CENTRES FOR EXCELLENCE IN MATHS

MATHS centre for excellence

city college plymouth

Improving the motivation and engagement of maths GCSE re-sit students in FE Colleges by providing additional maths coaching sessions personalised to their diagnosed gaps and to support with building confidence.

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OUR PARTNERS

AOC Association of Colleges · Pearson · touchconsulting · University of Nottingham UK | CHINA | MALAYSIA

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Department for Education

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Big shout out to Cath and Shobhna from ETF for their support and guidance throughout the Action research process

About CfEM

Centres for Excellence in Maths (CfEM) is a five-year national improvement programme aimed at delivering sustained improvements in maths outcomes for 16–19-year-olds, up to Level 2, in post-16 settings.

Funded by the Department for Education and delivered by the Education and Training Foundation, the programme is exploring what works for teachers and students, embedding related CPD and good practice, and building networks of maths professionals in colleges.

Summary

Coaching has long been a tool used to support learners or clients in achieving a specific personal or professional goal by providing training and guidance. The coaching action research at City College Plymouth is no different. This paper will showcase the increase in maths confidence from the learners who participated as well as highlighting key learning for staff and the coaching team.

One of the key findings from our research was an increase in maths confidence of 127% across the period of 6 sessions.

This paper will guide you through our action research cycle taking into account staff and learner feedback to highlight the barriers to completing the action research, such as covid, and key successes.

Contents

Background

The action research group at City College Plymouth has researched the effects of one-to-one coaching sessions on the motivation, engagement and learning of post-16 maths learners, with a focus on building maths confidence.

Improving the motivation and engagement of maths GCSE resit students in FE Colleges formed a fundamental starting point for our action research and as a team, we decided to look at providing additional maths coaching sessions personalised to students' diagnosed gaps and aim to support with building confidence. Coaching has been known to boost confidence, improve work performance, and build effective communication skills. The benefits can be even more vast and specific to an individual such as increased confidence as referenced in our literature review.

We felt our coaching project needed to not only address math skills specifically but also the wider confidence and resilience of our learners. Our coaching project was designed to enable learners to take ownership of the sessions to encourage buy-in and break down some of the barriers of the maths unknown.

"…Gallwey had put his finger on the essence of coaching. Coaching is unlocking a person's potential to maximize their own performance. It is helping them to learn rather than teaching them." (Whitmore, 2002, p. 8)

City College Plymouth is an inner-city campus, with the student demographic reflecting this in respect to deprivation, access to services and resources.

Due to the conditions of funding for post 16+ maths education in England, many students are retaking their qualifications. There are often high levels of subject-related anxiety within the cohorts. Factors that can lead to maths anxiety include "unrealistic expectations of students; gender bias; giving poor explanations; hostility, anger or intimidation; embarrassing students in front of peers if a concept is not understood; and, an insensitive or uncaring attitude" (Shields, 2005).

Currently, throughout all key stages, learners in Plymouth are below the national achievement rate in mathematics, and organisations within Plymouth are working together to overcome "The Plymouth Challenge" which focuses on Secondary School standards. "The percentage of pupils achieving 'the basics' in Plymouth is 58.8% which is below the national average of 59.4% and statistical neighbour average of 61.5%. The progress made by disadvantaged pupils is below that of non-disadvantaged pupils at the end of KS4." (Plymouth City Council, 2019). A high percentage of our students will be in this KS4

category, as our FE College is one of the main providers for 16-18 learners in Plymouth and the surrounding area. Although there is no research at present, we can assume that the covid situation may have compounded this issue.

Action Research team

Our action research team consisted of the Maths centre coordinator and coach and members of the maths department at City College Plymouth resulting in a rich blend of skills and expertise working with learners of all ages and abilities, both in formal and informal education settings. One member of the coaching team (Carol) recently completed her MA in Education degree, with her dissertation focusing on strategies to improve mathematical resilience in students returning to study maths. She had also completed the Subject Learning Coach qualification which contributed to the MA degree, and so was able to deliver inhouse CPD for the coaching team on growth mindset, and basic coaching and motivational interviewing techniques.

