Heads of Maths Network Meeting Autumn 1 2021

"The only way to learn mathematics is to do mathematics."
- Paul Halmos -

Jo.Lees@hants.gov.uk

Hampshire HoDs: Date schedule
All meetings start at 1315 with approximate finish of 1615

Date	
Thursday 07-10-21	**Holiday Inn Eastleigh**
Tuesday 30-11-21	**MSTeams**
Wednesday 02-02-22	**Holiday Inn Eastleigh**
Wednesday 23-03-22	**MSTeams**
Thursday 05-05-22	**Holiday Inn Eastleigh**
Tuesday 05-07-22	**MSTeams**

Materials for Hampshire HoDs Meetings

[HIAS Maths Moodle (hants.gov.uk)](https://hants.gov.uk)

Subject leaders
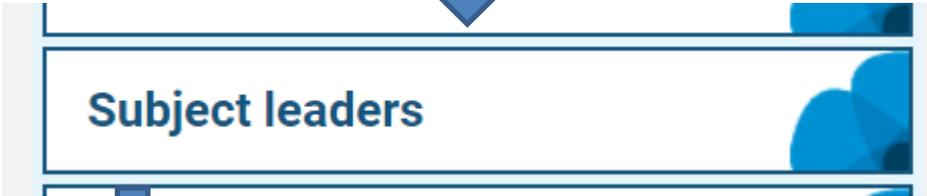
▶ Primary

▶ Secondary

▷ Secondary Special Schools

▷ Education Centres

Subject Leader Meetings 2021/22

HH2122

Agenda

| 13.00	**Welcome and coffee**
13.15	Some maths to get us started
13.25	Brief Ofqual update
13.30	Presentation with Q&A from AQA
14.00	Presentation with Q&A from OCR
14.30	Coffee and view exam board resources
15.00	Transition Y6-Y7
15.15	SEND and Dyscalculia
15.45	AOB, Summary and opportunity to catch up
16:15	Finish
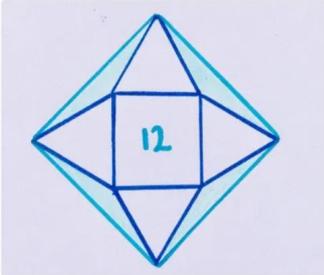
Four equilateral triangles are arranged around a square
which has area 12. **What's the shaded area?**

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Four equilateral triangles are arranged around a square
The square has an area of 12 units^2

What is the value of the shaded area ?

12

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Twenty Questions (Of Maddening, Delicious
Geometry) – Math with Bad Drawings

