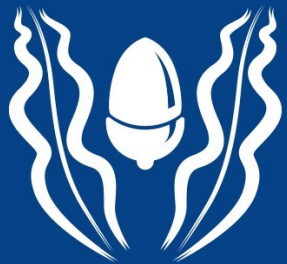


**Knowledge  
Is  
Power**



# *Introduction:* Knowledge is Power

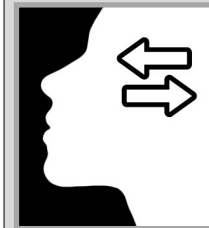
Welcome to the inaugural newsletter for Knowledge is Power.

In short, this is Highlands School's implementation of metacognition which empowers students to understand how they learn and to employ the most efficient and effective ways of doing so. Based upon scientific research, it is evidence based and has proven effectiveness. Although relatively new in terms of its use in schools, it does have an established reputation for ensuring students progress and deepen their knowledge.

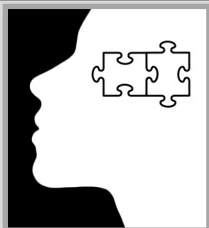
We will be focusing on five key strategies in a rolling programme of form time activities and within subject classrooms:



Dual coding develops the links between images and text and this is the work with which we have started



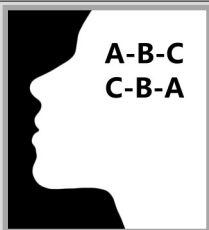
Retrieval practice to consolidate prior learning for use in new contexts



Concrete examples, which ensure that abstract concepts are grounded in the substance of pupils' lives



Elaboration to stretch and develop understanding



Interleaving—a form of spaced practice which encourages connections to be made across different topics

We hope you appreciate the fantastic work many of our students have done this term – some of which is included in this newsletter.

We have also included a booklist at the end for any parents who may wish to find out more.

If you would like to get more involved in either the research or in supporting our students beyond the classroom, please contact:

Mr Couzin at [couzinm@highlands.enfield.sch.uk](mailto:couzinm@highlands.enfield.sch.uk)

Many thanks and enjoy!

