applying across contexts

Linking fractions and ratio

Proportion

X

Proportion

What is it?

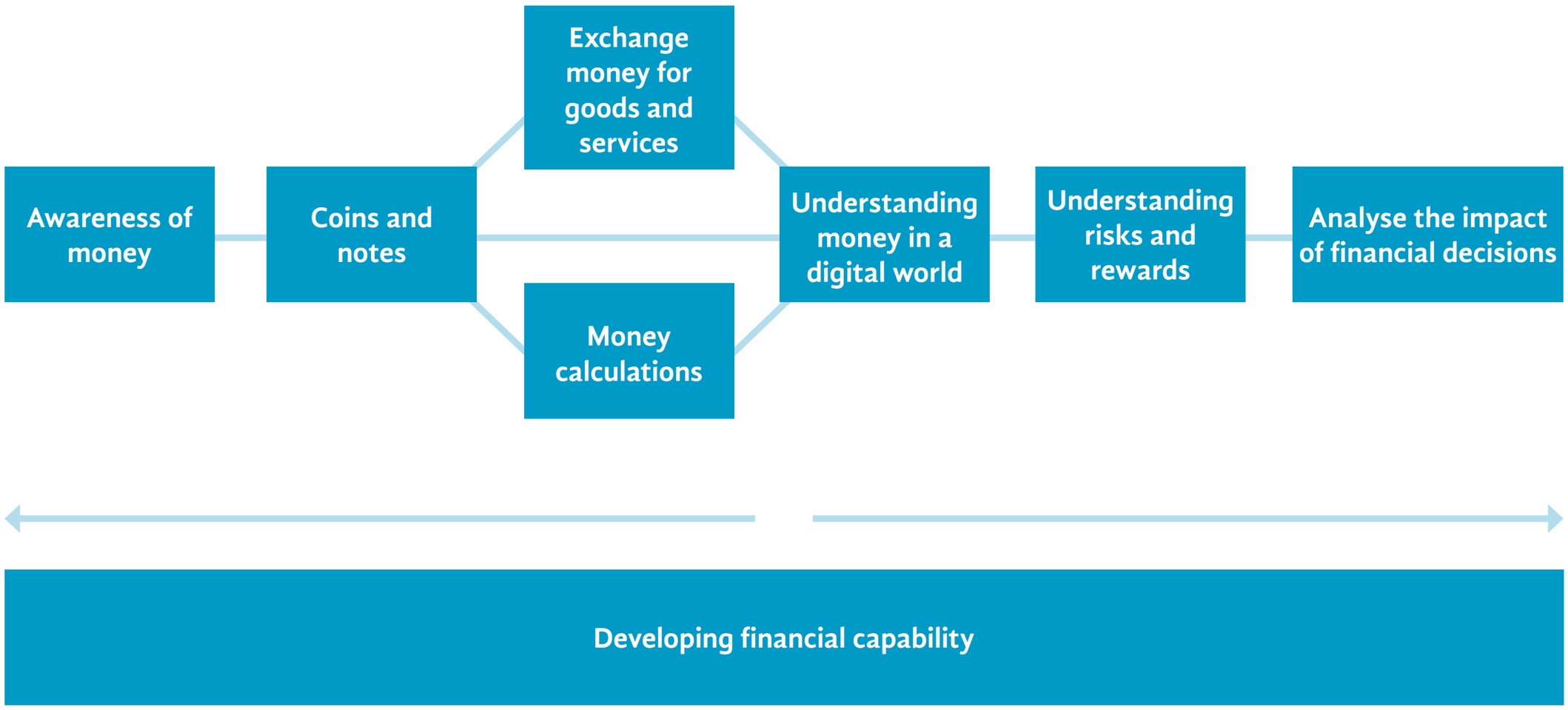
Two variables are proportional if a change in one is always accompanied by a change in the other. As one quantity increases or decreases another quantity increases or decreases in proportion.

Previous knowledge and understanding

- Awareness that multiplication and division are inverse operations
- Apply multiplication facts and corresponding division facts (inverse operations) to whole numbers
- Awareness of practical concept of proportion
- Apply multiplication facts and corresponding division facts (inverse operations) to fractions

MAIN MENU

Money



MAIN MENU

Money

Awareness of money

Why is it important?

An early appreciation of the contexts in which money is used is important. This includes an awareness that money is valuable and there is a need to keep it safe. In doing so young people will appreciate the difference between needs and wants.

Awareness of money

Awareness of money

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Awareness of money

What is it?
Working with money is the application of numbers in a specific context. Understanding that money can be used in exchange for goods and services.

Previous knowledge and understanding
- Knowledge of the existence of money
- Awareness of buying and selling

Awareness of money

n which money is used.
y is valuable and there is a
people will appreciate the

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Coins and notes

X

Why is it important?

Using notes and coins is an everyday life skill. In many transactions change should be given/received.

- Coins and notes
- Using coins and notes
- Relevant contexts
- The inter-relationship between different sets of coins and notes

Awareness of money

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Mone

Coins and notes

X

What is it?

Coins and notes have different monetary values and are used to buy products and services, as well as being used to save.

Previous knowledge and understanding

- Awareness that money takes various forms, e.g. coins, notes, cards and vouchers
- Know that money is used in real life to buy items and services

X

life skill. In many
/received.

Coins and notes

Using coins and notes

Relevant contexts

The inter-relationship between different sets of coins and notes

Awareness of money

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Using coins and notes

X

What is it?

The relationship between the value of coins and the cost of goods that are exchanged leads to understanding that different coins and notes have varying values. The ability to exchange an appropriate amount of money for goods or services and estimate/calculate the amount payable and change.

Previous knowledge and understanding

- Know and understand whole number addition and subtraction
- Understand the notion of saving

Coins

Why is

Using r
transac

X

Coins and notes

Using coins and notes

Relevant contexts

The inter-relationship between different sets of coins and notes

Awareness of money

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Coins and notes

Why is it important?

Using notes and coins is an e
transactions change should

Coins and notes

Using coins and notes

Relevant contexts

The inter-relationship between different sets of coins and notes

Relevant contexts

X

What is it?

Apply the knowledge of coins in play and in real life situations.

Previous knowledge and understanding

- Recognise that there are different ways to make exact amounts of money
- Be able to make exact combinations of simple amounts using mental strategies
- Have experienced the concept of giving and receiving change

Awareness of money

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Mone

The inter-relationship between different sets of coins and notes

X

What is it?

Understanding that different combinations of coins/ notes create a total amount, e.g. five 20p coins have the same value as a £1 coin, two £10 notes have the same value as a £20.

Previous knowledge and understanding

- Be able to use a range of addition and subtraction strategies with money
- Knowledge and understanding of whole numbers and their relative values
- Awareness of the units of money

X

life skill. In many
n/received.

Awareness
money

The inter-relationship between different sets of coins and notes

Relevant contexts

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Exchange money for goods and services

X

Why is it important?

Understanding that, in order to purchase goods or services, money has to be exchanged. Developing an awareness of where money comes from. Awareness of the difference between needs and wants.

Exchange money for goods and services

Application in everyday life

Awareness of money

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Mon

Exchange money for goods and services

X

What is it?
Knowing how much money is available and what can be purchased with it.

Previous knowledge and understanding

- Understand that money includes coins, notes, cards and vouchers
- Be able to calculate the costs of items by adding the prices together using the most appropriate strategies
- Be able to use a range of strategies to add and subtract
- Be able to confidently use vocabulary: more, less etc.

and services

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se goods or services,
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Exchange money for goods and services

Application in everyday life

Awarene
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Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Awareness of money

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Application in everyday life

What is it?
The ability to solve contextualised problems. Applying mental agility skills to solve abstract problems. When exchanging money for goods or services, being able to calculate change.

Previous knowledge and understanding
- Has experience of working with money through relevant contexts
- Is able to estimate and calculate costs
- Is able to estimate and calculate change
- Understands that affordability is based on money available

Exchange money for goods and services

Application in everyday life

X

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Awareness of money

Money calculations

X

Why is it important?

Developing confidence in mental and written calculations involving money is an important skill in everyday life.

- Money calculations
- Applying the four operations in calculations involving money

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Mon

Money calculations

X

What is it?

Money calculations are any calculations involving addition, subtraction, multiplication or division (or a combination of these operations.) Mental strategies can involve rounding. Written calculations can involve decimal fractions.

Previous knowledge and understanding

- Use a range of strategies to be able to add, subtract, multiply and divide using whole numbers
- Understand that monetary amounts can be written with no more than 2 decimal places
- Use a range of strategies to be able to add, subtract, multiply and divide numbers to 2 decimal places

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everyday life.

Money calculations

Applying the four operations in calculations involving money

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Awareness of money

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Analyse the impact of financial decisions

Money calculations

Applying the four operations in calculations involving money

Applying the four operations in calculations involving money

X

What is it?

Using money as a context for the application of number skills, including decimal fractions and percentages. Estimation or calculating the total cost of goods or services purchased.

Previous knowledge and understanding

- Use a range of strategies to be able to add, subtract, multiply and divide numbers to 2 decimal places
- Estimate amounts using rounding strategies

X

Developing financial capability

MAIN MENU

Money

Awareness of money

Analyse the impact of financial decisions

X

Understanding money in a digital world

Why is it important?

The increased variety of methods of payment has changed money from a concrete to a more abstract concept.

- Understanding money in a digital world
- Online shopping
- Online banking
- Best value

Developing financial capability

MAIN MENU

Mone

Awarenes
money

digital world

ayment has changed
tract concept.

Analyse the impact
of financial decisions

Understanding money in a digital world

What is it?
Recognising the advantages and disadvantages of debit and credit cards.

Previous knowledge and understanding
- Understand the various methods of paying for goods and services
- Understand the terms credit/debit and debt

Understanding money in a digital world

Online shopping

Online banking

Best value

Developing financial capability

MAIN MENU

Money

Awareness of money

Analyse the impact of financial decisions

Developing financial capability

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Online shopping

What is it?

Using cards to make payments for goods online. Making comparisons between different websites and shops.

Previous knowledge and understanding

- Use a range of strategies add/subtract/multiply and divide numbers to 2 decimal places to compare costs

Understanding money in a digital world

Online shopping

Online banking

Best value

MAIN MENU

Money

Understanding m

Why is it important?

The increased variety of
money from a concrete t

Understanding money in a digital world

Online shopping

Online banking

Best value

Online banking

What is it?

This involves keeping track of online banking, transactions using cards (including contactless technologies) and withdrawals from ATMs.

Previous knowledge and understanding

- Recognise and understand how to read a bank balance statement
- Use IT to login to secure websites
- Understanding of importance of online security

Awareness of money

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Developing financial capability

MAIN MENU

Money

Awarenes
money

Analyse the impact of financial decisions

digital world

ayment has changed

ract concept.

Online banking

Best value

X

Best value

What is it?
Making comparisons between different websites, shops and online savings accounts.

Previous knowledge and understanding
- Use a range of strategies add/subtract/multiply and divide numbers to 2 decimal places to compare costs
- Understand the concept of benefits and comparing these with overall costs

Developing financial capability

MAIN MENU

Money

Awareness of money

Analyse the impact of financial decisions

Understanding risks and rewards

X

Why is it important?

Spending and saving money responsibly involves budgeting, incomes and expenditure over a period of time.

- Understanding risks and rewards
- Risks and rewards of online shopping
- Personal financial products
- Borrowing

Developing financial capability

MAIN MENU

Mon

Understanding risks and rewards

X

What is it?

Recognising that there are a range of rewards for saving and investing money, as well as risks involved in borrowing. This includes calculations involving varying rates of interest and transactions.

Previous knowledge and understanding

- Understand the terms save, invest and borrow
- Understand the concept of debt
- Use a range of strategies add/subtract/multiply and divide numbers to 2 decimal places
- Use knowledge of percentages to calculate interest and compare costs

X

wards

y involves budgeting,
l of time.

Understanding risks and rewards

Risks and rewards of online shopping

Personal financial products

Borrowing

Awarenc money

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Risks and rewards of online shopping

What is it?

There can be financial benefits of purchasing goods and services online. There can be hidden costs e.g. delivery charges.

Previous knowledge and understanding

- Use a range of strategies add/subtract/multiply and divide numbers to 2 decimal places to compare costs
- Able to use literacy skills to determine hidden costs such as delivery

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Understanding risks and rewards

Risks and rewards of online shopping

Personal financial products

Borrowing

Awareness of money

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Understanding ri

Why is it important?

Spending and saving mo
incomes and expenditur

- Understanding risks and rewards
- Risks and rewards of online shopping
- Personal financial products
- Borrowing

Personal financial products

X

What is it?

Making informed choices around basic bank accounts, insurance products, credit/debit cards, investments and loans.

Previous knowledge and understanding

- Understand the terms associated with financial products
- Use knowledge of percentages to calculate interest and apply as interest
- Understand the concept of insurance
- Use knowledge of vague, robust and misleading information to inform choices

Awareness of money

he impact of financial decisions

Developing financial capability

MAIN MENU

Money

Borrowing

What is it?

Borrowing money can be appropriate if the benefits that come from the expenditure are in line with the loan period.

Previous knowledge and understanding

- Use knowledge of vague, robust and misleading information to inform choices
- Use knowledge of percentages to calculate interest and apply as interest

wards

y involves budgeting,
l of time.

Personal financial products

Borrowing

Awarenc
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Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Awareness of money

Analyse the impact of financial decisions

Analyse the impact of financial decisions

X

Why is it important?

The ability to analyse the impact of financial decisions ensures greater responsibility for individual economic wellbeing.

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Mone

Awarenes
money

ial decisions

ncial decisions ensures
omic wellbeing.

Analyse the impact
of financial decisions

Analyse the impact of financial decisions

X

What is it?

Financial decisions impact on the development of financial capability. This includes being able to analyse the impact of individual financial decisions on others as well as the impact that the financial decisions of others have on individuals.

Previous knowledge and understanding

- An understanding of ethical trading, tax (including direct and indirect taxation), National Insurance
- Applying understanding of financial services, saving, borrowing, overspending, online spending, debit, credit and scams to make financial decisions

Analyse the impact of financial decisions

Developing financial capability

MAIN MENU

Money

Awareness of money

se the impact ncial decisions

Developing financial capability

X

Why is it important?

Developing financial capability involves;

- Financial understanding
- Financial competence
- Financial responsibility
- Financial enterprise

These four aspects are interconnected and mutually supportive and outline a framework for developing skills, attitudes and behaviours that will support learners as employees, employers, entrepreneurs or voluntary workers.

The ability to make decisions on spending and saving money is vital in order to balance lifestyle with the cost of living.

Financial understanding

Financial competence

Financial responsibility

Financial enterprise

MAIN MENU

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and mutually supportive and outline
udes and behaviours that will support
repreneurs or voluntary workers.

ding and saving money is vital in order
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ncial decisions

Financial understanding

What is it?
Developing financial understanding is the first step in ensuring young people leaving school have the skills required to deal confidently with everyday financial issues. It will also help them to make informed decisions and choices about their personal finances.

- This milestone includes knowledge, understanding and skills from across the curriculum

This video clip highlights the impact of Financial Education on young people and their families. It includes learners conversations with advice and support for practitioners.

http://www.educationscotland.gov.uk/video/n/nnpf/money.asp

Financial understanding

Financial competence

Financial responsibility

Financial enterprise

MAIN MENU

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Awareness of money

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Financial competence

What is it?

This means being able to apply knowledge and understanding of financial matters across a range of contexts, using digital technologies where appropriate. Being financially competent includes being able to identify and tackle problems or issues with confidence and being able to manage financial situations effectively and efficiently.

- This milestone includes knowledge, understanding and skills from across the curriculum

This video clip highlights the impact of Financial Education on young people and their families. It includes learners conversations with advice and support for practitioners.

http://www.educationscotland.gov.uk/video/n/nnpf/money.asp

Financial understanding | **Financial competence** | **Financial responsibility** | **Financial enterprise**

MAIN MENU

Money

Developing financial capability

X

Why is it important?

Developing financial cap

- Financial understanc
- Financial competenc
- Financial responsibili
- Financial enterprise

These four aspects are ir
a framework for develop
learners as employees, e

The ability to make decis
to balance lifestyle with

Financial responsibility

X

What is it?

This means having a caring and responsible attitude with regard to the use of resources. Children and young people who budget wisely and plan for the future will be responsible citizens who look after themselves.

- This milestone includes knowledge, understanding and skills from across the curriculum

This video clip highlights the impact of Financial Education on young people and their families. It includes learners conversations with advice and support for practitioners.

http://www.educationscotland.gov.uk/video/n/nnpf/money.asp

Awareness of money

se the impact ncial decisions

Financial understanding | Financial competence | Financial responsibility | Financial enterprise

MAIN MENU

Money

Awareness of money

Developing financial capability

Why is it important?

Developing financial capability involves;

- Financial understanding
- Financial competence
- Financial responsibility
- Financial enterprise

These four aspects are interconnected and
a framework for developing skills, attitudes
learners as employees, employers, entrepre

The ability to make decisions on spending a
to balance lifestyle with the cost of living.

Financial understanding | Financial competence | Financial responsibility | Financial enterprise

X

Financial enterprise

What is it?

Financial enterprise is about being able to deploy resources in an imaginative and confident manner. Financially enterprising behaviours will involve recognising risks and rewards and making decisions based on informed thought enabling children and young people to contribute effectively to the development of Scotland's wealth.

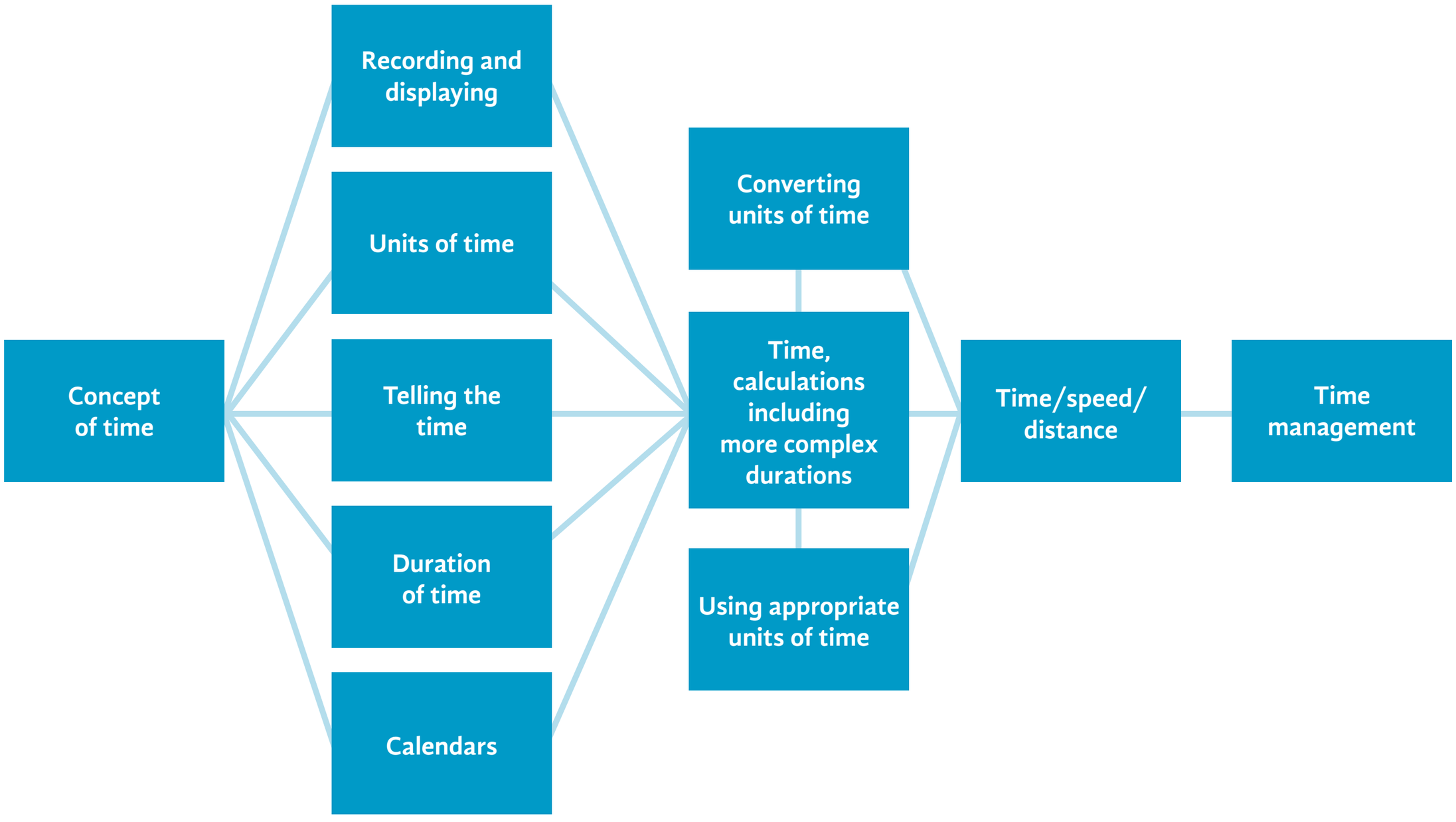
- This milestone includes knowledge, understanding and skills from across the curriculum

This video clip highlights the impact of Financial Education on young people and their families. It includes learners conversations with advice and support for practitioners.

http://www.educationscotland.gov.uk/video/n/nnpf/money.asp

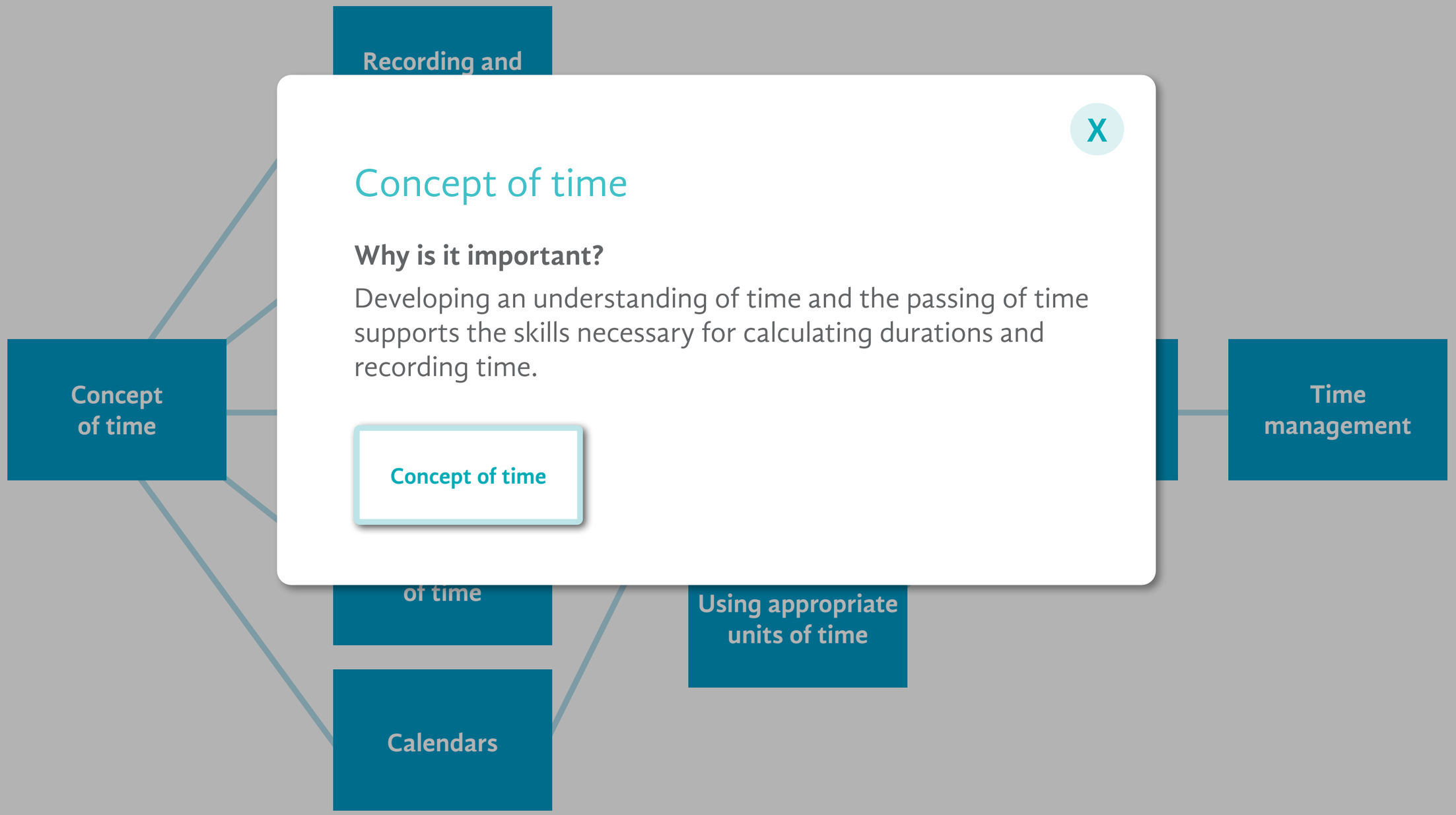
MAIN MENU

Time



MAIN MENU

Time



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Concept of time

Why is it important?

Developing an understanding of time and the passing of time supports the skills necessary for calculating durations and recording time.

Concept of time

Time

MAIN MENU

Concept of time

What is it?
Awareness of patterns of time and the passing of time in relation to years, seasons, months, weeks, days, hours, minutes and seconds.

Previous knowledge and understanding
- Have experience of routines, e.g. night and day, routines at home
- Recognise and understand that clocks, watches, digital displays etc. are used to tell the time

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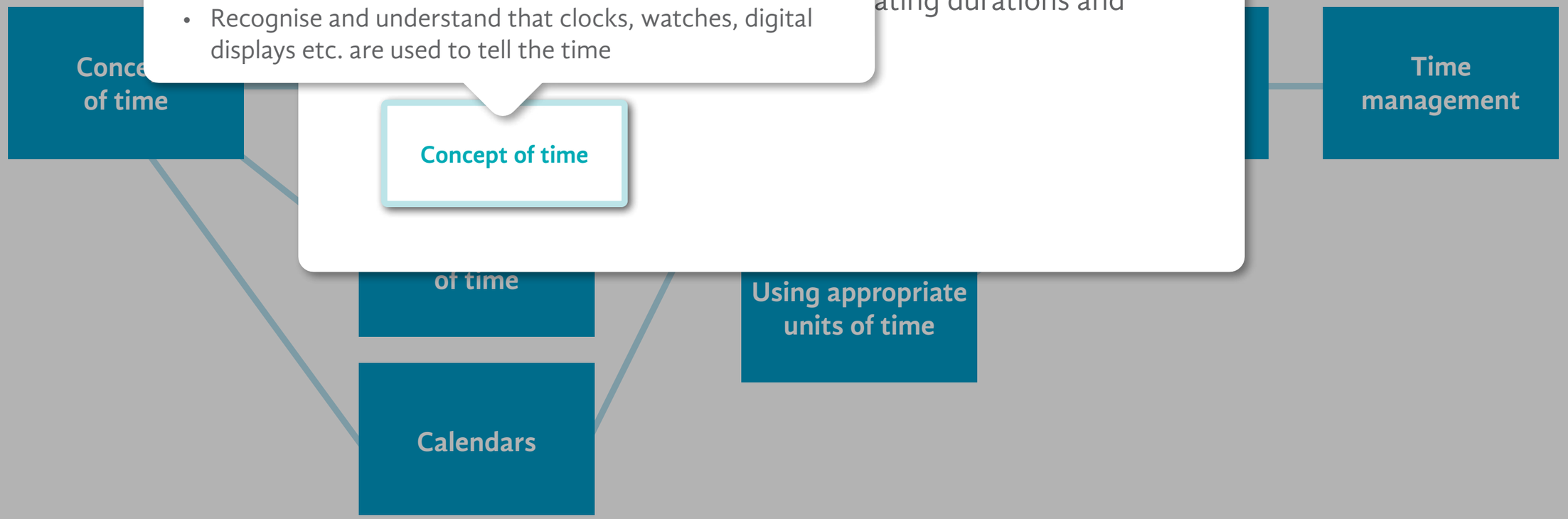
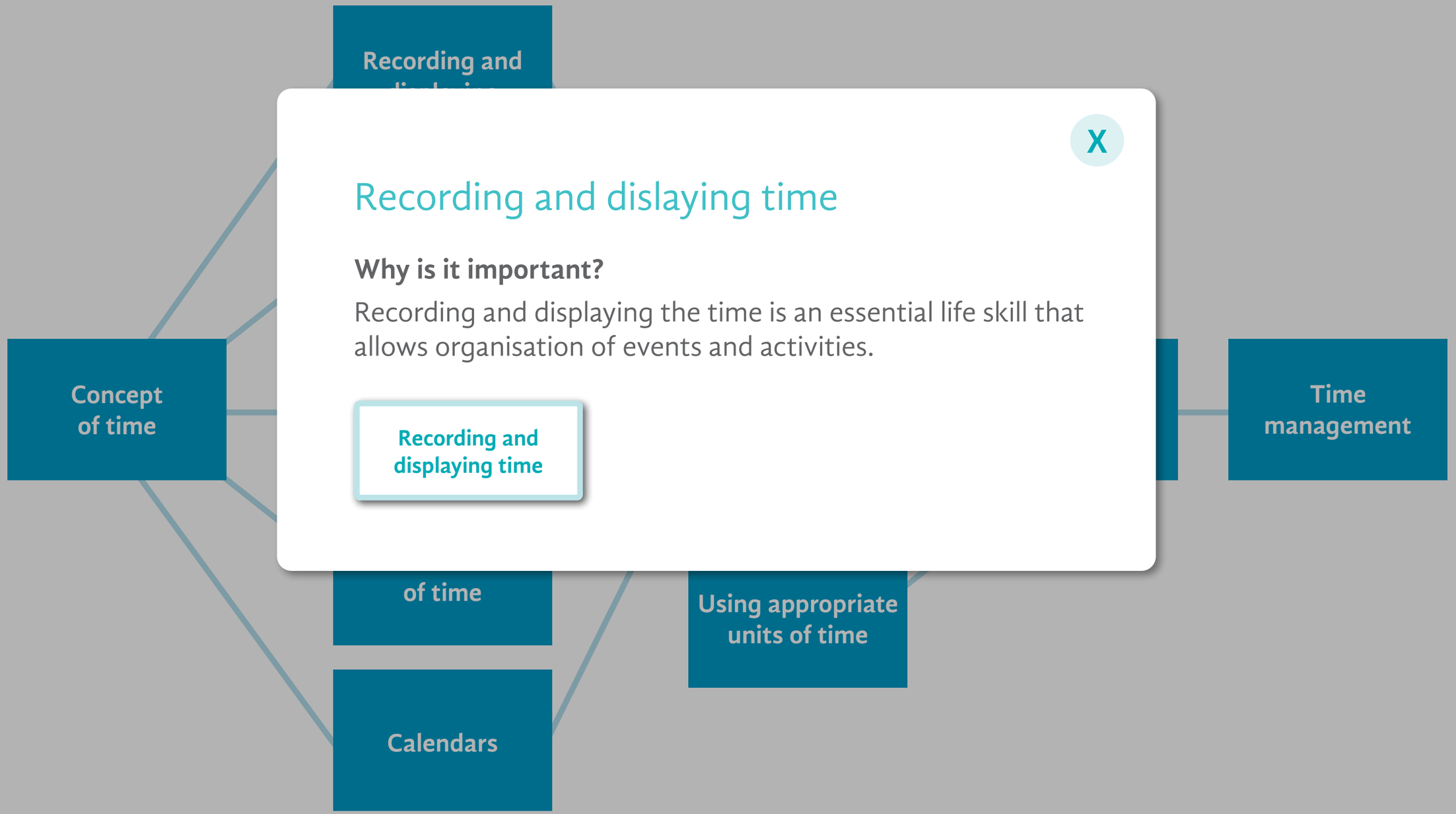


MAIN MENU

Time



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Recording and dislaying time

Why is it important?