Literature Review

A good literature review alongside summarising its sources, also analyses and evaluates to give a clear picture of the knowledge gained on the subject. With this in mind, we started off with a clear mission and action research question in mind as our starting point. This allowed us to focus on the relevant material that would best support us. We looked at a variety of sources including published literature, online education articles, published research reports to evaluate which literature best suited our action research. To aid with this, we also sought support from the expertise within the team. Our own research was backed up and complemented by learning from our previous action research as well as shared best practices from the 21 CfEMs and feedback from students, staff, Senior Leadership Team, network partners and the wider community.

We also debated the relevance of some of the material as a team to agree on a set suite of literature moving forward.

Coaching isn't about blowing a whistle and barking orders at people, it's much more nuanced than that. It's about focusing on an individual to help them reach their potential. Freedman (2006) states that approximately 30% of college students struggle with math anxiety and that this issue has consistently ranked among the top 20 concerns for college students. "Coping with Math Anxiety," by B. Sidney Smith includes coping mechanisms and solution focussed practice explanation which supported the development of our coaching resources.

We were keen for our action research to impact teaching staff as well as our students "Our aim as action researchers is to improve our teaching by using professional (informed) eyes to observe our own practice (Arhar et al, 2001)."

As an action research group, we have discussed the impact we feel the coaching project will also have on ourselves as coaches, including on our reflective practice and our understanding of our FE students and their barriers/journey.

Arhar & Buck (2000), although focused on environmental science, cover some of these areas and highlight some interesting points we have taken forward about the ongoing adaptation of the resources and individual approaches.

".....by looking through the eyes of our students, we become more conscious of our purposes, our own unquestioned assumptions, and ourselves. By focusing on how our students see the world, we may see our own world with new eyes." (Arhar & Buck 2000)

Pearson (2020) has created a guide to tackling maths anxiety, which can be accessed at pearson.com. The guide draws on research and insights from leading experts across education, academia, business and the third sector who attended Pearson's 2019 Power of Maths roundtable to help address the issue namely, Bobby Seagull, Sue Johnston-Wilder and Susan Okereke.

This guide resonated with us as we designed our coaching programme, especially this from Bobby Seagull (2019) “I have witnessed how maths anxiety can negatively impact the competence and confidence of people in dealing with maths. This can sadly harm their ability to engage with maths for the rest of their lives. This guide gives an insight into some of the solutions and ideas that can be taken forward in schools and wider society to build a more confident and resilient nation when it comes to maths. Together, we must continue the conversation and fight for the wonder of maths.”

We felt our coaching project needed to not only address maths skills specifically but the wider confidence and resilience of our learners as well. Our coaching project was designed to enable learners to take ownership of the sessions to encourage buy-in and break down some of the barriers of the maths unknown.

An article on TES website (2010) focused on Maths anxiety examines the level of maths anxiety and culture towards this within the UK. The article highlights the importance of new approaches including practical/active learning, communicating mathematically, and working with students to encourage a more curious and positive approach to maths teaching and learning.

“Along with many misconceptions about the value and usage of maths in adult life, the problem is exacerbated by a culture in the UK where it is surprisingly acceptable to be negative about maths. It’s not uncommon to hear people say “I’m bad at maths” or “numbers aren’t my thing”, with some even wearing this as a badge of pride.” (Cornish. and Richardson, 2019)

In relation to the new OFSTED framework for maths teaching - “Other methods to build confidence include supporting students to communicate mathematically, generalise and explore relationships. An impact study of a resource like this demonstrated that 95 per cent of teachers said that there was a positive impact on pupil enjoyment of mathematics as a result of these methods being implemented in their school. Being active, illustrating and talking are all part of communicating mathematically, and this active approach from the start helps to remove the fear and anxiety surrounding maths.” (Cornish. and Richardson, 2019)

We wanted all staff to use coaching skills to support students. Starr (2016) explores all things coaching and what to do and how to do it! As an action research group, we have used this resource for its insight into starting new coaching conversations, effective questions, and how to develop focus and mindfulness techniques. The manual gives examples of potential coaching situations and possible dialogue and highlights the important areas within this.