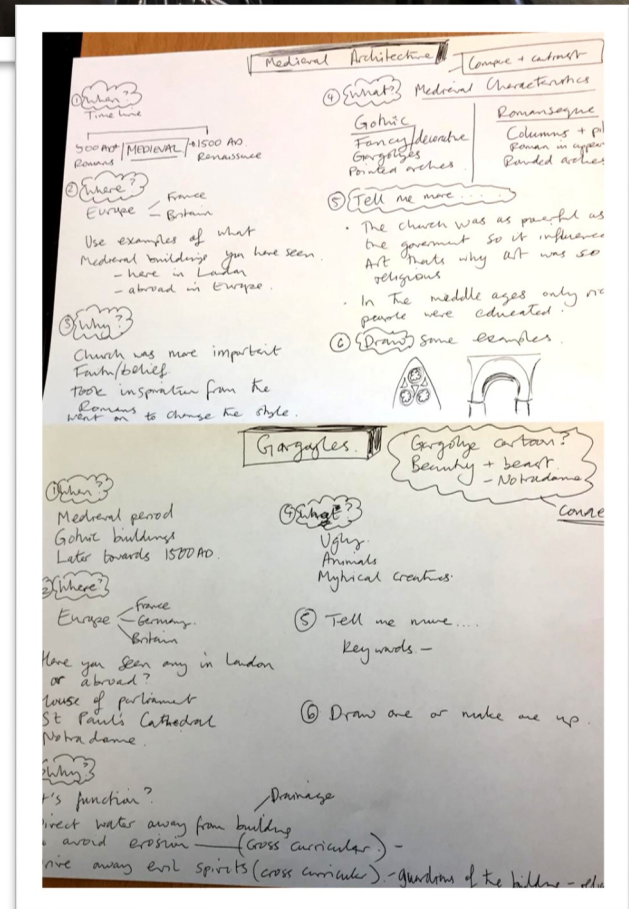
# Knowledge is Power

## Learning about Metacognition

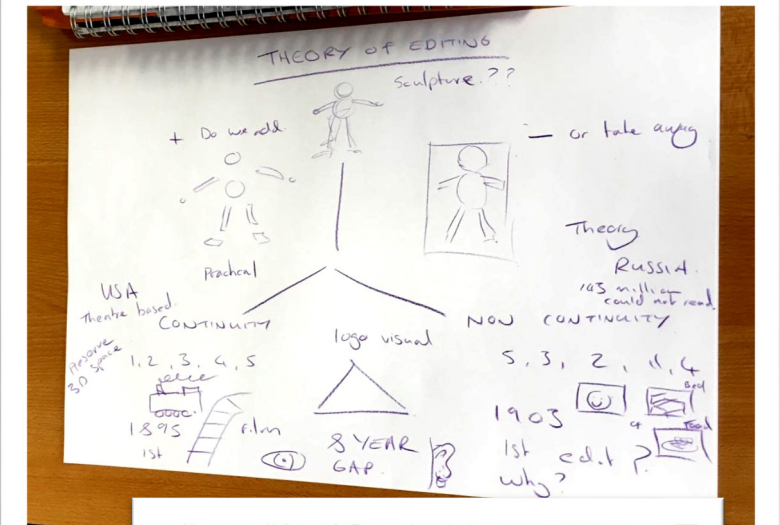
During the January inset day, staff were introduced to the research literature based on five key learning processes which, the evidence tells us, are instrumental in students acquiring, retaining and applying knowledge in a variety of contexts. This is key considering the increased demands of new curricula throughout all subjects and phases.



We will be developing all of these areas as part of a rolling programme during form time and through teaching and learning.



# Knowledge is Power



Ks3 - RE

BLOCK LEARNING - JUDAISM.

Lesson 1 - intro Judaism.

Lesson 2 - idea of monotheism in all 3 religions Christianity - Islam - Judaism.

Lesson 3 - Abraham  
interleaving (Abrahamic religions) - father of what others religion?

Lesson 4 - Moses (10 commandments)  
interleaving (Laws in UK) + 5 Pillars of Islam?

other topics - Holy Books  
that can interleaving  
- life after death beliefs.

With new research comes new practice. Staff used time on the inset day to explore the theories and the ways in which they will modify their teaching strategies.

$$x = 64 \quad x = 16.4$$

$$① \quad 2x + 3 = 64 \quad 10x + 16 = 64 \quad 10x = 48 \quad x = 4.8$$

$$② \quad 3x + 5 = 6x - 3 \quad x = -8$$

$$③ \quad 4x - 20 = 180 \quad 4x = 200 \quad x = 50$$

$$④ \quad 3x - 30 = 180 \quad 3x = 210 \quad x = 70$$

# Dual Coding

## Transferring Knowledge

Although modern textbooks are often visually appealing, they are often still dense with information and knowledge for students to learn and remember. Knowledge organisers are an extreme example of this: they are great for containing all the required knowledge, but can be off-putting and intimidating.

Rather than copying, highlighting or even summarising, by transferring information from one place to another and then dual coding with images, students are able to develop their thinking around key concepts. This is active learning and is cognitively demanding because students must select, use their own words and then design an image.

Our students selected a subject knowledge organiser and transferred some information and then used images to dual code. See the example below:

**Key Icons & Graphics**

2019

Food transfer to all  
Carbon dioxide from the air  
Water from the roots  
Energy transferred by light

Cell  
Root hair cell

Tissue  
Root hair + tissue

Organ  
Root

System  
veins in leaves and stem

Organism  
Tree

Respiration  
Glucose + Oxygen → Carbon dioxide + Water  
Fuel + Oxygen → Carbon dioxide + Water

Formation of sex cells

Energy transferred by  
Sun light  
 $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{Glucose} + \text{oxygen}$

Fermentation  
 $\text{Glucose} \rightarrow \text{Ethanol} + \text{CO}_2$

Photosynthesis  
 $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{Glucose} + \text{O}_2$

Chemicals  
Alcohol  
Drugs  
Smoking

Selective Breeding

Exercise  
Person running

Record key images and graphics here, you can keep these flashcards for future use.