Recording and displaying the time is an essential life skill that allows organisation of events and activities.

Recording and displaying time

MAIN MENU

Time

Recording and displaying time

X

What is it?

Recording time involves expressing time using numbers and words. Displaying time is representing the time on a clock face or on a digital display.

Previous knowledge and understanding

- Be able to recognise and understand that clocks, watches and digital displays are used to tell the time
- Be able to recognise and understand that calendars and diaries are used for recording events in time
- Be able to recognise the numerals 1-12, 1-24 then 1-60 as appropriate to learning as required

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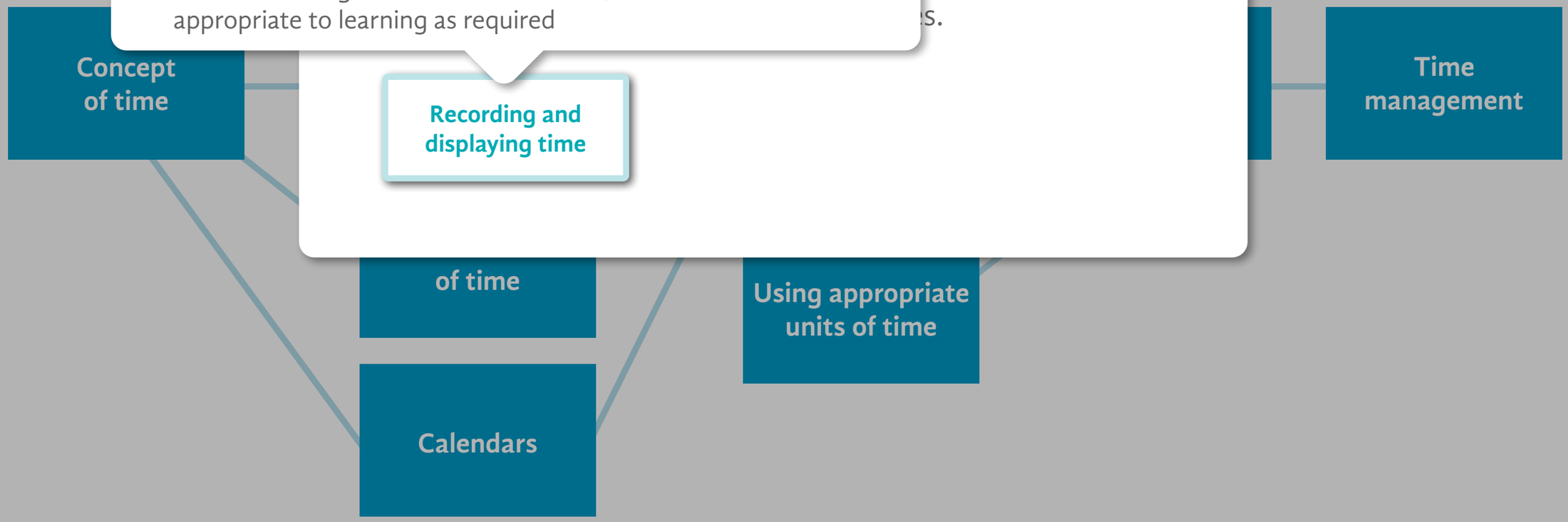

MAIN MENU

Time

Concept of time

Recording and

of time

Calendars

Using appropriate units of time

Time management

X

Units of time

Why is it important?

Use of units of time allows communication using a common language and understanding.

Units of time

Relationships

Appropriate use

MAIN MENU

Time

Units of time

What is it?
The ways in which we record time using the appropriate vocabulary. Knowledge of the relationship between different units of time.

Previous knowledge and understanding
- Understand routines
- Recognise and understand that there are different styles of clocks, e.g. analogue and digital
- Recognise and understand when calendars and diaries are used
- Be able to name the days of the week
- Be able to name the months of the year
- Be able to name the seasons

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Units of time | Relationships | Appropriate use

Concept of time

of time

Calendars

Using appropriate units of time

Time management

MAIN MENU

Time

Concept of time

Record

Units

Why is

Use of

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of time

Calendars

Using appropriate units of time

Time management

X

Relationships

What is it?

The relationship between different units of time e.g. number of days in a year, minutes in an hour etc.

Previous knowledge and understanding

- Know key time vocabulary, e.g. seconds, hours, decades, millennia etc.
- Know the ordinal number of the months, e.g. January 1st month
- Have an awareness of a variety of patterns of time, e.g. day follows night, Monday follows Sunday, December follows November, Autumn follows Summer

Units of time | Relationships | Appropriate use

X

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MAIN MENU

Time

Concept of time

Recording and

of time

Calendars

Time management

Using appropriate units of time

Units of time

Why is it important?

Use of units of time allows c
language and understanding

Units of time | Relationships | Appropriate use

X

Appropriate use

What is it?

Using the appropriate unit of time depending on the context and situation.

Previous knowledge and understanding

- Know the days of the week
- Know the numbers 1-60
- Know time facts such as: there are 7 days in a week, 365 days in a year and 366 in a leap year, 4 seasons in the year etc.
- Know the reason why there is a leap year
- Understand the terms seconds, minutes, hours, days, weeks, months, years
- Interpret a variety of date formats, e.g. 12.3.15, 12th March 2015

MAIN MENU

Time

Recording and

Concept of time

of time

Calendars

Using appropriate units of time

Time management

X

Telling the time

Why is it important?

Supports the development of skills in effective time management.

Telling the time

Analogue and digital

MAIN MENU

Tim

Telling the time

X

What is it?

Understanding time displays of various types and being able to express this using the correct vocabulary and in relation to specific times of the day e.g. morning or afternoon.

Previous knowledge and understanding

- Know the numbers 1-60, e.g. 1-12 for hours on an analogue clock, 0-60 for minutes
- Recognise and understand that there are different styles of clocks, e.g. analogue and digital and different types of timers
- Be able to count in 5s
- Be able to round appropriately
- Know that there are 24 hours in a day, 60 minutes in an hour and 60 seconds in a minute
- Have an understanding of ¼, ½ and ¾ turn

X

ctive time

Concept of time

Telling the time

Analogue and digital

of time

Calendars

Using appropriate units of time

Time management

MAIN MENU

Time

Analogue and digital

X

What is it?

Understand the position of and relationship between the hour and minutes hands. Familiarisation with the position of the hands and the vocabulary of half past and quarter to/past. Understanding the link between analogue and the 24 hour digital clock.

Previous knowledge and understanding

- Recognise different types of displays which indicate time
- Know that an analogue clock has an hour hand and a minute hand
- Be able to count on and back
- Understand on a standard analogue clock the main increments are in 5s
- Understand that am is before midday
- Understand that pm is after midday
- Have an understanding of ¼, ½, ¾ in fractions and are able to relate this to quarter past, half past and quarter to

Telling the time

Analogue and digital

Concept of time

of time

Calendars

Using appropriate units of time

Time management

MAIN MENU

Time

Duration of time

X

Why is it important?

Understanding duration of time helps to plan and organise events and activities effectively. Understanding the duration of time introduces start and finish times and leads to being able to work out how long events last. The ability to calculate the length of time taken is essential for planning and organising events in daily life. Using timetables helps to develop mental agility in relation to time calculations and develops skills in estimation and in rounding.

Duration of time

Timing of tasks

Simple timetables

Estimating duration

Concept of time

Calendars

Time management

MAIN MENU

Time

Duration of time

What is it?
The length of time between the start and finish point.

Previous knowledge and understanding

- Know that there are 60 minutes in an hour, 120 minutes in two hours and so on
- An awareness of quantity
- Know and be able to respond to the instructions start and stop/beginning and end
- Be able to count on and back

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Concept of time

Calendars

Time management

Duration of time

Timing of tasks

Simple timetables

Estimating duration

MAIN MENU

Time

Concept of time

Calendars

Time management

Duration of time

Timing of tasks

Simple timetables

Estimating duration

X

Timing of tasks

What is it?

Linking the chosen unit of time to the most appropriate timing device. Degree of accuracy is dependent on the situation.

Previous knowledge and understanding

- Have an understanding of place value
- Have an awareness of different units of time
- Recognise different tools for measuring, e.g. stopwatch, wrist watch, clocks, calendars
- Recognise different displays, e.g. analogue, digital

MAIN MENU

Time

Duration of time

Why is it important?

Understanding duration of
events and activities effect
of time introduces start an
being able to work out hov
calculate the length of tim
and organising events in d
develop mental agility in re
develops skills in estimatio

Simple timetables

What is it?

Timetables and schedules provide information including start and finish times for journeys. They can be used to plan events and demonstrate the importance of 24 hour time.

Previous knowledge and understanding

- Have experience of displays, e.g. seasons of the year
- Have an understanding of place value
- Can calculate simple time durations
- Recognise different displays, e.g. analogue, digital, 12 hour, 24 hour time

Duration of time | Timing of tasks | Simple timetables

Estimating duration

Concept of time

Time management

Calendars

MAIN MENU

Time

Duration of time

X

plan and organise
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last. The ability to
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timetables helps to
calculations and
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Estimating duration

X

What is it?
The ability to estimate how long an event took or will take, using non-standard or standard units of time. Developing a sense of how long a task will take, by using familiar benchmarks.

Previous knowledge and understanding

- Know and understand the units of time, e.g. seconds, minutes, hours, days
- Understand the cyclical nature of time
- Be able to count on and back (in steps of 1 or more)
- Have experience of how long something takes within familiar contexts, e.g. interval/playtime compared to lunchtime

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Simple timetables

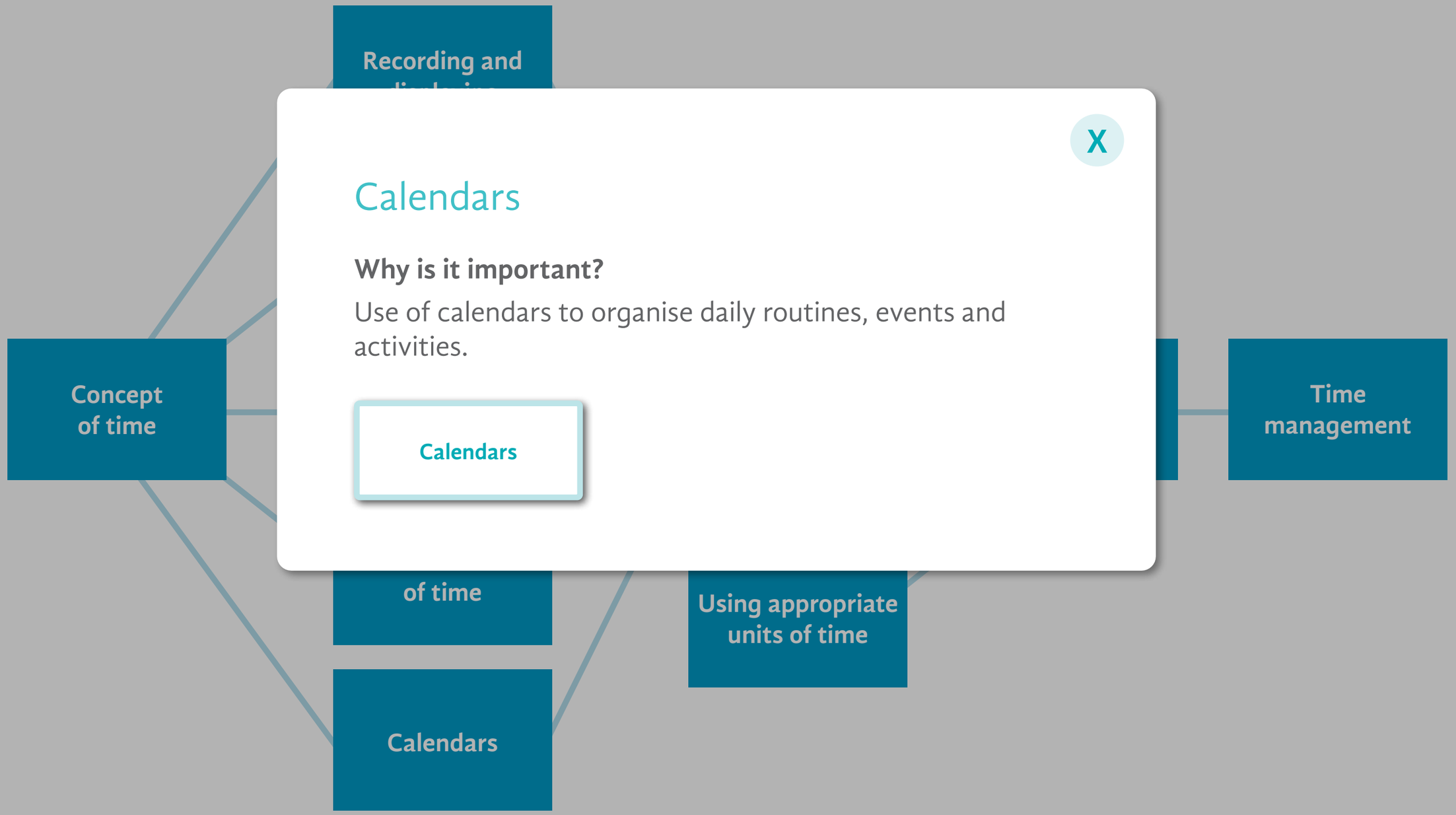
Estimating duration

Calendars

Time management

MAIN MENU

Time



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Calendars

Why is it important?

Use of calendars to organise daily routines, events and activities.

Calendars

MAIN MENU

Tim

Calendars

What is it?

Calendars are a structured representation of the months of the year. They reinforce the order of and number of days in the months of the year and can be used to illustrate the irregularity of number patterns in the months. Calendars can also be used to calculate elapsed time.

Previous knowledge and understanding

- Have experience of displays, e.g. seasons of the year
- Be able to count on and back
- Know the days of the week, months of the year
- Know the ordinal number of the months, e.g. January 1st month
- Understand the cyclical nature of time
- Know important events in learners' own lives, e.g. birthdays
- Select the most appropriate duration to count in, e.g. seconds, minutes, hours, days or years

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Concept of time

Calendars

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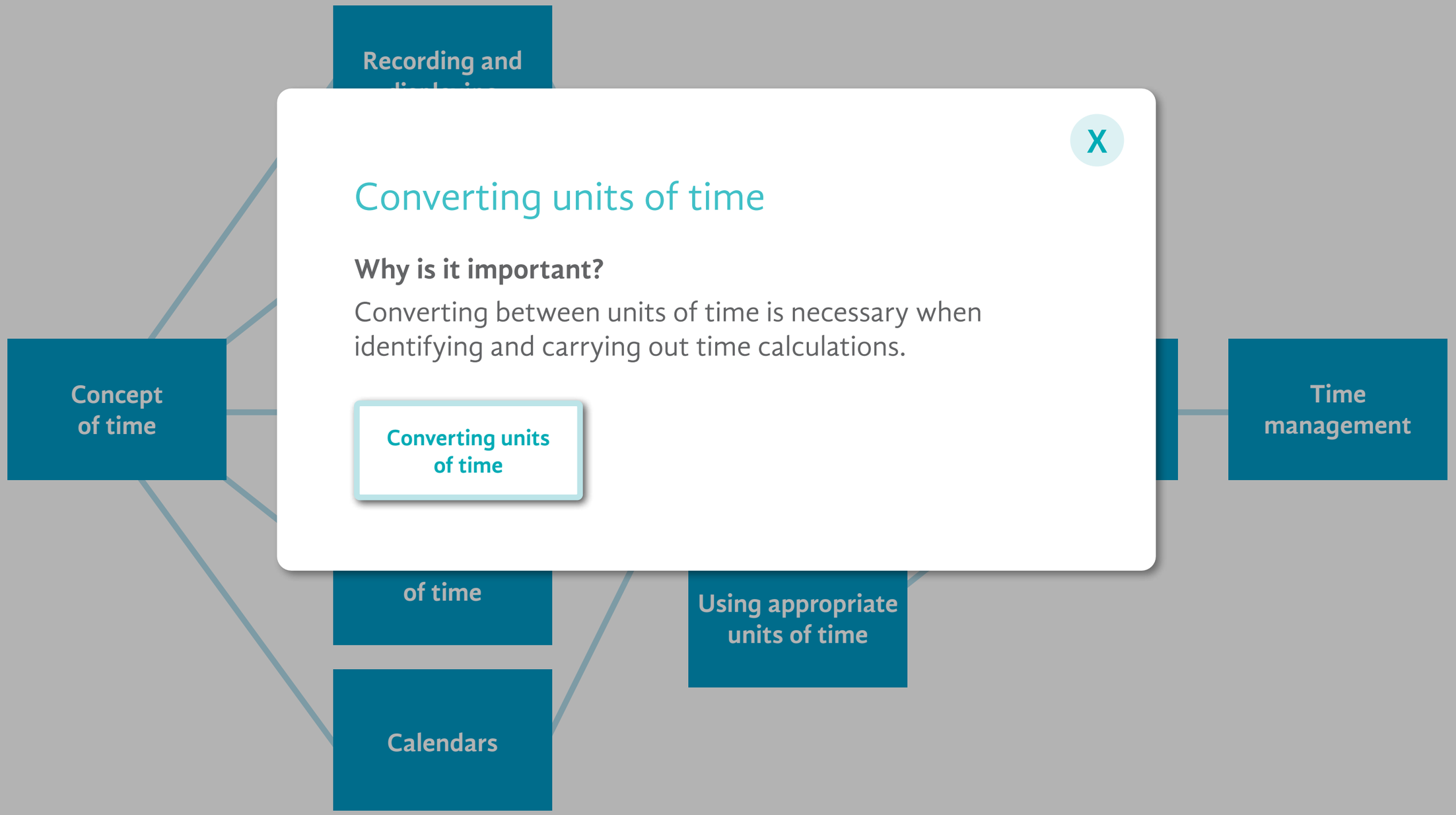
Calendars

Using appropriate units of time

Time management

MAIN MENU

Time



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Converting units of time

Why is it important?

Converting between units of time is necessary when identifying and carrying out time calculations.

Converting units of time

MAIN MENU

Time

Converting units of time

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What is it?

Knowledge that there are 60 seconds in a minute, 60 minutes in an hour and 24 hours in a day are essential when estimating or calculating lengths of time.

Previous knowledge and understanding

- Know and understand the relationships between the different units of time, e.g. 60 seconds in a minute, 60 minutes in an hour
- Understand values of time, e.g. that seconds are smaller than minutes and years are longer than months

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Concept of time

Converting units of time

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Calendars

Using appropriate units of time

Time management

MAIN MENU

Time

Time calculations including more complex durations

Why is it important?
Using information from a variety of sources to plan and schedule events and activities, including journeys, for personal lives and for work and leisure is an important life skill. Calculating journey times is an introduction to establishing the relationship between time, speed and distance and sets the foundation for more complex calculations and estimation.

Time calculations including more complex durations

Calendars and timetables

Journey times

Concept of time

Calendars

Time management

MAIN MENU

Time

Time calculations including more complex durations

What is it?

Using the four operations accurately to do calculations in relation to time, using the most efficient method and unit.

Previous knowledge and understanding

- Be able to tell the time
- Be able to apply the four operations
- Be able to convert times into a common unit, e.g. 2hrs and 90 mins = 2 hours and 1.5 hours
- Have an understanding of decimal fractions
- Have an understanding of place value

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Time management

Time calculations including more complex durations

Calendars and timetables

Journey times

Calendars

MAIN MENU

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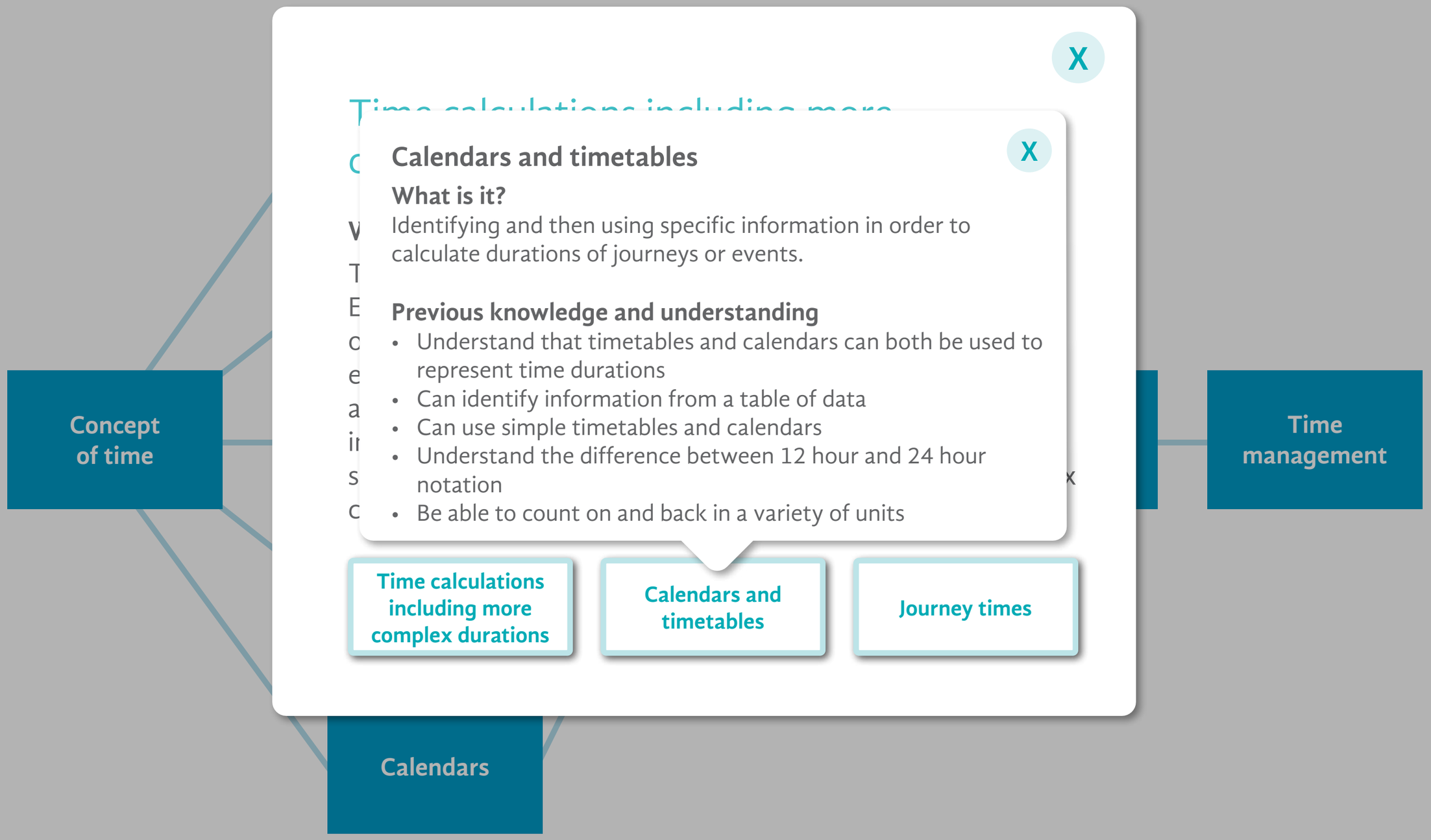

MAIN MENU

Time

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Why is it important?

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Time calculations including more complex durations

Calendars and timetables

Journey times

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Journey times

What is it?

Using the start and finish times to calculate how long a journey will last.

Previous knowledge and understanding

- Be able to tell the time
- Be able to identify 12 and 24 hour notation
- Can convert between 12 and 24 hour notation as appropriate
- Know and be able to use the four operations
- Have an understanding of decimal fractions
- Understand the relationship between the units of time
- Be able to convert times into a common unit, e.g. 2hrs and 90 mins = 2 hours and 1.5 hours

Concept of time

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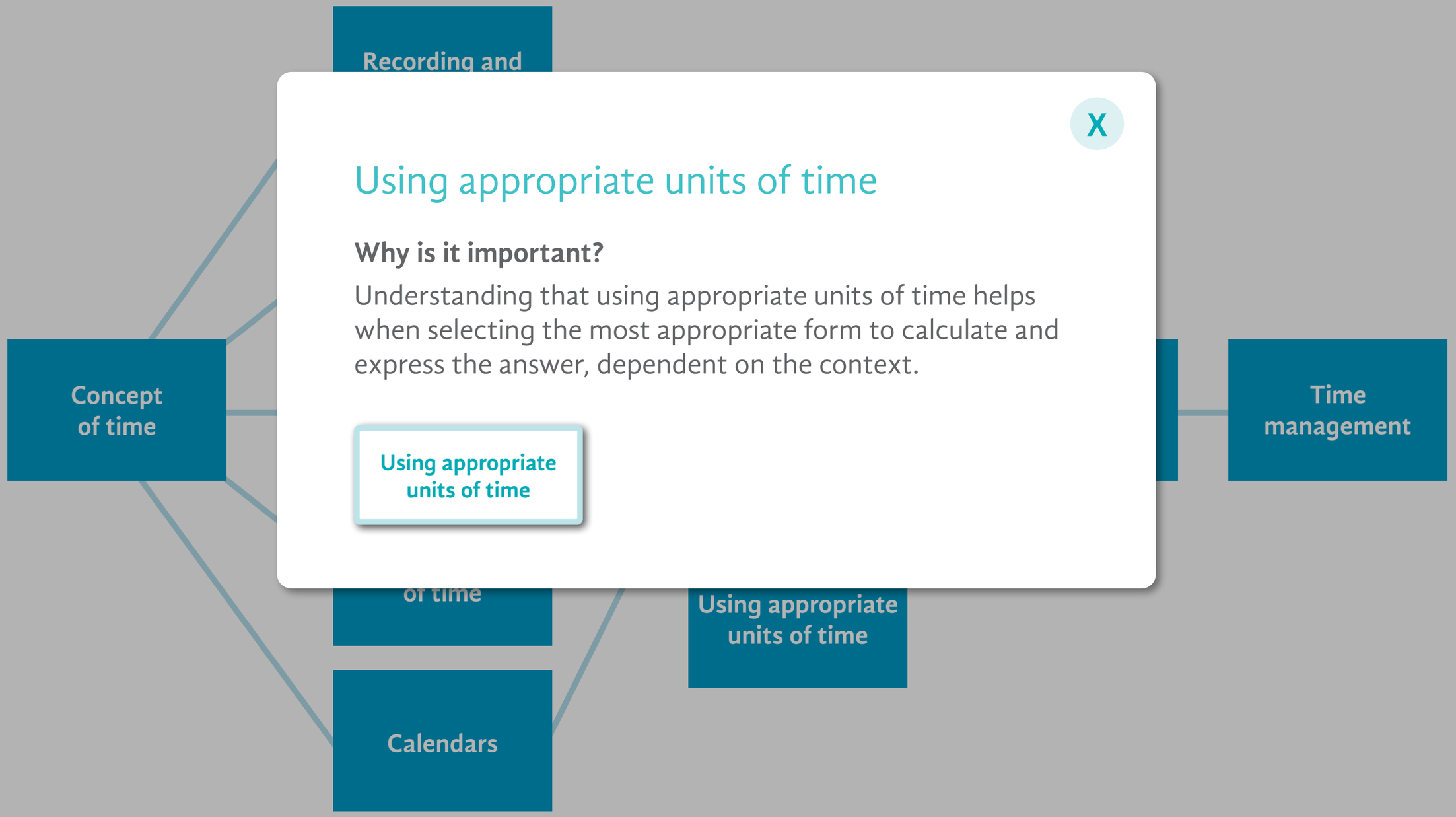
Calendars

Time

MAIN MENU



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Using appropriate units of time

Why is it important?

