Assessment Development

CAMBRIDGE ASSESSMENT

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Local Examinations Syndicate

Development of what?

School systems

National arrangements – tests and examinations

Use of outcomes

Day to day teaching practice - teacher development

Initial teacher training

Pupils' use of assessment

Parental expectations

Select Committee evidence January 2017

…We are the most tested system in the world

…Only, we aren't

…Only we have high accountability

…In fact, we really aren't the only ones

…High density assessment and accountability are not associated with 'improving systems'

…Actually, they are

Daisy Christodoulou 2017

The real concern is:

'If you try to teach generic skills, and only give generic feedback, you will end up always having to use assessments that have been designed for summative purposes. That is, you will end up over-testing and teaching to the test.

Political Economy

(*Two hours.*)

Not more than **seven** *of the following ten questions are to be attempted.*

1. What would you include under the term "Wealth"?

Which of the following would you regard as wealth: sound eyesight, a pair of spectacles, a warm climate, a coal mine, a business connexion, a good education? Give reasons in each case.

2. What are the chief conditions which determine the price at which an article is sold?

3. What is meant by Monopoly? Give examples of natural monopolies, legal monopolies, and of monopolies which fall under neither of the two former headings.

4. What are the most important economies to be obtained by manufacturing on a large scale?

5. What are the chief reasons why wages differ between one trade and another? Explain why it happens that relatively pleasant occupations are often better paid than unpleasant occupations.

6. Describe the various ways in which a sum of £5 could be paid, and explain the advantages of each method.

7. Give what you believe to be the five most important commodities imported into Great Britain, and the five most important commodities exported, stating in each case some of the chief countries with which the trade in question is carried on.

IDGE ASSESSMENT

Q: Stop the Train

A steam train moving with a speed of $v_0 = 60\,\mathrm{km\,h^{-1}}$ is brought to rest by first shutting off the steam, when the train runs against a resistance equal to $1/100$ of its weight, and later by applying the brakes, at which point the train runs against a force equal to $1/8$ of the weight of the train.

Answer Now | Hint 1 | Hint 2 | Hint 3 | Hint 4 | Hint 5

If the steam is shut off when the train is a distance $d = 0.33\,\mathrm{km}$ from a station, find the distance from the station that the brakes must be applied in order that the train may be brought to rest in the station.

Value

?

Please answer to an appropriate number of significant figures.

Units

Please choose an appropriate unit of measurement.

*Don't forget to use the **hint** tabs above if you need help.*

Check my answer

Adapted with permission from UCLES, Higher School Certificate Physics, June 1923, Paper 2, Question 1.

Questions, questions

The need for assessment kleptomania

‘Massive’ availability of questions (and responses ie scripts?)

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Education
Endowment
Foundation

