The 5Rs approach to GCSE Maths resits

Technical Notes

To accompany the Evaluation Report

The Education Endowment Foundation (EEF) is an independent grant-making charity dedicated to breaking the link between family income and educational achievement, ensuring that children from all backgrounds can fulfil their potential and make the most of their talents.

The EEF aims to raise the attainment of children facing disadvantage by:

- identifying promising educational innovations that address the needs of disadvantaged children in primary and secondary schools in England;

- evaluating these innovations to extend and secure the evidence on what works and can be made to work at scale; and

- encouraging schools, government, charities, and others to apply evidence and adopt innovations found to be effective.

The EEF was established in 2011 by the Sutton Trust as lead charity in partnership with Impetus Trust (now part of Impetus - Private Equity Foundation) and received a founding £125m grant from the Department for Education. Together, the EEF and Sutton Trust are the government-designated What Works Centre for improving education outcomes for school-aged children.

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Appendix 4: Attitudes Toward Mathematics Inventory (ATMI)

ATTITUDES TOWARD MATHEMATICS INVENTORY - ABRIDGED

Note: North American language/phrasing not yet amended to British English context

Directions: This inventory consists of statements about your attitude toward mathematics. There are no correct or incorrect responses. Read each item carefully. Please think about how you feel about each item. Darken the circle that most closely corresponds to how the statements best describes your feelings. (Responses: strongly disagree; disagree; neutral; agree; strongly agree)
S=self confidence; E=enjoyment

E3. I get a great deal of satisfaction out of solving a mathematics problem.
S9. Mathematics is one of my most dreaded subjects.
S10. My mind goes blank and I am unable to think clearly when working with mathematics.
S11. Studying mathematics makes me feel nervous.
S12. Mathematics makes me feel uncomfortable.
S13. I am always under a terrible strain in a math class.
S14. When I hear the word mathematics, I have a feeling of dislike.
S15. It makes me nervous to even think about having to do a mathematics problem.
S16. Mathematics does not scare me at all.
S17. I have a lot of self-confidence when it comes to mathematics
S18. I am able to solve mathematics problems without too much difficulty.
S19. I expect to do fairly well in any math class I take.
S20. I am always confused in my mathematics class.
S21. I feel a sense of insecurity when attempting mathematics.
S22. I learn mathematics easily.
E24. I have usually enjoyed studying mathematics in school.
E25. Mathematics is dull and boring.
E26. I like to solve new problems in mathematics.
E27. I would prefer to do an assignment in math than to write an essay.
E29. I really like mathematics.
E30. I am happier in a math class than in any other class.
E31. Mathematics is a very interesting subject.
E37. I am comfortable expressing my own ideas on how to look for solutions to a difficult problem   in   math.
E38. I am comfortable answering questions in math class.
S40. I believe I am good at solving math problems.

Appendix 5: Summary of the planned analysis

Primary analysis

The difference between the maths attainment for students in the intervention and control arms was to be compared using a mixed-effect linear regression at the student-level, with the standardised GCSE Maths mark as the response variable. The model was to be adjusted for group allocation, KS2 Maths score, and the minimisation factors (type of setting, number of resits in previous year at the setting (in continuous form), and participation in BMP) as fixed effects, and setting as a random effect. Students typically have two opportunities to resit GCSE Maths within an academic year; in November and the following May/June, and the students' most recent resit result was to be used within the model. The results were to be presented as the adjusted mean difference in scores between the two groups, with an associated 95% confidence interval (CI) and p-value.

Secondary analysis

ACHIEVEMENT OF GRADE 4 OR ABOVE AT RESIT (I.E. ACHIEVING A PASS)
A mixed-effects logistic regression was to be used to compare the likelihood of students achieving a pass on their most recent sitting between the two groups, as a binary variable. The model was to be adjusted in the same way as the primary outcome, with the baseline measure of prior attainment being KS2 Maths score.

STUDENT ATTENDANCE AT EXAM SESSION
The number of exams attended was to be compared using a mixed-effect logistic regression model adjusted in the same way as the primary analysis.

One of the exam boards (Eduqas) only had two papers whilst all of the other exam boards (OCR, AQA, Edexcel) had three papers – this was not noted in the SAP.

STUDENT ATTITUDES TOWARDS MATHS – ADAPTED ATMI
The total ATMI score was to be analysed in the exact same way as the primary outcome. The subscale scores for Self-confidence and Enjoyment were to be summarised descriptively by arm, but no formal comparison was to be undertaken.

Analysis in the presence of non-compliance

A CACE (Complier Average Causal Effect) analysis was planned for the primary outcome to consider the account for engagement with the intervention. Compliance was to be defined at the teacher level, rather than the setting level; with teachers associated with classes within the settings. Compliance was to be defined as attending at least the first two of the three training sessions. A Two Stage Least Squares (2SLS) instrumental variable (IV) approach with group allocation as the IV was to be used; full details of the models can be found in SAP.

Missing data analysis

The amount of missing data for the covariates used in the primary model and outcome variable were to be summarised, with reasons for missing data explored where possible. If more than 5% of students could not be included in the primary analysis model, the predictors of missingness were to be explored using a mixed-effects logistic regression model, with the presence of GCSE raw mark as a binary outcome, and all baseline variables as fixed effects, with setting as a random effect.

The impact of missing data was to be explored if the assumption of missing at random held, and no variables were found to predict missingness. This would have been done using multiple imputation by chained equations.

Sub-group analyses

Two sub-group analyses were planned. Firstly, to explore the effect of the intervention on students eligible for FSM (using EVERFSM_6_P from the NPD). The primary analysis model would have been rerun including FSM status and an interaction of FSM status and allocation include. The primary analysis would have also be rerun including just those students who were eligible for FSM.

Secondly, the timing of resits would have been explored by rerunning the primary analysis model with the inclusion of an interaction term between time of resit and group allocation. This was to be done as it was theorised that those who resat in May/June may have performed better, due to receiving the 5Rs programme for a longer period.

Neither of these analyses were powered to detect a difference and would have been exploratory only.

Additional analyses and robustness checks

SENSITIVITY ANALYSES

Similarly, two sensitivity analyses were planned. The first would have further assessed the timing of resit by repeating the primary analysis including timing of resit, and whether it was the students first or second resit attempt, as fixed effects (students could resit in May/June if they had failed in November). The primary analysis would have also been repeated including just those who sat in November, and again for those who resat in May, with the inclusion of first or second attempt as a fixed effect. Additionally, the primary analysis would have been repeated including just those who sat the foundation tier paper. The teacher impact would have been explored by including an additional variable representing class to the primary model, as a random effect.

Estimation of effect sizes

The effect size was to be expressed in terms of Hedges' g, calculated based on the mean difference between the two groups adjusted for prior attainment and minimisation factors, from the multi-level model, and the pooled unconditional variance. The 95% CI would have been reported, and any binary outcomes expressed as a risk ratio and difference in percentages.

Estimation of ICC

The ICC was to be summarised for the standardised GCSE Maths score at the setting level, extracted from the primary analysis model, and presented alongside the 95% CI.

Longitudinal analysis

No longitudinal analyses were planned.

Appendix 6: Day 1 5Rs Training Observation Schedule

Evaluation of 5Rs post-16 GCSE resit programme
Day One (Aug/Sept 2019)
Independent Evaluators Observation Schedule.