Understanding that using appropriate units of time helps when selecting the most appropriate form to calculate and express the answer, dependent on the context.

Using appropriate units of time

MAIN MENU

Time

Using appropriate units of time

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What is it?
Being able to select and use the most appropriate and efficient unit of time for the situation and context.

Previous knowledge and understanding

- Know the units of time
- Understand values of time, e.g. that seconds are smaller than minutes and years are longer than months
- Understand the differences and relationships between units of time
- Know how to convert between the different units of time

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Concept of time

Using appropriate units of time

Time management

of time

Using appropriate units of time

Calendars

MAIN MENU

Time

Time/speed/distance

Why is it important?

It is important in some aspects of travel and leisure to be able to estimate time taken, speed and distance travelled. More accurate time, speed and distance calculations are required for a range of real life contexts.

- Time/speed/distance
- Estimation in relation to distance/speed/time
- Calculations
- Graphs

Concept of time

Calendars

Time management

MAIN MENU

Time

Time/speed/distance

What is it?
Using the standard formula to calculate the unknown value when given the other two.

Previous knowledge and understanding
- Know units of time
- Know units of speed, e.g. mph, km/h
- Know units of distance
- Know and understand inverse operations
- Have experience of exploring a range of approaches to calculating speed, distance or time

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Concept of time

Time/speed/ distance

Estimation in relation to distance/ speed/time

Calculations

Graphs

Time management

Calendars

MAIN MENU

Time

Time

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Concept of time

Calendars

Time management

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Estimation in relation to distance/ speed/time

What is it?

Estimations are used in daily situations to determine either an approximate arrival time, speed or distance for a journey.

Previous knowledge and understanding

- Have experience of estimating appropriately
- Have experience of rounding
- Know and understand the relationship between speed, distance and time, and how this relates to the units of measure
- Apply the four operations in calculations

Time/speed/ distance

Estimation in relation to distance/ speed/time

Calculations

Graphs

Time

MAIN MENU

Concept of time

Calendars

Time management

Time/speed/distan

Why is it important?

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Time/speed/ distance

Estimation in relation to distance/ speed/time

Calculations

Graphs

Calculations

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What is it?

Calculations are required for specific more formal situations, e.g. areas of employment where this is a necessary part of daily business. Formula can be used to calculate one quantity given the other two.

Previous knowledge and understanding

- Be able to use the four operations
- Understand the inverse relationships between the four operations
- Have experience of using the speed distance time formula

MAIN MENU

Time

X

Graphs

What is it?

Time distance graphs can be used to investigate the relationships between distance, speed and time. Used to describe the features of a journey.

Previous knowledge and understanding

- Apply knowledge of graphs (link to data and analysis)
- Be able to interpret simple graphs
- Understand that a line graph shows a continuous measure
- Can estimate appropriately

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Time management

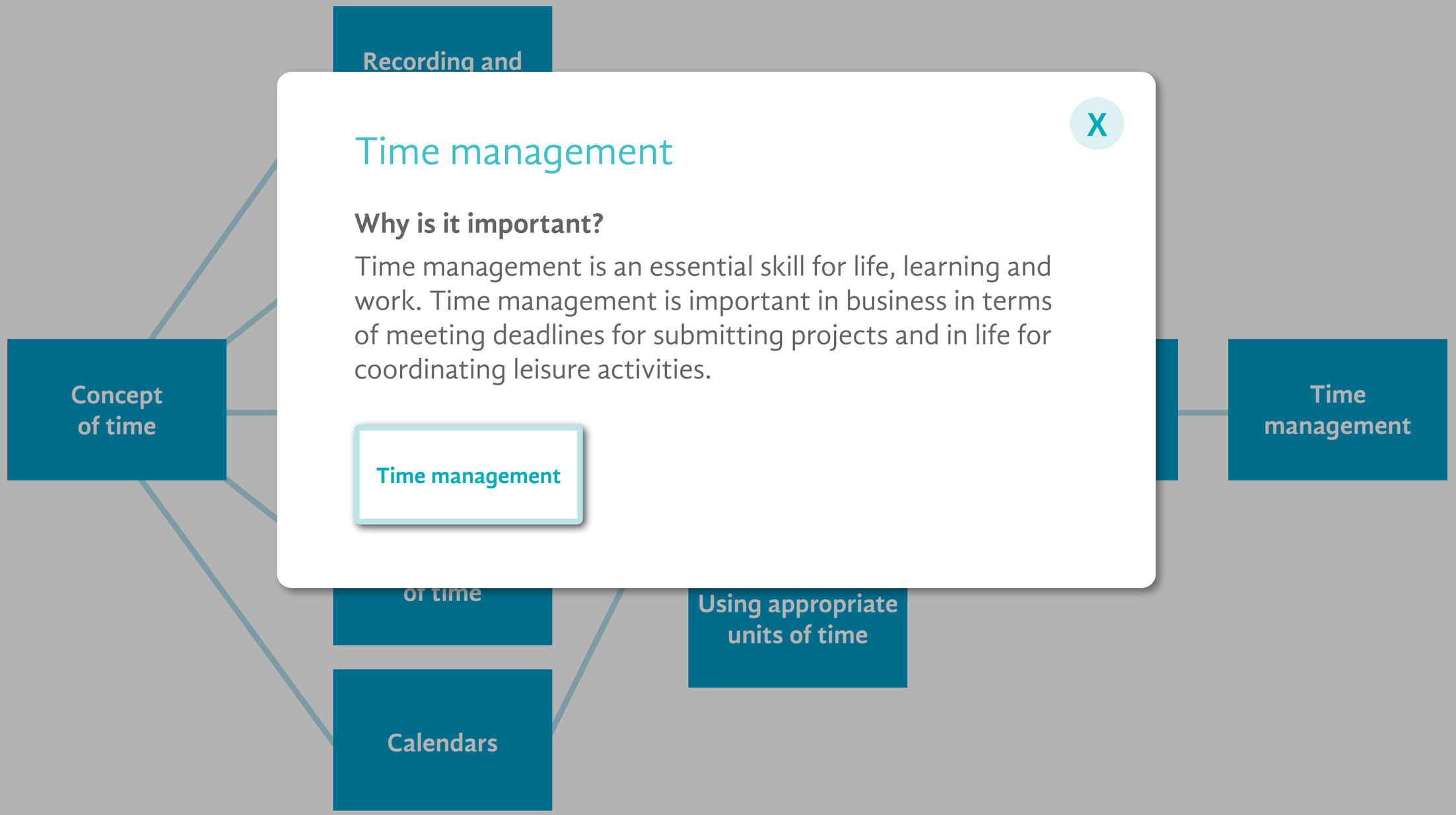
Calculations

Graphs

Calendars

MAIN MENU

Time



Time management

Why is it important?

Time management is an essential skill for life, learning and work. Time management is important in business in terms of meeting deadlines for submitting projects and in life for coordinating leisure activities.

Time management

MAIN MENU

Time

Time management

What is it?
Planning for different real-life situations. Flexible planning is taken into account when any adjustments are required. Responsive planning is necessary in order to address any unexpected events or changes.

Previous knowledge and understanding
- Be able to use a range of timetables in a variety of contexts
- Be able to tell the time from different displays
- Be able to calculate durations
- Have an understanding of the different types of calendars and be able to use them effectively
- Understand the appropriateness of rounding in relation to time
- Have experience of scheduling tasks within a given time

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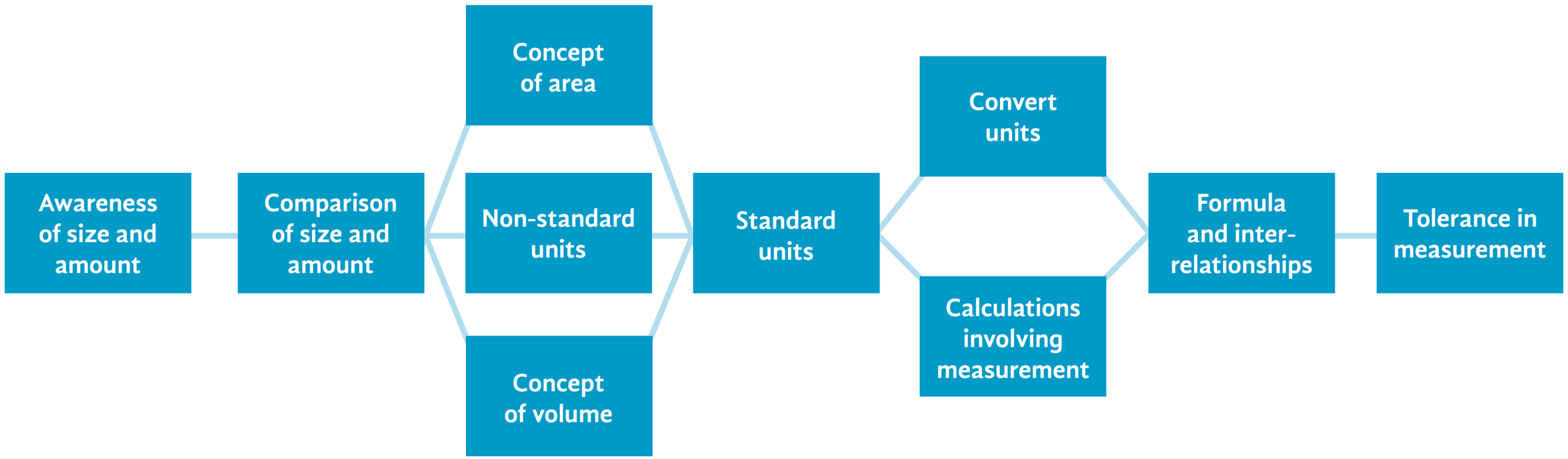
Time management

MAIN MENU

Measurement



MAIN MENU

Measurement

Awareness of size and amount

Why is it important?

An understanding of how measurements can be taken and applied in everyday contexts in an important life skill. Developing an awareness of size and amount promotes an understanding of spacial awareness and develops the specific vocabulary needed to make comparisons.

Awareness of size and amount

Awareness of size and amount

Compar of size amou

of volume

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Tolerance in measurement

MAIN MENU

Measurement

Awareness of size and amount

What is it?
Use appropriate vocabulary to describe the features of shapes and objects, linking to size and amount. Use the language of opposites and comparisons, particularly within practical situations, to develop understanding of these concepts and how they can be applied.

Previous knowledge and understanding
- In play, can group or segregate items by own criteria

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an important life skill.
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Awareness of size and amount

Awareness of size and amount

Tolerance in measurement

MAIN MENU

Measurement

Comparison of size and amount

Why is it important?

The ability to compare size and amount leads to a deeper understanding of relationships between measurements and how these can be applied to a range of situations and contexts.

Comparison of size and amount

Ordering

Conservation of size, weight and volume

Awareness of size and amount

Comp… of siz… amo…

Concept of volume

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Tolerance in measurement

MAIN MENU

Measurement

Comparison of size and amount

What is it?
Use appropriate vocabulary to describe the features of shapes and objects, linking to size and amount.

Previous knowledge and understanding

- Can talk about objects and shapes in own words and has a basic awareness of the vocabulary of comparison, e.g. taller, smaller, less, more

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of situations and contexts.

Awareness of size and amount

Comparison of size and amount

Ordering

Conservation of size, weight and volume

Concept of volume

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Tolerance in measurement

MAIN MENU

Measurement

Ordering

What is it?
Develop vocabulary associated with comparison and order objects according to set criteria and for different purposes.

Previous knowledge and understanding
- Can describe objects and shapes using own language
- Through play, can show an ability to sort and order items by own criteria

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Awareness of size and amount

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Comparison of size and amount

Ordering

Conservation of size, weight and volume

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Tolerance in measurement

MAIN MENU

Measurement

Comparison of size a

Why is it important?

The ability to compare size ar
understanding of relationship
how these can be applied to a

Awareness of size and amount

Compa of size amo

Concept of volume

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Tolerance in measurement

Comparison of size and amount

Ordering

Conservation of size, weight and volume

Conservation of size, weight and volume

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What is it?

Recognise that shapes and objects that look different can have equal length, weight or volume.

Previous knowledge and understanding

- Can compare and contrast objects and shapes to identify common properties
- Can group objects and shapes with identical properties together
- Can compare and order objects according to set criteria

MAIN MENU

Measurement

Non-standard units

Why is it important?

Measuring and estimating with non-standard units develops understanding of why standard units are necessary and help to provide an estimation of size. This leads to developing an understanding of the concept of standard units.

Non-standard units

Awareness of size and amount

Compar of size amou

of volume

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Tolerance in measurement

MAIN MENU

Measurement

Non-standard units

What is it?
Non-standard measurements can be used to develop the concept that measure and estimate of surface area can be described in terms of numerical values.

Previous knowledge and understanding
- Can apply counting skills

Non-standard units

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Awareness of size and amount

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Tolerance in measurement

MAIN MENU

Measurement

Concept of area

X

Why is it important?

The ability to compare size and amount leads to a deeper understanding of relationships between measurements and how these can be applied to a range of situations and contexts.

- Concept of area
- Understanding area
- Estimating area
- Units of area

Awareness of size and amount

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Tolerance in measurement

MAIN MENU

Measu

Concept of area

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What is it?

Develop an understanding of the concept of area through practical activities, investigation and discussion. This is related to geometric concept of enclosed area.

Previous knowledge and understanding

- Through play, have experience of investigating and comparing different objects and the amount of space they cover

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of situations and contexts.

Concept of area

Understanding area

Estimating area

Units of area

Awareness of size and amount

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Tolerance in measurement

MAIN MENU

Measurem

Awareness of size and amount

Compa of siz amo

mula inter- onships

Tolerance in measurement

X

Understanding area

What is it?

Area is used to describe the size of any surface. This includes the surface within any given 2D shape. The conservation of area is knowing that when any surface is split into smaller parts then the total area of the parts is equal to the original surface area.

Previous knowledge and understanding

- Can describe area as the amount of space covered by an object
- Understand that the amount of space taken up by a 2D object is known as area
- Understand that objects can look different but have equal areas

Concept of area

Understanding area

Estimating area

Units of area

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MAIN MENU

Measurement

Concept of area

Why is it important?

The ability to compar
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Concept of area

Understanding area

Estimating area

Units of area

Estimating area

What is it?

Use non-standard units to build an understanding of estimating the area of a surface. Then select the most appropriate standard unit for the context.

Previous knowledge and understanding

- Have an awareness of vocabulary of comparison
- Understand that an estimated value is not exact
- Can use knowledge of sizes of common objects to compare size, e.g. is bigger than, smaller than
- Understand area is the size of any surface, including the space within any 2D shape

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Awareness of size and amount

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Tolerance in measurement

MAIN MENU

Mea

Units of area

What is it?
Conventions for describing and recording experiential measurements of area are introduced when it is recognised that there is a need for a standard unit of area and initially in context to build from non-standard to standard.

Previous knowledge and understanding

- Have experience of talking about and recording area using a variety of non-standard units, e.g. hands, cubes, sticks
- Have explored a range of measuring instruments, e.g. cubes, sticks, jugs, buckets
- Can use non-standard units accurately when measuring a length
- Can apply counting skills

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Estimating area

Units of area

Awareness of size and amount

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Tolerance in measurement

MAIN MENU

Measurement

Awareness of size and amount

Compa of size amo

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Tolerance in measurement

Concept of volume

X

Why is it important?

Volume links with spatial awareness and impacts on a variety of objects encountered daily. The skills required to solve problems relating to volume are skills needed for learning, life and work.

Concept of volume

Unit of volume

Estimating volume

Capacity

Mass

MAIN MENU

Mea

Concept of volume

What is it?

Volume is the measure of space taken up by a 3D object. The conservation of volume is knowing that when any object is split into smaller parts then the total volume of the parts is equal to the original volume.

Previous knowledge and understanding

- Through play, have experience of investigating the amount different objects and containers can hold
- Explore objects with same volume but different dimensions to develop awareness of conservation of volume
- Can give examples of objects/containers where volume could be measured in relation to real-life, e.g. lunch box, water bottle, sand pit

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Concept of volume

Unit of volume

Estimating volume

Capacity

Mass

Awareness of size and amount

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Tolerance in measurement

MAIN MENU

Measurem

Awareness of size and amount

Compa of size amo

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Tolerance in measurement

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Unit of volume

What is it?

Conventions for describing and recording measurements of volume should be introduced when appropriate and initially in context.

Previous knowledge and understanding

- Understand that the amount of space taken up by a 3D object is known as volume
- Understand that objects can look different but have equal volume
- Have experience of talking about and recording volume using a variety of non-standard units, e.g. bean bags, handfuls of sand
- Can use non-standard units accurately to measure and record a range of volume
- Can apply counting skills

Concept of volume

Unit of volume

Estimating volume

Capacity

Mass

MAIN MENU

Measurement

Concept of v

Why is it importa

Volume links with
objects encounter
relating to volume

Concept of volume | Unit of volume | Estimating volume

Capacity | Mass

Estimating volume

What is it?

The ability to estimate volume is built on an understanding of how to estimate other properties of shapes, e.g. length, breadth, depth, area.

Previous knowledge and understanding

- Understand and use vocabulary of comparison
- Understand that an estimated value is not exact
- Can use knowledge of volume of common objects/containers to compare size, e.g. It has less space than this bucket
- Apply knowledge of length and area to provide an estimation of size
- Be able to estimate properties of 2D shapes, e.g. length, breadth and area

Awareness of size and amount

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Tolerance in measurement

MAIN MENU

Measurement

Awareness of size and amount

Concept of volume

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for learning, life and work.

Estimating volume

Capacity

Mass

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Tolerance in measurement

Capacity

X

What is it?
Spatial awareness of 3D objects and the amount they can contain. Interior volume of an object.

Previous knowledge and understanding
- Understand that the amount of space taken up by a 3D object is known as volume

MAIN MENU

Measurement

Concept of volume

Why is

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Mass

What is it?
A large body of matter with no definite shape.
The amount of matter in an object.

Previous knowledge and understanding
- Understand and use the vocabulary of volume and capacity

Awareness of size and amount

Compa of size amo

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Capacity

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Tolerance in measurement

MAIN MENU

Measurement

Awareness of size and amount

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Tolerance in measurement

Standard units

X

Why is it important?

Using standard units ensures a universal system of measurement which helps us to interpret, communicate and calculate measurements.

- Standard units
- Measure using standard units
- Inter-relationships between units of measurement
- Link between concept and formula of area

MAIN MENU

Me

Standard units

What is it?
Standard units are the universal system of measurement.

Previous knowledge and understanding

- Have experience of talking about and recording measurement using a variety of non-standard units, e.g. hands, cubes, sticks, handfuls of sand
- Can estimate and use non-standard units accurately when measuring and recording
- Can apply counting skills
- Have experienced standard units of measure in their own environment even if they do not understand the meaning, e.g. 2litre bottle of Cola, 25g packet of crisps

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Standard units

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Link between concept and formula of area

Awareness of size and amount

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Tolerance in measurement

MAIN MENU

Measurem

Measure using standard units

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What is it?

Use of a wide range of measuring instruments to accurately measure length, weight and volume. Awareness of a variety of types of scales should include analogue and digital and the most effective and efficient measuring instruments to be used.

Previous knowledge and understanding

- Through play, have an experience of a wide range of measuring instruments
- Understand that an agreed unit of measure is essential
- Be aware of common standard units and the appropriate use
- Understand that different measurements are required for different types of objects/shapes
- Can select an appropriate unit of measure, e.g. strides to measure the length of a classroom, cubes to measure the length of a pen

Awareness of size and amount

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Standard units

Measure using standard units

Inter-relationships between units of measurement

Link between concept and formula of area

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Tolerance in measurement

MAIN MENU

Measurement

Standard units

Why is it important?

Using standard units ens
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calculate measurements.

- Standard units
- Measure using standard units
- Inter-relationships between units of measurement
- Link between concept and formula of area

Inter-relationships between units of measurement

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What is it?

Understanding the relationship between units of measure e.g. 10mm=1cm, 100cm=1m.

Previous knowledge and understanding

- Can describe measurements using a range of units as appropriate, e.g. mm, cm, m, km, g, ml
- Understands that the metric system is structured in multiples and powers of 10
- Have an understanding of decimals and place value

Awareness of size and amount

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Tolerance in measurement

MAIN MENU

Meas

Link between concept and formula of area

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What is it?
More efficient ways of calculating surface area. Methodology should not detract from the concept of area.

Previous knowledge and understanding

- Understand the concept of area
- Be able to calculate the area of common shapes using a range of methods, e.g. cover with cubes then count, counting squares
- Understand that areas of common shapes can be calculated using a standard process
- Can apply multiplication and division facts (inverse operations) to whole numbers, fractions and decimal fractions

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Awareness of size and amount

Link between concept and formula of area

Inter-relationships between units of measurement

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Tolerance in measurement

MAIN MENU

Measurement

Convert units

X

Why is it important?

Ability to convert between units enables the most efficient and appropriate unit or measurement to be used.
It underpins the rules and concepts in many areas, e.g. science, engineering and technology.

Convert units

Selecting appropriate units

Awareness of size and amount

Compar of size amou

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Tolerance in measurement

MAIN MENU

Meas

Convert units

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What is it?
The metric system is the internationally agreed system of units. Knowledge and understanding of the inter-relationship between different units. Knowledge of appropriate prefixes and understanding the language of measurement and notation.

Previous knowledge and understanding

- Can apply multiplication and division facts (inverse operations) to whole numbers, fractions and decimal fractions
- Understand the relationship between the units within the metric system

Convert units

Selecting appropriate units

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Awareness of size and amount

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Tolerance in measurement

MAIN MENU

Measurem

Selecting appropriate units

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What is it?

Use the most appropriate unit of measurement in relation to individual contexts. The most appropriate unit of measurement is used to carry out a calculation.

Previous knowledge and understanding

- Understand the relationship between the unit of measure and the measuring instrument, e.g. cm – ruler, m – metre stick
- Understand that different objects require different units of measure
- Be able to describe common uses for the different units of measure
- Understand that changing the unit of measure impacts on the numerical value of the measure

Convert unit

Selecting appropriate units

Awareness of size and amount

Compar of size amou

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Tolerance in measurement

MAIN MENU

Measurement

Calculations involving measurements

X

Why is it important?

Calculations involving perimeter, area and volume are needed in real life contexts and enable us to work out accurate amounts.

Calculations involving measurements

Select the most appropriate calculation dependent on the situation

Awareness of size and amount

Compar of size amou

Concept of volume

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Tolerance in measurement

MAIN MENU

Meas

Calculations involving measurements

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What is it?
Carrying out calculations using the four operations involving perimeter, area and volume. Using whole numbers, fractions, decimal fractions or percentages according to context.

Previous knowledge and understanding

- Understand the terms perimeter, area and volume
- Can apply the four operations to whole numbers, fractions, decimal fractions or percentages
- Select the appropriate unit of measure
- Can convert between standard units
- Understand that using a common standard unit across all dimensions can simplify a calculation, e.g. l = 2m b = 90cm l = 200cm b = 90cm

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Calculations involving measurements

Select the most appropriate calculation dependent on the situation

Concept of volume

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Tolerance in measurement

MAIN MENU

Measurement

Select the most appropriate calculation dependent on the situation

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What is it?

Being able to apply the right calculation to fit the situation or context. Selecting the appropriate calculation, perimeter, area, or volume taking account of the dimensional aspect of the situation or context.

Previous knowledge and understanding

- Select the appropriate unit of measure
- Can apply the four operations to problems involving measure

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Calculations involving measurements

Select the most appropriate calculation dependent on the situation

Awareness of size and amount

Compar of size amou

Concept of volume

rmula d inter- ionships

Tolerance in measurement

MAIN MENU

Measurement

Formula and inter-relationships

X

Why is it important?

Formula is used to simplify the process of calculations and to calculate an unknown variable. Awareness of the inter-relationship between different formulae supports further calculations to be made, e.g. diameter=2 x radius C=πD or C=2π r

Formula

Inter-relationship

Awareness of size and amount

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of volume

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Tolerance in measurement

MAIN MENU

Me

Formula

What is it?

Specific formula are used to carry out calculations involving measurement. These provide a method for accurately and efficiently calculating perimeter area and volume. Use knowledge of the formula to be able to undertake a number of related calculations associated with length, breadth, height, area and volume. Understand the interconnectivity between the variances in the formula.

Previous knowledge and understanding

- Can apply the four operations to problems involving measure
- Understand that a common strategy can be applied to the same shape but with different dimensions, e.g. the same formula can be applied to rectangles of all sizes
- Be able to describe dimensions of shapes using length, breadth, height etc.

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Awareness of size and amount

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Formula

Inter-relationship

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Tolerance in measurement

MAIN MENU

Measuremer

Inter-relationships

X

What is it?

Understand the links between perimeter and area. Being able to work backwards and forwards when calculating measurements. Knowledge and understanding of relationships between dimensions and how to manipulate formula dependent on the context.

Previous knowledge and understanding

- Can apply common formula to calculate perimeter/ area/volume of common shapes
- Can apply the four operations to problems involving measure

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Awareness of size and amount

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of volume

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Tolerance in measurement

Formula

Inter-relationship

MAIN MENU

Measurement

Tolerance in measurement

X

Why is it important?

Relates to acceptable margins of error when measuring, estimating or calculating measurements. Understanding of tolerance in measurement is appreciation of accuracy when making calculation.

Tolerance in measurement

Awareness of size and amount

Compar of size amou

of volume

rmula d inter- ionships

Tolerance in measurement

MAIN MENU

Measurement

Tolerance in measurement

What is it?
To understand margins of error are acceptable in different contexts and the impact this could have.

Previous knowledge and understanding
- Describe when exact measurements could be difficult to calculate

Awareness of size and amount

of size amou

Tolerance in measurement

of volume

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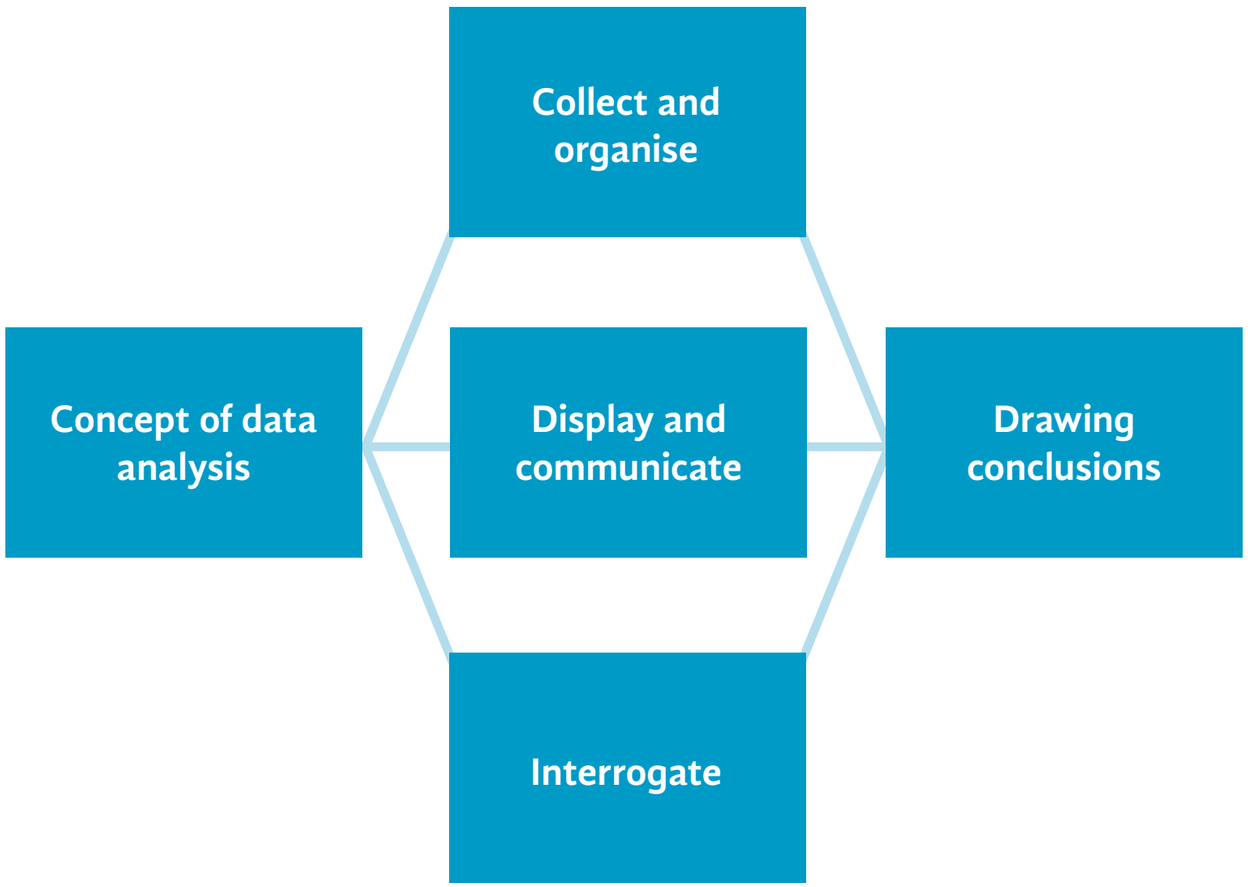
Tolerance in measurement

Data and analysis



MAIN MENU

Data and analysis

Concept of data analysis

X

Why is it important?