15º

150º 60º

60º 90º

15º

$\sqrt{12}$ 12 units²

$\sqrt{12}$

$\sqrt{12}$ 150⁰ $\sqrt{12}$
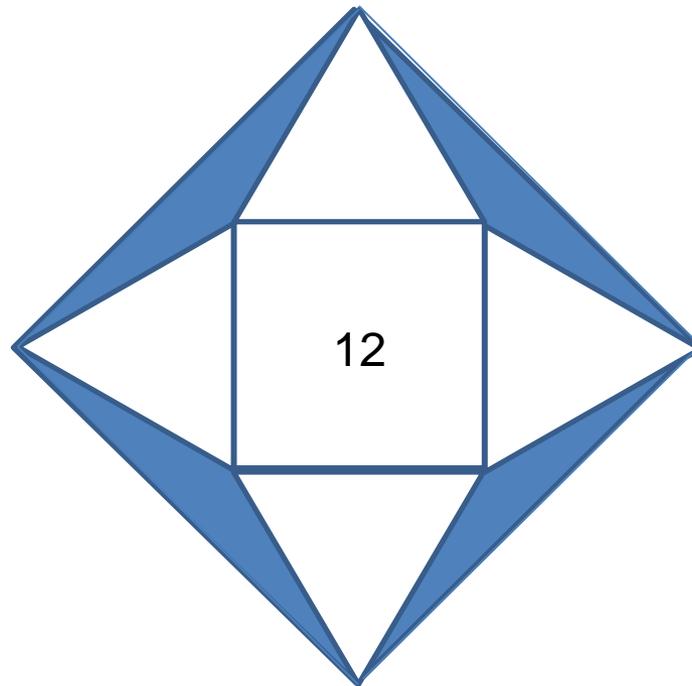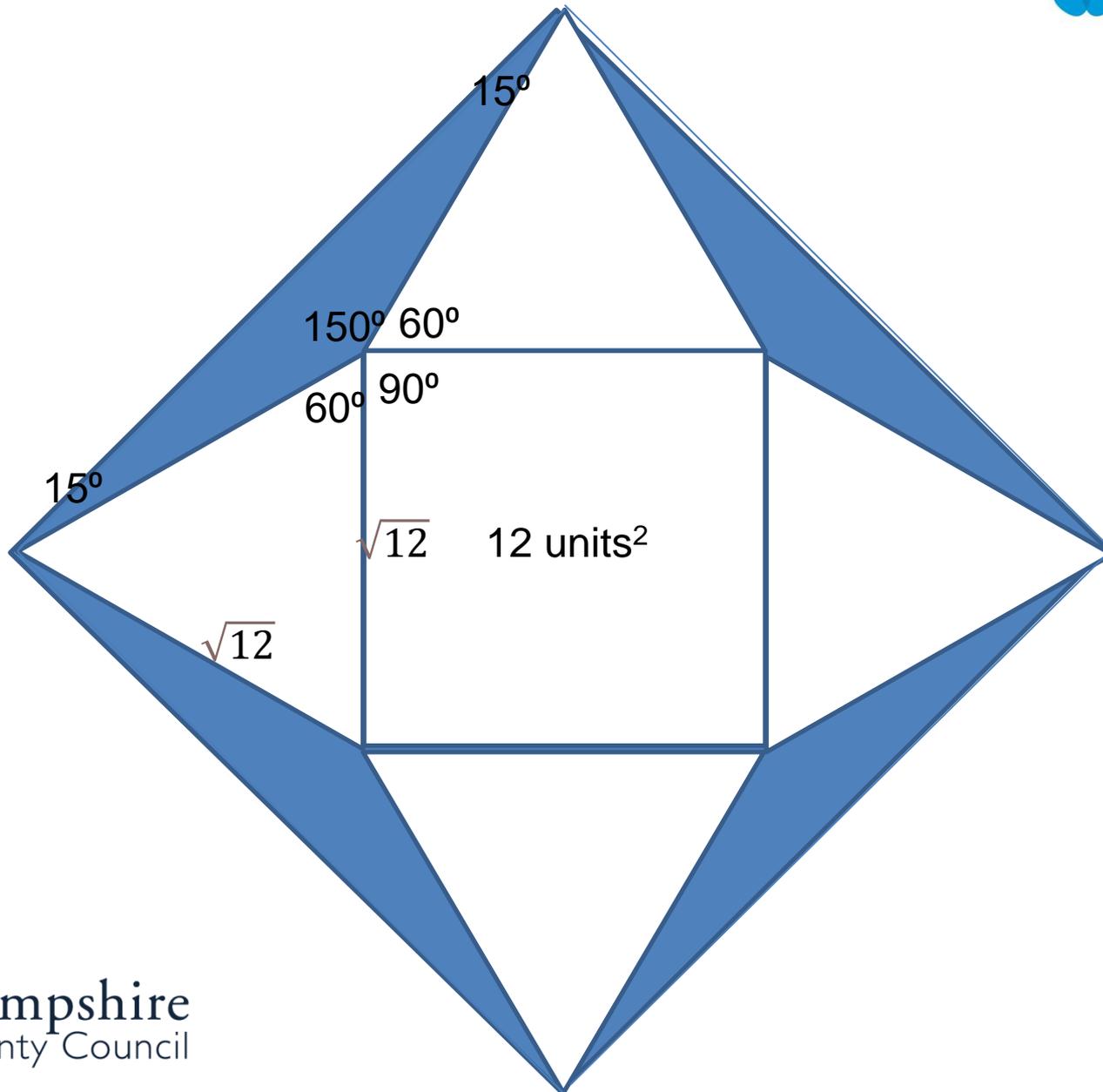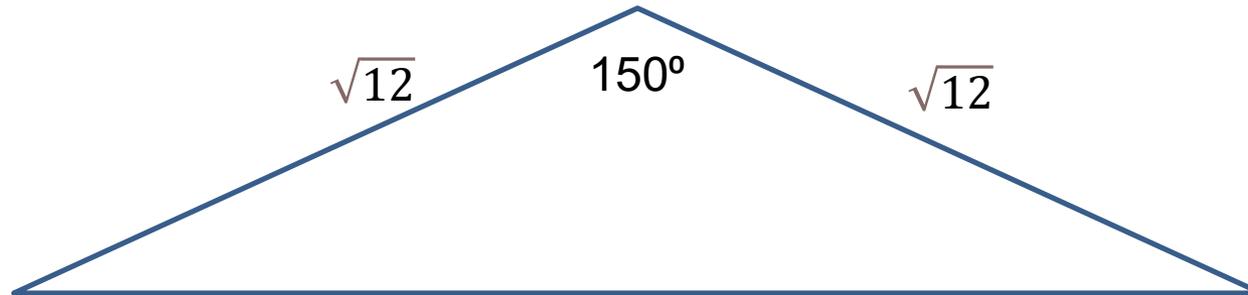
Area of triangle = $\frac{1}{2}$ ab sin C