We all have some coaching ability, maybe you're a good listener, conversationalist, or perhaps you know instinctively when something isn't 'right'. Throughout this project, the team has been able to discover and develop their own coaching skills. Whitmore (2017) sets out the GROW model (Goals, Reality, Options, Will) which we have opted to use as our coaching approach for the action research, due to its clear and effective process. As an action research group, we have used the principles to develop our in-house training and build the necessary coaching skills for the research. We were able to gain further insight into the origins of coaching, and the effects of coaching on both coach and coaches.

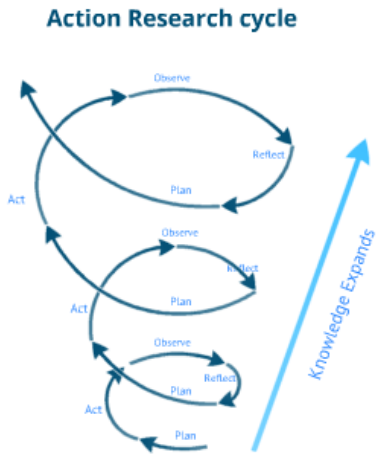
Motivational interviewing uses a guiding style to engage clients (in our case learners), clarify their strengths and aspirations, evoke their own motivations for change and promote autonomy in decision making. (Rollnick et al, 2008)

Haynes, Mullins and Stein (2004) discovered in their research that it isn't just the mathematical content being taught that instigates anxiety and apprehension but possibly the classroom environment and the manner of teaching the subject.

There is a clear synergy between the basics of motivational interviewing and the GROW model, and it sits parallel with what we want to achieve through the coaching project to elicit positive change from our learners.

Method

Whitmore suggests that Coaching is unlocking a person's potential to maximise their own performance. It is helping them to learn rather than teaching them. Reflecting on our previous action research we quickly realised that students enjoyed and benefited from small groups and one to one. From this, the idea for coaching developed from other CfEM partners successes with coaching projects. We were keen to see if the success elsewhere would translate to our students, with added activities that we developed through our team CPD and literature review findings.



Students opted into the coaching process and completed our initial diagnostic, regardless of their way to the coaching team, whether this was via a tutor referral or a student self-referral. All data was anonymised and stored securely in line with GDPR and you won't be able to identify any students from our data. The whole process was explained to students before they opted in ensuring informed consent.

Covid did have an impact on our action research and made it harder for coaches to engage some coachees. One to ones needed to be moved online which meant sessions were recorded for safeguarding purposes which did put a few students off. However, the majority of resources created could be used in an online setting.

The creation of the coaching action research at City College Plymouth had a few strands

- Staff training in coaching methodology and useful techniques to promote a growth mindset
- The creation of resources to be used alongside the maths focused side of the sessions to look at goal settings, confidence and motivation.

- The creation of GCSE and Functional Skills self-assessment for students to highlight their perceived weaknesses so that the coach could develop activities around these topics based on their maths expertise.
- Implementation of making maths relevant across the whole college curriculum.

After each session students would score their perceived maths confidence alongside their feedback on the sessions via a questionnaire providing the coaching team with qualitative and quantitative feedback for each session.

Each student received 3 hours of additional coaching across Sept to March 2021 split into 30-minute sessions which was a combination of one to one and small groups. The sessions supported self-diagnosed gaps in knowledge, but also involved a pastoral aspect of confidence, motivation and aspiration building. Our coaches were trained utilising fundamental coaching skills (Starr 2008) and used a GROW coaching model (Whitmore) with students.

The key principle focus of the coaching action research was “Fostering a can-do attitude/growth mindset (by setting short term goals, monitoring progress, recognising success)”

Our research objectives were;

1. To understand current mathematics practice in diagnosing student gaps in knowledge, and developing a process to fully assess learners starting point with maths and level of confidence/self-efficacy.