Data and analysis is an essential aspect of everyday life. The ability to read and analyse data is an important life skill.

Concept of data analysis

Interrogate

MAIN MENU

Data

Concept of data analysis

What is it?
Using data to make informed choices and decisions. Exploring data to make sense of the world around us.

Previous knowledge and understanding
- Understand the need to organise objects and/or information
- Awareness of different displays of data, and the use of these to make choices in everyday situations
- Awareness of appropriate vocabulary to talk about and organise data by their own criteria
- Awareness of the existence of information in different forms

Concept of data analysis

f everyday life. It is
presented in various

Interrogate

MAIN MENU

Data and analysis

Collect and organise

X

Why is it important?

Collecting and organising data and information supports decision making relevant to the context.

- Collect and organise
- Matching, sorting and comparing
- Gathering and organising

Interrogate

Dat

Collect and organise

X

What is it?
Gathering information from a variety of sources and organising it in a way that suits the audience.

Previous knowledge and understanding

- Awareness of the existence of various sources of information, e.g. self-registration, giving and receiving party invitations
- Awareness of being able to gather information by appropriate means
- Awareness of the need to organise information
- Awareness of appropriate vocabulary to collect data and begin to organise it

X

tion supports

Collect and organise

Matching, sorting and comparing

Gathering and organising

Interrogate

MAIN MENU

Data and

X

Matching, sorting and comparing

What is it?

Matching objects which have the same characteristics. As criteria increases then this become sorting, e.g. matching more than two objects. Sorting involves separating objects into groups according to their similarities or differences. Progression is made when moving from comparing individual items to comparing groups. This becomes increasingly sophisticated as learners progress their understanding.

Previous knowledge and understanding

- In play, have experience of matching, sorting and comparing using own criteria
- Have an understanding of characteristics that they are being asked to match, sort and compare with, e.g. size, colour
- Understand that objects (and data) have different characteristics (colour, size, etc.)
- Recognise these characteristics, and be able to differentiate objects based on these

Collect and organise

Matching, sorting and comparing

Gathering and organising

Interrogate

MAIN MENU

Data and analysis

Collect and orga

Why is it important?

Collecting and organisi
decision making releva

Collect and organise

Matching, sorting and comparing

Gathering and organising

Interrogate

Gathering and organising

X

What is it?

A range of information and data can be collected from a variety of appropriate sources and for many purposes. This is organised into an appropriate form; table, chart or diagram to support interrogation and analysis. Data can be organised into groups depending on the context.

Previous knowledge and understanding

- Know that data must be sourced
- Understand that, to make sense of data, one must organise it
- Have had experience of organising techniques, e.g sorting, matching, comparing
- Understand that organisation of the data is preparation for further communication

MAIN MENU

Data and analysis

Display and communicate

Why is it important?

Accuracy in displaying and communicating data is important to ensure it is clear and easily understood by the audience.

- Display and communicate
- Types of display
- Communicating findings

Interrogate

MAIN MENU

Data a

Display and communicate

X

What is it?
Sharing information in a variety of forms that can be understood by the intended audience.

Previous knowledge and understanding

- Demonstrate knowledge of appropriate organising techniques
- Know how to design a survey appropriate to level, e.g. question(s), organising response(s)
- Understand that the purpose of displaying data is communication
- Have had experience of different types of chart/ graph of appropriate complexity to the learner's level

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a logical form.

Display and communicate

Types of display

Communicating findings

Interrogate

MAIN MENU

Data and ana

Displ

Why is

To shar

Types of display

What is it?

The choice of how to display information will vary and should be appropriate for the context and the intended audience. Progression from simple bar graphs and picture charts to venn diagrams and pie charts.

Previous knowledge and understanding

- Awareness that there are different types of displays
- Understand that the purpose of displaying data graphically is to ease communication

Display and communicate

Types of display

Communicating findings

Interrogate

MAIN MENU

Data and analysis

Display and comm

Why is it important?

To share information an

Display and communicate

Types of display

Communicating findings

Interrogate

X

Communicating findings

What is it?

Presenting the findings and conclusions from the collation of information and data.

Previous knowledge and understanding

- Know how to construct diagrams/charts
- Know how to interpret diagrams/charts
- Know how to select the most appropriate display method to fit a given purpose/data set
- Understand how to compare data displays
- Understand and recognise that data collecting has a purpose
- Use appropriate vocabulary to describe displays and comparisons e.g. more than, most

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Data and analysis

Interrogate

Why is it important?

In real life situations information is provided in a variety of ways. To interrogate the information enables choices and decisions to be made.

Interrogate

Critical analysis of data

Interrogate

MAIN MENU

Data

X

Interrogate

What is it?
Simple interrogation of data is reading and extracting key information from tables, charts, graphs etc. This enables decisions around the validity and reliability of the data, e.g. in relation to sample size.

Previous knowledge and understanding
- Know where to find data in relevant displays, e.g. timetable, bar chart, pictograph
- Understand and interpret information from displays at a level appropriate to the learner
- When considering the data, have an awareness of reliability and validity, e.g. what is the sample size?

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ables choices and

Interrogate

Critical analysis of data

Interrogate

MAIN MENU

Data and an

Critical analysis of data

What is it?

Critical analysis is an indepth scrutiny of data which could include looking at trends, correlations and relationships between data.

Previous knowledge and understanding

- Knowledge and understanding of different comparison techniques
- Demonstrate ability to compare data sets in context, and with purpose, e.g. back to back stem and leaf diagram
- Understand and interpret various graphs and charts, e.g. pie charts, line graphs, scatter graphs

Interrogate

Critical analysis of data

Interrogate

MAIN MENU

Data and analysis

Drawing conclusions

X

Why is it important?

Knowing how to draw conclusions from data helps make informed choices.

- Drawing conclusions
- Reliability and validity
- Bias and sample size
- Statistical calculations

Interrogate

MAIN MENU

Data

Drawing conclusions

X

What is it?

Using the information presented in different forms and its source to draw conclusions which could affect decision making.

Previous knowledge and understanding

- Knowledge and understanding of the most appropriate graphical representation for data (line graphs, pie charts etc.)
- Knowledge and understanding of spread of data/account for outliers
- Demonstrate ability to compare data sets in context, and with purpose

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nake informed choices.

Drawing conclusions

Reliability and validity

Bias and sample size

Statistical calculations

Interrogate

MAIN MENU

Data and

Reliability and validity

X

What is it?

Reliability is the credibility of the source as well as the collation of the data. Reliability is the repeatability of a particular set of findings e.g. how accurate would the information be in a second identical information gathering activity? Reliability is a necessary ingredient for determining the overall validity of an investigation or survey and enhancing the strength of the results.

Previous knowledge and understanding

- Know how to obtain information from real life sources
- Demonstrate an awareness that not all information is equally reliable
- Understand different types of average and how these can be misleading due to the existence of outliers
- Be able to use calculations to interpret data
- Demonstrate knowledge of how to make predictions based on the data supplied

Drawing conclusions

Reliability and validity

Bias and sample size

Statistical calculations

Interrogate

MAIN MENU

Data and analysis

Drawing conc

Why is it importan

Drawing conclusio

Drawing conclusions

Reliability and validity

Bias and sample size

Statistical calculations

Interrogate

Bias and sample size

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What is it?

Bias is who or what is included in the intended sample. A biased sample can result in a non-valid data set. The size of the group can have an impact on the validity of the survey.

Previous knowledge and understanding

- Awareness of word bias
- Know how to design and interpret surveys
- Know how to display data
- Know how to draw conclusions
- Awareness of sample size
- Understand reliability of data

MAIN MENU

Data

Statistical calculations

What is it?

Statistical calculations support the evaluation and interpretation of data and draw conclusions from data.

Previous knowledge and understanding

- Has experienced working with fractions, decimal fractions and percentages in a range of contexts
- Knowledge and understanding of a range of strategies to carry out calculations
- Apply knowledge and understanding of integers, e.g. temperature
- Understanding of what averages are intended to represent

make informed choices.

Statistical calculations

Bias and sample size

Interrogate

MAIN MENU

Ideas of chance and uncertainty

Simple choice and decision making

Predicting and describing likelihood

Choice and decision making based on likelihood

Probability

Applying knowledge of probability

MAIN MENU

Ideas of chance and uncertainty

Simple choice and decision making

Simple choice and decision making

Why is it important?

Using everyday language to identify outcomes of familiar events supports the development of critical thinking skills. This enables discussion around choices and consideration of alternative options when making choices and decisions.

Simple choice and decision making

X

Applying knowledge of probability

MAIN MENU

Ideas of chance and uncertainty

Simple choice and decision making

What is it?
Describing the possible outcomes using everyday language, e.g. will happen, won't happen, always, never, sometimes.

Previous knowledge and understanding
- Understand that you can make choices

Simple choice and decision making

n making

outcomes of familiar
f critical thinking skills.
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Applying knowledge of probability

MAIN MENU

Ideas of chance and uncertainty

Simple choice and decision making

Predicting and describing likelihood

Why is it important?

Predicting and describing the likelihood of events occurring can help develop the ability to make informed choices and mathematical thinking.

Predicting and describing likelihood | Language of chance | Scale

Applying knowledge of probability

MAIN MENU

Ideas of chance and uncertainty

Simple choic and decisio making

Predicting and describing likelihood

What is it?
Using information to determine possible outcomes.

Previous knowledge and understanding
- Know and understand appropriate vocabulary for simple choice and decision making
- Have an awareness of the reasonableness of an outcome
- Be able to make simple choices and decisions

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Predicting and describing likelihood

Language of chance

Scale

X

Applying knowledge of probability

MAIN MENU

Ideas of chan ty

Simple choice and decision making

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Language of chance

What is it?
Being able to classify outcomes using appropriate language, e.g. likely, certain.

Previous knowledge and understanding
- Know and understand appropriate vocabulary of chance
- Be able to make and justify simple choices and decisions
- Verbally justify reasons for outcomes using appropriate vocabulary

Predicting and describing likelihood

Language of chance

Scale

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Applying knowledge of probability

MAIN MENU

Ideas of chance and uncertainty

Simple choice and decision making

Predicting and desc

Why is it important?

Predicting and describing t
can help develop the ability
mathematical thinking.

Predicting and describing likelihood

Language of chance

Scale

Scale

What is it?
Knowledge of the numerical scale to describe probability 0-1.

Previous knowledge and understanding
An awareness of scale
Understand the concepts of certainty and impossibility
Awareness the vocabulary of chance and uncertainty

X

Applying owledge of probability

MAIN MENU

Ideas of chance and uncertainty

Simple choice and decision making

Choice and decision making based on likelihood

X

Why is it important?

Developing an understanding of how likely an event is to happen will support the decision making process.

- Choice and decision making based on likelihood
- Conducting chance experiments
- Order the chance of specified outcomes

Applying knowledge of probability

MAIN MENU

Ideas c certainty

Simple choice and decision making

Choice and decision making based on likelihood

What is it?
Likelihood is the probable chance of an event occurring and using this information to make informed choices.

Previous knowledge and understanding
Know and understand appropriate vocabulary for likelihood, e.g. impossible, possible, certain
Understand their predictions of outcomes based on past experiences
Have an awareness that you can predict probability based on described likelihood of past events

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y likely an event is to
king process.

Choice and decision making based on likelihood

Conducting chance experiments

Order the chance of specified outcomes

Applying knowledge of probability

MAIN MENU

Ideas of c

Simple choice and decision making

X

Conducting chance experiments

What is it?

Practical experiments to support understanding of possible outcomes and the likelihood of an event occurring.

Previous knowledge and understanding

- Know and understand appropriate vocabulary for likelihood, e.g. impossible, possible, certain
- Understand how to predict probability based on described likelihood of past events
- Know how to explain possible outcomes in the context of probability
- Awareness of desired outcome(s), e.g. picking a red counter from a bag of red, blue and green
- Understand certainty and impossibility

Choice and decision making

Conducting chance experiments

Order the chance of specified outcomes

Applying knowledge of probability

MAIN MENU

Ideas of chance a

Simple choice and decision making

Choice and c
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Why is it importa

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Choice and decision making | Conducting chance experiments | Order the chance of specified outcomes

of probability

Order the chance of specified outcomes

X

What is it?

Use the numerical value to order events from most likely to least likely.

Previous knowledge and understanding

- Know the scale between 0-1
- Know that probability can be represented by a numerical scale from 0 to 1 inclusive, using the appropriate language, e.g. possible, certain, evens
- Demonstrate ability to order probabilities of particular events, appropriate to level using appropriate language, e.g possible
- Know and understand place value with especially decimal fractions
- Know the interrelationship between fractions, decimal fractions and percentages

MAIN MENU

Ideas of chance and uncertainty

Simple choice and decision making

Probability

Why is it important?

Calculating theoretical probability helps build an understanding of the consequences of events and likelihood of an event occurring.

- Probability
- Assigning numerical values
- Interpreting probability
- Notation

Applying knowledge of probability

MAIN MENU

Idea

ertainty

X

Probability

What is it?
The likelihood of an event occurring. Many events cannot be predicted with total certainty.

Previous knowledge and understanding

- Know and understand appropriate vocabulary for probability, e.g. impossible, possible, certain
- Know that probability can be represented by a numerical scale from 0 to 1 inclusive
- Understand the concepts of mathematical certainty and impossibility
- Be able to describe a simple outcome's probability by placing it on the scale, with divisions appropriate to level

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Simple choice and decision making

Probability

Assigning numerical values

Interpreting probability

Notation

Applying knowledge of probability

MAIN MENU

Ideas

Assigning numerical values

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What is it?

A probability scale is used to numerically represent the probability of an event occurring. The numerical representation can be in the form of fractions, decimal fractions or percentages within a scale of 0-1 or 0-100%. The probability of any possible mutually exclusive event happening is 1, i.e. certain.

Previous knowledge and understanding

- Know that probability can be represented by a numerical scale from 0 to 1 inclusive
- Be able to describe a simple outcome's probability by placing it on the scale, with divisions appropriate to level
- Know how to construct a numerical representation of probability
- Know and understand appropriate vocabulary for probability, e.g. mutually exclusive
- Relate vocabulary to the probability scale fluently
- Understand and be able to use fractional notation
- Know and understand place value especially decimal fractions
- Know and understand the interrelationship between fractions, decimal fractions and percentages

Simple choice and decision making

Probability

Assigning numerical values

Interpreting probability

Notation

Applying knowledge of probability

MAIN MENU

Ideas of chance a

Probability

Why is it importar

Calculating theore
understanding of t
of an event occurr

Simple choice and decision making

Applying knowledge of probability

Probability

Assigning numerical values

Interpreting probability

Notation

Interpreting probability

What is it?

Using the numerical representation to determine the likelihood of the event happening to inform decision making.

Previous knowledge and understanding

- Know that probability can be represented by a numerical scale from 0 to 1 inclusive
- Be able to describe a simple outcome's probability by placing it on the scale, with divisions appropriate to level
- Know how to construct a numerical representation of probability
- Awareness that the numerical representation of an outcome, can predict future outcomes

X

MAIN MENU

Ideas of chance and uncertainty

Simple and de… mak…

Notation

What is it?
A method of expressing the probability of an event occurring using a mathematical statement.

Previous knowledge and understanding
- Know that probability can be represented by a numerical scale from 0 to 1 inclusive
- Know how to construct a numerical representation of probability
- Know how to order probabilities based on numerical scale 0-1
- Understand place value especially decimal fractions
- Know and understand the interrelationship between fractions, decimal fractions and percentages

Notation

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…vents and likelihood

Interpreting probability

Applying knowledge of probability

Ideas of chance and uncertainty

Simple choice and decision making

Applying knowledge of probability

X

Why is it important?

Understanding and being able to quantify risks helps us to make more informed decisions.

Applying knowledge of probability

Formula

Applying knowledge of probability

MAIN MENU

Applying knowledge of probability

X

What is it?

The ability to assess risk involves considering all the possible outcomes and planning for them. This would include understanding of chance experiments involving repeated trials often with the use of technology.

Previous knowledge and understanding

- Know and understand how to use numerical representations of probability
- Know how to give the probability of an event happening or not occurring
- Demonstrate awareness of how influencing the possible outcomes affects the probability of the desired outcome
- Know the difference between theoretical and experimental probability, e.g. you CAN toss a coin 3 times and get 3 heads.
- Awareness of the concept of risk, and how this affects real life, e.g. insurance
- Understand chance and experiments
- Understand sample size and its relationship to reliability and validity

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and decision making

Applying knowledge of probability

Formula

Applying knowledge of probability

MAIN MENU

Ideas of c

Simple choice and decision making

Formula

X

What is it?
Is used to calculate the probability of an event occurring.

Previous knowledge and understanding

- Know that probability can be represented by a numerical scale from 0 to 1 inclusive
- Be able to describe a simple outcome's probability by placing it on the scale, with divisions appropriate to level
- Know how to construct a numerical representation of probability
- Know and understand appropriate vocabulary for probability, e.g. mutually exclusive
- Relate vocabulary to the probability scale fluently
- Understand sample size and its relationship to reliability and validity

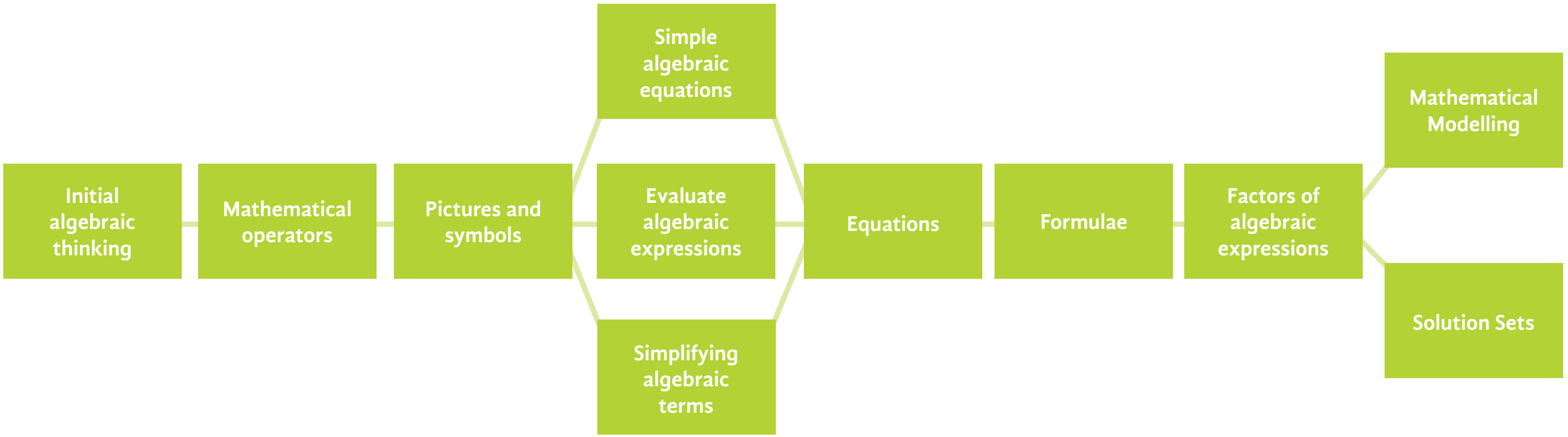
Applying knowledge of probability

Formula

Applying knowledge of probability

MAIN MENU

Expressions and equations



MAIN MENU

Expressions and equations pathway showing

Initial algebraic thinking

X

Why is it important?

Developing early algebraic thinking will lay the foundations for learners to be more successful in achieving the associated key milestones for the progression pathway in algebra.

Initial algebraic thinking

Initial algebraic thinking

Mathematical operators

Simplifying algebraic terms

Factors of algebraic expressions

Mathematical Modelling

Solution Sets

MAIN MENU

Expressions and equations pathway showi

Initial algebraic thinking

What is it?
Initial algebraic thinking is understanding the order of numbers, their place on the number line and how they can be combined. This is an essential step to developing algebraic capabilities.

Previous knowledge and understanding
- Basic number bonds
- The concept of the number line
- The order of numbers on a number line

will lay the foundations
achieving the
rogression pathway in

Initial algebraic thinking

Initial algebraic thinking

Mathematical operators

Simplifying algebraic terms

Factors of algebraic expressions

Mathematical Modelling

Solution Sets

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Expressions and equations pathway show

Mathematical operators

Why is it important?

Being able to use and interpret mathematical symbols is a necessary skill in developing an understanding of algebra.

Initial algebraic thinking

M

Mathematical operators

Equality and balance

Inequality and imbalance

Greater than/ less than

Simplifying algebraic terms

s

Mathematical Modelling

Solution Sets

MAIN MENU

Expressions and equations pathway sho

X

Mathematical operators

What is it?
Symbols are part of the universal language of mathematics.

The four operators +, –, ×, ÷ are the first set of symbols that learners usually become familiar with. These symbols allow mathematical statements to be expressed in as short and concise a way as possible.

X

…ematical symbols is a necessary skill in …ebra.

Initial algebraic thinking

M…

Mathematical operators

Equality and balance

Inequality and imbalance

Greater than/ less than

Simplifying algebraic terms

…s

Mathematical Modelling

Solution Sets

MAIN MENU

Expressions and equations pathway show

Math

Why is

Being a … necessary skill in develo…

Equality and balance

What is it?

The equal sign indicates that one quantity is the same as another. Visualising the equals sign (=) as a balance point is very useful as algebraic operations progress and extend to more challenging equations.

Mathematical operators | Equality and balance | Inequality and imbalance | Greater than/ less than

Initial algebraic thinking

M…

Simplifying algebraic terms

…s

Mathematical Modelling

Solution Sets

MAIN MENU

Expressions and equations pathway show

Mathematical operators

Why is it important?

Being able to use and interp
developing an understandir

Inequality and imbalance

What is it?

A symbol for “is not equal to” (≠) is required when quantities on either side do not have the same value.

Mathematical operators | Equality and balance | Inequality and imbalance | Greater than/ less than

Initial algebraic thinking

M

Simplifying algebraic terms

s

Mathematical Modelling

Solution Sets

MAIN MENU

Expressions and equations pathway show

Mathematical operators

Why is it important?

Being able to use and interpret mathematical syr
developing an understanding of algebra.

Initial algebraic thinking

M

Mathematical operators

Equality and balance

Inequality and imbalance

Greater than/ less than

Simplifying algebraic terms

s

hematical odelling

Solution Sets

X

Greater than/less than

What is it?

Symbols to represent 'greater than' (>), 'less than' (<), 'greater than or equal to' (≥) and 'less than or equal to' (≤) are also part of the language of algebra.

Previous knowledge and understanding

- Recognising the four operations
- Confidence with number bonds
- The order of numbers on the number line

MAIN MENU

Expressions and equations pathway showing

Pictures and symbols

X

Why is it important?

Understanding that numbers, and operators, can be replaced by pictures or symbols is fundamental to all algebraic thinking. Introducing the concept of 'finding the unknown quantity', or operator, is an essential step in developing the ability to work with expressions and solve equations.

Pictures and symbols

Abstract Thinking

Initial algebraic thinking

Mathematical operators

Simplifying algebraic terms

Factors of algebraic expressions

Mathematical Modelling

Solution Sets

MAIN MENU

Expres s pathway showi

Pictures and symbols

What is it?
A picture or symbol that replaces a certain number, or operator, in one equation or expression can have a completely different value in another equation or expression. A picture or symbol can represent a number or operator but not necessarily the same number all the time. The understanding of variability is important in algebra.

Previous knowledge and understanding
- The concept of greater than and less than when relating to the number line

can be replaced
lgebraic
the unknown
eveloping the
uations.

Initial algebraic thinking

Mathematical operators

Pictures and symbols

Abstract Thinking

Simplifying algebraic terms

Factors of algebraic expressions

Mathematical Modelling

Solution Sets

MAIN MENU

Expressions and equations pathway showing

Pictures and symbols

Why is it important?

Understanding that symbols can represent numbers and how to work by pictures and symbols is a key part of algebraic thinking. Understanding quantities and how they relate to each other is the ability t

Abstract Thinking

What is it?

Abstract thinking is about thinking logically without the use of concrete material or visual representations.

Initial algebraic thinking

Mathematical operators

Pictures and symbols

Abstract Thinking

Simplifying algebraic terms

Factors of algebraic expressions

Mathematical Modelling

Solution Sets

MAIN MENU

Expressions and equations pathway showing

Simple algebraic equations

X

Why is it important?

Moving from pictures or symbols to letters paves the way for solving algebraic equations and evaluating algebraic expressions. This also helps develop an understanding of variables and constants.

Initial algebraic thinking

Mathematical operators

Simple algebraic equations

Developing approaches to solving equations

Simplifying algebraic terms

Factors of algebraic expressions

Mathematical Modelling

Solution Sets

MAIN MENU

Expressions and equations pathway showing

Simple algebraic equations

Why is it important?

paves the way
ng algebraic
erstanding of

Simple algebraic equations

What is it?
Simple algebraic equations (variables to a power are not included) that have one variable or one letter have one correct solution, e.g. $4 + x = 9$.

Initial algebraic thinking

Mathematical operators

Simple algebraic equations

Developing approaches to solving equations

Simplifying algebraic terms

Factors of algebraic expressions

Mathematical Modelling

Solution Sets

MAIN MENU

Expressions a… …way showing

Simp…

Why is …

Moving … for solv… expres… variabl…

Developing approaches to solving equations

What is it?

A sound knowledge of number facts will support the ability to solve simple algebraic equations. Learners may use their knowledge of inverse operations to find solutions when the equations become progressively more challenging.

Previous knowledge and understanding

- Using pictures to represent numbers
- Number bond problems involving pictures or symbols
- The significance of the = sign and its link to balance

Simple algebraic equations

Developing approaches to solving equations

Initial algebraic thinking

Mathematical operators

Simplifying algebraic terms

Factors of algebraic expressions

Mathematical Modelling

Solution Sets

MAIN MENU

Expressions and equations pathway showing

Simplifying algebraic terms

X

Why is it important?

Many problems involve a number of algebraic terms, some of which have common variables. Being able to simplify this combination of terms makes solving the problem considerably less challenging.

Initial algebraic thinking

Mathematical operators

Simplifying algebraic terms

Simplifying algebraic terms

Factors of algebraic expressions

Mathematical Modelling

Solution Sets

MAIN MENU

Expressions and equations pathway showi

X

Simplifying algebraic terms

What is it?

The simplification of like terms, or collecting like terms, is the process of writing a combination of different algebraic terms in as compact a way as possible.

Previous knowledge and understanding

- Familiarity with algebraic conventions, e.g. $a + a = 2a$ and $1a$ is always written as a
- The properties of basic geometric shapes for context

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Expressions and equations pathway showing

Evaluate algebraic expressions

Why is it important?

Substituting given values into algebraic expressions and consequently obtaining a value for the expression is important in mathematical modeling. Understanding that the values to be substituted into the expressions can change allows different problems to be solved.

Evaluate algebraic expressions

Substitution

Variables

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Expressions and equations pathway showing

Evaluate algebraic expressions

Why is it important?

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Evaluate algebraic expressions

What is it?
Evaluating is performing the calculations which are implied in the expression to find the value of an algebraic expression.

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Evaluate algebraic expressions

Why is

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Substitution

What is it?

Substitution is replacing a letter in an algebraic expression with a numerical value. Different letters can be assigned different numerical values, unless they are constants such as Pi (π). If a letter appears more than once in an expression, the same numerical value is assigned each time.

Evaluate algebraic expressions

Substitution

Variables

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Why is it important?

Substituting given values into
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allows different problems to b

Evaluate algebraic expressions

Substitution

Variables

Variables

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What is it?