Sutton Trust - EEF
Teaching and Learning Toolkit

Spring 2013

Approaches

APPROACH	COST ESTIMATE	EVIDENCE ESTIMATE	AVERAGE IMPACT	SUMMARY
Ability grouping	£	★★★	- 1 Month	Negative impact for very low or no cost, based on moderate evidence.
After school programmes	£££££	★★	+ 2 Months	Low impact for high cost, based on limited evidence.
Arts participation	££	★★★	+ 2 Months	Low impact for low cost, based on moderate evidence.
Aspiration interventions	£££	★	0 Months	Very low or no impact for moderate cost based on very limited evidence.
Behaviour interventions	£££	★★★★	+ 4 Months	Moderate impact for very high cost, based on extensive evidence.
Block scheduling	£	★★	0 Months	Very low or negative impact for very low of no cost, based on limited evidence.
Collaborative learning	£	★★★★	+ 5 Months	Moderate impact for very low cost, based on extensive evidence.
Digital technology	££££	★★★★	+ 4 Months	Moderate impact for high cost, based on extensive evidence.
Early years intervention	£££££	★★★★	+ 6 Months	Very high impact for very high costs, based on extensive evidence.
Extended school time	£££	★★	+ 2 Months	Low impact for moderate cost, based on limited evidence.
Feedback	££	★★★	+ 8 Months	Very high impact for low cost, based on moderate evidence.
Homework (Primary)	£	★★★	+ 1 Month	Low impact for very low or no cost, based on moderate evidence.
Homework (Secondary)	£	★★★	+ 5 Months	Moderate impact for very low or no cost, based on moderate evidence.
Individualised instruction	£	★★★	+ 2 Months	Low impact for low cost, based on moderate evidence.
Learning styles	£	★★★	+ 2 Months	Low impact for very low cost, based on moderate evidence.
Mentoring	£££	★★★	+ 1 Month	Low impact for moderate cost, based on moderate evidence.
Meta-cognition and self-regulation	££	★★★★	+ 8 Months	High impact for low cost, based on extensive evidence.
One to one tuition	££££	★★★★	+ 5 Months	Moderate impact for high cost, based on extensive evidence.
Parental involvement	£££	★★★	+ 3 Months	Moderate impact for moderate cost, based on moderate evidence.
Peer tutoring	££	★★★★	+ 6 Months	High impact for low cost, based on extensive evidence.
Performance pay	££	★	0 Months	Low or no impact for moderate cost, based on very limited evidence.
Phonics	£	★★★★	+ 4 Months	Moderate impact for very low cost, based on extensive evidence.
Physical environment	££	★	0 Months	Very low or no impact for low cost based on very limited evidence.
Reducing class size	£££££	★★★	+ 3 Months	Low impact for very high cost, based on moderate evidence.
School uniform	£	★	0 Months	Very low or no impact for very low cost, based on very limited evidence.
Small group tuition	£££	★★	+ 4 Months	Moderate impact for moderate cost, based on limited evidence.
Social and emotional aspects of learning	£	★★★★	+ 4 Months	Moderate impact for very low cost, based on extensive evidence.
Sports participation	£££	★★	+ 2 Months	Moderate impact for moderate cost based on moderate evidence.
Summer schools	£££	★★	+ 3 Months	Moderate impact for moderate cost based on limited evidence.
Teaching assistants	££££	★★	0 Months	Very low or no impact for high cost, based on limited evidence.

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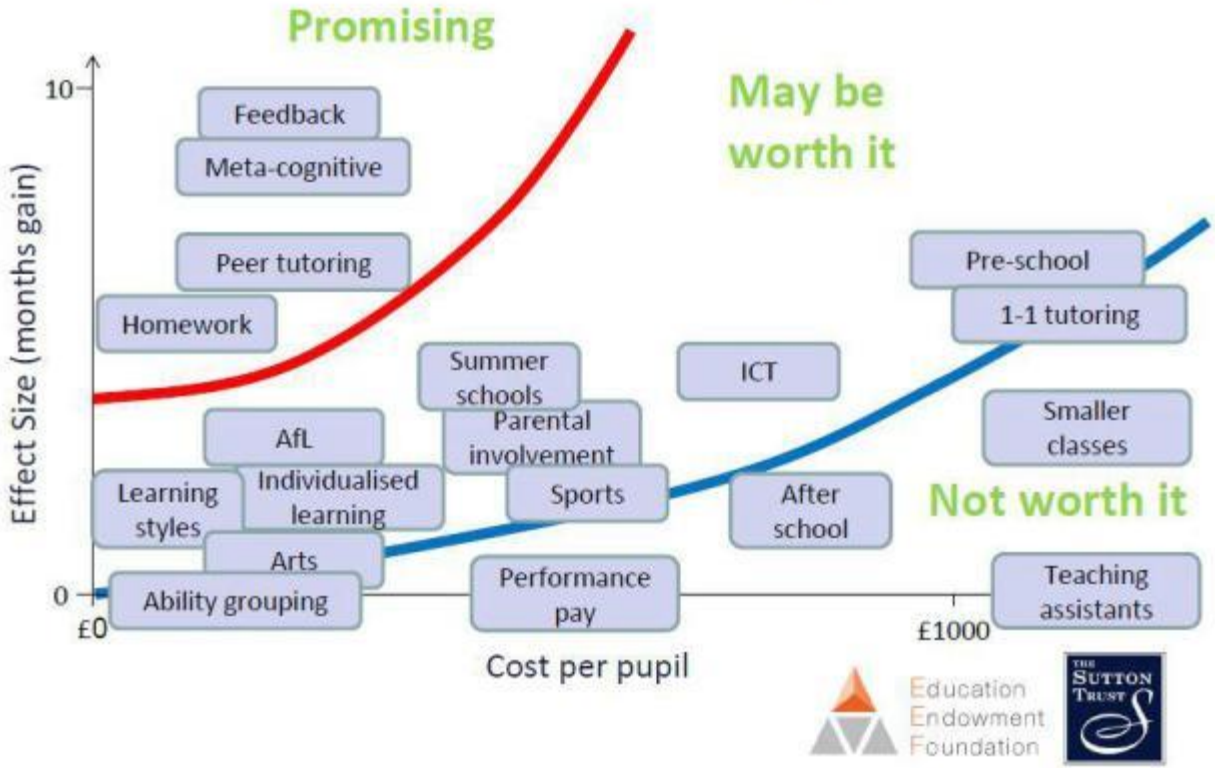
Toolkit findings