2. To develop an effective end-to-end process for teachers to capture gaps in knowledge and apply them to maths learning.

3. To design and deliver a range of coaching sessions on a one to one and/or small group basis, and analyse their effectiveness with regard to learner motivation and engagement, measured through regular student, tutor and coach feedback.

4. To investigate whether there are differences in engagement by learner characteristics (Age, Gender, SEN, previous attainment, vocation)

5. To analyse the progress made by those students who have had access to maths coaching.

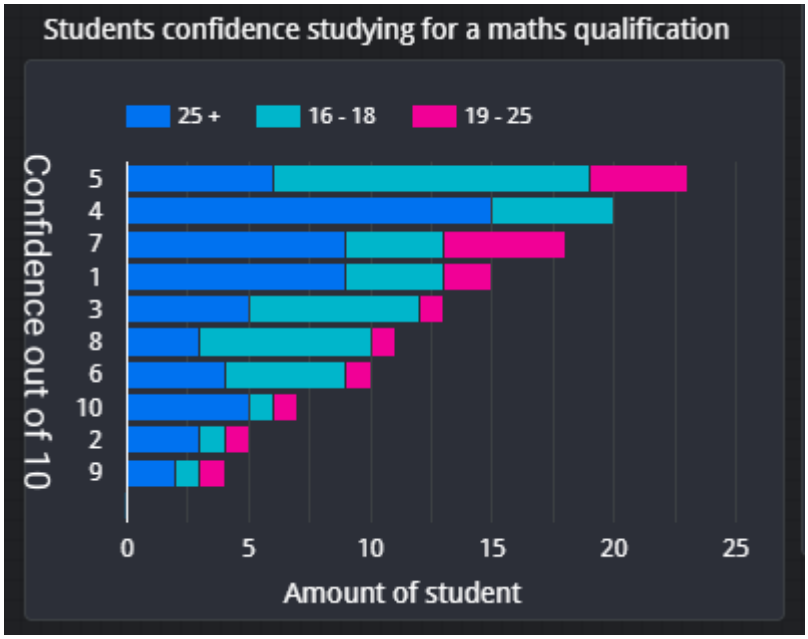
6. To assess and explain ways in which growth mindset and interest-based activities can support maths mastery.

7. To share results and, if possible effective approaches, with GCSE maths, re-sit teachers locally and nationally.

Results and Discussion

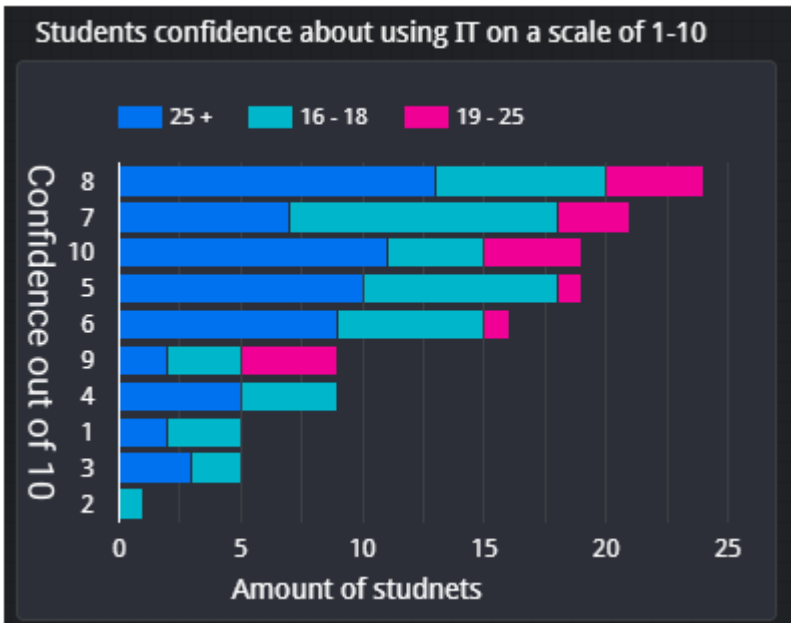
The starting point of our coaching action research was students' self-diagnosis. We had a fantastic response to this with 127 students opting to complete the survey. The findings of this survey showed that students, regardless of their age, had relatively low self-diagnosed confidence with regards to studying for a maths qualification (Fig 1) with the average confidence of all students being only 5.07 out of 10.