Venue: Date:

No of participants:

Trainer:

Observer:

Session	Observer notes
Intro: developers and participants	
1. The Context: the 5RS project, the students; the classes; the settings and the outcomes; anecdotal evidence	
2. Key Features: 5Rs starting points; the rationale; Chief Examiners reports; Exam Board work and the 5Rs	
3. Alternative methods: the nine basics; mathematical tea towels; You Tube Channel	
4. Top Tips: approaches; resources; padlet technologies	
5. The 5Rs website: log in; Autumn Term; Resources; FAQs; Video Channel; Support	
Next Steps: reflection and evaluation	

How well has the session achieved its aims?	
Familiarise with principles of 5Rs and with 5Rs project (incl being a revision year, not like school)	
to analyse the features of the 5Rs approach including the research pertaining to maths revision	
to consider the context of GCSE maths resit classes – the reality, numbers of students and outcome evidence	
to access Autumn term 5Rs lesson plans and consider its implementation in your setting	
Participant response	
How engaged and interested were participants?	
Did they seem to understand 5Rs as a programme and as a project/evaluation?	
Did they seem confident to start delivering 5Rs?	

Appendix 7: Intervention Baseline Survey

5Rs Baseline Teacher Survey Intervention
About You - Professional Background
Q1 Name:

_____

Q2a Setting Name:

_____

Q2b Setting Postcode:

_____

X→

Q3 Role in the 5Rs project:

○ Teaching 5Rs

○ Project Lead AND Teaching 5Rs

○ Project Lead NOT Teaching 5Rs

If Role in the 5Rs project: Project Lead NOT Teaching 5Rs Is Selected GO TO Q21

Q4 How long have you been a teacher? (Please select from the list below.)

○ This is my first year

○ 1-2 years

○ 3-5 years

○ 6+ years

Q5 What is the main subject you teach? (Please select from the list below.)

○ Maths

○ Science (Any)

○ Engineering (Any)

○ Other (Please state) _____

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Q6 What is your highest qualification in Maths? (Please select from the list below.)

○ GCSE or equivalent

○ A Level or equivalent

○ Undergraduate degree or equivalent

○ Postgraduate degree

○ Other (Please state) _____

Q7a How many years have you taught a post 16 GCSE maths resit group?

○ This is my first year

○ Only one year prior to this

○ 2 or 3 years

○ 4+ years

Q7b Do you teach maths lessons/classes that aren't post-16 GCSE resits? (Select as many boxes as apply)

☐ Yes - this year

☐ Yes - in previous years

☐ No

Display This Question:
    If Q7a != This is my first year

Q8a Have you ever followed the 5Rs approach to post-16 GCSE maths resits before your involvement in this project?

○ Yes

○ No

Display This Question:
    If Q8a = Yes

Q8b Please give further details about how you have previously followed the 5Rs approach to post-16 GCSE maths resits. e.g. When, where, with whom etc

_____

If How many years have you taught a post 16 GCSE maths resit group This is my first year is Selected then GO TO Q14

Current Practice

Please answer the following questions thinking about the **most recent** post-16 GCSE maths resit class(es) you have taught **before this academic year**. Pick the most accurate response category for each statement.

Q9 How many students usually:

	All or most	More than half	About half	Less than half	Few or none	Don't know
Are engaged during lessons?	○	○	○	○	○	○
Do extra work outside lessons?	○	○	○	○	○	○
Appear to be confident in maths?	○	○	○	○	○	○
Appear motivated to do well in maths?	○	○	○	○	○	○
Turn up to the lesson?	○	○	○	○	○	○

Q10 How often do you use the following resources in your lessons?

	Very often	Quite often	Not very often	Hardly ever or never
Online maths resources	○	○	○	○
Paper textbooks	○	○	○	○
Worksheets	○	○	○	○
Manipulatives / virtual manipulatives	○	○	○	○
Other (please state)	○	○	○	○

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Q11 How often do you do the following in your lessons?

	Every lesson	Most lessons	Some lessons	Very few lessons	Never
Spend time getting students to recall maths facts	○	○	○	○	○
Give students questions from past exam papers	○	○	○	○	○
Focus on exam techniques	○	○	○	○	○
Discuss revision techniques	○	○	○	○	○
Look at common mistakes and misconceptions	○	○	○	○	○
Explore non-standard methods of doing calculations	○	○	○	○	○
Set homework or suggest work to do outside the lesson	○	○	○	○	○

Q12 Do your students do a diagnostic assessment test in maths towards the beginning of the academic year?

☐ Yes - bksb

☐ Yes - Other _____

☐ No

☐ Not sure

Q13 How do you feel about teaching post-16 resit maths class(es)?

_____
_____

Q14
Training

Please indicate which of these training sessions you attended:

- ○ Newcastle
- ○ Stockport
- ○ Stoke-on-Trent
- ○ Wantage
- ○ Bristol
- ○ London 9th September
- ○ London 20th September
- ○ None of the above

Display This Question:
    If Q14 = None of the above

Q15 What alternative arrangements were made to provide training to deliver 5Rs?

- ○ I completed a webinar
- ○ I had a personal visit from a trainer
- ○ I was trained by a colleague
- ○ Plans have been made to train me but not yet carried out
- ○ No plans have been made to train me
- ○ Other (please state) _____

Display This Question:
    If Q14 != None of the above
    Or Q15 = I completed a webinar
    Or Q15 = I had a personal visit from a trainer
    Or Q15 = I was trained by a colleague

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Q16a How well did the training prepare you for delivering 5Rs?

○ Very well

○ Quite well

○ Not very well

○ Not well at all

Q16b Please explain why you felt the training prepared you in this way

_____

Q17 How confident do you feel using the 5Rs approach?

○ Very confident

○ Quite confident

○ Not very confident

○ Not at all confident

Q18 Have you been in touch with the trainer since the training?

○ Once or twice

○ A few times

○ Many times

○ No

Q19 Please briefly explain why you were in touch

_____

Q20 How satisfied were you with their response?

○ Very satisfied

○ Quite satisfied

○ Not very satisfied

○ Not at all satisfied

Q21 When you **first heard** about the 5Rs project, what impacts did you hope it would have on you, your students and your school/college?

Q22 And what impacts do you anticipate that 5Rs will have on you, your students and your school/college **now that you have been trained** to deliver the programme?

_____

Q23 Finally, is there anything else you'd like to add?

_____

Appendix 8: Control Baseline Survey

5RS Baseline Teacher Survey Control

About You - Professional Background

Q1 Name:

_____

Q2a Setting Name:

_____

Q2b Setting Postcode:

_____

Q4 How long have you been a teacher? (Please select from the list below.)

- ○ This is my first year
- ○ 1-2 years
- ○ 3-5 years
- ○ 6+ years

Q5 What is the main subject you teach? (Please select from the list below.)

- ○ Maths
- ○ Science (Any)
- ○ Engineering (Any)
- ○ Other (Please state) _____

Q6 What is your highest qualification in Maths? (Please select from the list below.)

- ○ GCSE or equivalent
- ○ A Level or equivalent
- ○ Undergraduate degree or equivalent
- ○ Postgraduate degree
- ○ Other (Please state) _____

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Q7a How many years have you taught a post 16 GCSE maths resit group?

○ This is my first year

○ Only one year prior to this

○ 2-3 years

○ 4+ years

Q7b Do you teach maths lessons/classes that aren't post-16 GCSE resits? (Select as many boxes as apply)

☐ Yes - this year

☐ Yes - in previous years

☐ No

Q8a Have you ever followed the 5Rs approach to post-16 GCSE maths resits?