A variable quantity, as its name suggests, can change in value. In algebra, letters can be assigned a number.

Previous knowledge and understanding

- Familiarity with algebraic convention, e.g. $3c = 3 \times c = c + c + c$
- Simplifying groups of like terms
- Using the four operations

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Expressions and equations pathway showing

Equations

Why is it important?

Translating a real problem from words into a simple equation demonstrates the importance and relevance of mathematics. Being able to form equations from written, pictorial or spoken information is fundamental to mathematical modelling.

- Equations
- Forming simple equations from statements and problems
- Solving equations

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Expressions and equations pathway showing

Equations

Why is it important?

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Equations

What is it?
Equations use letters, numbers, signs and symbols and allow given situations or conditions to be expressed in the most concise way possible.

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Simplifying algebraic terms

Equations

Forming simple equations from statements and problems

Solving equations

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Expressions and equations pathway showing

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Forming simple equations from statements and problems

What is it?

Letters are assigned to each variable and appropriate mathematical signs are used to imply the correct calculation. Simple equations will normally have one variable and one solution. Familiarity with integers and fractions allows scope for forming equations that may not have whole number solutions. The facts and properties of geometric shapes can be used to form simple equations.

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Equations

Forming simple equations from statements and problems

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Expressions and equa showing

Equations

Why is it important?

Translating a real problem from equation demonstrates the imp of mathematics. Being able to f written, pictorial or spoken info mathematical modelling.

Equations | Forming simple equations from statements and problems | Solving equations

Solving equations

What is it?

An equals symbol (=) and language such as 'solve' would indicate that a numerical value has to be found.
An equation can be solved using different procedures.
Solutions to equations can be found algebraically or graphically. Solving an equation or inequation can result in a unique solution (one answer), an interval of values or a choice of individual values.

Previous knowledge and understanding

- Solving simple equations
- The properties of geometric shapes for context

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Expressions and equations pathway showing

Formulae

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Why is it important?

Being able to use formulae is essential in many areas of the curriculum and beyond. Being able to construct a formula supports the type of problem solving skills needed in many occupations in the modern world.

Formulae

Creating formulae and generating solutions

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Expressions and equations pathway showing

Formulae

X

Formulae

What is it?
Formulae show the proven relationship between quantities using letters, signs and symbols and describe the calculations needed to evaluate any given quantity. Some formulae can have constants involved as well as letters for each variable. Formulae can involve a combination of constants and letters.

Formulae

Creating formulae and generating solutions

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Creating formulae and generating solutions

What is it?

Formulae are created by comparing the relationship between different quantities and obtaining a rule that links these quantities.

Solutions can be found from the calculations involved in using formulae. Formulae are a mechanism for producing different output values dependent on the values substituted in the first place. Simple formulae are ideal for comparing changes in output with changes in input.

Previous knowledge and understanding

- Letters can represent quantities, e.g. *P* can represent perimeter (important reminder: if the perimeter was 20cm then P would represent 20 and *P*cm would be 20cm)
- Algebraic conventions, e.g. abc means $a \times b \times c$, a x $a = a^2$

Formulae

Creating formulae and generating solutions

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Expressions and equations pathway showing milestones

Factors of algebraic expressions

Why is it important?

The ability to factorise algebraic expressions enables more complex equations to be solved in an efficient manner.

- Factors of algebraic expressions
- Recognising common factors
- Understanding the distributive law

Initial algebraic thinking

Mathematical operators

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Expressions and equations pathway showing milestones

Factors of algebraic expressions

What is it?
This development builds on the previous work and now involves common algebraic factors as well as numerical factors and the use of brackets to represent the factorised terms.

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Initial algebraic thinking

Mathematical operators

Factors of algebraic expressions

Recognising common factors

Understanding the distributive law

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Expressions and equations pathway showing milestones

Facto

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Recognising common factors

What is it?

When comparing the factors of two or more terms, being able to list factors that are common, is important. The concept of a 'highest common factor' is critical to factorising fully an expression.

Factors of algebraic expressions

Recognising common factors

Understanding the distributive law

Initial algebraic thinking

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Expressions and equa showing milestones

Factors of algebraic e

Why is it important?

The ability to factorise algebr
complex equations to be solv

Factors of algebraic expressions | Recognising common factors | Understanding the distributive law

Understanding the distributive law

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What is it?

The distributive law highlights a basic mathematical process and its equivalent inverse process. Multiplying the sum of two numbers by a third number is the same as multiplying the two numbers individually by the third number first and then finding the sum of the two new numbers formed. $a\,(b + c) = ab + ac$

Previous knowledge and understanding

- The factors of a number
- Listing common factors for two or more numbers
- Recognising the highest common factor
- Algebraic convention, e.g. $6a = 3 \times 2a$

Initial algebraic thinking

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Expressions and equations pathway showing

Mathematical modelling

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Why is it important?

Many problems in manufacturing, engineering, technology and science require the skills involved in mathematical modelling. This ability to construct, interpret and solve equations or inequations that represent a real life, or theoretical, situation are fundamental to the process.

Mathematical modelling

Solving inequalities

Initial algebraic thinking

Mathematical operators

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Mathematical Modelling

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Expressions and equations pathway showi

Mathematical modelling

What is it?

Mathematical modelling is a skill that involves translating a complex problem into the most concise algebraic form. It is the ability to read and interpret a problem, to express the information appropriately as an equation, inequation, inequality or formula, to solve it and to be able to communicate the answer using the context of the original information.

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Initial algebraic thinking

Mathematical operators

Mathematical modelling

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Mathematical modelling

Solving inequalities

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Solving inequalities

What is it?

Solving inequalities is the idea of a set of possible solutions. An inequality does not have an 'equality' sign but instead uses either 'greater than' sign, 'greater than or equal to' sign, 'less than' sign or 'less than or equal to' sign. The same concepts and skills used to solve equations can help to solve inequalities. It is important to stress that attention should be paid to the conditions that are applied to the inequality as this will impact on what is permitted in the solution set.
e.g. $x \geq 5$, where x is a single digit whole number

Previous knowledge and understanding

- Changing words and diagrams into algebraic form
- The properties of geometric shapes for context
- Angle classifications, e.g. complementary and supplementary angles

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Expressions and equations pathway showing milestones

Solution sets

Why is it important?

Many mathematical problems can have more than one solution. The ability to list all possible solutions is essential in mathematical problems of this type.

Solution sets

Initial algebraic thinking

Mathematical operators

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Solution Sets

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Solution sets

What is it?

A solution set is a set of numbers that lists all possible solutions to a given mathematical problem. In many cases the solution lies within defined mathematical sets.
E.g. Whole numbers {0, 1, 2, 3,...}, Natural numbers (1, 2, 3, ...}, Integers {....., -2, -1, 0, 1, 2, ...} and Real numbers {all points on an infinitely long number line (e.g. fractions, decimal fractions, roots, π, ...)}

Previous knowledge and understanding

- Equations, inequations and formulae

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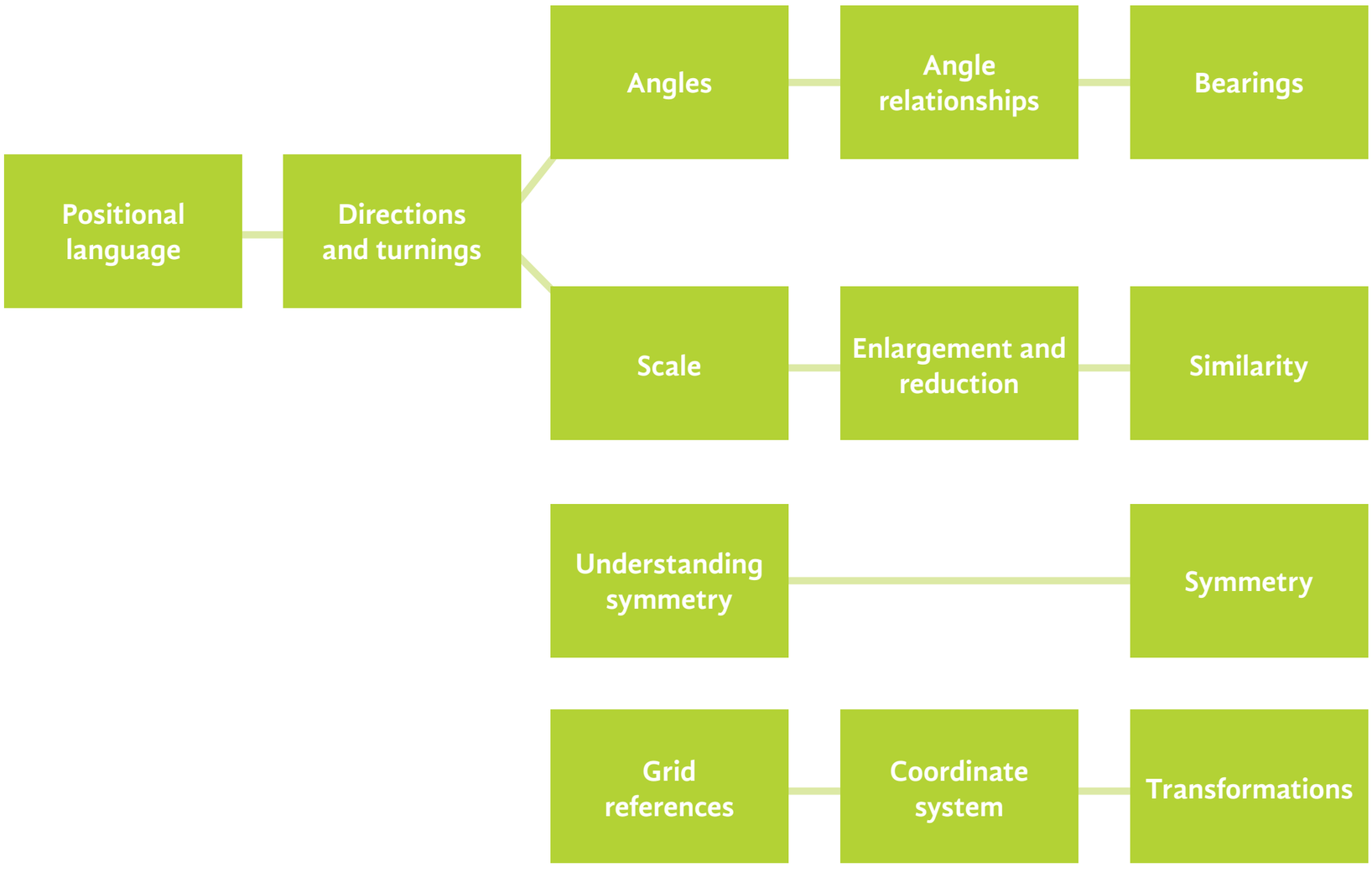
Solution Sets

Angles, symmetry and transformation



MAIN MENU

Angles, symmetry and transformation

Positional language

Positional language

Why is it important?

The use of positional language is one of the first steps in understanding spatial awareness.

Positional language

symmetry

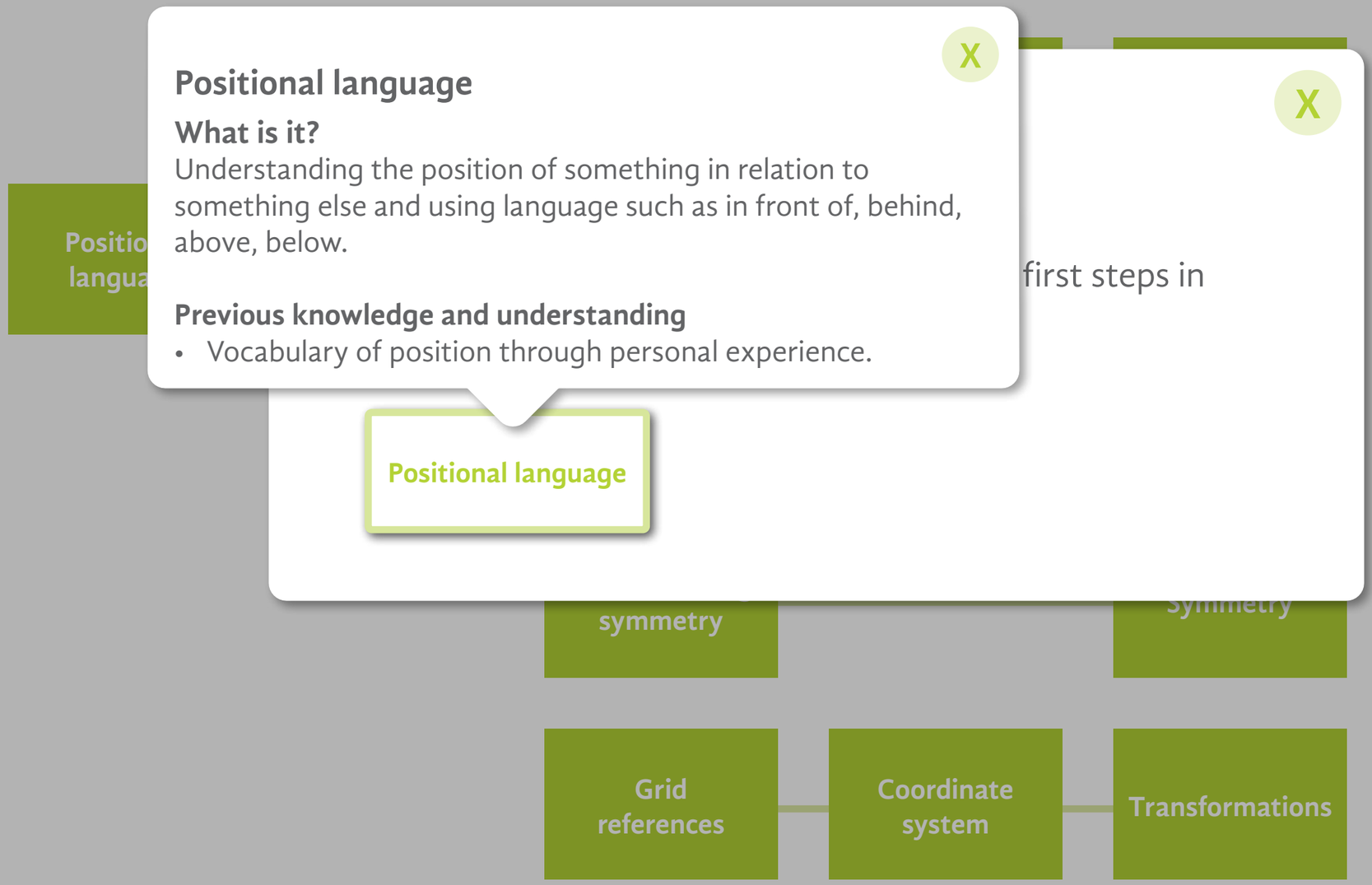
Symmetry

Grid references

Coordinate system

Transformations

Angles, symmetry and transformation



MAIN MENU

Angles, symmetry and transformation

Positional language

Directions & turnings

Why is it important?

Being able to follow and give directions is a necessary life skill that allows local areas to be efficiently navigated. It also develops basic map reading skills.

Directions & turnings

Cardinal compass points

symmetry

Symmetry

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Angles, symmetry and transformation

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Directions & turnings

What is it?
A description of personal locations, following and giving directions using language such as forwards, backwards, left, right, clockwise, anti-clockwise as well as North, South, East and West.

Directions & turnings

Cardinal compass points

X

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Angles, symmetry and transformation

Positional language

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Cardinal compass points

What is it?
Understanding that the points of the compass can be used to describe and give directions.

Previous knowledge and understanding
- Understand and follow instructions

Directions & turnings

Cardinal compass points

symmetry

Symmetry

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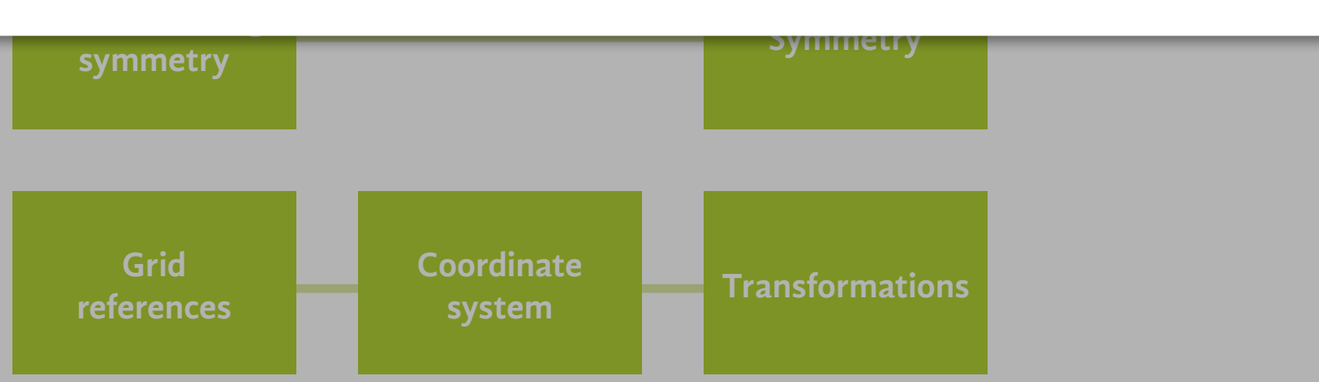
Angles, symmetry and transformation

Angles

Why is it important?

A knowledge of angles is required for the understanding of position and geometrical properties of shapes.

- Angles
- Classifying angles
- Measuring Angles
- Drawing Angles
- Compass points and angles



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Angles, symmetry and transformation

Angles

What is it?
An angle measures amount of turning. Understanding the relationship between the vocabulary of direction and the associated angle, e.g. ¼ turn = 90°.

Previous knowledge and understanding
- Vocabulary associated with position: to the right of etc.

nderstanding of
es.

Angles | Classifying angles | Measuring Angles | Drawing Angles | Compass points and angles

symmetry | Symmetry

Grid references | Coordinate system | Transformations

MAIN MENU

Angles, symmetry and transformation

Angles

Why is

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Classifying angles

What is it?
Angles can be classified depending on their size, e.g. acute is less than 90º.

Angles | Classifying angles | Measuring Angles | Drawing Angles | Compass points and angles

symmetry

Symmetry

Grid references — Coordinate system — Transformations

MAIN MENU

Angles, symmetry and transformation

Angles

Why is it important?

A knowledge of angles is rec
position and geometrical pro

Measuring Angles

What is it?

Angles are measured in degrees (°) using a protractor.

Angles | Classifying angles | Measuring Angles | Drawing Angles | Compass points and angles

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Angles, symmetry and transformation

Angles

Why is it important?

A knowledge of angles is required for the underst
position and geometrical properties of shapes.

Drawing Angles

What is it?

Making use of ruler and protractor to accurately measure and draw a given angle.

Angles | Classifying angles | Measuring Angles | Drawing Angles | Compass points and angles

symmetry | Symmetry

Grid references | Coordinate system | Transformations

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Angles, symmetry and transformation

Angles

Why is it important?

A knowledge of angles is required for the understanding of position and geometrical properties of shapes.

X

Compass points and angles

What is it?

Investigate the angle between two compass points.

X

Angles | Classifying angles | Measuring Angles | Drawing Angles | Compass points and angles

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Angles, symmetry and transformation

Angle Relationships

Why is it important?

An understanding of the angle relationships in 2D diagrams allows for the calculation of missing angles.

Angle Relationships | Naming angles | Angles in geometric shapes and intersecting lines | Angles and circles

Position
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symmetry

Symmetry

Grid references — Coordinate system — Transformations

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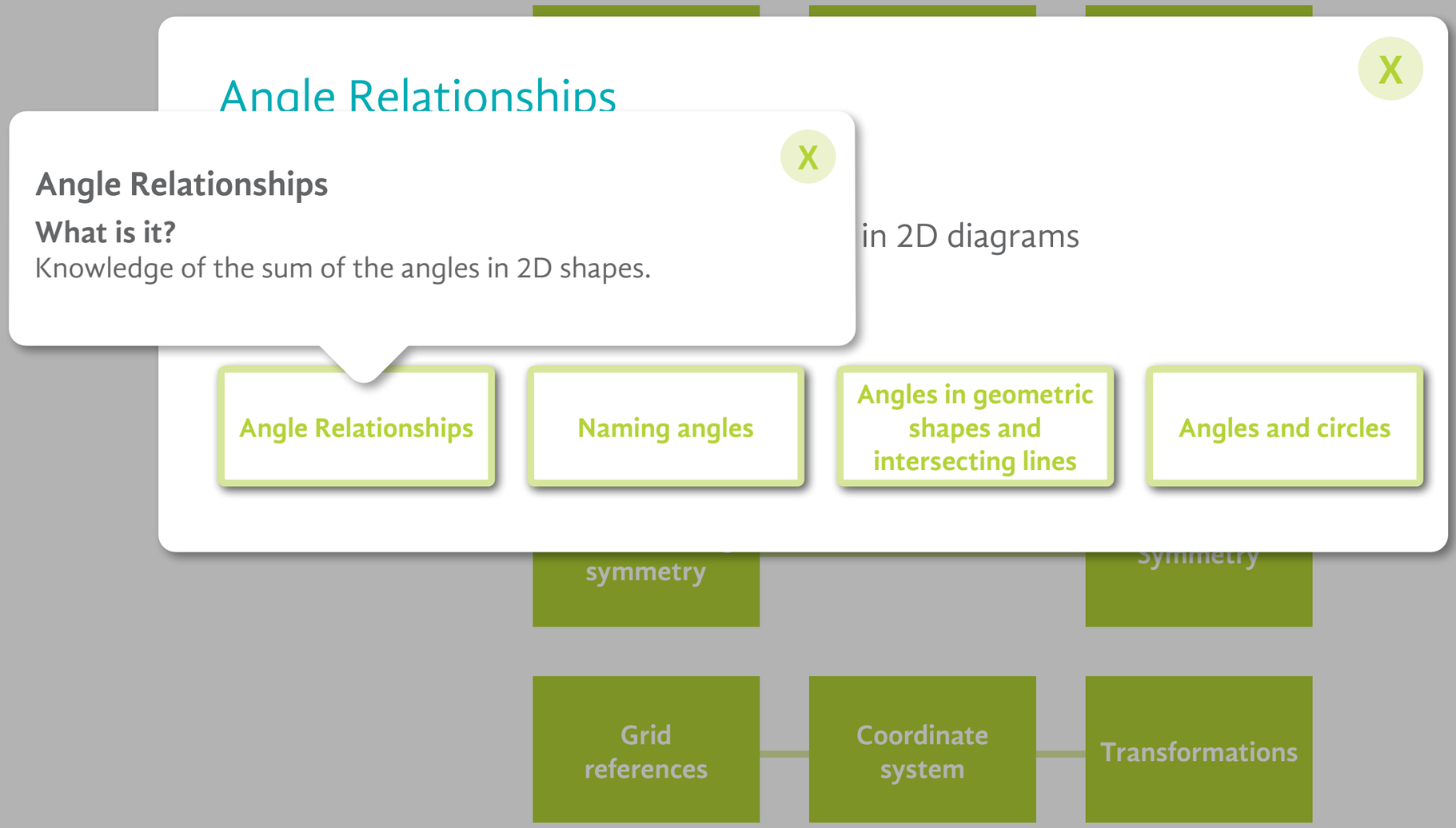
Angles, symmetry and transformation



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Angles, symm n

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Position
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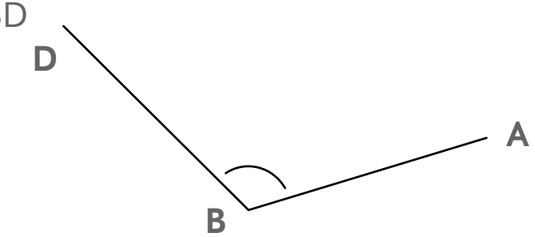
Naming angles

What is it?

Angles are named using three letters. These are written at the vertex and at the ends of the two arms that form the angle. The vertex is always the middle of the three letters.

This angle is made from two arms, AB and BD, with vertex at B.
<DBA or <ABD



Angle Relationships | Naming angles | Angles in geometric shapes and intersecting lines | Angles and circles

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Angle Relationships

Why is it important?

An understanding of the an
allows for the calculation of

Angle Relationships | Naming angles | Angles in geometric shapes and intersecting lines | Angles and circles

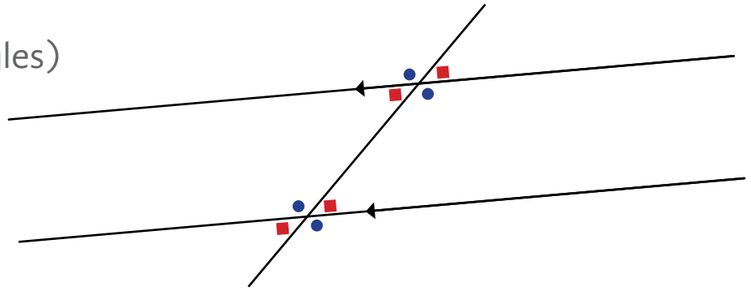
Angles in geometric shapes and intersecting lines

X

What is it?

- Knowledge of the sum of the angles in 2D shapes.
- The conditions for complementary (add up to 90°) and supplementary (add up to 180°) angles.
- The occurrence of corresponding and alternate angles in parallel lines.
- The occurrence of vertically opposite angles.

(F, Z and X angles)



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Angles, symmetry and transfo

Angle Relationships

Why is it important?

An understanding of the angle relationships in 2D allows for the calculation of missing angles.

Angle Relationships | Naming angles | Angles in geometric shapes and intersecting lines | Angles and circles

Angles and circles

X

What is it?

A tangent is a straight line that touches the diameter of a circle at one point only. If a radius is also drawn to this point then the resulting angle between radius and tangent is right-angled and so the tangent is perpendicular to the radius at the point of contact. Understand that a triangle formed using the end-points of the diameter of a circle and the third point rests on the circumference of the circle will always be right-angled.

Previous knowledge and understanding

- The meaning of perpendicular

Position language

symmetry

Symmetry

Grid references — Coordinate system — Transformations

MAIN MENU

Angles, symmetry and transformation

Bearings

Why is it important?

Understanding bearings is essential for the daily safety of millions when travelling on planes or ships at sea.

Bearings

Positional language

symmetry

Symmetry

Grid references

Coordinate system

Transformations

MAIN MENU

Angles, nation

Bearings

What is it?
Understanding the convention used when describing a bearing. Being able to link all standard compass points with their associated bearings. Being able to construct accurate scale drawings for journeys involving distances and bearings.

Previous knowledge and understanding
- Scale drawing
- Points on a compass
- Measuring angles
- Complimentary and supplementary angles

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t sea.

Bearings

symmetry

Symmetry

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MAIN MENU

Angles, symmetry and transformation

Positional language

Scale

Why is it important?

Scale is essential for regularly encountered contexts such as maps, plans and modelling.

Scale

X

symmetry

Symmetry

Grid references

Coordinate system

Transformations

MAIN MENU

Angles, symmetry and transformation

Scale

What is it?
Understanding scale factors and using them to solve problems that relate to similar objects, shapes, maps and plans. Choose an appropriate scale to draw journeys where all actual information is given.

Previous knowledge and understanding
- Ratio
- Measuring and drawing angles

Scale

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context such as

symmetry

Symmetry

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Transformations

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Angles, symmetry and transformation

Enlargement and Reduction

X

Why is it important?

Enlargement of molecular structures assists with investigations into cells and supports medical advancements. Reduced scale models are commonly used in wind tunnels to determine wind resistance etc.