Fig 1.



Other interesting findings showed that students felt extremely low confidence with being asked to explain a maths formula just 3.73 out of 10. When asked about how confident students felt about being given a surprise exam their self-diagnosed confidence was 4.99 out of 10. As a college cohort from the students who completed the initial diagnostic, we can infer that confidence in maths is low. A positive that came from the diagnostic and was even more important with Covid was students' perceived confidence with IT. Students rated their confidence with using IT at 6.71 out of 10. (Fig 2)

Fig 2.

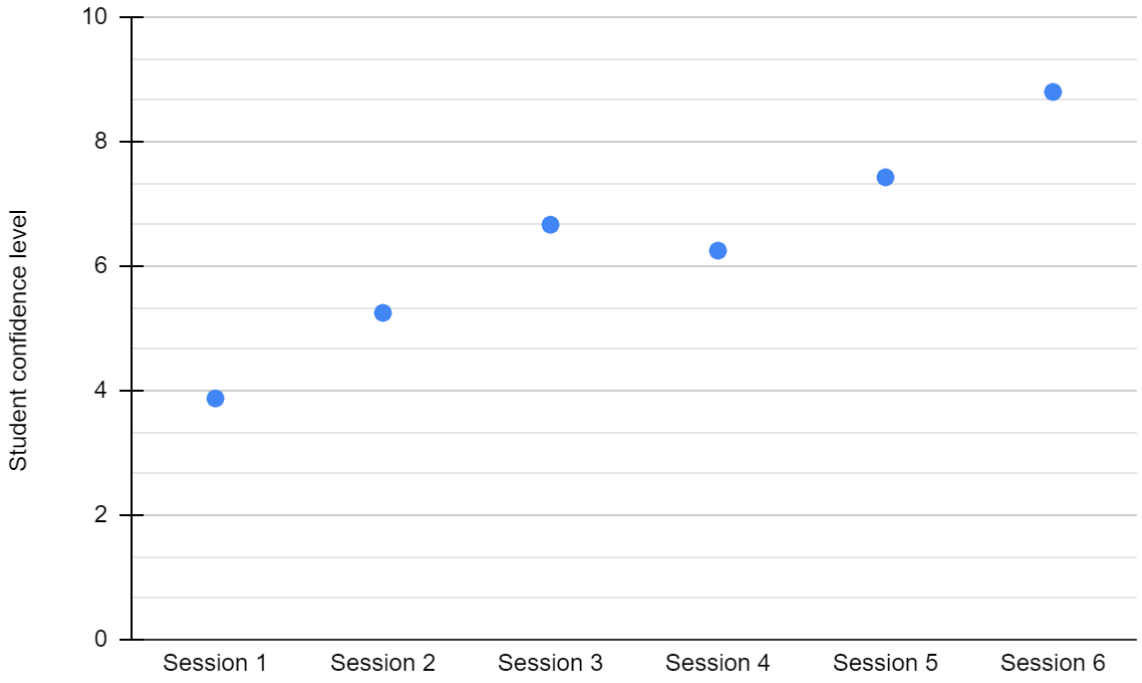


Of the 127 students who completed the initial diagnostic, 122 said that they would like to take part in the coaching project or receive more information about the sessions. Of these 122, 59 had at least one coaching session with one of the coaching team.

Of the 59 students who completed a coaching session, we would have hoped to have responses for 354 sessions. Due to the nature of the action research and the voluntary participation we had 9 participants complete at least one session feedback form giving us 41 data points for the coaching sessions.