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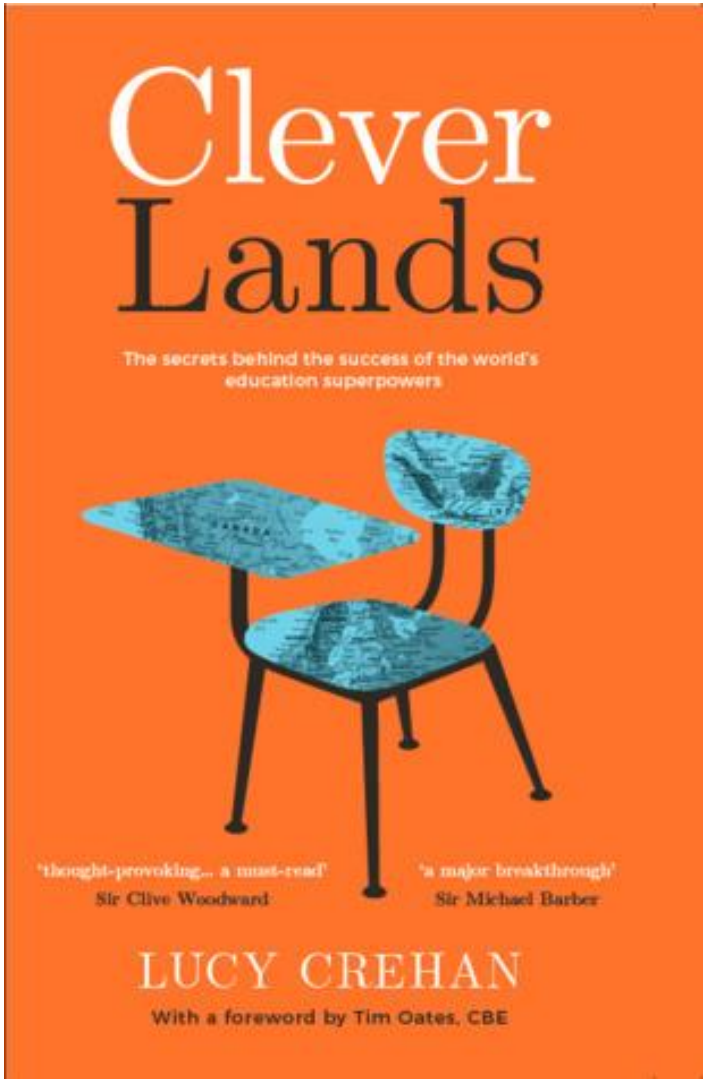

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The other important point to emphasise is the feedback. Practising at length is not useful, and can even be harmful, if you're practising in the wrong way. Chinese teachers make the most of their extra non-teaching time to offer feedback to pupils in three ways. Firstly, they will often mark the students' classwork and homework on the same day it's handed in, using a set of symbols to indicate what the students got wrong so that students get immediate feedback.[165] This doesn't always happen; in some schools I saw students in the staffroom marking their peers' work using the mark scheme, but this still gives the teacher an idea about the distribution of mistakes, which they can use in their planning.

Secondly, they discuss common mistakes or misunderstandings at the beginning of the very next lesson, and ask students who got the tricky questions to demonstrate how they did it on the board to the rest of the class. On one occasion a maths teacher was hesitant to let me observe her class because, she said, 'we're only going over homework', yet this is probably where the most learning gains happen.