Enlargement and reduction

Positional language

symmetry

Symmetry

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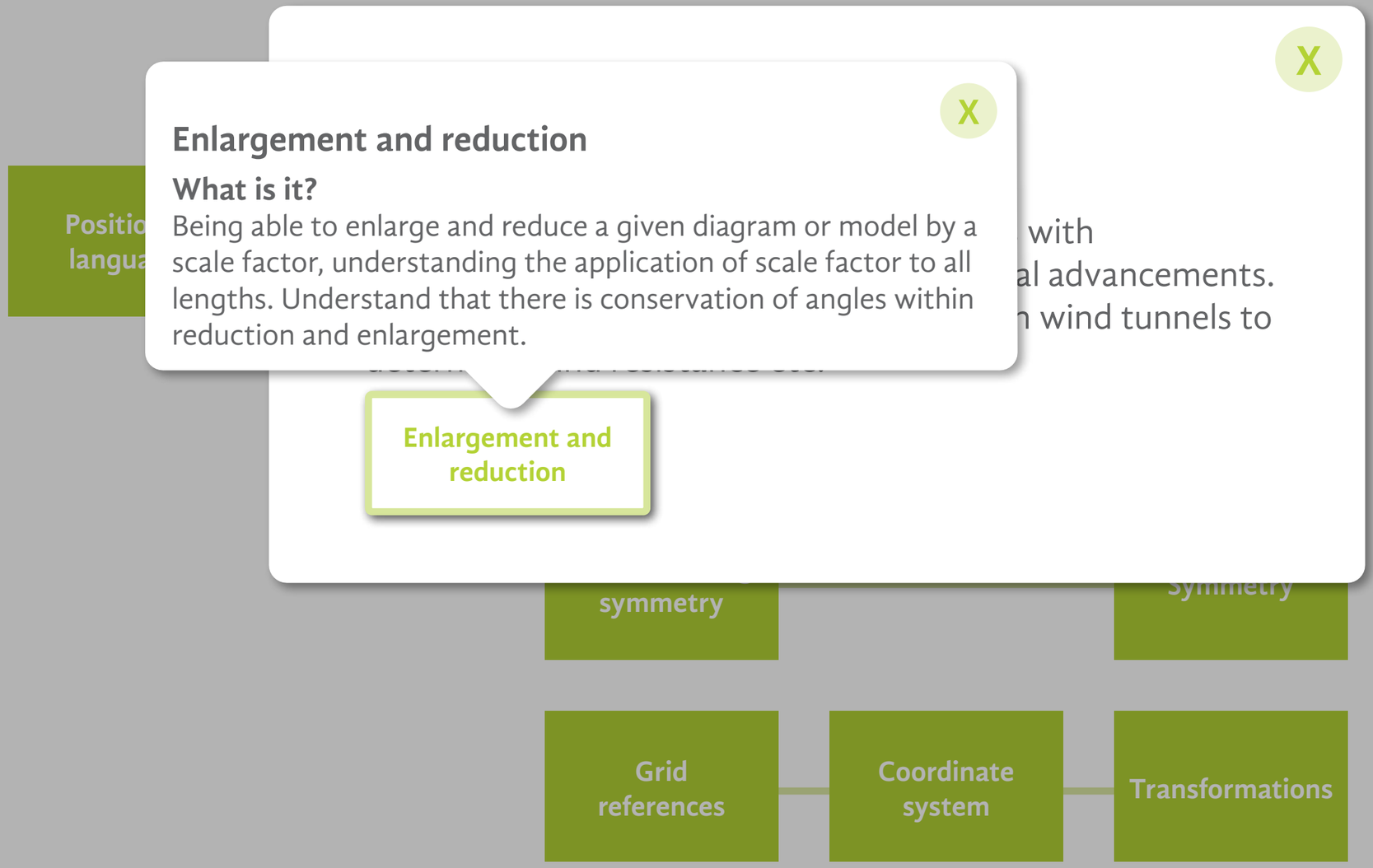

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Angles, symmetry and transformation

Similarity

X

Why is it important?

Appreciating that two objects which are similar will share key properties, underpins the practice of modelling. This allows wind tunnels, wave tanks etc. to be used on scaled down models knowing results obtained will mirror real-life outcomes.

Similarity

Positional language

symmetry

Symmetry

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Angles, nation

Similarity

What is it?

Being able to calculate and use a scale factor that connects two similar figures.

Understand that problems involving the area of similar figures requires the scale factor to be squared. Possible extension: problems that compare the volumes of two similar objects require the scale factor to be cubed.

Previous knowledge and understanding

- Ratio
- Scale factors
- Solving basic scale problems
- Squaring and cubing fractions

Similarity

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symmetry

Symmetry

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Angles, symmetry and transformation

Understanding symmetry

Why is it important?

Interpreting and drawing symmetrical patterns, shapes and pictures develops an understanding of the relationship between reflection and symmetry.

Understanding symmetry

Positional language

symmetry

Symmetry

Grid references

Coordinate system

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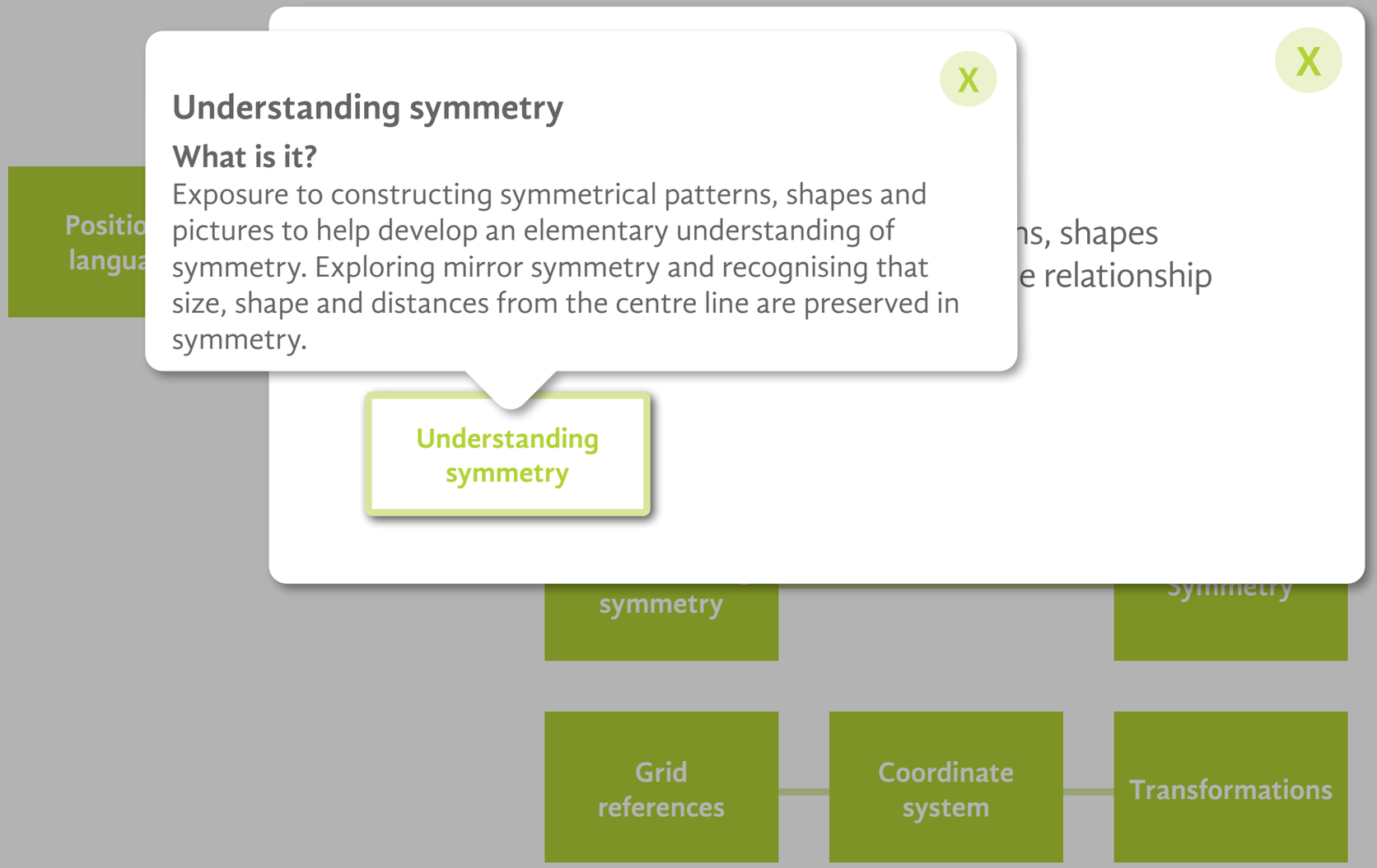
Angles, symmetry and transformation



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Angles, symmetry and transformation

Positional language

Symmetry

X

Why is it important?

Investigating symmetrical patterns and designs enhances an understanding and appreciation of the natural world and art. It is also fundamental to developing skills associated with geometrical reasoning.

Symmetry

Line symmetry

Rotational symmetry

symmetry

Symmetry

Grid references

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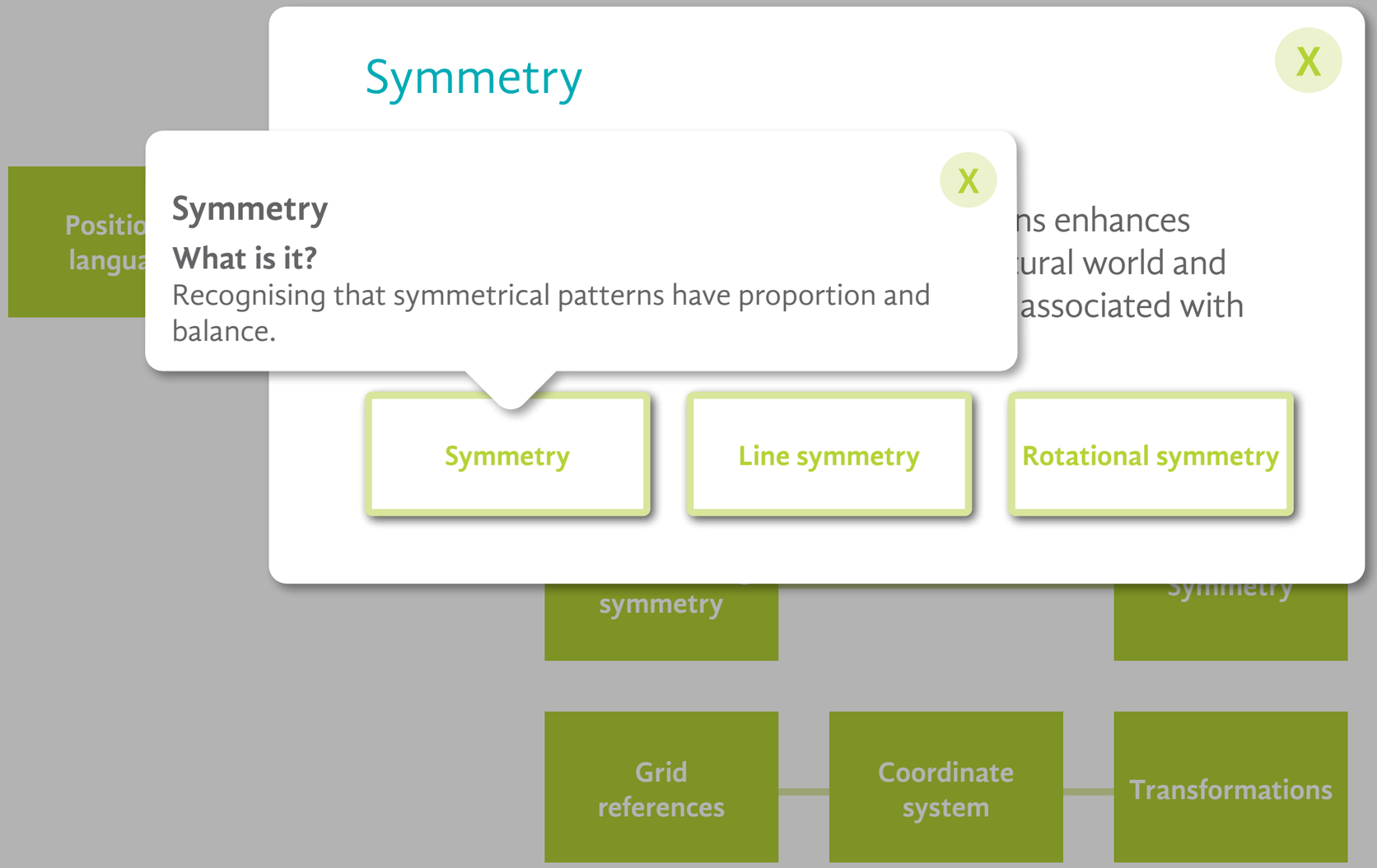
Angles, symmetry and transformation



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Angles, symmetry and transformation

Positional language

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Line symmetry

What is it?

Recognising that a line of symmetry divides a shape into two congruent parts, each of which is the mirror image of the other. The line of symmetry can be horizontal, vertical or inclined.

Symmetry

Line symmetry

Rotational symmetry

symmetry

Symmetry

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Angles, symmetry and transformation

Symmetry

Why is it important?

Investigating symmetrical pat
an understanding and apprec
art. It is also fundamental to c
geometrical reasoning.

Symmetry | Line symmetry | Rotational symmetry

Rotational symmetry

What is it?

A shape has rotational symmetry if it can be rotated through an angle to fit exactly on to its original outline. The order of rotational symmetry is the number of times a shape can be rotated and fit exactly on top of its original position within a complete turn. The centre of symmetry is the fixed point about which the shape is rotated.

Positional language

symmetry

Symmetry

Grid references

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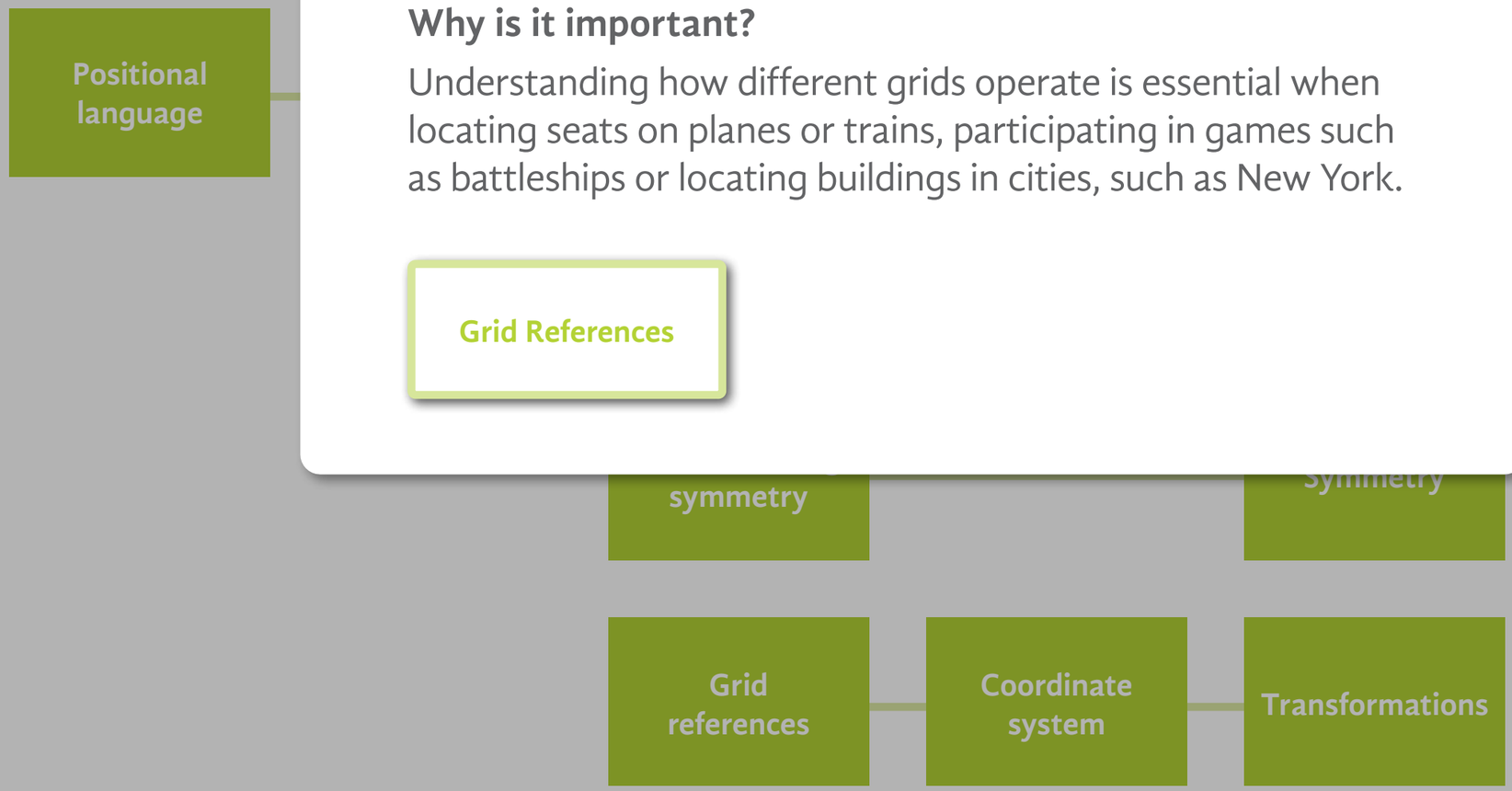
Angles, symmetry and transformation

Grid References

Why is it important?

Understanding how different grids operate is essential when locating seats on planes or trains, participating in games such as battleships or locating buildings in cities, such as New York.

Grid References



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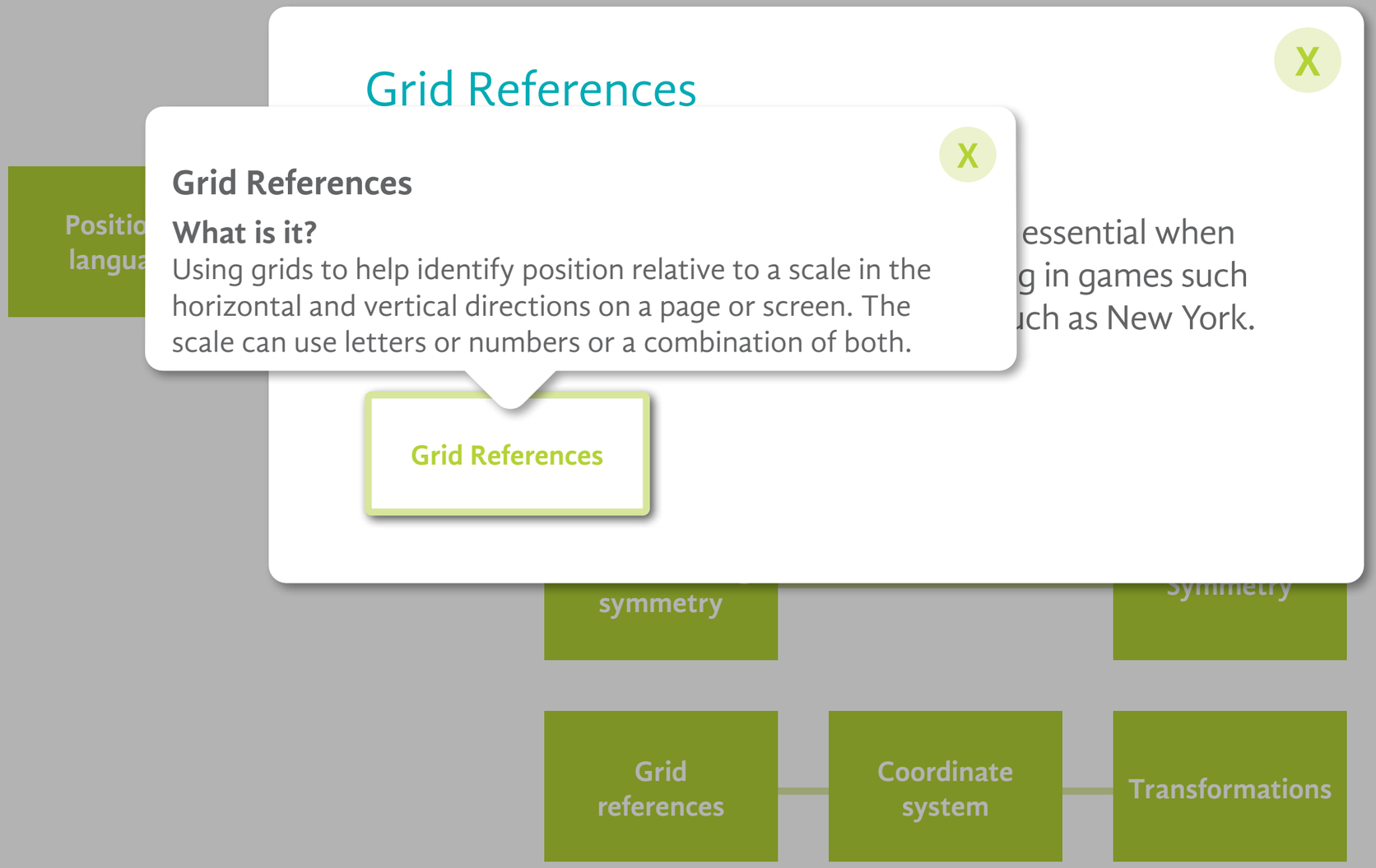

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Angles, symmetry and transformation

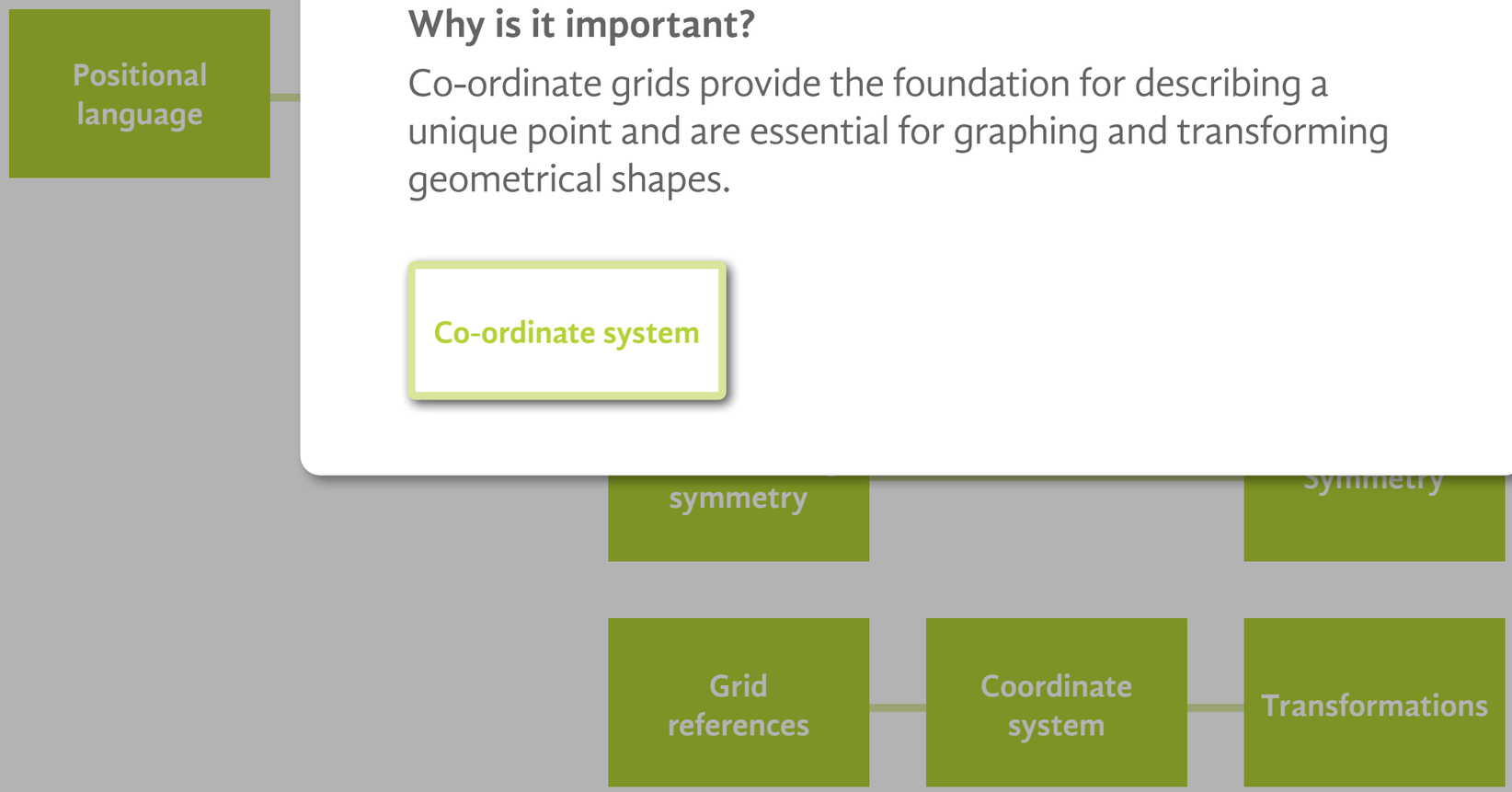
Co-ordinate system

X

Why is it important?

Co-ordinate grids provide the foundation for describing a unique point and are essential for graphing and transforming geometrical shapes.

Co-ordinate system



Angles, symmetry and transformation

Co-ordinate system

What is it?
Labeling and numbering axes. Emphasise the numbering of lines and not spaces in-between. Be able to plot points and give the co-ordinates of a group of points. Be able to extend a one quadrant grid to one with four quadrants.

Previous knowledge and understanding
- Understanding grids
- Know the numbers on the number line
- Understand negative numbers

Co-ordinate system

Positio
langua

describing a
nd transforming

symmetry

Symmetry

Grid references

Coordinate system

Transformations

MAIN MENU

Angles, symmetry and transformation

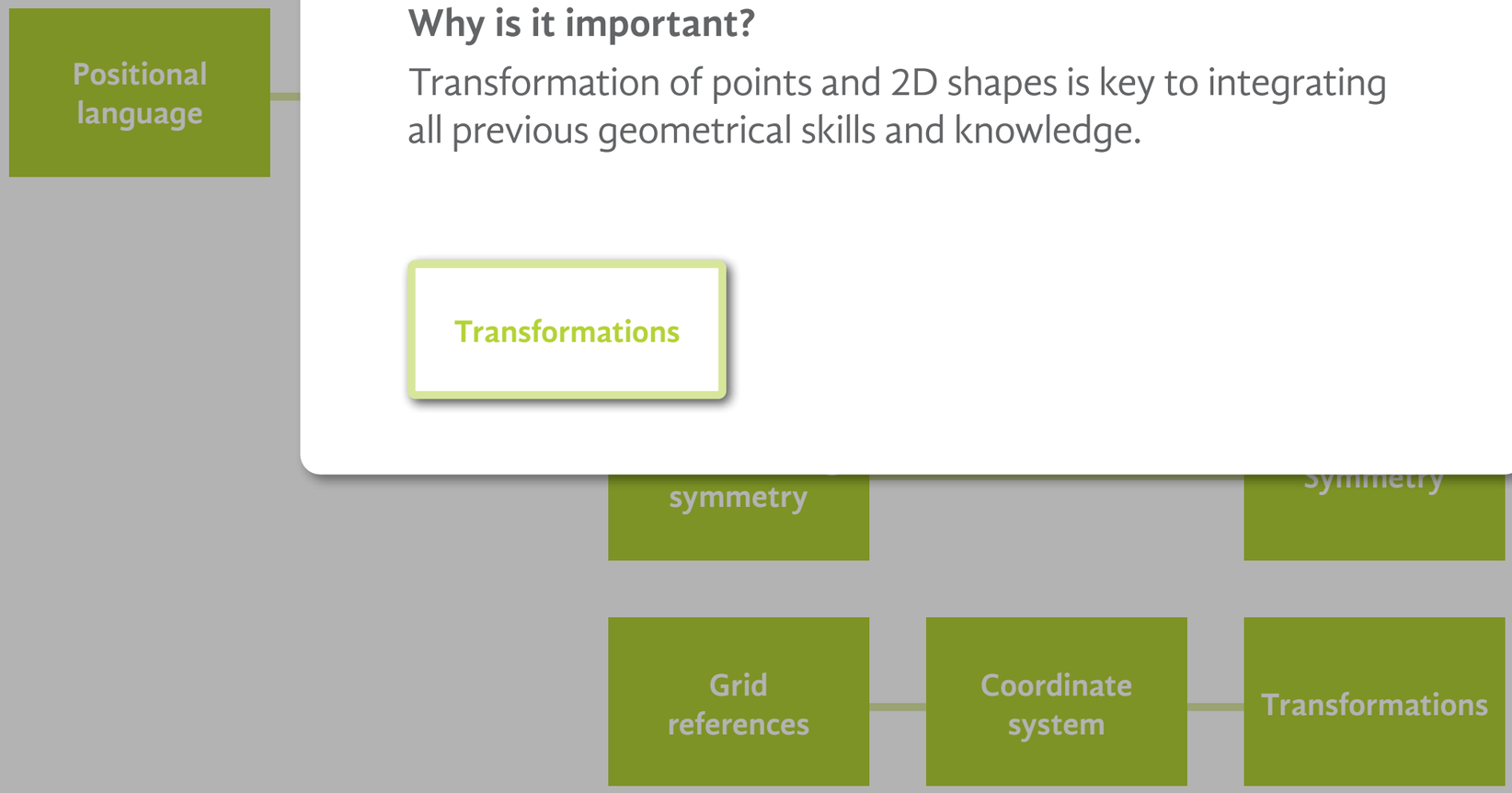
Transformations

X

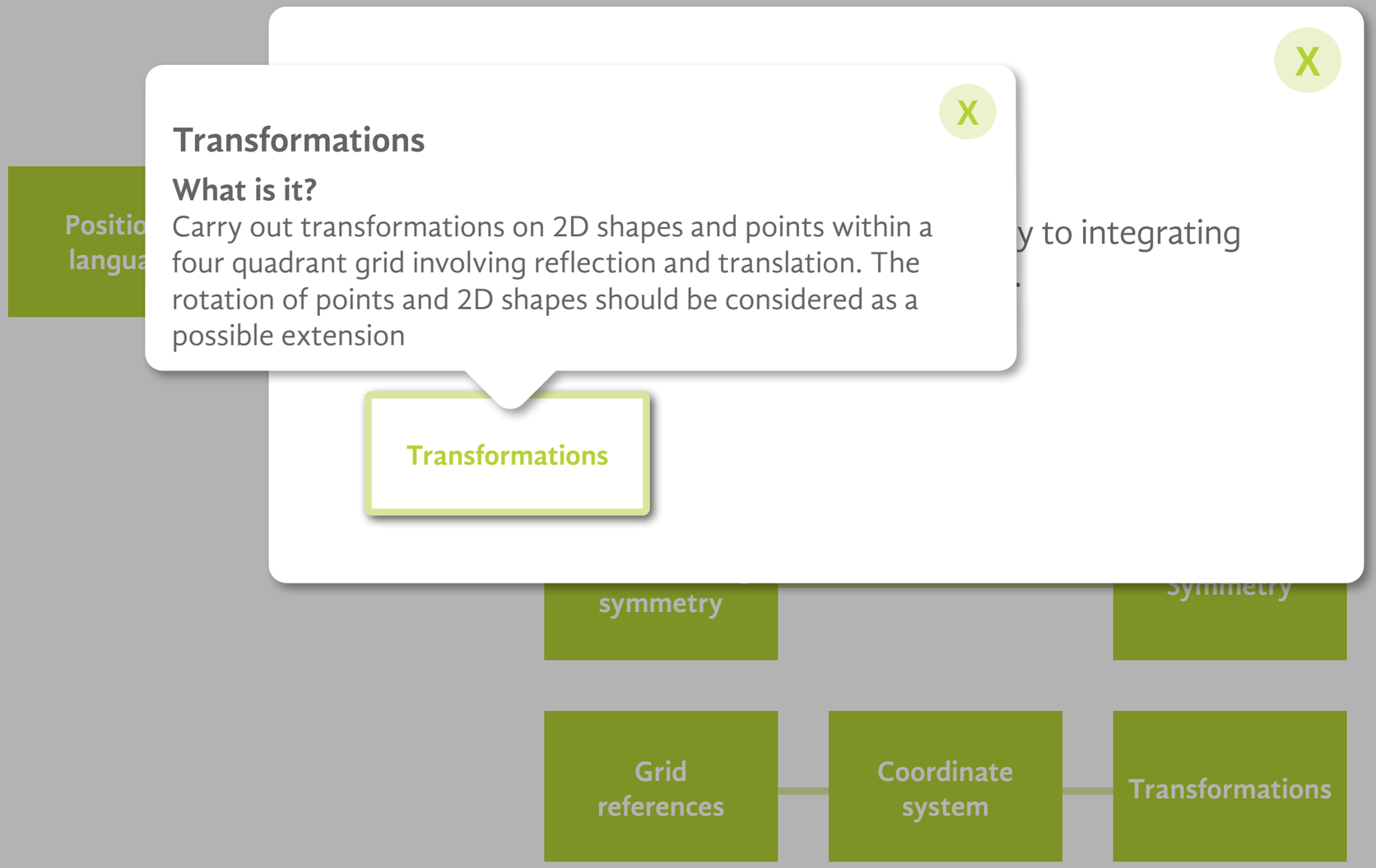
Why is it important?