○ Yes

○ No

Q8b Please give further details about how you have previously followed the 5Rs approach to post-16 GCSE maths resits. e.g. When, where, with whom etc

_____

_____

If How many years have you taught a post 16 GCSE maths resit group This is my first year is Selected then GO TO Q13

Current Practice

Please answer the following questions thinking about the **most recent** post-16 GCSE maths resit class(es) you have taught **before this academic year**. Pick the most accurate response category for each statement.

Q9 How many students usually:

	All or most	More than half	About half	Less than half	Few or none	Don't know
Are engaged during lessons?	○	○	○	○	○	○
Do extra work outside lessons?	○	○	○	○	○	○
Appear to be confident in maths?	○	○	○	○	○	○
Appear motivated to do well in maths?	○	○	○	○	○	○
Turn up to the lesson?	○	○	○	○	○	○

Q10 How often do you use the following resources in your lessons?

	Very often	Quite often	Not very often	Hardly ever or never
Online maths resources	○	○	○	○
Paper textbooks	○	○	○	○
Worksheets	○	○	○	○
Manipulatives / virtual manipulatives	○	○	○	○
Other (please state)	○	○	○	○

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Q11 How often do you do the following in your lessons?

	Every lesson	Most lessons	Some lessons	Very few lessons	Never
Spend time getting students to recall maths facts	○	○	○	○	○
Give students questions from past exam papers	○	○	○	○	○
Focus on exam techniques	○	○	○	○	○
Discuss revision techniques	○	○	○	○	○
Look at common mistakes and misconceptions	○	○	○	○	○
Explore non-standard methods of doing calculations	○	○	○	○	○
Set homework or suggest work to do outside the lesson	○	○	○	○	○

Q12 Do your students do a diagnostic assessment test in maths towards the beginning of the academic year?

☐ Yes - bksb

☐ Yes - Other (Please state) _____

☐ No

☐ Not sure

Q13 How do you feel about teaching post-16 resit maths class(es)?

_____

Q14 Finally, is there anything else you'd like to add?

_____

Appendix 9: Post-Intervention Survey – Intervention

5Rs Post Test Teacher Survey Intervention
About You - Professional Background

Q1 Name:

_____

Q2a College / School Name:

_____

Q2b College / School Postcode:

_____

_____

Q3
Training & Support

The team delivered core training at three points of the year: before/at start of Autumn term 2019; end of Autumn term 2019/beginning of Spring term 2020; end of Spring term 2020. Please indicate below whether you attended each of these sessions and what form it took.

	In-person core session	Webinar (Live)	Webinar (Recorded)	Other training arrangements	Received no training at all
Session 1 (Aug / Sept 2019)	○	○	○	○	○
Session 2 (Dec 2019 / Jan 2020)	○	○	○	○	○
Session 3 (March 2020)	○	○	○	◉	○

Display This Question:
If Q3 = Other training arrangements

Q3a You ticked that your training for one or more sessions was via other training arrangements. Please explain what form this training took e.g. who delivered it, how was it delivered, and how long did it last etc

_____

Display This Question:
If Q3 != Received no training at all

Q4 How well do you think the training prepared you to deliver the 5Rs programme? Please explain your answer.

○ Very well _____

○ Quite well _____

○ Not very well _____

○ Not at all well _____

Q5 Did you receive any other training / support from the 5Rs team during the year?

○ Yes

○ No

Q6 How well did the additional support (outside the set training sessions) meet your needs?

○ Very well

○ Quite well

○ Not very well

○ Not at all well

Q7 Are there any improvements you would suggest for the training / support offered for the 5Rs programme?

_____

Q8 **Resources - Website / other materials**

How would you rate the 5Rs website in terms of ease of use?

○ Very easy to use

○ Quite easy to use

○ Quite difficult to use

○ Very difficult to use

○ Never tried to use it

Display This Question:
If Q8 = Quite difficult to use
Or Q8 = Very difficult to use

Q9 Please explain why the 5Rs website was difficult to use.

_____

Q10 How often did you make use of the lesson plans provided on the 5Rs website?

○ Always

○ Usually

○ Sometimes

○ Occasionally

○ Never

Display This Question:
If Q10 = Never

Q10a Why did you never use the lesson plans provided on the 5Rs website?

_____

Display This Question:
If Q10 != Never

Q11 When you used the lesson plans from the 5Rs website, how closely did you tend to stick to them?

○ Very closely

○ Quite closely

○ Not very closely

○ Not closely at all

Display This Question:
If Q10 != Never

Q12 Please give further details about your use of the lesson plans on the 5Rs website, eg explain your reasons for frequency of use and how closely you stuck to them.

_____

✱

Q13a Please indicate **UP TO THREE** main resources you used to **support your lessons.**

- ☐ BBC Bitesize
- ☐ Corbettmaths 5 a day
- ☐ Hegarty Maths
- ☐ Maths Genie
- ☐ MathsWatch
- ☐ Mr Barton Maths
- ☐ MyMaths
- ☐ Past exam papers
- ☐ Other (please specify) _____
- ☐ None

✳

Q13b Please indicate **UP TO THREE** main resources you used **when giving homework.**

- ☐ BBC Bitesize
- ☐ Corbettmaths 5 a day
- ☐ Hegarty Maths
- ☐ Maths Genie
- ☐ MathsWatch
- ☐ Mr Barton Maths
- ☐ MyMaths
- ☐ Past exam papers
- ☐ Other (please specify) _____
- ☐ None

✳

Q13c Please indicate **UP TO THREE** main resources you used **as general recommendations to your students.**

☐ BBC Bitesize

☐ Corbettmaths 5 a day

☐ Hegarty Maths

☐ Maths Genie

☐ MathsWatch

☐ Mr Barton Maths

☐ MyMaths

☐ Past exam papers

☐ Other (please specify) _____

☐ None

Q14 How often did you set homework?

○ Every lesson

○ Every 2-3 lessons

○ Less often

○ Rarely or never

Q15 How frequently did you encourage your students to use the Padlet to do extra maths in addition to their homework outside lesson time?

○ Every week

○ Every 2-3 weeks

○ Less often

○ Rarely or never

Q15a Please explain your answer.

_____

Q16 To the best of your knowledge how often did the majority of your students use the Padlet to do some extra maths in addition to their homework outside lesson time?

○ At least once a day

○ 2-3 times a week

○ About once a week

○ Less often

○ Rarely or never

○ Don't know / can't say

Q17
Structure of the 5Rs lessons - the 5 elements

On average how many 5Rs GCSE maths resit lessons are timetabled for each student per week?

○ One or fewer

○ Two

○ Three

○ Four

○ Five or more

Q18 How long does each 5Rs lesson last?

○ 50 minutes

○ 60 minutes

○ 75 minutes

○ 90 minutes

○ 120 minutes

○ Other (please state) _____

Q19

How closely did you tend to follow the 5Rs lesson structure (Recall, Routine, Revise, Repeat, Ready) when delivering maths lessons to 5Rs groups?

○ Very closely

○ Quite closely

○ Not very closely

○ Not at all closely

Q19b Please explain how and why you deviated from the 5Rs lesson structure.

_____

Q20
The 5Rs Programme - Overall

On average, how would you rate your 5Rs GCSE resit students on the following?