Crehan L 2016 Cleverlands p183

Mastery

comprehensive knowledge or skill in a particular subject or activity

Synonyms
Proficiency, ability, capability, knowledge, comprehension, familiarity, command, grasp, grip

Not used in the Expert Panel Report
Dominant in continental vocational education
Re-introduced in Maths Hub Shaghai exchange

Persistence
Reproduction
Analytic thought

An issue in school-HE progression
Understanding of relations and deep structures

21Century skills
‘Children do not need to remember anything any more…’

21Century skills

Suto on '…most of them are not...(21 Century)...'

'Children do not need to remember anything any more…'

On the contrary: Helen Abadzi on the limits of working memory

'**Children will not need to write in future…'**

Mangan & Velay: 'traditional' writing develops psychomotor co-ordination, planning, complex language (what, if, then) structured argument, cognitive development - Miskin: oral exposure, then writing

The equals sign =
The electron
The shortest distance between two points

The Unconscious
Character – Lady Macbeth
Plot – Memento

Mastery

comprehensive knowledge or skill in a particular subject or activity

Synonyms
Proficiency, ability, capability, knowledge, comprehension, familiarity, command, grasp, grip

Understanding or capacity which is persistent, and adequate to the next stage of the learning programme/educational progression

Construct-irrelevant variation
'Metamorphosis'

Revealing thinking
The 'story of the lesson' in Japan
Worksheet culture

Generalisation - application in varied contexts – the importance of practice

Identification of the margins of understanding, when misconceptions kick in – the importance of questions

'H20', 'tectonic plates'

We can operationally define 'depth of treatment' through the answers we expect to well-chosen questions, as well as stimulate learning

Questions

‘what’s multiplication, children…’
We challenge ourselves – Wroxham School

Gravity and ‘looking up at the stars’

Nodal questions
Jupiter and Venus in conjuncton in 2015
One inside, other outside…and it’s dark

Crehan: in a Shangahi maths classroom: routinely up to 120 questions in a single lesson – purposes: stimulating learning, engaging, monitoring

IDGE ASSESSMENT

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Isaac Physics is now at a max of 55,000 hits per day. This is extraordinary. NRich – which has been in place for a decade – has 900,000 per month, but covers 11 years of schooling.

Isaac Physics has 27,500 hits for each year of schooling; NRich 2,700. And that with Maths as the most popular A level at 92,000 and physics at 35,000.

Singapore – secondary maths

Chapter overview – story, topic – engagement
Discover – learning outcomes
Use of diagrams explained

Key ideas – concepts/constructs – margin notes – focus on concepts

Worked examples
Did you know – interesting facts
Guidance on the use of a calculator
Exercises
'Time out activity'
Journal writing task
Summary – recap and revision – checking main concepts
Revision paper
Ten-minute concept check
Review paper
Enrichment maths

Hong Kong – secondary maths

Pre-requisites
Review

Different forms of the equations of circles
Features of circles from the equations
Equations of circles from the different given conditions
Intersection of a straight line and a circle

Learning objectives
Problems
Check through assessment: 6 problems, 1 practice exam Q, 1 *lively maths problem*
Clear concepts/constructs
Good elaboration through application
Checking understanding

Spiral curriculum model

Construct

Practice

Production

Exposure

The National Curriculum 1995

Science - key stage 3

Materials and properties

Chemical Reactions

i. that when chemical reactions take place, mass is conserved;
j. that virtually all materials, including those in living systems, are made through chemical reactions;
k. to represent chemical reactions by word equations;
l. that there are different types of reaction, including oxidation and thermal decomposition;
m. that useful products can be made from chemical reactions, including the production of metals from metal oxides;
n. about chemical reactions, *e.g. corrosion of iron, spoiling of food,* that are generally not useful;
o. that energy transfers that accompany chemical reactions, including the burning of fuels, can be controlled and used;
p. about possible effects of burning fossil fuels on the environment.

Chemical and Material Behaviour

In their study of science, the following should be covered:

a. chemical change takes place by the rearrangement of atoms in substances;
b. there are patterns in the chemical reactions between substances;
c. new materials are made from natural resources by chemical reactions;
d. the properties of a material determine its uses.