= $\frac{1}{2} \sqrt{12} \sqrt{12}$ sin 150

= $\frac{1}{2} \, x \, 12 \, x \, \frac{1}{2}$

= 3

Jewel Cutters

3   3

12

3   3
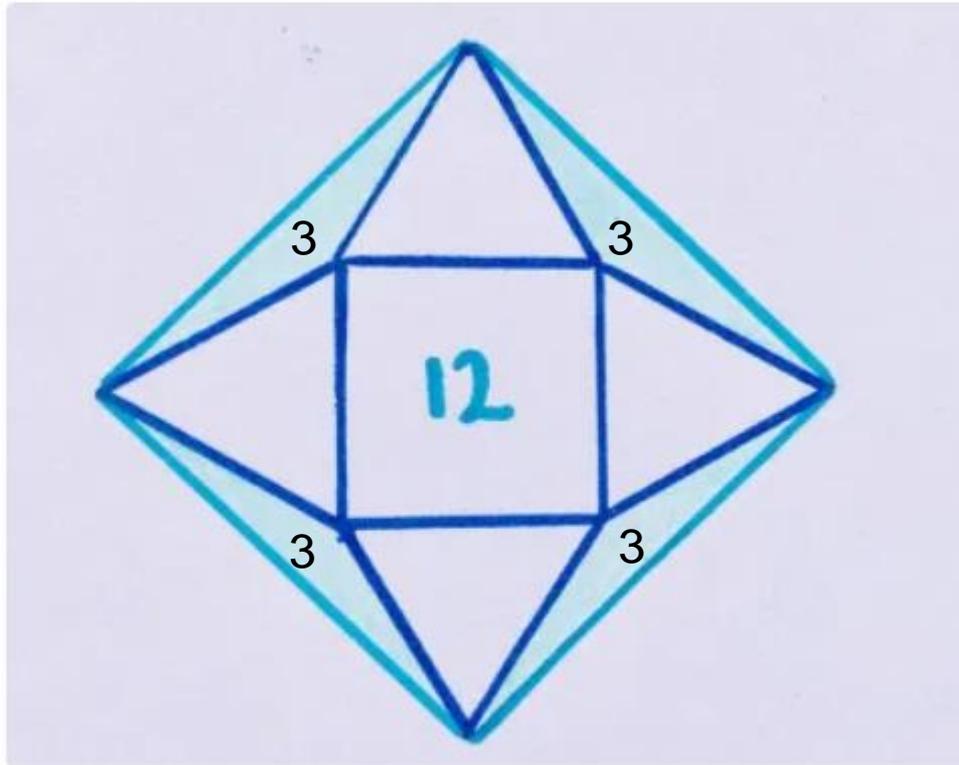
Shaded area = 12 units^2

Four equilateral triangles are arranged around a square
which has area 12. **What's the shaded area?**

Twenty Questions (Of Maddening, Delicious
Geometry) – Math with Bad Drawings

6834_Decisions_for_proposed_changes_to_the_assessment_of_GCSEs__AS_and_A_levels_in_2022.pdf

6. Exam boards will provide advance information about the focus of the content of the exams for all GCSE, AS and A level subjects (except GCSE English literature, history, ancient history and geography) for the summer 2022 exams. The advance information will meet the principles set out in the consultation document.

7. The policy intention of providing advance information is that it will support students' revision. Therefore, the DfE has confirmed that advance information will be provided by 7 February 2022 at the latest. This will enable teachers to plan to adapt their teaching in the second half of the spring term if necessary. DfE has also decided to retain the flexibility for advance information to be deployed at other points ahead of 7 February 2022 if circumstances require. At least a week's notice will be given if it is decided that advance information will be released earlier than 7 February 2022.

8. Students will be given a formulae sheet for GCSE mathematics in summer 2022. Exam boards will provide copies of the formulae sheet for use in teaching and to ensure that students are familiar with it prior to the exams. Clean copies of the formulae sheet will be provided in the exams.

These changes will apply to exams in 2022.
It is the intention that exams will go ahead as normal in 2023

Advance information will also be provided for the November 2022 series of exams in GCSE English language and mathematics. This will be different advance information to the summer series, and will be released in July 2022, unless further disruption justifies earlier release. For the GCSE mathematics exams in November 2022 the same formulae sheets will be provided as for summer series exams.