	Very good	Quite good	Quite poor	Very poor	Don't know
Mathematical knowledge and understanding	○	○	○	○	○
Independent learning strategies	○	○	○	○	○
Exam technique	○	○	○	○	○
Confidence in maths	○	○	○	○	○
Motivation to learn	○	○	○	○	○
Attendance at maths lessons	○	○	○	○	○
Engagement in lessons	○	○	○	○	○
Behaviour in lessons	○	○	○	○	○
Completion of homework	○	○	○	○	○

Q21 Approximately how long did you spend planning each 5Rs lesson?

○ Up to 15 minutes

○ 15-30 minutes

○ 31-60 minutes

○ over one hour

Q22 In terms of the use of exercise books, paper (e.g. for worksheets) and other consumables, how have your 5Rs lessons compared to other GCSE maths resit lessons you have taught?

○ 5Rs uses a lot more

○ 5Rs uses a little more

○ About the same

○ 5Rs uses a little less

○ 5Rs uses a lot less

○ Can't say - I've only taught 5Rs resit lessons

Q23 How has teaching the 5Rs programme affected your confidence in teaching GCSE maths resit lessons?

○ I feel a lot more confident

○ I feel a little more confident

○ No change

○ I feel a little less confident

○ I feel a lot less confident

Q24 If it was your decision, how likely would you be to use the 5Rs programme in the future?

○ Very likely

○ Quite likely

○ Not very likely

○ Not at all likely

Q24a Please explain the reasons for your answer_____

Q25 Please use the space below to make any other comments or observations about any aspect of the 5Rs programme. _____

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Appendix 10: Post Intervention Survey - Control

5Rs Post Test Teacher Survey Control

About You - Professional Background
Q1 Name:

_____

Q2a College / School Name:

_____

Q2b College / School Postcode:

_____
Q3
Training

Have you received any training to support your teaching of GCSE Maths / resit lessons over the course of the academic year 2019-2020?

Please tick **all that apply and provide details** of the training in the boxes below.

☐ Attended a course in person

_____

☐ Attended a webinar / online seminar

_____

☐ Self-study (including online training course)

_____

☐ In-house training (e.g. cascaded training)

_____

☐ Other _____

☐ No training received

Display This Question:
If Q3 != No training received

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Q4 How well do you think the training supported you to deliver GCSE maths resit lessons?

○ Very well

○ Quite well

○ Not very well

○ Not at all well

Q5
Resources - Websites / other materials
Does your college / school use a set scheme for teaching GCSE maths resits?

○ Yes (please give details) _____

○ No

[*]

Q6a Please indicate **UP TO THREE** main resources you used to **support your lessons.**

☐ BBC Bitesize

☐ Corbettmaths 5 a day

☐ Hegarty Maths

☐ Maths Genie

☐ MathsWatch

☐ Mr Barton Maths

☐ MyMaths

☐ Past exam papers

☐ Other (please specify) _____

☐ None

[*]

Q6b Please indicate **UP TO THREE** main resources you used **when giving homework.**

☐ BBC Bitesize

☐ Corbettmaths 5 a day

☐ Hegarty Maths

☐ Maths Genie

☐ MathsWatch

☐ Mr Barton Maths

☐ MyMaths

☐ Past exam papers

☐ Other (please specify) _____

☐ None

✱

Q6c Please indicate **UP TO THREE** main resources you used **as general recommendations to your students.**

☐ BBC Bitesize

☐ Corbettmaths 5 a day

☐ Hegarty Maths

☐ Maths Genie

☐ MathsWatch

☐ Mr Barton Maths

☐ MyMaths

☐ Past exam papers

☐ Other (please specify) _____

☐ None

Q7 How often did you set homework?

○ Every lesson

○ Every 2-3 lessons

○ Less often

○ Rarely or never

Q8 How frequently did you encourage your students to do some extra maths in addition to their homework outside lesson time?

○ Every week

○ Every 2-3 weeks

○ Less often

○ Rarely or never

Q8a Please explain your answer.

_____

Q9 To the best of your knowledge how often did the majority of your students do some extra maths in addition to their homework outside lesson time?

○ Every week

○ Every 2-3 weeks

○ Less often

○ Rarely or never

○ Don't know / can't say

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Q10
Structure of the GCSE maths resit lessons
On average how many GCSE maths resit lessons are timetabled for each student per week?

○ One or fewer

○ Two

○ Three

○ Four

○ Five or more

Q11 How long does each lesson last?

○ 50 minutes

○ 60 minutes

○ 75 minutes

○ 90 minutes

○ 120 minutes

○ Other (please state) _____

Q12 Did your GCSE maths resit lessons have a set structure for most lessons e.g. quick-fire starter, main topic, exam question practice?

○ Yes

○ Sometimes

○ No

Skip To: Q16 If Q12 = No

Q13 Please outline this set structure for your GCSE maths resit lessons.

_____

Q14 How closely did you tend to follow this structure?

○ Very closely

○ Quite closely

○ Not very closely

○ Not at all closely

Q15 Please explain how and why you deviated from this structure

_____

Q16 On average how would you rate your GCSE Maths Resit students on the following:

	Very good	Quite good	Quite poor	Very poor	Don't know
Mathematical knowledge	○	○	○	○	○
Independent learning strategies	○	○	○	○	○
Exam technique	○	○	○	○	○
Confidence in maths	○	○	○	○	○
Motivation to learn	○	○	○	○	○
Attendance at maths lessons	○	○	○	○	○
Engagement in lessons	○	○	○	○	○
Behaviour in lessons	○	○	○	○	○
Completion of homework	○	○	○	○	○

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Q17 Approximately how long did you spend planning each GCSE maths resit lesson?

○ up to 15 minutes

○ 15-30 minutes

○ 31-60 minutes

○ over one hour

Q18 How has teaching GCSE maths resit classes this year affected your confidence in teaching these lessons in the future?

○ I feel a lot more confident

○ I feel a little more confident

○ No change

○ I feel a little less confident

○ I feel a lot less confident

Q19 If it was your decision how likely would you be to teach GCSE maths resit lessons in the same way in the future?

○ Very likely

○ Quite likely

○ Not very likely

○ Not at all likely

Q20 Please explain the reasons for your answer

_____

Q21 If there is anything else you would like to tell us about your experience teaching GCSE maths resits, please use the space below.

_____

Appendix 11: Intervention Setting Teacher Interview

5Rs: visit interview with Teacher (intervention)

Section 1: Background

Q1 How long have you been teaching GCSE maths resits?
PROMPT if their first year: do you teach any resit classes that don't use 5Rs?

Q2 How many sessions of 5Rs do students get each week? And how long do they last?

Section 2: If interview follows lesson observation:

Thinking about the lesson you've just taught....

Q3 IF APPROPRIATE: Pick up on anything you want to clarify.

Q4 Would you say that was a typical example of your 5Rs lessons?
PROBE if appropriate: how was it different?

Q5 Do you use the 5Rs programme with any other classes? How similar or different are they to the one I've just seen?

Section 3: 5Rs programme overall

Q6 What would you identify as the main differences between 5Rs and how you used to teach post-16 GCSE maths?

Q7 What, if anything, do you particularly like about 5Rs?

Q8 What, if anything, do you particularly dislike?

Q9 [Apart from what you've already mentioned] are there any improvements you can suggest?