**KNOWLEDGE IS POWER**

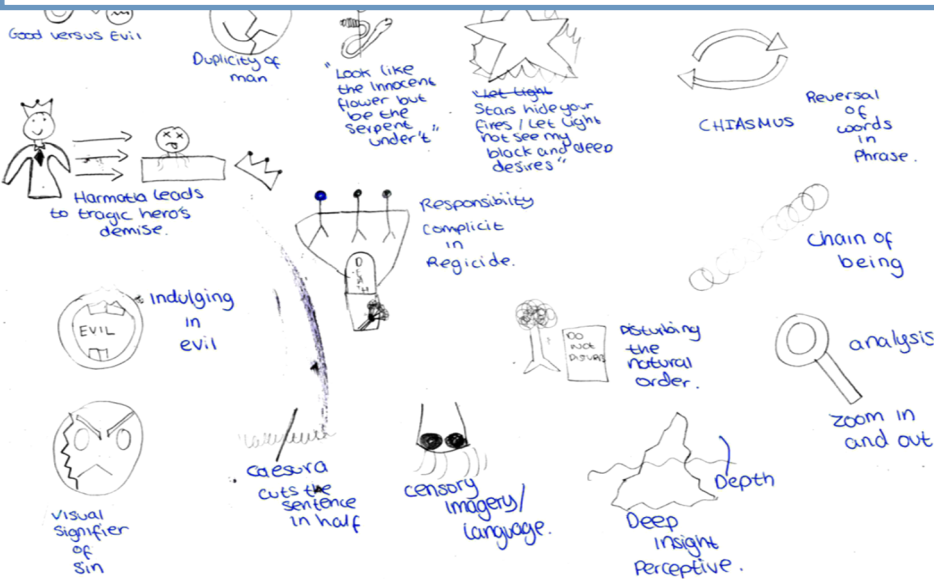
Through this strategy, students are actively engaged in the learning process and this helps with retention.

# Dual Coding

One of the great joys of teaching is to marvel at the creativity and originality of thought young people possess. Here are some examples of the images they created to prepare for dual coded flashcards:



Abstract concepts are far harder to learn, understand and memorise than concrete facts. This is because they don't have tangible, ready-made dual coding attached to them.



By encouraging our students to be creative and design their own images for abstract, often challenging concepts, they will be able to recall these ideas more easily and will also understand them in a more personal and profound way.

## Flashcard Page

You can buy flashcards in stationery shops, but you can also use this page as a template.



Name 3 specialised cells? Thence: My Packed Suitcase	Features Animal Cell & Plant cell AC: 6 characteristics PC: Characteristics	What is an organism?
Major Muscle - contract & relax P for plant cell - carry out photosynthesis S - sperm cell - fused to egg =	AC: Cell Membrane, Cytoplasm, Nucleus PC: N + Cy + chloroplasts + vacuole + cell wall	Organs that are grouped together to form systems. The whole thing is called an organism

Reverse

Front

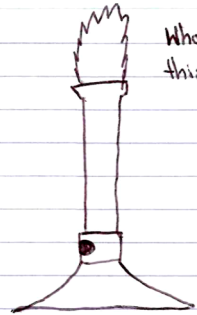
KNOWLEDGE IS POWER

# Dual Coding

## Recent Dual Coding Work – Producing Flashcards

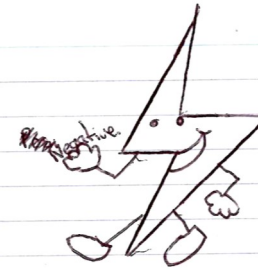
Some stunning examples of fantastic flashcards:

BUNSEN  
BURNER



What piece of equipment is this?

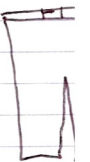
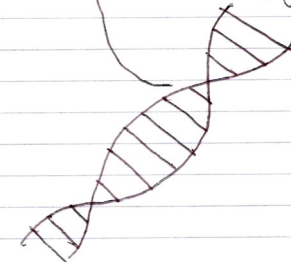
ELECTRON



What type of component is this that makes up an element?