Examination Boards Presentation Pearsons: Edexcel

This will be available to view in your subject leaders Folder on the HIAS maths moodle (password HH2122)

Subject leaders

▸ Secondary

▸ Subject Leader Meetings 2021-22

Examination Boards Presentation
AQA
OCR

30 minute break for networking
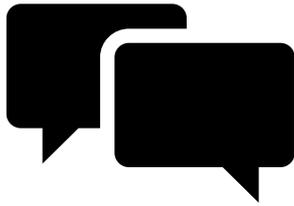
Transition from Year 6 to Year 7

How is it going ?

What is working well ?

Most primaries used the HIAS assessment guidance to make a summary judgement

Minimum sufficiency within Year 6	Typically by the end of Year 6
Learners should be able to use formal written methods for all four operations including long multiplication and division. They should be working confidently with fractions, decimals, percentages, and simple ratios. Learners should be able to solve a range of problems demanding efficient written and mental methods of calculation. They are beginning to use algebraic representations as a tool for problem-solving Learners are able to: • compare, order, and calculate with fractions, decimals, and percentages • use simple formulae • recognise and generate number sequences • calculate the area and volume of simple shapes • classify shapes using correct vocabulary. • measure and draw angles • interpret a range of graphs and charts and calculate the mean average	Learners should be fluent in formal written methods for all four operations including long multiplication and division. They should be working confidently with fractions, decimals, percentages, and ratios. Learners should be able to solve a wide range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. They are beginning to use algebraic representations as a tool for problem-solving Learners are able to: • compare, order, and calculate with fractions, decimals, and percentages • use simple formulae • recognise and generate number sequences • describe positions on the four-quadrant grid • calculate the area and volume of simple shapes • classify shapes with increasingly complex geometric properties using correct vocabulary. • measure and draw angles • interpret a range of graphs and charts and calculate the mean average

HIAS Summer 2021 Assessment Guidance - MATHEMATICS.pdf

The HIAS assessment guidance includes formative assessment journeys based on the DfE ready-to-progress criteria

Addition and Subtraction, Multiplication and Division			
Year 5	**Summer Term 2021**		**Year 6**
Understand that additive relationships and multiplicative relationships between two numbers are different (17 + 3 ≠ 17 x 3)	Given any two numbers, know that the relationships between them can be expressed additively or multiplicatively For example: Holly cycles 20km and Lola cycles 60km. Lola has cycled 40km more than Holly (additive relationship) Lola has cycled 3 times the distance that Holly has cycled. (multiplicative relationship)	Given a sequence of numbers, be able to decide if the terms are related additively or multiplicatively For example: 3,7,11,14…. has the rule 'add 4' (additive relationship) 3,6,12,24…has the rule 'multiply by 2' (multiplicative relationship)	6AS/MD–1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number)
Understand and use the commutative (3 + 8 = 8 + 3) and associative (3 + 8 + 4 = 4 + 3 + 8) properties of addition and the commutative (3 x 7 = 7 x 3), associative (3 x 7 x 6 = 6 x 3 x 7) and distributive (36 x 4 = (30 x 4) + (6 x 4)) properties of multiplication	Generate equivalent and related equations from a given fact, using inverses, place value knowledge and laws of arithmetic (commutative, associative, distributive). For example: Use the equation 2448 ÷ 34 = 72 to complete 72 x ____ = 24 480	Understand and use the compensation (or balanced adjustment) property of addition and multiplication For example: 25 + 75 = 23 + 77 (an adjustment of +/-2) 0.3 x 320 = 3 x 32 (an adjustment of x/ 10)	6AS/MD–2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.
Use the 'for every' relationship between two numbers to complete simple ratio calculations, for example: Given the ingredients for a recipe for 1 person, calculate the amount of each ingredient required for 6 people . For every 1g of flour for 1 person, we need 6g of flour for 6 people.	Identify multiplicative relationships between given numbers in order to complete tables showing a 1-to-many (multiplier) relationship. For example: cups of rice: 1, 2, 3, 4, 5, 6 cups of water: 2, 4, 6, 8, 10, 12	Identify multiplicative relationships between given numbers in order to complete tables showing a many-to -1 (division) relationship. For example: no of pupils: 10, 20, 30, 40, 50, 60 no of adults: 1, 2, 3, 4, 5, 6	6AS/MD–3 Solve problems involving ratio relationships.
5MD–4 Divide a number with up to 4 digits by a one-digit number using a formal written method and interpret remainders appropriately for the context.	Understand and use known multiplication and associated division facts to divide two- and three- digit numbers by one- and two-digit numbers using formal repeated subtraction(chunking) choosing multiples of any size to subtract	Understand and use known multiplication and associated division facts to divide two- and three- digit numbers by one- and two-digit numbers using formal repeated subtraction (chunking) choosing the most efficient multiple size to subtract	Divide numbers up to 4-digits by a two-digit number using appropriate formal written methods for division, interpreting remainders as fractions, decimals, or whole number remainders.