Q10 Have you made any adaptations to the 5Rs programme? What? Anything else?
PROMPT IF APPROPRIATE:
Your lessons are longer/shorter than the hour that the 5Rs programme is designed for. How do you adjust for that?

Section 4: 5Rs programme features

Q11 SHOW participant the list of the elements (Recall, Routine, Revise, Repeat, Ready). Ask:

Q11a Which of these do you think are the most useful elements of a 5Rs lesson? Why is that?

Q11b Are there any elements that you think don't work very well? Why is that?

Section 5: Resources and support

Q12 What do you think about the 5Rs website, including the Padlets?
PROMPTS:
How much do you use it?
What do you use it for?

SPECIFIC PROMPTS:
How much do you use the resources?
    What do you think of them?
What about the lesson plans?
    How useful do you find them?
    Have you had any issues with using them? What?

Q13 What do you think of the training & support package provided by the 5Rs team?

Section 6: Student reaction

Q14 How have the students reacted to the 5Rs programme?
POSSIBLE PROBES:
What do they particularly like/dislike?
How do they engage with the lessons?

Q15 Do you think the students do any other work outside the lessons? IF YES:
What?
PROMPTS:
What, if anything, do you do to encourage them to use the Padlet and other resources outside the lesson?
Do you set homework for the students?
Do you think they do it?

Section 7: Programme costs
Finally, a few questions that allow us to estimate the cost of the programme to your college/school.
Q16 How much time do you spend outside the lesson in preparation and marking? (clarify the time they specify is per lesson, so we can compare across answers).
PROMPT (if appropriate): How does that compare to previously?

Q17 How many sheets of paper would you estimate you produce per student for each lesson?
PROMPT (if appropriate): How does that compare to previously?

Q18 Apart from your time and the worksheets, are there any other costs associated with 5Rs maths resit lessons?

Q19 Have you any other comments?

5Rs Teacher int schedule v1.2_20200130_intervention

Appendix 12: Control Setting Teacher Interview

5Rs: visit interview with Teacher (CONTROL)

Section 1: Background

Q1 How long have you been teaching GCSE maths resits?

Q2 How many sessions of GCSE resit maths do students get each week? And how long do they last?

Section 2: If interview follows lesson observation:

Thinking about the lesson you've just taught....

Q3 IF APPROPRIATE: Pick up on anything you want to clarify.

Q4 Would you say that was a typical example of your maths resit lessons?
PROBE if appropriate: how was it different?

Q5 Do you teach resit maths to any other classes? How similar or different are they to the one I've just seen?

Section 3: Teaching resit maths

Interviewer aide-memoire: These questions attempt to get at whether/how much business-as-usual overlaps with the elements within 5Rs eg recapping on knowledge, practising exam questions, reminding about exam technique, looking at misconceptions.

Q6a Do you use any set structure in your resit lessons?

Q6b What are the main activities you use?

Q7 IF teacher has taught or does teach non-resit GCSE maths: How would you compare teaching GCSE maths resits with teaching it to students doing it for the first time? PROBE for differences in teaching approach, priorities, expectations of students etc

Section 4: Resources and support

Q8 What resources do you use to help you teach resit maths?
PROMPTS:
Where do you find them?
How difficult are they to find?
How much do you use them?
What do you use them for?

5Rs Teacher int schedule v1.0_20200130_CONTROL

Q9 How do you go about developing your lesson plans?
PROMPTS:
Do they have a specific format?
How closely do you stick to them?

Q10 Have you received any training to deliver GCSE maths resits?

Q11 Do you receive any (other) support in delivering GCSE maths resits? [explain if necessary: for example, from colleagues in the maths department]

Section 5: Student reaction

Q12 How do the students react to maths resit lessons?
POSSIBLE PROBES:
What do they particularly like/dislike?
How do they engage with the lessons?

Q13 Do you think the students do any other work outside the lessons? IF YES:
What?
PROMPTS:
What, if anything, do you do to encourage them to use maths resources outside the lesson?
Do you set homework for the students?
Do you think they do it?

Section 6: Maths resit costs
Finally, a few questions that allow us to estimate the cost of providing GCSE maths resit lessons to your college/school.
Q14 How much time do you spend outside the lesson in preparation and marking? (clarify the time they specify is per lesson, so we can compare across answers).

Q15 How many sheets of paper would you estimate you produce per student for each lesson?

Q16 Apart from your time and the worksheets, are there any other costs associated with GCSE maths resit lessons?

Q17 Have you any other comments?

Appendix 13: Project Lead / Head of Department Interview Intervention

5Rs: visit interview with Head of Maths/Project Lead (intervention)

Section One: Background

Q1 How would you describe post-16 GCSE maths in your college/school?
PROMPT: What is the students' attitude to it?
How do the teachers feel about teaching GCSE resits? (ie Do they like teaching it or not)?

Q2 Why did you initially decide to participate in the trial of the 5Rs post-16 GCSE maths resit programme?
POSSIBLE PROMPTS:
How did you think it might benefit your students?
What issues did you expect it to address?

Section Two: Involvement with 5Rs

Q3 Are you teaching any GCSE maths resit lessons using 5Rs yourself?

Q4 How many teachers in total are using 5Rs?

Q5a Roughly what proportion of your maths GCSE resit cohort is doing 5Rs?

IF NOT full cohort, ask Q5b:
Q5b Why was it decided not to deliver 5Rs to the whole cohort?

Section Three: Opinion of 5Rs

Q6

IF full cohort is doing 5Rs:	IF NOT full cohort:
Q6 What would you identify as the main differences between 5Rs and how post-16 GCSE maths used to be delivered?	Q6 What would you identify as the main differences between 5Rs and how post-16 GCSE maths is delivered to the rest of the cohort?

Q7 How has the 5Rs programme compared with your expectations? (Probe benefits mentioned in Q2)

Q8 Has your college/school faced any particular challenges introducing and delivering 5Rs? If yes, probe for detail.

Q9 What do you think of the training and support package from 5Rs that has been offered to those who are delivering the programme in your college/school?

Q10 How have the teachers reacted to 5Rs? Probe for likes/dislikes

5Rs HoD int schedule v1.1_20200128_intervention

Q11 How have the students reacted to 5Rs? Probe for likes/dislikes

Q12 Are there any improvements you could suggest?

Section Four: College/school policy [exclude if time is running short]

Finally, a few questions about wider college/school policy on the teaching of post-16 GCSE maths resits:

Q13 How did the college decide which students to enter for the November GCSE maths resits?

Q14 What is the policy about setting homework for GCSE maths resit students? How much work are they expected to do outside the lesson?

Q15 If we don't already have this information from the setting: How many 5Rs lessons would an individual student have a week? How long does each lesson last?

Q16 Thinking of the resources used in post-16 GCSE maths resit lessons, how much is selected and supplied by the college/school and how much by the individual teachers?

Q17 That's all the questions I have, is there anything else you'd like to add?

Thank and close.

Appendix 14: Project Lead / Head of Department Interview Control

5Rs: visit interview with Head of Maths/Project Lead (CONTROL)

Section One: Background

Q1 How would you describe post-16 GCSE maths in your college/school?
PROMPT:
What is the students' attitude to it?
How do the teachers feel about teaching GCSE resits? (ie Do they like teaching it or not)?

Q2 If we don't already have this information from the setting: How many GCSE maths resit lessons would an individual student have a week? How long does each lesson last?