2014 National Curriculum KS3 Chemistry

The particulate nature of matter

•The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure
•Changes of state in terms of the particle model.

Atoms, elements and compounds

•A simple (Dalton) atomic model
•Differences between atoms, elements and compounds
•Chemical symbols and formulae for elements and compounds
•Conservation of mass changes of state and chemical reactions

Pure and impure substances

- The concept of a pure substance
- Mixtures, including dissolving
- Diffusion in terms of the particle model
- Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography
- The identification of pure substances

Chemical reactions

- Chemical reactions as the rearrangement of atoms
- Representing chemical reactions using formulae and using equations
- Combustion, thermal decomposition, oxidation and displacement reactions
- Defining acids and alkalis in terms of neutralisation reactions
- The pH scale for measuring acidity/alkalinity; and indicators
- Reactions of acids with metals to produce a salt plus hydrogen
- Reactions of acids with alkalis to produce a salt plus water
- What catalysts do.

Materials

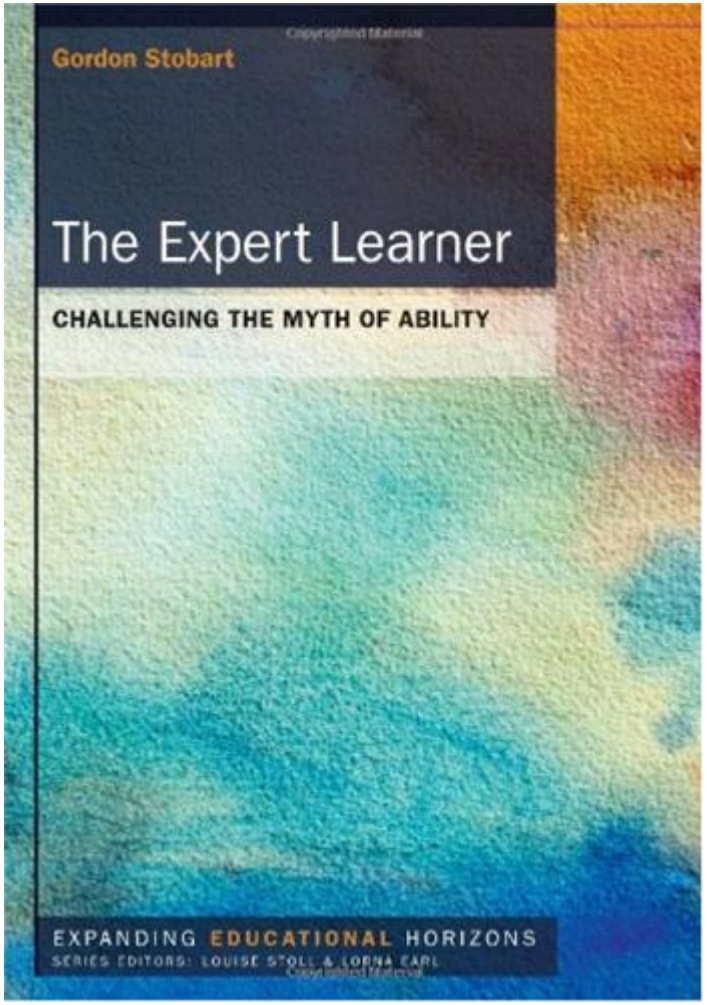
- The order of metals and carbon in the reactivity series
- The use of carbon in obtaining metals from metal oxides
- Properties of ceramics, polymers and composites (qualitative).

Earth and atmosphere

- The composition of the Earth
- The structure of the Earth
- The rock cycle and the formation of igneous, sedimentary and metamorphic rocks
- Earth as a source of limited resources and the efficacy of recycling
- The carbon cycle
- The composition of the atmosphere
- The production of carbon dioxide by human activity and the impact on climate.

Practice - expansive practice, not dull repetition

Thinking about the subject outside contact time



The National Curriculum for mathematics aims to ensure that all pupils:

Becoming **fluent** in the fundamentals of mathematics through regular and varied practice, so that they have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems; and

reasoning mathematically by following a line of enquiry and developing and presenting an argument, justification or proof using mathematical language

So that pupils:

Can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including within mathematics, in other subjects and from in and outside the classroom.