Maths guidance year 6 (publishing.service.gov.uk)

HIAS Summer 2021 Assessment Guidance - MATHEMATICS.pdf

The NCETM have produced 79 PowerPoints with appropriate models and images to exemplify the 79 DfE ready-to-progress criteria, of which 16 are designed for Y6

DfE Primary National Curriculum Guidance 2020
Supporting Materials for the Ready-to-Progress Criteria
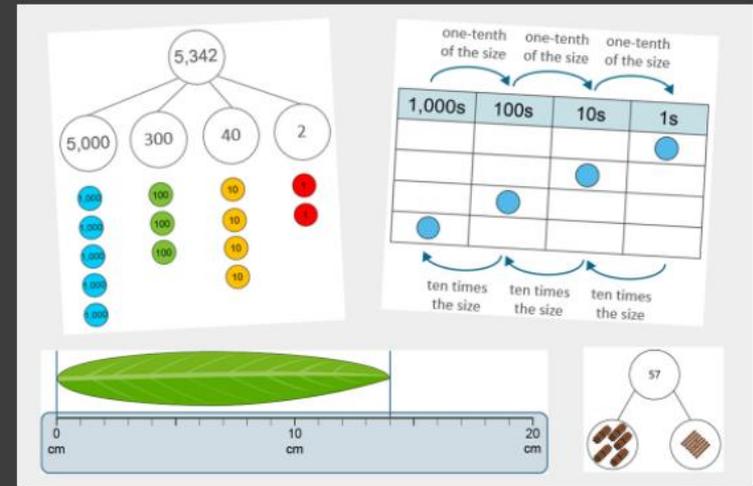
Ready-to-Progress Criterion 6F-1

Simplify fractions

NCETM
NATIONAL CENTRE FOR EXCELLENCE
IN THE TEACHING OF MATHEMATICS

Example: 6F1: Simplify Fractions

Links to some video lessons

6F-1 Linked video lessons

Upper Key Stage 2 fractions

Upper KS2 Fractions
Lesson 10

Revise the language of 'factor', 'multiple' and 'common factor'

Upper KS2 Fractions
Lesson 11

Introduction to simplifying fractions, using fractions that can be simplified to unit fractions

Upper KS2 Fractions
Lesson 12

Express fractions in their simplest forms using the terms common factor & highest common factor

Upper KS2 Fractions
Lesson 13

Simplify a fraction when the numerator is not the highest common factor

Upper KS2 Fractions
Lesson 14

How to check whether a fraction is in its simplest form

Upper KS2 Fractions
Lesson 15

Why do we simplify fractions?

Upper KS2 Fractions
Lesson 16

Simplify fractions that are greater than 1

Upper KS2 Fractions
Lesson 17

Expressing an improper fraction in its simplest form – method 2

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6F-1 Simplify fractions

$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$	
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$

$\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$ $\frac{1}{12}$

$\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$

- What can we say about the fractions shown?

   The fractions are equivalent.

$$\boxed{\frac{3}{4}} = \frac{6}{8} = \frac{9}{12} = \frac{12}{16}$$

- Which fraction is in its simplest form? How do you know?

$\frac{3}{4}$ *is in its simplest form. I know this because the only common factor of the numerator and the denominator is 1.*

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6F-1 Simplify fractions

$$\frac{6}{15} =$$
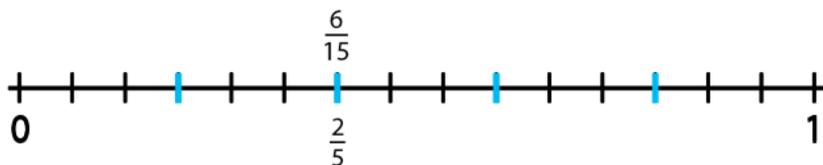
- What are the common factors of 6 and 15?

The common factors of 6 and 15 are 1 and 3.

- What is the highest common factor?

The highest common factor of 6 and 15 is 3.

- What happens when we divide both the numerator and denominator by their highest common factor?

Dividing both the numerator and denominator of a fraction by their highest common factor converts the fraction into its simplest form.

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Mathematics guidance: Key Stage 3

Non-statutory guidance for the national curriculum in England

September 2021

Aims

This publication aims to:

- Bring greater coherence to the national curriculum for mathematics by exemplifying the statutory guidance for Key Stage 3 (DfE, 2013) and giving schools, mathematics departments and teachers further guidance on how learning in mathematics develops across Key Stage 3.
- Highlight the most important knowledge and understanding developed during Key Stage 3, the connections between different mathematical topics, and how they link back to Key Stage 2 and forward to Key Stage 4.