Q3 Why did you initially decide to participate in the trial of the 5Rs post-16 GCSE maths resit programme?
POSSIBLE PROMPTS:
How did you think it might benefit your students?
What issues did you expect it to address?

Section Two: post-16 GCSE maths resits

Q4 Do you teach any GCSE maths resit lessons yourself?

Q5 How many teachers in total teach GCSE maths resits?

Q6 How would you compare teaching GCSE maths resits with teaching it to students doing it for the first time? PROBE for differences in teaching approach, priorities, expectations of students etc

Q7 Does your college/school offer any training or support specifically for those teaching GCSE maths resits?

Section Three: College/school policy [exclude if time is running short]

Finally, a few questions about wider college/school policy on the teaching of post-16 GCSE maths resits:

Q8 How did the college decide which students to enter for the November GCSE maths resits?

Q9 What is the policy about setting homework for GCSE maths resit students? How much work are they expected to do outside the lesson?

Q10 Thinking of the resources used in post-16 GCSE maths resit lessons, how much is selected and supplied by the college/school and how much by the individual teachers?

Q11 That's all the questions I have, is there anything else you'd like to add?

5Rs HoD int schedule v1.0_20200129_CONTROL

Appendix 15: Student Interviews – Intervention

5Rs: friendship pair interview with students (intervention)

Section One: Overall lesson feedback

Q1 Is the lesson I've just seen a typical example of your maths lessons?
If different PROBE: In what ways was it different? Any others?

Q2a What did you think of that lesson?
PROMPT: What parts of the lesson did you find most useful?
Were there any parts you didn't find useful?

Q3 The main topic of the lesson today was [from observation]. Do you think you learnt anything new about that topic? If so, what?

Section Two: GCSE maths lessons

Q4 I'd like you to compare the maths lessons you've had since September with your previous GCSE maths lessons.

Q4a Are there any differences? What are they? Any others?

Q4b How does your confidence in doing maths now compare with this time a year ago? Why do you think that is?

Q4c Do you feel more or less prepared to take the exam than you did last year? Why do you say that?

Section Three: 5Rs elements

If not obvious from the observation/interview, check if the students are aware that their GCSE maths lessons follow something called the 5Rs programme.

SHOW card with the 5 elements.

A typical 5Rs lesson is made up of these five parts.

Q5 Are there any parts you find particularly useful? And any you think are a waste of time? PROBE for what/why.

5Rs Student pair schedule v1.2_20200131_intervention

Section Four: Work outside lesson

Q6 In an average week, how much work would you say you do on your maths outside the lesson?

Q7a If do some: What sort of thing do you do? Probe: Do you use any resources to help you – books or websites etc?

OR

Q7b If do none: Why don't you do any? Is there anything that would motivate you to do some?

Section Five: Padlet

IF Padlet NOT mentioned, probe specifically:

Q8 Have you come across the Padlet? [you can access it from your phone, tablet or PC and it has lots of maths resources, such as practice questions and quizzes, on it]

Yes
No – SKIP to Section 5

Q9 ASK all those AWARE of PADLET who haven't covered this previously eg Q7: Do you use it?

IF YES:	IF NO:
Q10a What do you use it for?	Q10a Have you ever used it?
Q10b How useful do you find it?	Q10b Why don't you use it (anymore)?

Section Six: Summary

Q11 Are there any improvements you can suggest to the 5Rs lessons, the Padlet or the resources?

Q12 That's all the questions I have, is there anything else you'd like to add?

Thank and close.

Appendix 16: Student Interviews – Control

5Rs: friendship pair interview with students (CONTROL)

Section One: Overall lesson feedback

Q1 Is the lesson I've just seen a typical example of your maths lessons?
If different PROBE: In what ways was it different? Any others?

Q2 What did you think of that lesson?
PROMPT: What parts of the lesson did you find most useful?
Were there any parts you didn't find useful?

Q3 The main topic of the lesson today was [from observation]. Do you think you learnt anything new about that topic? If so, what?

Section Two: GCSE maths lessons

SAY: I'd like you to compare the maths lessons you've had for your resits with those you used to have for GCSE maths the first time you took it.

Q4 Are there any differences? What are they? Any others?

Q5 How does your confidence in doing maths now compare with this time a year ago? Why do you think that is?

Q6 Do you feel more or less prepared to take the exam than you did last year? Why do you say that?

Section Three: Work outside lesson

Q7 In an average week, how much work would you say you do on your maths outside the lesson?

Q8a If do some: What sort of thing do you do? Prompt: Do you use any resources to help you – books or websites etc? Probe for details

OR

Q8b If do none: Why don't you do any? Is there anything that would motivate you to do some?

Section Four: Summary

Q9 Are there any improvements you can suggest to your maths resit lessons or the resources you use?

Q10 That's all the questions I have, is there anything else you'd like to add?

Thank and close.

5Rs Student pair schedule v1.0_20200131_CONTROL

Appendix 17: 5Rs Intervention Lesson Observation

5Rs lesson observation schedule

Observer: _____

Setting ID: _____

Teacher ID: _____

No. in class: _____

Key topic: _____

Start time: _____

Length of lesson: _____

Date: _____

Other context: _____

5Rs Lesson observation schedule v1.1_20200115_intervention.docx

Lesson overview (complete after lesson)

Time	5Rs elements	Main points
	Recall (of knowledge; different topics) Note: resources eg Corbett cards	
	Routine (maths practice – different topics) Note: practice Qs/worksheets	
	Revise (one key topic)	
	Repeat (exam Qs on key topic) Teacher modelling?	
	Ready (exam techniques/common mistakes)	

5Rs Lesson observation schedule v1.1_20200115_intervention.docx

	0 (never) to 3 (always/whenever appropriate)					Comments/notes
Lesson moves at an appropriate pace	N/A	0	1	2	3	
Evidence that teacher has prepared lesson	N/A	0	1	2	3	
Mention of Padlet, homework, revision outside lessons (specify which)	N/A	0	1	2	3	
Teacher has good classroom management	N/A	0	1	2	3	
Teacher models skills eg exam questions	N/A	0	1	2	3	
Use of resources from 5Rs website or elsewhere[1] [note any use of physical Corbett cards]	N/A	0	1	2	3	
Adaptations made to 5Rs structure	N/A	0	1	2	3	
Students are engaged during:						
Recall	N/A	0	1	2	3	
Routine	N/A	0	1	2	3	
Revise	N/A	0	1	2	3	
Repeat	N/A	0	1	2	3	
Ready	N/A	0	1	2	3	

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[1] Eg onmaths.com, mathsbot.com, m4ths.com

5Rs Lesson observation schedule v1.1_20200115_intervention.docx

	0 (never) to 3 (always/whenever appropriate)				Comments/notes
Students seem familiar with 5Rs structure	N/A	0	1	2	3	
Teachers have a clear idea of students' understanding at end of lesson	N/A	0	1	2	3	

Overall Implementation Rating: 0   1   2   3

(0=5Rs in name only, no fidelity to the lesson plans or programme materials; 1=evidence of some 5Rs lesson structure/materials, but the programme is not consistently/universally followed with fidelity; 2=5Rs lesson structure is followed and some resources used but not consistently; 3=5Rs lesson plans and materials are followed with fidelity, and routines are embedded in the lessons)

Fieldnotes (use additional sheets as necessary)