Production

Production

The externalisation of thinking

Making thoughts an object of study for the pupil

Revealing pupils' thinking to teachers

Removing the requirement for ‘levels’
Granular, analytic assessment

Re-inventing levels

2010 – the state of ‘Levels’

3 contrasting, co-existing models

1 the score on a compensation-based test
2 best fit
3 threshold

Poor construct integrity – including subject differences
Tom Bramley on single scale for very different ages and age-attainment
John Blake on predictive validity in post-16 progression
Contradictions between school and State
Poor communication with parents
Undue pace – expectations of Ofsted
Labelling – contrary to TGAT
corrosive of primary secondary links

Today – in the system right now…

The Landscape:

- Phonics check
- Baseline testing
- KS1 tests and TA
- KS2 tests and TA
- KS2 progress measure
- GCSE – including EB
- KS2-GCSE progress measure
- A level

A lot of discussion about TA at KS1

- Review of performance descriptors
- Use of optional and commercial tests – what is TA?
- NAHT Commission, ASCL work, McIntosh Commission
- National item bank of excellent questions – Debbie Morgan Shanghai 120

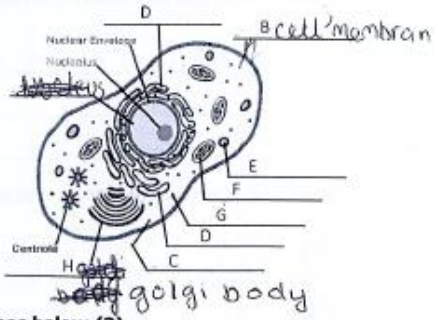
Recap Quiz

1/1 **1) What are all living things made out of? (1)** Cells ✓

2) Complete the table below filling in the names of each labelled organelle (8).

	Name of organelle
A	Nucleus ✓
B	Cell membrane ✓
C	Cytoplasm ✓
D	~~Lysosomes~~ lysosomes ×
E	
F	Mitochondria sp. ✓
G	Ribosomes ✓
H	golgi body ✓

6/8



3) Explain the functions of each organelle on the lines below (3).

a) Cell membrane: is the outside of a cell which is the line ×

b) Nucleus: is outside of the nucleous ×

c) Cytoplasm: is the gooey stuff. × What do they do?

0/3

4) Use a ruler to match the organelles below to their correct function (5).

Endoplasmic reticulum	This transports materials within the cell.
Ribosomes	This is the site of respiration in a cell.
Mitochondria ×	This is responsible for making proteins in cells
Golgi body	This packages and exports the proteins that the cell has made.
Lysosomes	This digests old parts of the cell and acts as a second line of defence.

0/5

5) Pick and answer ONE question from the list below (3).

a. Why is it important that sperm and egg cells have a nucleus?

b. Our muscles are made up of millions of muscle cells. Why do muscle cells contain many more mitochondria than other specialised animal cells?

c. Some molecules such as glucose, can pass easily through the cell membrane but other molecules, such as starch, cannot pass easily through the cell membrane? Why can some molecules pass through the cell membrane more easily than others?

0/3 Because our muscle cells. So that when the egg goes inside the nucleas a baby can be made because it will have to break inside.

Reuse = succeed!! Please redo incorrect answers!!

Yes miss

7/20

CAMBRIDGE ASSESSMENT

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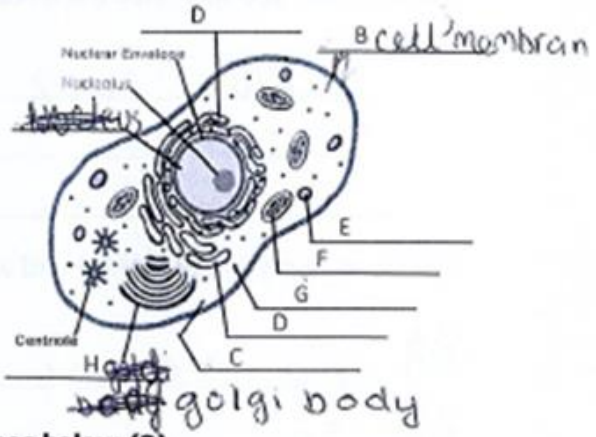

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0/3

Reflection and Review

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How many minutes did you spend preparing for the recap quiz (Answer honestly!)? _____

3 Things that you feel have gone really well so far this year in Biology:

- I knew some of the ~~cells~~ parts of the cell

3 Barriers to my improvement and achievement in Biology this half term:

- To revise alot and alot more
- to remember more of the cells
- Read questions properly.