One of the key aims of our Action research was to ascertain whether one to one coaching would have a direct impact on students' perceived confidence around maths. From the data we were able to collect, students' responses showed a confidence increase on average from 3.9 out of 10 from session one to 8.8 out of 10 by session six. Fig 3 shows the average confidence level of each student for each session.

Fig 3



Key themes that students highlighted from their reflections of the coaching sessions were:

- Maths is getting easier - graphs are starting to make sense as there was a hole in my knowledge.
- Being able to speak with a teacher, instead of watching online. To be able to ask questions.
- I am able to work on areas I struggle with
- Showed there is a chance (of passing the exam)

These are direct quotes by students picked out by the coaching team, with these views being replicated by all participants. A large proportion also mentioned that they were becoming more proactive with their asynchronous maths learning.

Another strand of our action research was the impact on teaching staff and their thoughts. Of the 8 coaches from the maths team, 4 completed our coaching reflections sheet. When asked on a scale of 1 - 10 (1 being not at all and 10 definitely) how beneficial, to students, do you think it will be to run the coaching sessions again in the term 21/22 the average came out at 9.75. When asked on a scale of 1 - 10 (1 being not at all and 10 strongly agree) what are your thoughts on this statement. 'Being part of the coaching project and CPD has developed and informed my teaching practice providing new approaches to try in my everyday teaching.' the average was 8.75 out of 10.

Key themes highlighted by the coaching team were:

- I could notice that working on a one-to-one level creates that approachable atmosphere, where students feel more relaxed and open themselves.
- I discussed learners' confidence and anxiety issues frequently. I found that learners were quick to self-criticise and did not recognise their own strengths.
- Lockdown, and having sessions online, has affected the coaching sessions.
- Being there as a coacher rather than a teacher which has positively impacted the lessons and their achievements too.

Discussion

In line with our research objectives, session one of the coaching project was to engage students to discuss and highlight their own individual gaps in learning. We used a prompt sheet for this (see appendix 1) This document was used as a base for conversations and was a vital tool for students to visualise the different areas of maths. Students at the end of session one stated that they "had a plan moving forward". This ties into the research from TES (2010) referenced in our literature review around maths anxiety which states 'we need to find solutions to maths anxiety that starts in the classroom and focuses on giving children a positive experience of maths from the outset.' Step 1 for our action research was to get buy-in from students so that they feel more ownership for their learning and could direct where they wanted to focus. This adds to the students' positive experience towards mathematics.

The findings of our research from the collection of data from the coaches back up our research aim of looking at gaps in learning and applying it to learning. Coaches have highlighted how they have used coaching techniques in their main lessons to the benefit of all students.

In terms of developing an effective end-to-end process for teachers to capture gaps in knowledge and apply them to maths learning, the research shows that students enjoy taking ownership of their learning and identifying their own gaps in knowledge. However, there isn't enough evidence from this research to effectively back up a complete process for capturing gaps and applying that to maths learning.

The design of the sessions with worksheets and short icebreaker activities (see appendix 2) was well received from the coaches and the coachees and provided a good base for each session. All coaches were members of the maths team and were paired with students they didn't teach so hadn't met the students before. The feedback from the team was that the favourite session was number 2 and "what was in the box" (see appendix) this was due to

the clear link between memory skills and maths revision. The activities were designed to start conversations, get students thinking outside the box and brain-stimulating exercises that can improve memory, focus, or daily functionality. This combined with the maths focus highlighted by the students created a positive learning coaching environment. These sessions, as highlighted by our findings, motivated and engaged learners in line with our research objectives. There are a few changes we would make which will be expanded in our recommendations. The main ‘criticism’ of the coaching sessions was that half an hour was not long enough and the majority of staff spent longer than the allocated time with each student. This does show the passion of the coaching team and is good learning if we run the coaching again.