5Rs Lesson observation schedule v1.1_20200115_intervention.docx

Appendix 18: Lesson Observation Control

CONTROL lesson observation schedule

Observer: _____

Setting ID: _____

Teacher ID: _____

No. in class: _____

Key topic(s): _____

Start time: _____

Length of lesson: _____

Date: _____

Other context: _____

5Rs Lesson observation schedule CONTROL v1.0_20200121.docx

Lesson overview (complete after lesson): any similarities to 5Rs elements

Time	5Rs elements	Main points
	Recall (of knowledge; different topics) Note: resources eg Corbett cards	
	Routine (maths practice – different topics) Note: practice Qs/worksheets	
	Revise (one key topic)	
	Repeat (exam Qs on key topic) Teacher modelling?	
	Ready (exam techniques/common mistakes)	

Overall Rating – similarity to 5Rs: 0   1   2   3

(0=no similarity to 5Rs lesson plans or programme materials; 1=evidence of some 5Rs-style lesson structure/materials; 2=lesson structure very similar to 5Rs some similar resources used; 3=lesson plans and materials are very similar to 5Rs, and 5Rs-style routines are embedded in the lesson)

5Rs Lesson observation schedule CONTROL v1.0_20200121.docx

	0 (never) to 3 (always/whenever appropriate)					Comments/notes
Lesson moves at an appropriate pace	N/A	0	1	2	3	
Evidence that teacher has prepared lesson	N/A	0	1	2	3	
Mention of homework, revision, resources outside lessons (specify which)	N/A	0	1	2	3	
Teacher has good classroom management	N/A	0	1	2	3	
Teacher models skills eg exam questions	N/A	0	1	2	3	
Use of resources from websites or elsewhere[1] [note any use of physical Corbett cards]	N/A	0	1	2	3	
Students are engaged during lesson	N/A	0	1	2	3	
Students seem familiar with format of lesson	N/A	0	1	2	3	
Teachers have a clear idea of students' understanding at end of lesson	N/A	0	1	2	3	

Make field notes on additional sheets as necessary

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[1] Eg onmaths.com, mathsbot.com, m4ths.com

5Rs Lesson observation schedule CONTROL v1.0_20200121.docx

Appendix 19: 5Rs Lesson Structure Prompt Card

5Rs suggested lesson structure

1.	5 minutes	**Recall**	of knowledge covering different topics
2.	10 minutes	**Routine**	practising maths across different topics
3.	15 minutes	**Revise**	one key topic
4.	15 minutes	**Repeat**	doing exam questions on the key topic
5.	10/15 minutes	**Ready**	going over exam techniques and common mistakes

Appendix 20: Example 5Rs lessons plans

![AQA logo - Realising potential]

AQA Route Map
GCSE Mathematics 8300 – 1-year (re-sit only)
Week 14 – Mode/charts & graphs

Introduction

This week focuses upon key area of difficulty as highlighted in Chief Examiners Reports – charts and graphs are poorly interpreted and drawn in exams with key features missed.

This week focuses upon modal average specifically. There are a number of sample assessment questions relating to the new questioning of averages which are worth a look.

The Scheme of Work follows a Five R's teaching approach documented in the course overview; Recall, Routine, Revise, Repeat, Ready.

Key Points

- Common mistakes within charts and graphs are axes, titles and choosing an appropriate chart or graph.
- Determine with students the difference between mean and mode and which could be used for what circumstance.

Week 14 Learning Objectives

- To become familiar with modal average.
- To work effectively with a range of charts and graphs.

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Lesson Preparation

Resources   AQA Collecting & representing data Week 14 Topic Test 1
AQA Statistical measures Week 14 Topic Test 2
Craig Barton Diagnostic Tests (requires free registration and account)

AQA Statistical measures Week 14 Worksheet 1; Week 14 Homework sheet 1

AQA Collecting & representing data Week 14 Homework sheet 2; Week 14 Activity 1;
Week 14 Worksheet 2; Week 14 Activity 2

First Hour Activity Route Map links (S2 S4)

Duration	Activity	Notes
5 mins	Recall starter;	Students recall the Hey Diddle Diddle rhyme *...or articulate the process behind calculating mean, median and mode
10 mins	Routine work;	Students should work individually on one of Corbett Maths 5 a day & Just Maths Bread & Butter - intersperse with www.m4ths.com *Challenges *for misconceptions
15 mins	Revise; Averages – modal in particular	Week 14 Worksheet 1 (mode only) Corbett Maths Video 56
20 mins	Repeat;	Corbett Maths practice questions
10 mins	Ready for exam	Diagnostic Questions 22434, 22436 Don Steward Blogspot http://3.bp.blogspot.com/-REKDy92nQqQ/VHEJVSLY-hI/AAAAAAAAOpU/tP2weawoXWA/s1600/Picture3.png

Second Hour Activity (S2 S4)

Duration	Activity	Notes
5 mins	Recall starter;	Students to complete Week 14 Homework sheet 1 and undertake general discussion on types of data
10 mins	Routine work;	Students should work individually on Corbett Maths 5 a day & Just Maths Bread & Butter
15 mins	Revise; Charts & Graphs	Nuffield Mathematics http://www.nuffieldfoundation.org/fsmqs/level-1-using-data Corbett Maths Videos 147 ,148, 160
20 mins	Repeat	www.corbettmaths.com videos with practice questions
10 mins	Ready for exam	Diagnostic Questions 17409

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Third Hour Activity (N1 N2 N3)

Duration	Activity	Notes
5 mins	Recall starter;	Week 14 Homework sheet 2
10 mins	Routine work;	Students should work individually on Corbett Maths 5 a day & Just Maths Bread & Butter
15 mins	Revise; Charts & Graphs	Week 14 Activity 1 Corbett Maths Videos 163, 164
20 mins	Repeat	Week 14 Worksheet 2 Week 14 Activity 2 Corbett Maths practice questions (see above)
10 mins	Ready for exam	Week 14 Topic Test 1 Week 14 Topic Test 2

Useful Links

Routine practice work with www.corbettmaths.com 5 a day questions for GCSE 9-1 and Just Maths Bread and Butter approaches www.justmaths.co.uk. www.m4ths.com has an excellent set of "Challenge" videos which tackle head on misconceptions. There are extensive video teaching elements on www.corbettmaths.com which are referenced throughout.

Extension

The 90 Maths Problem Solving Questions Resource is appropriate for extension work
http://allaboutmaths.aqa.org.uk/attachments/5592.pdf

Preparation for next week

Identify to students what topic is to be the focus of revision next week (**Trigonometry**). Share with them resources for self-study so they may take ownership of the resit opportunity. Opportunities such as www.studymaths.co.uk www.m4ths.com, www.corbettmaths.com and Hegarty Maths are invaluable.

Homework

Pret and DIRT Homeworks.

*   "Hey diddle diddle, the median's the middle,

You add then divide for the mean.

The mode is the one that you see the most,

And the range is the difference between"

3 of 3

AQA Route Map

GCSE Mathematics 8300 – 1-year (re-sit only)

Week 20 – Surface area & area of compound shapes

Introduction

Surface area has been visited previously but is still a common area of difficulty. This revision week focuses upon surface area within a range of 3D shapes. Skip shapes as required, according to student knowledge.