- A sample model curriculum framework
- Fundamental concepts are highlighted
- Building on KS2 curriculum
- Developing fluency, efficiency and flexibility
- Reasoning and problem-solving
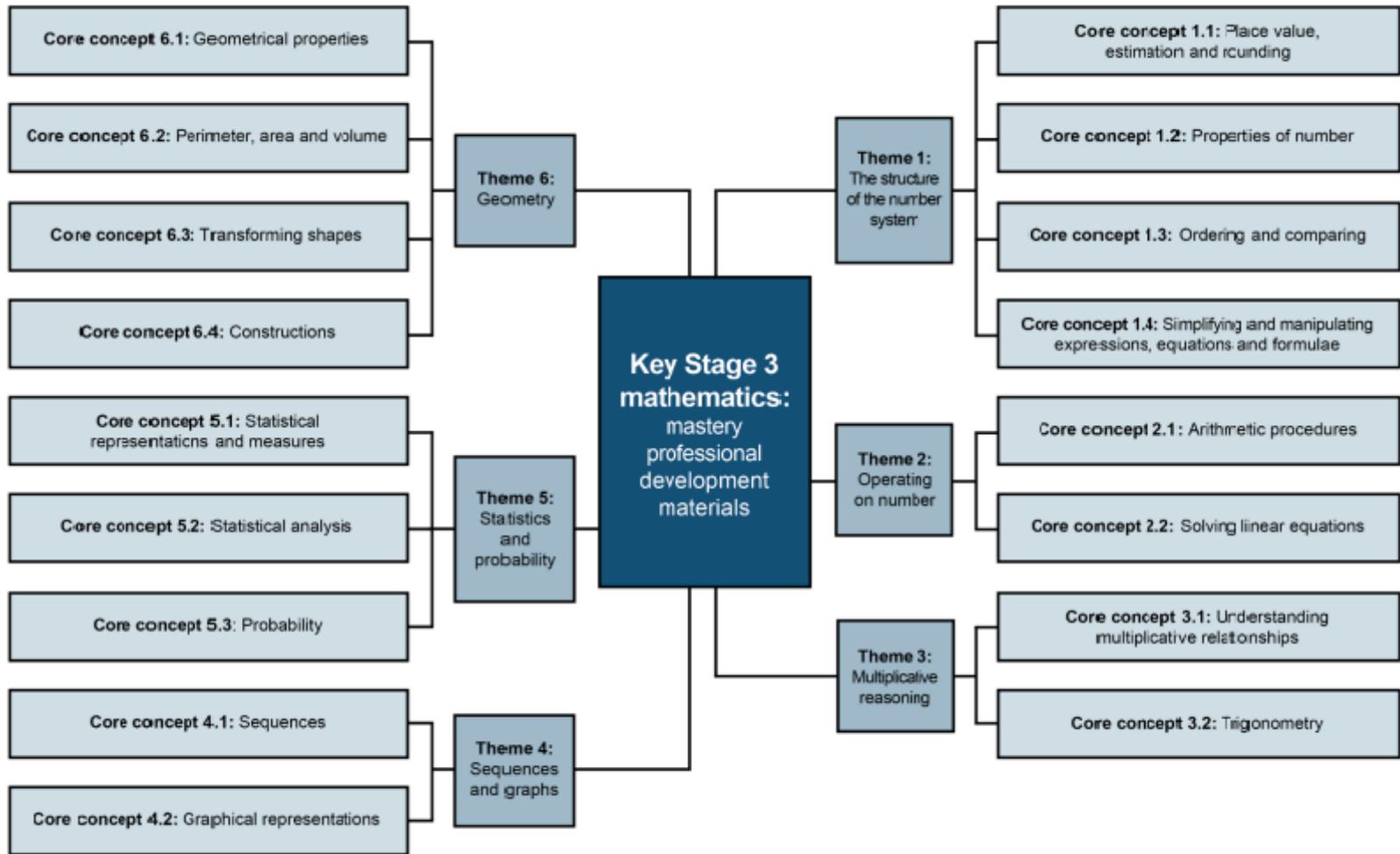
Sample curriculum framework using NCETM materials

SECONDARY MASTERY PROFESSIONAL DEVELOPMENT

Materials that will assist you in your professional development and support you in teaching for mastery with confidence
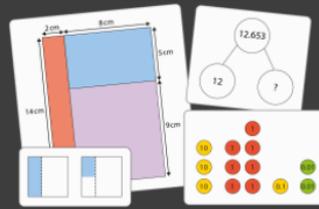
These materials offer a 'fine-grained' description of the key themes and big ideas of the national curriculum by detailing:

- six broad mathematical **themes**
- a number of **core concepts** within each theme
- a set of **'knowledge, skills and understanding' statements** within each core concept
- a collection of focused **key ideas** within each statement of knowledge, skills and understanding.