Transformation of points and 2D shapes is key to integrating all previous geometrical skills and knowledge.

Transformations



Angles, symmetry and transformation



MAIN MENU

Multiples, factors and primes

MAIN MENU

Multiples, factors and primes

Multiples and Factors

X

Why is it important?

Understanding of multiples and factors is essential to support work in fractions. A clear understanding of the links within the multiplication tables and the use of inverse processes are essential.

Multiples and Factors

MAIN MENU

Multiples, factors and primes

Multiple and factors

What is it?
A multiple can be found in the multiplication tables eg the multiples of 7 are 14, 21, 28... The multiples are never ending. The factors of a number are any numbers that divide exactly into a larger number.

Previous knowledge and understanding
- Multiplication tables
- Division with or without a remainder

Multiples and Factors

ential to support
e links within
e processes are

MAIN MENU

Multiples, factors and primes

Common multiples and factors

Why is it important?

Common multiples and factors help and support learners when working with fractions and algebraic manipulations.

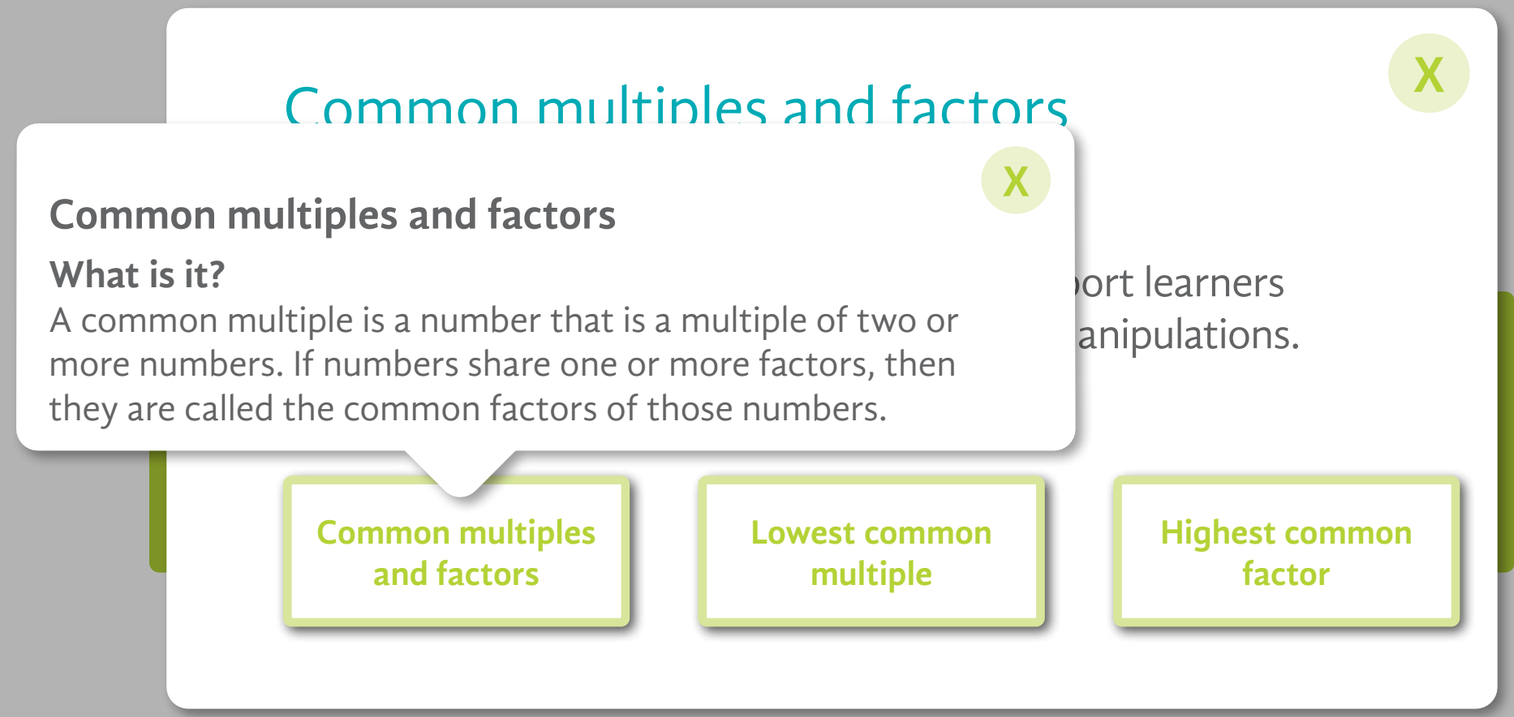
Common multiples and factors

Lowest common multiple

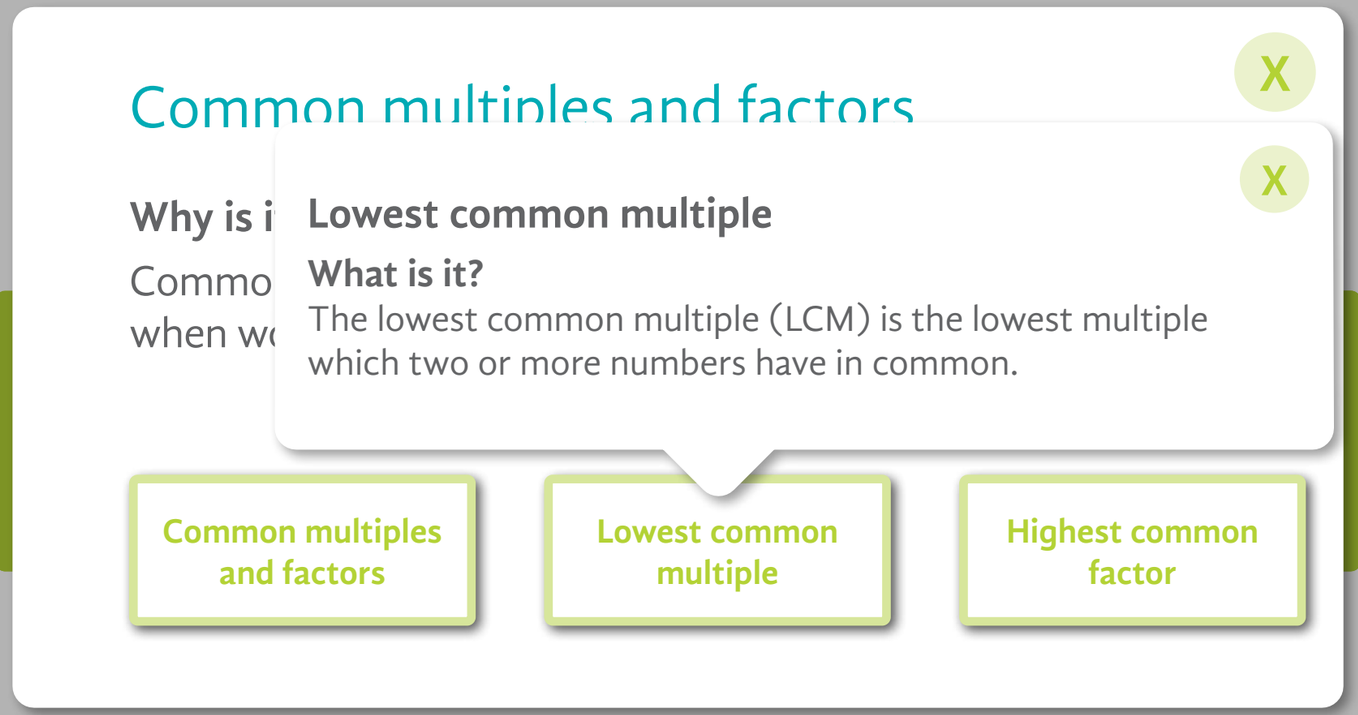
Highest common factor

MAIN MENU

Multiples, factors and primes



Multiples, factors and primes



MAIN MENU

Multiples, factors and primes

Common multiples and factors

Why is it important?

Common multiples and factors h
when working with fractions an

Highest common factor

What is it?

The largest common factor of two or more numbers is called the highest common factor (HCF).

Common multiples and factors

Lowest common multiple

Highest common factor

MAIN MENU

Multiples, f

Prime numbers

X

Why is it important?

Prime numbers are the building blocks of the number system. The link with factors will establish that every whole number greater than 1 is either prime or is a product of prime numbers. This is the Fundamental Theorem of Arithmetic. Prime numbers are used to encrypt information through communication networks utilised by mobile phones and the internet.

Prime numbers

MAIN MENU

Multiples, f

Prime numbers

number system.
whole number
ct of prime
of Arithmetic.
on through
hones and the

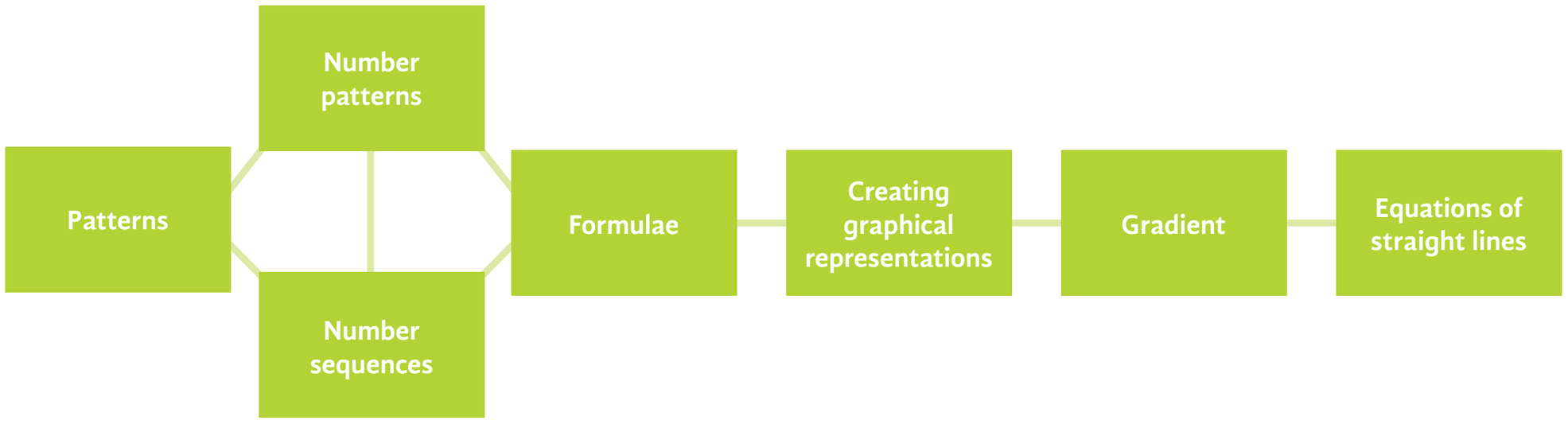
Prime Numbers

What is it?
Prime numbers have only two distinct factors. Prime numbers are whole numbers greater than 1. A prime number can only be divided by itself and 1 to give a whole number solution.

Previous knowledge and understanding
- Being able to list all the factors of a number

Prime numbers

Patterns and relationships



MAIN MENU

Patterns and relationships

Patterns

Why is it important?

Recognising and using patterns is an essential building block for algebraic thinking and understanding numbers.

Patterns

Patterns

sequences

Equations of straight lines

MAIN MENU

Patterns

Patterns

What is it?
A pattern is a repetitive sequence of events, shapes or numbers which can be continued.

Previous knowledge and understanding
- Personal experiences of looking for patterns in the environment
- Vocabulary of next, before, after
- Knowledge of colour and simple shapes
- Able to count in order

building block

bers.

Patterns

Patterns

sequences

Equations of straight lines

MAIN MENU

Patterns and relationships

Number Patterns

Why is it important?

Recognising and using number patterns is an essential building block for algebraic thinking, algebraic sequencing, generating formulae and graphical representation.

Number pattern

Exploring number patterns

Patterns

sequences

Equations of straight lines

Patterns

Number pattern

What is it?
A number pattern is a set of numbers that is governed by a rule which makes the pattern predictable, e.g. odds and evens, times tables etc.

Previous knowledge and understanding
- Know odd and even numbers
- Able to add, subtract, multiply and divide
- Multiples

essential building
cing, generating

MAIN MENU

Patterns and relationships

Number Patterns

Why is i

Recogni
block fo
formulae

Exploring number patterns

What is it?

Explore and extend prominent number patterns, such as square, triangular and Fibonacci numbers.

Number pattern

Exploring number patterns

Patterns

sequences

Equations of straight lines

MAIN MENU

Patterns and relationships

Number sequences

Why is it important?

Understanding number sequences allows us to generate algebraic formulae either pictorially, orally or using algebraic notation

Number sequences

Modelling

Patterns

sequences

Equations of straight lines

MAIN MENU

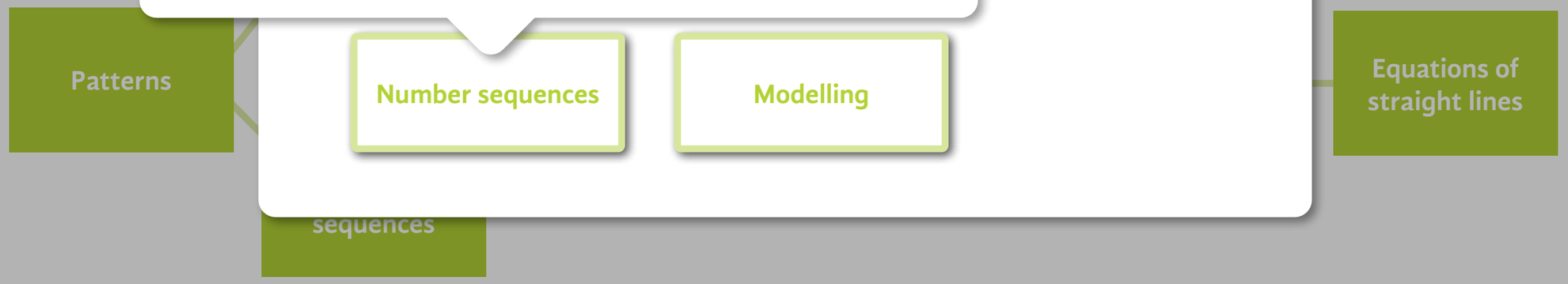
Patterns

Number sequences

What is it?
A number sequence has a rule, which can be used to find the value of each term. It is important to understand and explain the rule associated with a number sequence and use the rule to predict any number in the sequence. This is usually developed pictorially, orally or using algebraic notation.

Previous knowledge and understanding
- Able to spot and continue number patterns
- Confidence in using the 4 operations

o generate
using algebraic



Patterns and relationships

Numb

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Understa
algebraic
notation

Modelling

What is it?

Generating a number sequence illustrated by a physical or pictorial pattern and determining the equation that the sequence represents. The formula is used to determine information about the items at any position in the sequence to make evaluations and solve problems.

Patterns

Number sequences

Modelling

Equations of straight lines

sequences

MAIN MENU

Patterns and relationships

Formulae

Why is it important?

Formulae are fundamental in developing mathematical modelling and underpin all graphical representation.

Formulae

Generating a set of outputs using a formula

Determining a formula from a table of values

Patterns

sequences

Equations of straight lines

Pattern

Formulae

What is it?

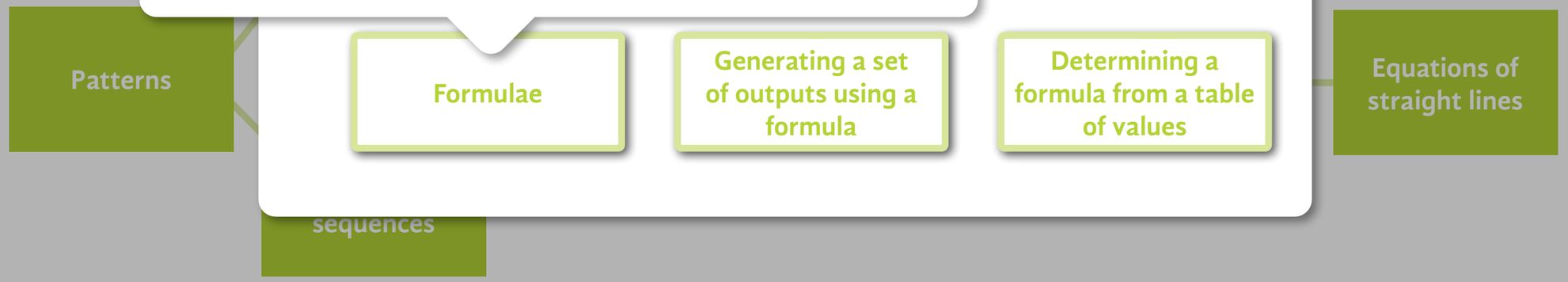
A formula is a special type of equation that shows the relationship between different variables. Using a formula is the most efficient way of solving problems that compare different sets of variables.

e.g. Area of rectangle = length x breadth,
Volume of a cuboid = *l x b x h*

Previous knowledge and understanding

- Knowing the convention of algebra, e.g. *ab* means *a* x *b*, a^2 means *a x a*

hematical
ntation.



Patterns and relationships

Formu

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Formula
modellin

sequences

Generating a set of outputs using a formula

What is it?

Use a given set of inputs to generate a set of outputs. This combination of inputs and outputs allows for graphical representations to be developed.

Patterns

Formulae

Generating a set of outputs using a formula

Determining a formula from a table of values

Equations of straight lines

MAIN MENU

Patterns and relationships

Formulae

Why is it important?

Formulae are fundamental in de
modelling and underpin all grap

Determining a formula from a table of values

What is it?

Being able to construct a formula is a fundamental algebraic process and permits the expansion of any input/output.

Patterns

Formulae

Generating a set of outputs using a formula

Determining a formula from a table of values

sequences

Equations of straight lines

Patterns and relationships

Creating graphical representations

Why is it important?

Creating graphical representations is the most efficient way of representing the comparison between two variables and presenting it in a visual form. It helps develop the fundamental skills of interpolation and extrapolation.

Creating graphical representations

Determining a general formula

Patterns

Equations of straight lines

MAIN MENU

Patterns and relationships

Creating graphical representations

What is it?
It is the most efficient method of comparing two related variables, in a visual way.

Previous knowledge and understanding
- Plotting points
- Constructing appropriate formulae

ions

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o the fundamental

Patterns

Creating graphical representations

Determining a general formula

Equations of straight lines

MAIN MENU

Patterns and relationships

Creating graphical representations

Why is

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skills of

Determining a general formula

What is it?

The ability to generate a formula for a given sequence of numbers allows any number in the sequence to be determined without having to calculate all previous numbers

Patterns

Creating graphical representations

Determining a general formula

Equations of straight lines

MAIN MENU

Patterns and relationships

Gradient

X

Why is it important?

Through the ability of allocating a numerical value to a slope, it allows limits to be placed for design and safety considerations, e.g. a mobility ramp access to buildings, slopes of roofs, incline of roads.

Patterns

Gradient

Equations of straight lines

MAIN MENU

Pattern

Gradient

What is it?
The rate at which vertical height changes with respect to horizontal distance covered, numerically represented as a fraction, decimal fraction or percentage. The gradient can be found by inspection of co-ordinate diagrams or the gradient formula. Understand that a straight line that rises from left to right has a positive gradient and a straight line that falls from left to right has a negative gradient. It should be understood that a horizontal line has a gradient of zero whereas the gradient of a vertical line is undefined.

Previous knowledge and understanding
- Be able to calculate the change between two values
- Be able to plot given points

value to a slope, it
ty considerations
es of roofs, incline

Patterns

Gradient

Equations of straight lines

MAIN MENU

Patterns and relationships

Equations of straight lines

X

Why is it important?

Understanding equations of straight lines enables comparisons to be made using graphical representations and allows for informed decisions. Familiarisation with linear equations enables more complicated equations to be investigated.

Equations of straight lines

Locus

Patterns

Equations of straight lines

Pattern

Equations of straight lines

What is it?

A form of the equation of the straight line is $y = mx + c$.
Graphically, m represents the gradient and c represents the 'point where the line intercepts the y-axis' (y-intercept).
Horizontal and vertical lines are special cases of $y = mx + c$

Previous knowledge and understanding

- Be able to calculate the gradient between 2 points
- Understand the vocabulary of intercept on the x-axis and y-axis

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Patterns

Equations of straight lines

Locus

Equations of straight lines

MAIN MENU

Patterns and relationships

Patterns

Equations of straight lines

Equations of straight lines

X

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Equations of straight lines

Locus

X

Locus

What is it?

Determining a few points from the equation of a straight line allows us to join these points and therefore identify the locus of all points that conform to the formula.

MAIN MENU

Powers and roots

MAIN MENU

Powers and roots

Powers

X

Why is it important?

Powers enable large numbers to be expressed more concisely.

Powers

MAIN MENU

Powers

Powers

What is it?

Understanding that the shorthand notation for repeated multiplication can be expressed in power notation.

Possible extension work could include:

- Fractions to whole number powers
- Negative numbers to whole numbers powers, e.g. $(-2)^3 = -8$
- Negative powers, for example, $4^{-2} = \frac{1}{16}$
- The concept of a zero power, e.g. $5^0 = 1$
- Introducing the laws of indices

Previous knowledge and understanding

- Knowledge of square numbers, noting the link to area
- The concept of repeatedly multiplying the same number, e.g. $8 \times 8 \times 8 = 8^3 = 512$, noting the link to volume
- Knowledge of place value and multiplication by 10

d more concisely.

Powers

MAIN MENU

Powers and roots

Scientific Notation

X

Why is it important?

Scientific notation enables large and small numbers to be written in a shorter form. Problems involving multiplication and division of large or small numbers become more manageable through the use of scientific notation. It also allows very large or very small numbers to be displayed on calculator screens when they would otherwise overflow.

Scientific Notation

Calculations involving scientific notation

MAIN MENU

Powers and roots

Scientific Notation

Why is it important?

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...e overflow.

Scientific Notation

What is it?
Scientific notation is a standardised method of writing numbers in the form $a \times 10^n$ Where $1 \leq a < 10$ and n is an integer.

Scientific Notation

Calculations involving scientific notation

MAIN MENU

Powers and roots

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Calculations involving scientific notation

What is it?

Undertake calculations with numbers written in scientific notation.

Previous knowledge and understanding

- Place value
- Multiplying by powers of 10
- Dividing by powers of 10

Scientific Notation

Calculations involving scientific notation

MAIN MENU

Powers and roots

Roots

Why is it important?

Roots are an essential tool when performing calculations and develop the understanding of the inverse operation of powers.

- Roots
- Square roots
- Cube roots
- Higher roots

MAIN MENU

Powers and roots

Roots

What is it?
Roots are the inverse process of powers.

Previous knowledge and understanding
- The concept of powers
- The concept of inverse operations

g calculations and
peration of powers.

Roots | Square roots | Cube roots | Higher roots

MAIN MENU

Powers and roots

Roots

Why is

Roots a
develop

Square roots

What is it?

Finding the square root is the inverse process of squaring a number. The square root of all positive numbers has two solutions, one negative and one positive. Square roots can be evaluated mentally within the commonly known multiplication tables.

Previous knowledge and understanding

- Knowledge of square numbers

Roots | Square roots | Cube roots | Higher roots

MAIN MENU

Powers and roots

Roots

Why is it important?

Roots are an essential tool v
develop the understanding

Cube roots

X

What is it?
Finding the cube root is the inverse process of cubing a number.

Previous knowledge and understanding
- Knowledge of trial and improvement as a strategy, e.g. 64, student could try $2 \times 2 \times 2 \neq 64$, $3 \times 3 \times 3 \neq 64$

Roots | Square roots | Cube roots | Higher roots

MAIN MENU

Powers and roots

Roots

Why is it important?

Roots are an essential tool when performing ca
develop the understanding of the inverse opera

Roots | Square roots | Cube roots | Higher roots

X

Higher roots

What is it?

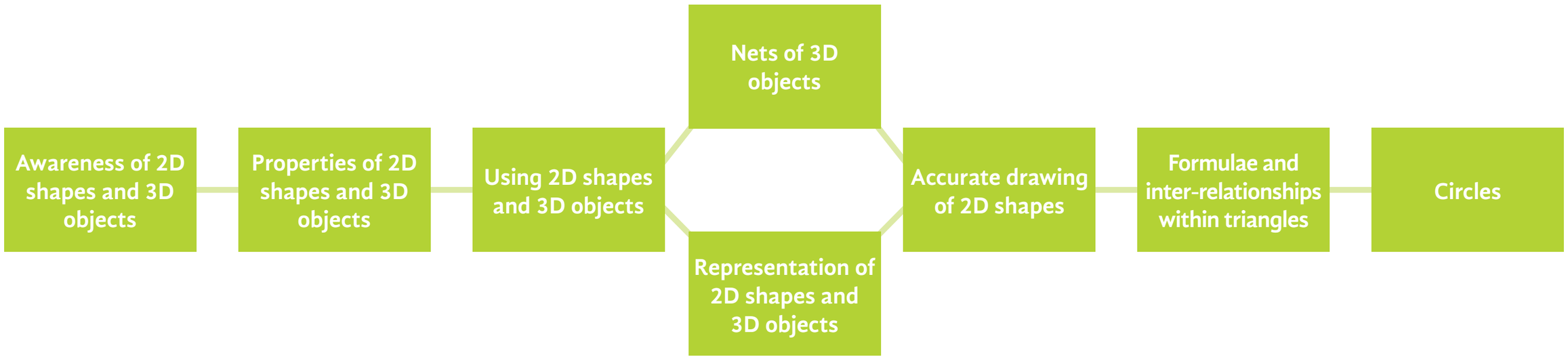
Higher roots work in the same way as cube roots and common roots can be evaluated within the commonly known multiplication tables.

Previous knowledge and understanding

- Knowledge of trial and improvement as a strategy
- Use of a calculator

MAIN MENU

Properties of 2D shapes and 3D objects



MAIN MENU

Properties of 2D shapes and 3D objects

Awareness of 2D shapes and 3D objects

Why is it important?

It links personal experiences and observations with a more structured way of investigating 2D shapes and 3D objects.