Unfortunately, we didn’t obtain enough data to investigate whether there are differences in engagement by learner characteristics (Age, Gender, SEN, previous attainment, vocation). However, 48.3% of learners who completed our initial diagnostic were 25+ with 38.3% being 16-18 and 13.3% 19-25. To a large extent, it's not surprising that mature learners would opt for extra support, but it is very positive to see a large proportion of 16-18 year-olds put themselves forward for coaching.

The key to Whitmore's Grow model is setting a goal that is inspiring and challenging. Many of the students' goals were to pass their Maths qualification. However, the coaching team, through the resources in appendix 2 and the CPD they received, were able to link this goal into career aspirations or higher education goals. Through working through the Reality and Options with students the coaches ensured the coachees had the Will to participate. This paired with the students' ownership of their own learning ensured that students were more positive about their maths learning (Fig 3) and more engaged in achieving their goals.

Our research appears to back up the research of Haynes, Mullins and Stein (2004) who discovered in their research that it isn’t just the mathematical content being taught that instigates anxiety and apprehension but possibly the classroom environment and the manner of teaching the subject. Students really seemed to enjoy the coaching approach with its one-to-one nature and personalised approach. Although it is too early to say if this approach has impacted on results (written early July 2021) early indications from Functional skills assessments and the GCSE evidence being collated it is looking positive for students who received coaching.

Conclusions and Recommendations

This paper has discussed the benefits of our coaching action research for students and staff at City College Plymouth. The overriding aim of our research was to have a positive impact on students' anxiety around their Maths learning. Despite the impact of Covid and lack of engagement in the evaluation process from some students, the evidence gathered strongly suggests that one to one coaching can and does have a positive impact on students' Maths confidence. The research also shows a positive impact on teaching staff as well showing the importance of coaching as a holistic approach for the whole college.

The coaching project found that despite some extra complications added by Covid lockdowns, for example, students not wanting cameras on, the coaching project was still able to continue, and still had positive results. We would like to see the impact of a complete coaching cycle online to see if that would have an impact on the number of responses we could get from students. One of the key aspects of learning for future projects is to build in the student evaluation time into the session to ensure that responses can be captured from all students. Also as half an hour is not long enough and we recommend extending the sessions to at least 45 minutes with 15 minutes focused on goal setting and coaching activities with 30 minutes for the maths activities including time to complete the session evaluation.

Overall, the coaching project was a positive experience for staff and students with excellent outcomes for all involved.

We would like to see more time given to staff CPD so that staff could receive an accredited coaching qualification such as motivational interviewing, however, the coaching CPD provided by Carol was an excellent starting point for the coaching team and introduced the key coaching principles in a manner that was appropriate and digestible for all involved. As a result of this research, we hope to provide a 5 part CPD programme around maths anxiety for staff next year.

We didn’t achieve all our objectives and this paper would recommend condensing the number of objects for a further coaching action research project to ensure staff can focus on key issues.

As a tool for enabling students to talk about their maths anxiety and build their confidence around maths, a coaching project is a fantastic approach to positively engage students.

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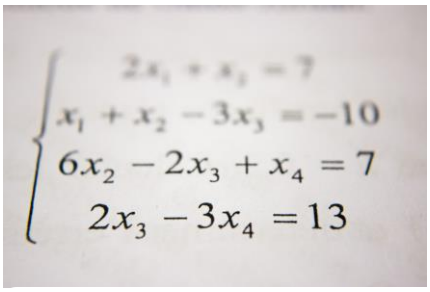
Appendix

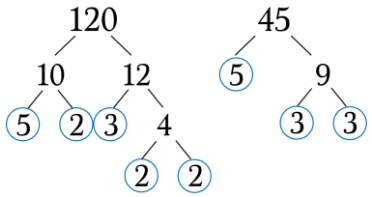
Appendix 1 - My Maths Self-Assessment (GCSE)