MATERIALS AND GUIDANCE

The structure of the number system

Theme 1 comprises four interconnected core concepts, each of which covers a set of 'knowledge, skills and understanding' statements.
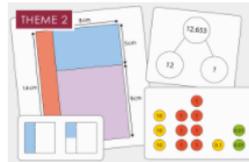
Operating on number

Theme 2 comprises two interconnected core concepts, each of which covers a set of 'knowledge, skills and understanding' statements.
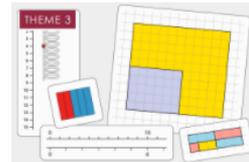
Multiplicative reasoning

Theme 3 comprises two interconnected core concepts, each of which covers a set of 'knowledge, skills and understanding' statements.
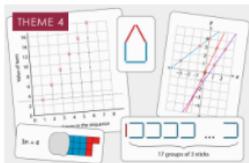
Sequences and graphs

Theme 4 comprises two interconnected core concepts, each of which covers a set of 'knowledge,
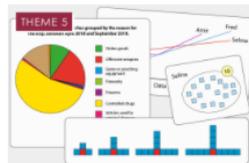
Statistics and probability

Theme 5 comprises three interconnected core concepts, each of which covers a set of 'knowledge,
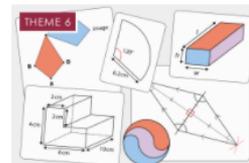
Geometry

Theme 6 comprises four interconnected core concepts, each of which covers a set of 'knowledge,
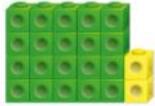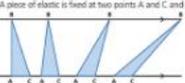
[Secondary Mastery Professional Development | NCETM](#)

A department focus on pupils with SEND

A focus on SEND in mathematics: Dyscalculia

What is it ?
'a condition that affects the ability to acquire arithmetical skills. Dyscalculia learners may have difficulty in understanding simple number concepts, lack an intuitive grasp of numbers, and have problems learning number facts and procedures. Even if they produce a correct answer, or use a correct method, they may do so mechanically and without confidence'
(DfES 0512/2001, p.2)

A specific difficulty with number and arithmetic

SEN Support
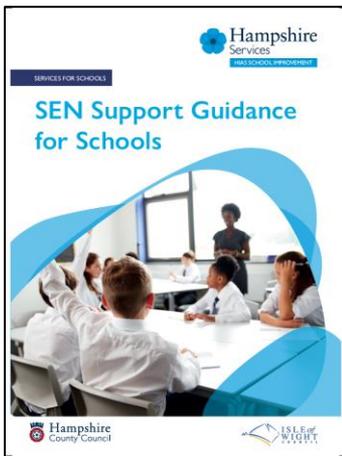
'Access for every CYP to suitable, **high-quality provision, which meets diverse need and diminishes barriers to participation and engagement'**

'**A strong commitment to early intervention and prevention to tackle, diminish or avert potential barriers to success'**

from The Hampshire and Isle of Wight principles of inclusion which underpin these guidelines

'The class teacher is the leader of provision for SEND at the point of delivery in the classroom and so occupies a pivotal – perhaps the most pivotal - role. Trained, skilful teachers who have a repertoire of teaching methods, strategies and resources, coupled with strong assessment practices and a responsive curriculum offer are therefore paramount to the success of provision and outcomes for CYP with SEND.' p21

SEN Support Guidance for Schools
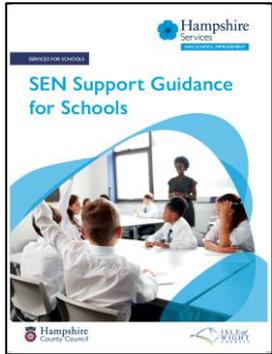
'It is vitally important that SEND is seen as a difference in need as opposed to a shortcoming or a weakness.' p13

'The SEND Pathway shows a graduated approach to ways in which needs may be met. It is important to recognise a continuum of need, with much variation of extent and nature of need within a defined group. Many CYP are identified as requiring SEN Support but the level and extent of need will vary significantly within that group, including for CYP who have the same category of need. This is why a graduated approach is important; one size will not fit all, and boundaries of need may often be blurred and/or variable.'