Awareness of 2D shapes and 3D objects

2D shapes

3D objects

Awareness of 2D shapes and 3D objects

Properti… shapes … obj…

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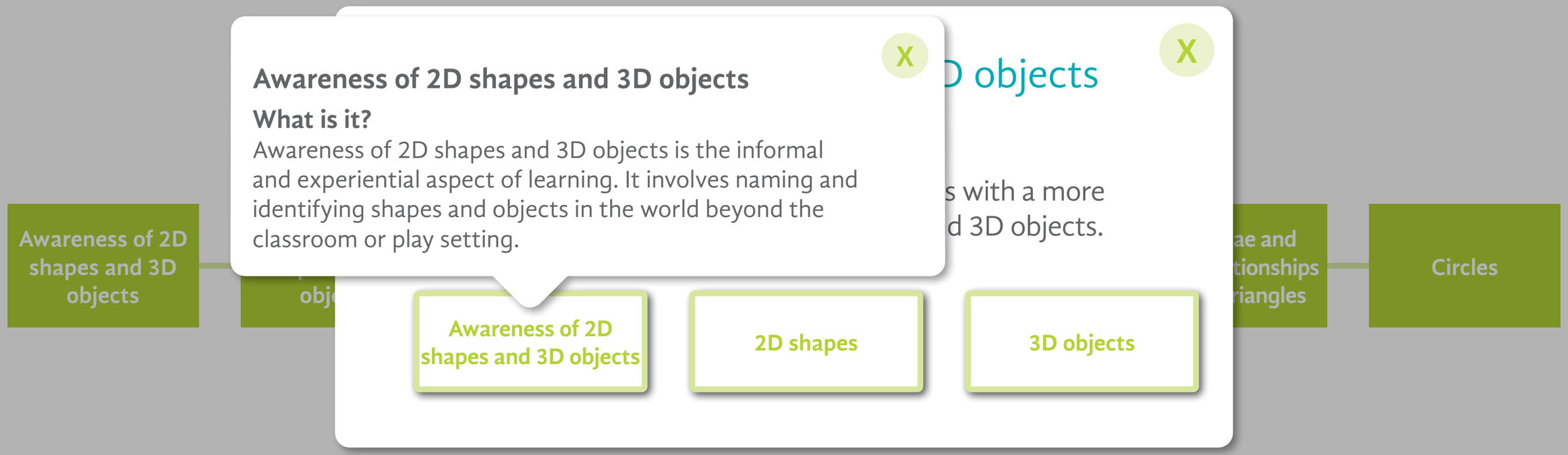
Circles

MAIN MENU

Properties of 2D shapes and 3D objects



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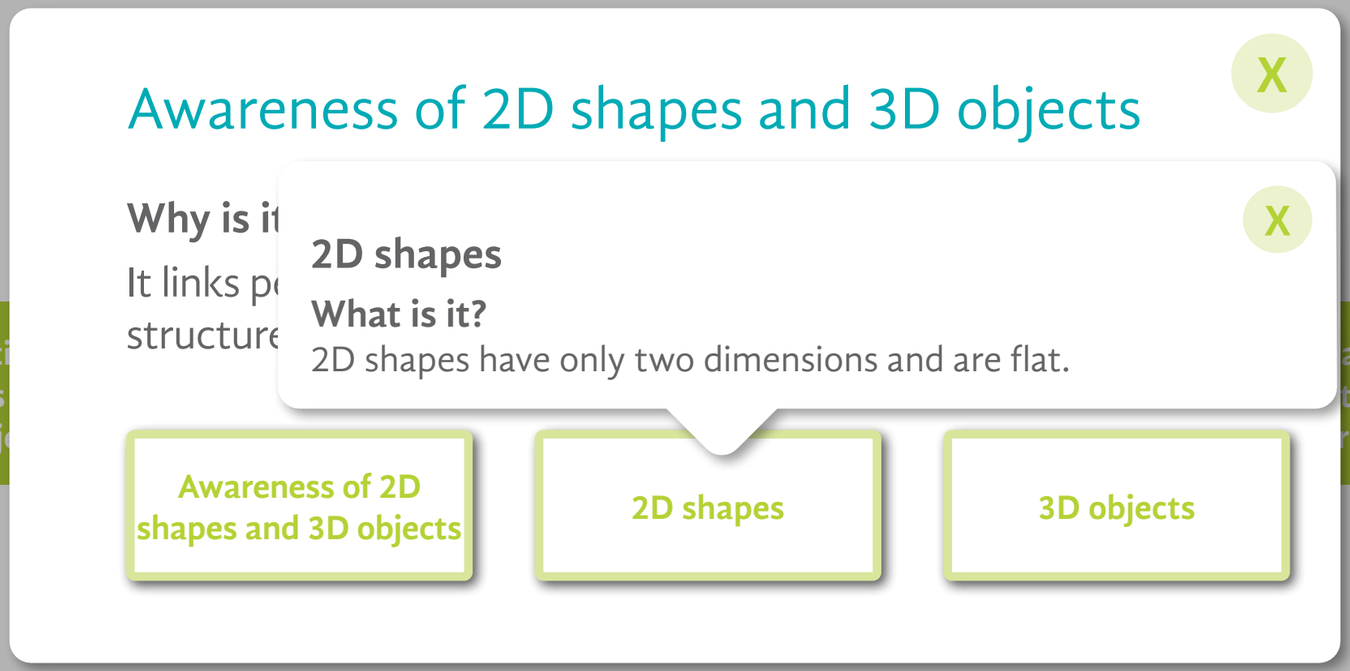
Properties of 2D shapes and 3D objects



Awareness of 2D shapes and 3D objects
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Circles

MAIN MENU

Properties of 2D shapes and 3D objects

Awareness of 2D shap

Why is it important?

It links personal experiences an
structured way of investigating

Awareness of 2D shapes and 3D objects

Properti shapes obj

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Awareness of 2D shapes and 3D objects

2D shapes

3D objects

X

3D objects

What is it?

3D objects have three dimensions. The sides, or faces, of many 3D objects are made up of 2D shapes. 3D objects can be stacked or rolled and items can be put inside some 3D objects. They can also be combined to make models.

Previous knowledge and understanding

- Experience of outdoor learning
- Observational skills
- Basic vocabulary

MAIN MENU

Properties of 2D shapes and 3D objects

Properties of 2D shapes and 3D objects

X

Why is it important?

Understanding the properties of 2D shapes and 3D objects enables more sophisticated identification and sorting by their features. An understanding of the properties of 2D shapes and 3D objects will enable learners to appreciate how they fit together and how they are used in everyday life.

Properties of 2D shape and 3D objects

Tiling

Awareness of 2D shapes and 3D objects

Properti shapes obj

ae and tionships riangles

Circles

MAIN MENU

Properties of 2D shapes and 3D objects

Properties of 2D shape and 3D objects

What is it?
Knowing the properties of 2D shapes and 3D objects develops a problem solving approach to solving many geometric problems.

Previous knowledge and understanding
- Name 2D shapes and 3D objects
- Recognise 2D shapes and 3D objects in the environment

Awareness of 2D shapes and 3D objects

Properties of 2D shape and 3D objects

Tiling

Circles

MAIN MENU

Properties of 2D shapes and 3D objects

Properties of 2D shapes and 3D objects

Why is i

Understa
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together

Tiling

What is it?

Determining which 2D shapes are suitable for tiling is a key step in extending geometrical knowledge of 2D shapes.

Previous knowledge and understanding

- Understanding how shapes fit together

Properties of 2D shape and 3D objects

Tiling

Awareness of 2D shapes and 3D objects

Properti
shapes
obj

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tionships
riangles

Circles

MAIN MENU

Properties of 2D shapes and 3D objects

Using 2D shapes and 3D objects

Why is it important?

Understanding why certain shapes and objects are more suited to specific areas of use helps link the main properties of the shapes and objects with the key requirements of their usage. This has major implications in product design and efficient use of resources.

Using 2D shapes and 3D objects

Properties of triangles

Awareness of 2D shapes and 3D objects

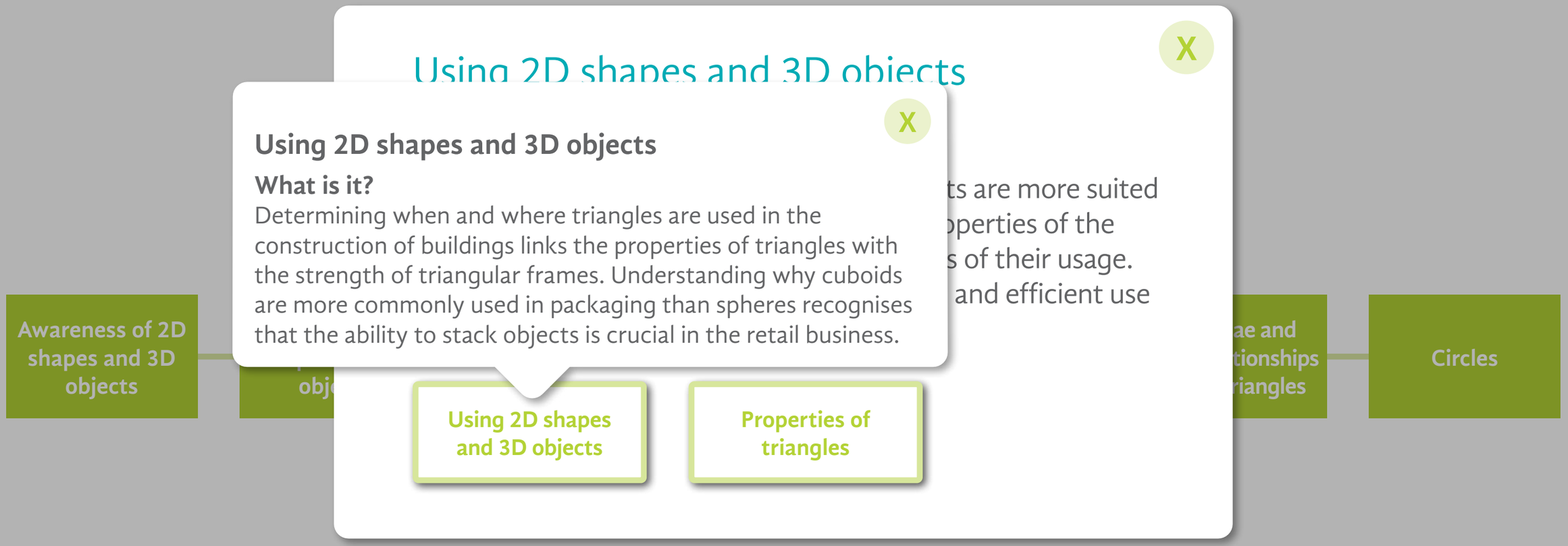
Properti shapes obj

ae and tionships riangles

Circles

MAIN MENU

Properties of 2D shapes and 3D objects



MAIN MENU

Properties of 2D shapes and 3D objects

Using 2D shapes and 3D objects

Why is it important?

Understanding properties of 2D shapes and 3D objects enables us to specify, classify and describe shapes and objects in the world around us. This has applications in many areas, including the use of resources, design and construction.

Properties of triangles

What is it?

The ability to classify triangles as acute, obtuse, equilateral, isosceles, right-angled and scalene develops the ability to match properties with agreed definitions.

Using 2D shapes and 3D objects

Properties of triangles

Awareness of 2D shapes and 3D objects

Properti… shapes … obj…

…ae and …tionships …riangles

Circles

MAIN MENU

Properties of 2D shapes and 3D objects

Nets of 3D Objects

Why is it important?

Develops the spacial awareness that allows a 3D object to be unpacked to form a combination of 2D surfaces. This has important applications in the packaging industry.

Nets of 3D Objects

Awareness of 2D shapes and 3D objects

Properti shapes obj

ae and tionships riangles

Circles

MAIN MENU

Properties of 2D shapes and 3D objects

X

Nets of 3D objects

What is it?
A net is the 2D representation of an unpacked 3D object. The lengths and angles in the 3D object are conserved within the net.

Previous knowledge and understanding
- Properties of 2D shapes
- Understanding edges, faces and vertices

X

3D object to
faces. This has
stry.

Awareness of 2D shapes and 3D objects

Nets of 3D Objects

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riangles

Circles

MAIN MENU

Properties of 2D shapes and 3D objects

X

Representation of 2D shapes and 3D objects

Why is it important?

This develops spacial awareness and promotes the concepts of equal lengths and angles when they are distorted in the 2D representations.

Representation of 2D shapes and 3D objects

Awareness of 2D shapes and 3D objects

Properti shapes obj

ae and tionships riangles

Circles

MAIN MENU

Properties of 2D shapes and 3D objects

Representation of 2D shapes and 3D objects

What is it?
Using sketches, isometric paper or computer packages to draw 3D objects on a 2D plane.

Previous knowledge and understanding
- Familiarity with the properties of 3D objects
- Properties of 2D shapes
- Experience of perspective in art (drawing)

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torted in the 2D

Awareness of 2D shapes and 3D objects

obj

Representation of 2D shapes and 3D objects

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tionships
riangles

Circles

MAIN MENU

Properties of 2D shapes and 3D objects

Accurate drawing of 2D shapes

X

Why is it important?

Drawing accurately develops dexterity, reading scales and the ability to follow instructions. It is an essential life skill in architecture and many areas of the construction industry.

Awareness of 2D shapes and 3D objects

Properti shapes obj

Accurate drawing of 2D shapes

Drawing triangles and quadrilaterals

Regular and irregular polygons

ae and tionships riangles

Circles

MAIN MENU

Properties of 2D shapes and 3D objects

X

Accurate drawing of 2D shapes

What is it?
This requires the scaling of the lengths and the conservation of the angles.

Previous knowledge and understanding
- Measure lengths accurately
- Know how to name angles
- Measure angles accurately

X

ng scales and
ll in architecture

Awareness of 2D shapes and 3D objects

obj

Accurate drawing of 2D shapes

Drawing triangles and quadrilaterals

Regular and irregular polygons

ae and
tionships
riangles

Circles

MAIN MENU

Properties of 2D shapes and 3D objects

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and mar

Drawing triangles and quadrilaterals

What is it?

Drawing a range of triangles with different properties.
Drawing a range of quadrilaterals with different properties and investigating how the diagonals intersect.

Previous knowledge and understanding

- Able to use relevant instruments
- Able to measure accurately

Awareness of 2D shapes and 3D objects

Properti
shapes
obj

Accurate drawing of 2D shapes

Drawing triangles and quadrilaterals

Regular and irregular polygons

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tionships
riangles

Circles

MAIN MENU

Properties of 2D shapes and 3D objects

Accurate drawing of 2

Why is it important?

Drawing accurately develops de
following instructions. It is an es
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Awareness of 2D shapes and 3D objects

Properti
shapes
obj

Accurate drawing of 2D shapes

Drawing triangles and quadrilaterals

Regular and irregular polygons

riangles

X

Regular and irregular polygons

What is it?

Understanding the difference between regular and irregular polygons. Demonstrating the properties of regular polygons to draw accurate representations. Understand that all polygons can be constructed through a summation of triangles.

Previous knowledge and understanding

- Understand the term ‘regular’ when describing 2D shapes
- Accurately measure angles

MAIN MENU

Properties of 2D shapes and 3D objects

Formulae and inter-relationships within triangles

X

Why is it important?

This milestone develops the mathematical concepts associated with Pythagoras' Theorem and trigonometry. These concepts are fundamental, as much of the mathematics encountered after this will be built upon these foundations.

- Formulae and inter-relationships within triangles
- Pythagoras' theorem and Converse of Pythagoras
- Trigonometry within right-angled triangles

Awareness of 2D shapes and 3D objects

Properti… shapes … obj…

…ae and …tionships …riangles

Circles

Properties of 2D shapes and 3D objects

Formulae and inter-relationships within triangles

What is it?
Through investigating the lengths of sides in right-angled triangles the theorem and converse of Pythagoras are developed. Building on similar triangles and investigating ratios of different pairs of sides leads to right-angled trigonometry.

Previous knowledge and understanding
- Name and identify different triangles
- Know the properties of different types of triangles

ncepts associated
. These concepts
s encountered
.

Awareness of 2D shapes and 3D objects

Formulae and inter-relationships within triangles

Pythagoras' theorem and Converse of Pythagoras

Trigonometry within right-angled triangles

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Circles

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Properties of 2D shapes and 3D objects

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Pythagoras' theorem and Converse of Pythagoras

What is it?

Applying Pythagoras' Theorem enables the length of one side of a right-angled triangle to be calculated, given the lengths of the other two sides. The converse can also be used to establish if a triangle is right-angled.

Previous knowledge and understanding

- Algebra
- Number processes/operations
- Know and understand square and square root

Formulae and inter-relationships within triangles

Pythagoras' theorem and Converse of Pythagoras

Trigonometry within right-angled triangles

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Formulae and inter-re within triangles

Why is it important?

This milestone develops the ma with Pythagoras' Theorem and are fundamental, as much of th after this will be built upon thes

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Pythagoras' theorem and Converse of Pythagoras

Trigonometry within right-angled triangles

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Trigonometry within right-angled triangles

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What is it?

Enables the length of a side to be calculated, given the length of another side and the size of either of the acute angles. It also enables the calculation of an angle, given the length of any two of the triangle's sides.

Previous knowledge and understanding

- Algebraic manipulation
- Number processes/operations
- Similar triangles

Possible Extension

- Although this building block concentrates on trigonometry within right-angled triangles, students can be encouraged to investigate trigonometry within all triangles. This naturally leads on to problems involving the sine and cosine rule.

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Properties of 2D shapes and 3D objects

Circles

Why is it important?

The circle is a commonly used shape that occurs both in nature and everyday life. Its importance is based on the fact that a circle encloses the maximum area for a given perimeter. The circle, despite being one of the simplest shapes, has numerous geometric properties. An understanding of these properties, and associated formulae, provides a foundation for further learning in geometry.

Circles

Circumference and arcs

Area and sectors

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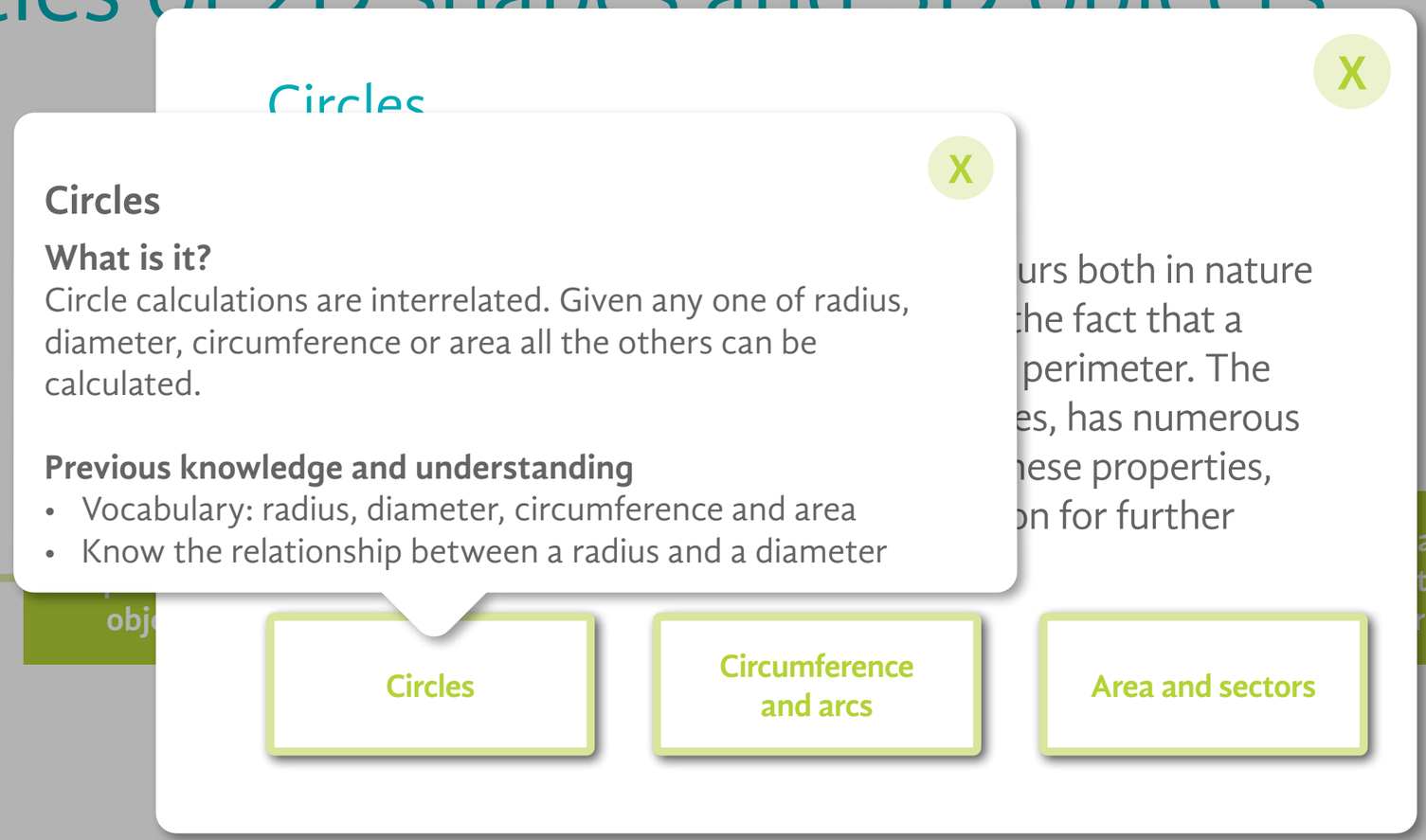

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Properties of 2D shapes and 3D objects

Circles

Why is it important?

The circle is a commonly used shape that occurs both in nature and ever
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Circumference and arcs

What is it?

Investigate the significance of π and establish the formula connecting the radius, diameter and circumference of a circle. Investigate arc lengths.

Circles | Circumference and arcs | Area and sectors

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Properties of 2D shapes and 3D objects

Circles

Why is it important?

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and associated formulae, provic
learning in geometry.

Circles | Circumference and arcs | Area and sectors

Area and sectors

What is it?

Investigate the significance of π and establish the formula connecting the radius, diameter and area of a circle.
Investigate the area of sectors of circles.

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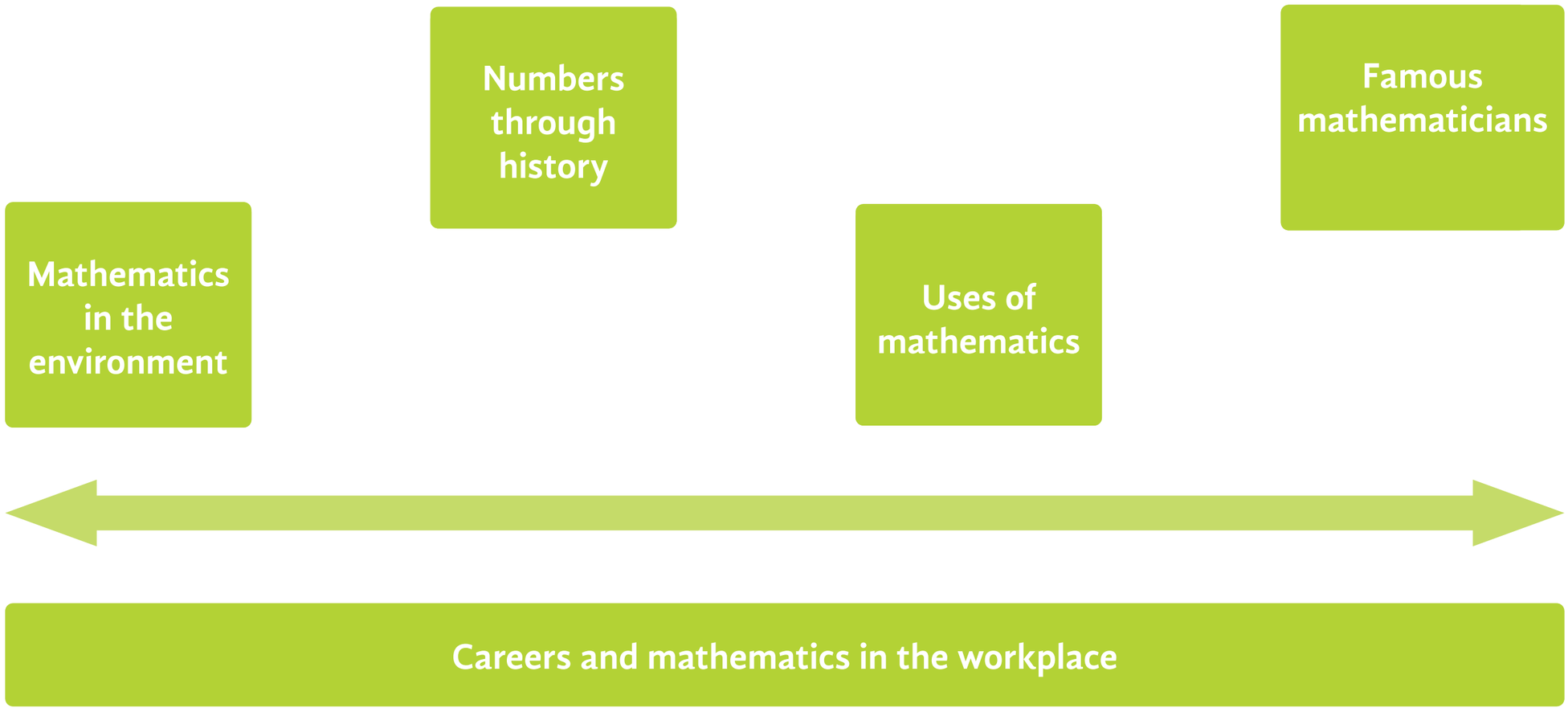
Mathematics—its impact on the world past, present and future



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Mathematics—its impact on the world past, present and

Mathematics in the environment

Why is it important?

It is important that learners recognise mathematics in their environment as it provides the foundations for exploring the use of mathematics in their everyday lives.

Famous mathematicians

Mathematics in the environment

Mathematics in the environment

Careers and mathematics in the workplace

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Mathematics in the environment

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Mathematics in the environment

What is it?
This is the awareness of the vast amount of mathematics and mathematical information in the environment which provides information to help with real-life, everyday situations. It also reinforces the concept of mathematics being relevant and important to future learning.

Mathematics in the environment

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Mathematics—its impact on the world past, present and

Numbers through history

Why is it important?

It is important learners know the origins of their own number system through exploring those from the past to understand how they have evolved, changed and improved. It also highlights the multi-cultural nature of mathematical development and how other great civilisations contribute.

Numbers through history

Decimal number system

Famous mathematicians

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Mathematics—its impact on the world past, present and

Numbers through history

Why is it important?

It is important learners know the origins of their own
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Numbers through history

What is it?

Number systems from around the world have evolved over time and become more efficient. This includes number systems used in the computer age, such as binary.

Numbers through history

Decimal number system

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Numbers through history

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Decimal number system

What is it?

Based on 10 digits (0, 1, 2, 3, 4, 5, 6, 7, 8, 9). It is the place of the digit(s) which makes the difference to the value of the number, both in whole numbers and decimal fractions. Zero is important as a placeholder.

Numbers through history

Decimal number system

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Mathematics—its impact on the world past, present and

Uses of mathematics

Why is it important?

It is important learners understand the vast uses of mathematics in their everyday lives. This should ensure their learning is relevant and purposeful.

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Famous mathematicians

Mathematics in the environment

Uses of mathematics

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Mathematics—its impact on the world past, present and

Uses of mathematics

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Uses of mathematics

What is it?
Mathematics enables learners to model real-life situations and make connections and informed predictions. It also equips learners with the skills needed to interpret and analyse information, simplify and solve problems, assess risk and make informed decisions.

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Uses of mathematics

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Why is it important?

Learners should understand how a large number of mathematicians have contributed to the present reservoir of mathematical knowledge. It is important to evaluate how mathematical discoveries were, and still are, important in daily life. To motivate the learners of today, it is also important to stress that many new mathematical discoveries will happen in the future and they could contribute to new discoveries. Chaos theory, string theory and fuzzy logic are recent developments that have been taken forward by creative, young mathematicians.

Famous
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Famous mathematicians

Why is it important?

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Famous mathematicians

What is it?

Famous mathematicians are recognised for their special aptitude and creativity in mathematics and have used this to contribute significantly to society.

Investigations into famous mathematicians should be linked to areas of the curriculum being studied.

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Famous mathematicians

Famous mathematicians

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Why is it important?

Mathematics plays an important role in the fields of science and technologies, and is vital to research and development in engineering, computing science, medicine and finance. Promoting awareness and interest in such careers is of vital importance for economic development.

Careers and mathematics in the workplace

Careers in mathematics

Workplace mathematics

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Careers and mathematics in the workplace

What is it?
Standard algorithms, formulae, problem solving and teamwork are generic transferrable mathematical skills which have important practical applications in many careers, particularly science, technology and engineering.

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Careers in mathematics

What is it?

Understanding which careers depend on mathematical skills. Obvious ones such as the STEM subjects should be investigated as well as less obvious career paths in the arts, business and climatology.

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Famous mathematicians

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Mathematics—its impact on the world past, present and

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Why is it important?

Mathematics plays an importan
and technologies, and is vital to
in engineering, computing scien
Promoting awareness and inter
importance for economic devel

Workplace mathematics

What is it?

Discussing different workplace situations and identifying the mathematical skills regularly used, e.g. hairdressers use ratio when mixing hair dyes.

Mathematics in the environment

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Careers and mathematics in the workplace