3 Targets to help me improve further and achieve in Biology:

- Give an answer even if I dont know it.
- Revise harder
- Remember parts of the cell and to read the questions properly

Teacher comment:

WWW: you are beginning to develop more detailed and scientifically accurate answers. well done.

EBI: * Read questions carefully before answering them
* Respond to feedback to fill any gaps in yor knowledge.

Student comment:

I need to revise more and research if I am stuck or ask the teacher.

Problems in UK assessment

Underdeveloped formative assessment
Assessment dominating curriculum thinking
Relentless transformation into high stakes
Creep in function
Escalation of purposes

Form and purposes of assessment – why summarise?

Baseline testing
Phonics check
Start of KS1

Form and purposes of assessment – why summarise?

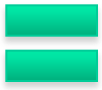
Baseline testing
Phonics check
Start of KS1

Form and purposes of assessment – why summarise?

Baseline testing
Phonics check
Start of KS1

Dependable, granular, probing, stimulating construct focussed, informative

Form and purposes of assessment – why summarise?



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Form and purposes of assessment – why summarise?

KS1 tests and TA
End of KS1

Check of ‘learning gain’ – progress?
Dependable measure – scaled score

Dependable, granular, probing, stimulating

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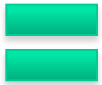

KS1 tests and TA
End of KS1

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Dependable measure – scaled score

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Baseline testing
Phonics check
Start of KS1

Form and purposes of assessment – why summarise?

KS2 tests and TA
End of KS2

A check by the State – learning gain - triage in Secondary
Dependable measure – scaled score

Dependable, granular, probing, stimulating

KS1 tests and TA
End of KS1

Check of ‘learning gain’ – progress?
Dependable measure – scaled score

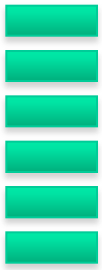
Dependable, granular, probing, stimulating

Baseline testing
Phonics check
Start of KS1

Form and purposes of assessment – why summarise?

A level
GCSE – including EB

State check of learning gain KS1, 2, GCSE



Dependable, granular, probing, stimulating

end KS3

Dependable, granular, probing, stimulating

Diagnostic check? KS2 re-takes?

KS2 tests and TA
End of KS2

A check by the State – triage in Secondary
Dependable measure – scaled score

Dependable, granular, probing, stimulating

KS1 tests and TA
End of KS1

Check of 'learning gain' – progress?
Dependable measure – scaled score

Dependable, granular, probing, stimulating

Baseline testing?
Phonics check
Start of KS1

How do we understand progress?

By what a pupil has ***produced***: the things they have written, the questions they can answer

Ofsted beginning to focus on production: looking at the beginning of a term and the end of a term

Link between the learning plan and outcomes – the structure in Singapore, Hong Kong and Shanghai textbooks – pre-assessment and returning to topics

Wiliam ‘I got the credit…’, Oates ‘But I got 8 on that...’

Granular, analytic – summarising loses information

Model approaches
No reinvention of levels

School #1
Common agreement on a learning model
A specific model of ‘differentiation’ – ‘mastery’
Granular focus on learning
Targeted support to learners who require it
High levels of qualification & competence in TAs

School #2
Pre-planning of learning programme on a termly-annual basis
Re-use and refinement of model activities – lesson observation
Constant progress monitoring on a day-by-day basis
Immediate allocation of high quality additional support
Use of high-quality resources

Agreed marking policy

Construct focus

Access to high level thinking – rote learning

Pace – deep learning – fewer things in greater depth

Practice - extent – variation

Learning outside contact time – thinking – social learning

Assessment – depth of treatment – rich Q&A

Granular analytic focus – use of data