SEN Support HIAS guidance Section 2

Hampshire County Council

HQT + SEND SUPPORT

Manage time and resources efficiently

Expectations of behaviour consistently applied

Graduated approach

Assessment

Flexible grouping

Pace and purposeful learning

Technology

Deep knowledge of the curriculum and pupil misconceptions

Promote positive relationships

Promote positive motivation and high expectations

Create an organised and learning based classroom environment

Displays, layout and resources

Understanding content

Supportive environment

High quality resources that support learning

Clarity of learning intentions

Explicit instruction

Scaffolding

Cognitive and Metacognitive strategies: chunking

Maximising opportunity to learn

Build on holistic understanding of pupil and their needs

High quality teaching

Activating hard thinking

Small group/1:1 interventions

Work effectively with TAs

Structuring

Explaining

Questioning

Interacting

Embedding

Activating

Adapted from:

Special Enducational Needs in Mainstream Schools - EEF

The Great Teaching Toolkit - Evidenced Based Education

HQ teaching supports all pupils

Create a positive and inclusive environment for all pupils without exception

Complement high quality teaching with carefully selected one to one and small group intervention

Build an ongoing holisitc understanding of your pupils and their needs

Work effectively with teaching assistants

Ensure all pupils have access to high quality teaching

effective diagnostic assessment

Subject knowledge: progression in concepts and skills

explicit instruction

cognitive and metacognitive strategies

scaffolding

flexible grouping

SPECIAL EDUCATIONAL NEEDS IN MAINSTREAM SCHOOLS
Guidance Report

Education Endowment Foundation

THE EEF GUIDE TO SUPPORTING SCHOOL PLANNING: A TIERED APPROACH TO 2020-21

Education Endowment Foundation

Hampshire Services
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Hampshire County Council

HQ teaching supports all learners

'…research suggests a group of teaching strategies that teachers should consider emphasising for pupils with SEND. Teachers should develop a repertoire of these strategies they can use flexibly in response to the needs of all pupils.

- flexible grouping;
- cognitive and metacognitive strategies;
- explicit instruction;
- using technology to support pupils with SEND; and
- scaffolding.'

How will ==expertise of SENCo and subject leader== be used jointly to support all teachers to secure good progress for pupils with SEND?

- Setting realistic achievable targets in appropriate curriculum
- Ensuring development of independence and application of maths

SPECIAL EDUCATIONAL NEEDS IN MAINSTREAM SCHOOLS
Guidance Report

Education Endowment Foundation
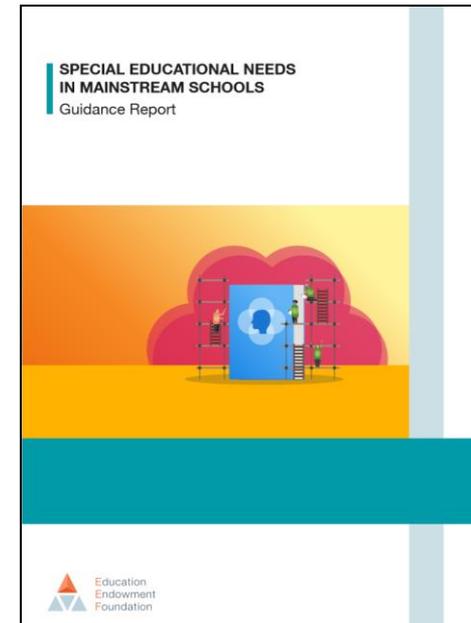
High Quality Teaching

Mathematics

Pupil voice/ Attitude to maths

Concepts, knowledge and skills KS1 and 2:
- Counting
- Place value: representing, ordering, rounding
- Key facts
- Part whole logic and reasoning underpinning calculation
- Vocabulary and language for the domain
- Understanding of links between ideas they know and understand across domains?
- How successfully are manipulatives used

Which aspects of HQT could be further enhanced to provide bespoke support?

What will reasonable adjustments look like in the classroom?

Asses | **Plan**

Review | **Do**

Review:

How is the pupil responding to targeted provision?

Has there been any improvement in confidence, independence, rate of progress?

Pupil views and teacher views

Are there changes to the SEN?

Access strategy- scaffolding, pre- teaching, flexible grouping, content, process, chunking tasks, resources

Teaching approaches- language, precision teaching, overlearning, alternative ways of recording, explicit teaching of links to prior learning, remind pupil of previous successes

Core Provision 2021-22

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Next Meeting via MS Teams
1315 start
Tuesday 30th November
Look forward to seeing you all there

Suggested foci:
- Inclusion and SEND
- Progress and attainment in Y.10 & Y.11
- Successes and challenges of Y.7 transition
- Y8 & Y9 provision. What is working well?
- Assessment ~ what is it telling us so far?
- HoDs choice (email me at jo.lees@hants.gov.uk)

Safe journey home