The Scheme of Work follows a Five R's teaching approach documented in the course overview; **Recall, Routine, Revise, Repeat, Ready.**

Key Points

- Students often get confused by units of measure and remembering the common area formulae so is worth revisiting. It is often linked to volume calculations and this presents another area of confusion. It is worth splitting surface area and volume which will be revisited.
- Recall is focused back onto elements of number work. Revisiting topics is proven to be very effective after a period of time and jumbling up topics requires more working knowledge application which is proven to increase memory retention.

Week 20 Learning Objectives

- To become familiar with calculating surface area of a range of 3D shapes.
- To apply a range of area calculations.
- To consider strategies for dealing with more problem solving questions.

Prerequisite knowledge

Students should be able to identify common polygons and 3D shapes. Students will work converting between units of measure and understand the properties of solids.

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Lesson preparation

Resources   Measures Week 20 Topic Test 1
2D representations of 3D shapes Week 20 Topic Test 2
Craig Barton Diagnostic Tests (requires free registration and account)

First Hour Activity Route Map links (G16)

Duration	Activity	Notes
5 mins	Recall starter;	Students to revisit Estimation Diagnostic Test 17298
10 mins	Routine work;	Students should work individually on one of Corbett Maths 5 a day & Just Maths Bread & Butter - intersperse with www.m4ths.com "Challenges "for misconceptions
15 mins	Revise; Surface Area	Corbett Maths Videos 310 to 315 Don Steward Extended Surface Area problems http://donsteward.blogspot.co.uk/search/label/surface%20area
20 mins	Repeat;	Corbett Maths practice questions
10 mins	Ready for exam	Week 20 Topic Test 1

Second Hour Activity (G16)

Duration	Activity	Notes
5 mins	Recall starter;	Students to recall real, sensible measures Diagnostic Questions 17301
10 mins	Routine work;	Students should work individually on Corbett Maths 5 a day & Just Maths Bread & Butter
15 mins	Revise; Area of compound shapes	Corbett Maths Videos 40 to 49 as appropriate Don Steward NCETM Compound shapes http://donsteward.blogspot.co.uk/search/label/area%20compound%20shapes
20 mins	Repeat	Corbett Maths practice questions
10 mins	Ready for exam	Diagnostic Questions 17770, 7697

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Third Hour Activity

Duration	Activity	Notes
5 mins	Recall starter;	Students would revise mean and mean of grouped data Corbett Maths Video 44 and 45
10 mins	Routine work;	Students should work individually on Corbett Maths 5 a day & Just Maths Bread & Butter. There are a range of Just Maths Bread & Butter with new AO2 and AO3 questions
15 mins	Revise; Wordy problems	BBC Bitesize Problem solving http://www.bbc.co.uk/education/guides/zg9tn39/revision
20 mins	Repeat	BBC Bitesize practice questions (see above)
10 mins	Ready for exam	Week 20 Topic Test 2

Useful Links

Routine practice work with www.corbettmaths.com 5 a day questions for GCSE 9-1 and Just Maths Bread and Butter approaches www.justmaths.co.uk. www.m4ths.com has an excellent set of "Challenge" videos which tackle head on misconceptions. There are extensive video teaching elements on www.corbettmaths.com which are referenced throughout.

Extension

The 90 Maths Problem Solving Questions Resource is appropriate for extension work. http://allaboutmaths.aqa.org.uk/attachments/5592.pdf

Preparation for next week

Identify to students what topic is to be the focus of revision next week (**Standard form/loci & constructions**). Share with them resources for self-study so they may take ownership of the resit opportunity. Opportunities such as www.studymaths.co.uk www.m4ths.com, www.corbettmaths.com and Hegarty Maths are invaluable.

Homework

Pret and DIRT Homeworks.

Access Maths revision materials.

AQA Route Map

GCSE Mathematics 8300 – 1-year (re-sit only)

Week 27 – Percentages/simple compound interest

Introduction

This week's focus is back on number work from the first term. It is worth revisiting for clarification of the basics. There is usually a confusion that lies between simple and compound interest. Further work on the key basics, which underpins a lot of other maths work, is crucial. It is also worth revisiting the basics as a reminder of skills that are easily forgotten.

The Scheme of Work follows a Five R's teaching approach documented in the course overview; **Recall, Routine, Revise, Repeat, Ready.**

Key Points

Revisiting number work and extending it further may inspire some confidence in ability and plug further gaps.

Week 27 Learning Objectives

- To distinguish between simple and compound interest and work effectively with both types of calculation.
- To identify gaps in knowledge with fractions, decimals and percentages.
- To identify gaps in knowledge with ratio and proportion.

Prerequisite knowledge

Basic number knowledge & knowledge of common equivalencies.

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Lesson preparation

Resources   Ratio & proportion Week 27 Topic Test 1
              Craig Barton Diagnostic Tests (requires free registration and account)

First Hour Activity Route Map links

Duration	Activity	Notes
5 mins	Recall starter;	Diagnostic Tests 21811, 22284, 23406
10 mins	Routine work;	Students should work individually on one of Corbett Maths 5 a day & Just Maths Bread & Butter - intersperse with www.m4ths.com "Challenges "for misconceptions
15 mins	Revise; Percentages – simple & compound interest	Corbett Maths Videos 233 to 240 for full scope with percentage work
20 mins	Repeat;	Corbett Maths practise questions
10 mins	Ready for exam	Diagnostic Questions available - filter out individual questions from the question sets

Second Hour Activity (R9 N12)

Duration	Activity	Notes
5 mins	Recall starter;	www.m4ths.com challenge 2 Misconceptions – choose a range – calculator & non-calculator
10 mins	Routine work;	Students should work individually on Corbett Maths 5 a day & Just Maths Bread & Butter
15 mins	Revise; Further fractions, decimals and percentages	Corbett Maths Videos 130, 137, 138 AQA Activities and a range of Don Steward activities at www.donsteward.blogspot.co.uk
20 mins	Repeat	Corbett Maths practice questions
10 mins	Ready for exam	Diagnostic Questions – choose a range for practice

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Third Hour Activity

Duration	Activity	Notes
5 mins	Recall starter;	www.m4ths.com challenge 2 Misconceptions – choose a range – calculator & non-calculator
10 mins	Routine work;	Students should work individually on Corbett Maths 5 a day & Just Maths Bread & Butter
15 mins	Revise; Further ratio and proportion work	Corbett Maths Videos 269, 270, 271, 256
20 mins	Repeat	Corbett Maths practice questions (see above)
10 mins	Ready for exam	Week 27 Topic Test 1

Useful Links

Routine practice work with www.corbettmaths.com 5 a day questions for GCSE 9-1 and Just Maths Bread and Butter approaches www.justmaths.co.uk. www.m4ths.com has an excellent set of "Challenge" videos which tackle head on misconceptions. There are extensive video teaching elements on www.corbettmaths.com which are referenced throughout.

Extension

The 90 Maths Problem Solving Questions Resource is appropriate for extension work.
http://allaboutmaths.aqa.org.uk/attachments/5592.pdf

Preparation for next week

Identify to students what topic is to be the focus of revision next week (**Frequency tables; mean, median, mode**). Share with them resources for self-study so they may take ownership of the resit opportunity. Opportunities such as www.studymaths.co.uk www.m4ths.com, www.corbettmaths.com and Hegarty Maths are invaluable.

Homework

Pret and DIRT Homeworks.

	The Education Endowment Foundation 5th Floor, Millbank Tower 21–24 Millbank London SW1P 4QP	https://educationendowmentfoundation.org.uk @EducEndowFoundn Facebook.com/EducEndowFoundn