GENES

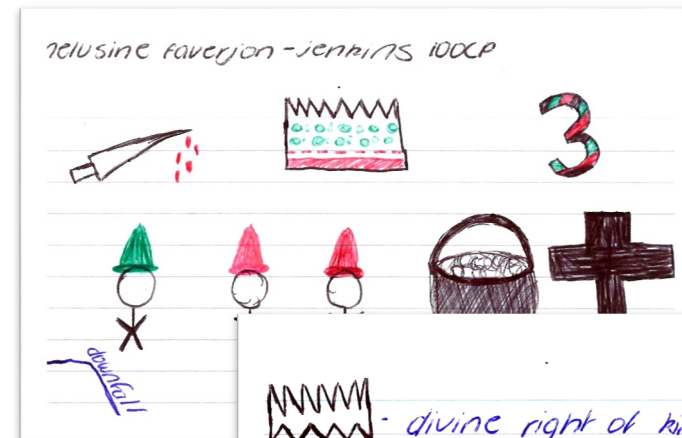
at 29 make up your person.




KNOWLEDGE IS POWER

# Dual Coding

Students have studied the principles of effective flashcard design. Using icons and graphics they have created themselves (which encourages their 'ownership' of the images – helping them 'stick' in their memory), students have now converted them onto flashcards as a key element of dual coding.






 - divine right of kingship  
 - light and dark side of human  
 - biblical allusion - ~~psych~~ psychosis  
 - catalyst for evil - remorse  
 - tragedy play - deception  
 - mental deterioration - inner anguish  
 - religious transgression - supernatural  
 - destruction of tyranny - prophetic powers  
 - corruption - hallucinatory vision

alpha Huxley 100CP

rect / Inverse proportion with power

By providing visual clues, these dual coded flashcards allow for easier retrieval of information as the memory has been coded in two ways – through subject-specific words and images.

Note how uncluttered these flashcards are – which means that students don't clog up working memory with too much information!


 $\dots / \dots + \triangle S$   
 $= Kx^n$ 
  
 $y = \frac{K}{x^n}$

## TWO-PART IMITATION

IN BACH : 3<sup>RD</sup> MOVEMENT BRANDENBURG CONCERTO, WHAT ARE THE FIRST THREE SOLO INSTRUMENTS HEARD?

D MAJOR.

Samir Lo

ANSWER : Violin, Flute and Harpsichord

Remember: This piece has latin names on score.

HINT BOX



# Dual Coding

Some of the form class winners for producing excellent work on dual coding!



Denzel Quainoo

Grace Maher

Kate Rogers

Ben Foggo

Benji Wackett

Simran Pandit

Melina Watson

Harry Price

Katherine Boddy

Anya Adelu

Zahra

Motighavanin

Thara Dean

Jamie Grant

Tanya Mehmet

Jack Savage

Katie Johnson

# Dual Coding

If you are interested in learning more, here are the key texts which can all be purchased online:

**Understanding How We Learn: A Visual Guide** Paperback – 16 Aug 2018

by Yana Weinstein (Author), Megan Sumeracki (Author), Oliver Caviglioli (Author)

★★★★★ 8 customer reviews

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Read with Our <b>Free App</b>	3 Used from £171.98 9 New from £87.66	6 Used from £16.30 30 New from £15.40



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Educational practice does not, for the most part, rely on research findings. Instead, there's a preference for relying on our intuitions about what's best for learning. But relying on intuition may be a bad idea for teachers and learners alike.

**Make It Stick: The Science of Successful Learning** Hardcover – 25 Apr 2014

by Peter C. Brown (Author), Henry L. Roediger (Author), Mark A. McDaniel (Author)

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To most of us, learning something "the hard way" implies we believe, should be creatively tailored to the different learning styles. But research shows that the best way to learn is to use strategies that make learning easier. Make It Stick "turns" this idea on its head. Drawing on recent discoveries in cognitive psychology, the authors offer concrete techniques for becoming more productive learners.



## The Cambridge Handbook of Cognition and Education (Cambridge Handbooks in Psychology) Paperback – 7 Feb 2019

by John Dunlosky (Editor), Katherine A. Rawson (Editor)

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This Handbook reviews a wealth of research in cognitive and educational psychology that investigates how to enhance learning and instruction to aid students struggling to learn and to advise teachers on how best to support student learning. The Handbook includes features that inform readers about how to improve instruction and student achievement based on scientific evidence across different domains, including science, mathematics, reading and writing. Each

<http://www.learningscientists.org/blog?category=For+Parents>