PERCENTAGES

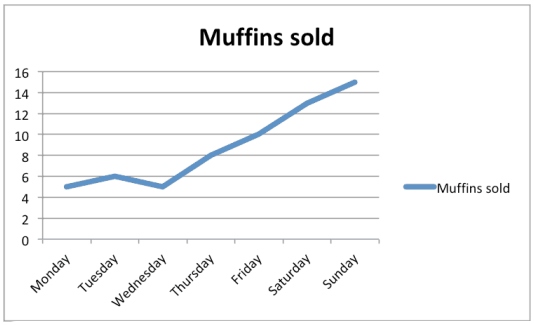
ALGEBRA



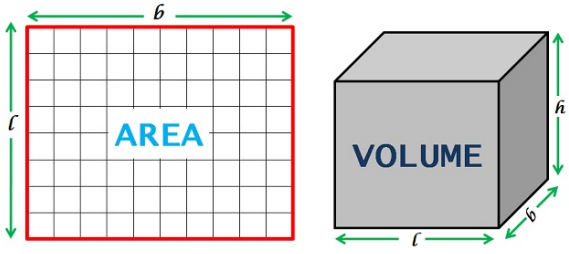
WORKING WITH NUMBERS



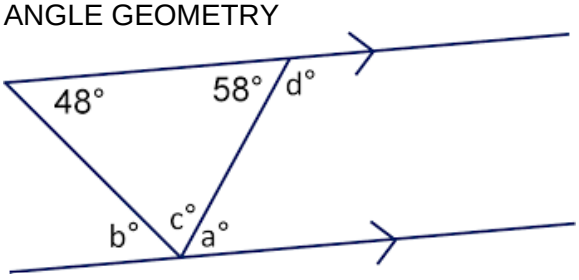
RELATIONS AND GRAPHS



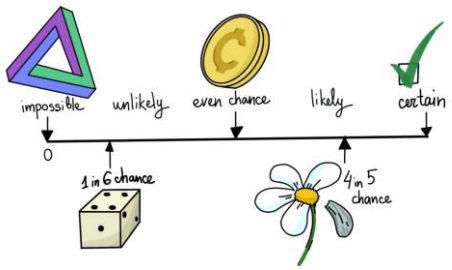
SHAPES AND MEASUREMENTS



ANGLE GEOMETRY



PROBABILITY

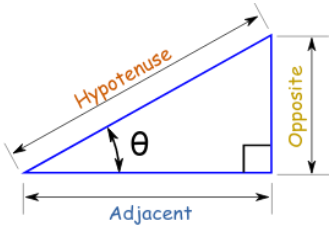


GEOMETRY AND TRIGONOMETRY

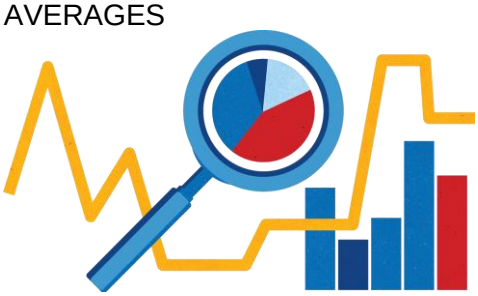
$\sin\theta = \frac{\text{Opposite}}{\text{Hypotenuse}}$

$\cos\theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$

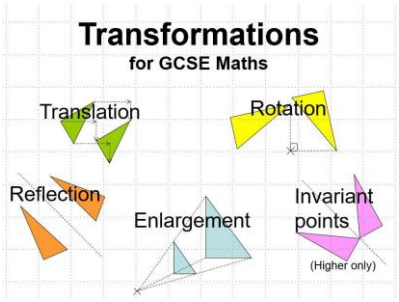
$\tan\theta = \frac{\text{Opposite}}{\text{Adjacent}}$



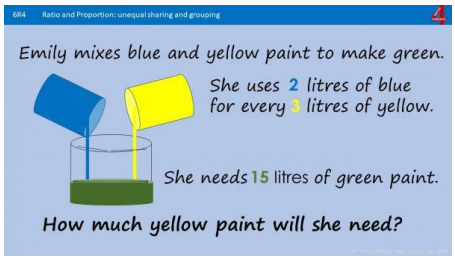
DATA ANALYSIS, GRAPHS AND AVERAGES



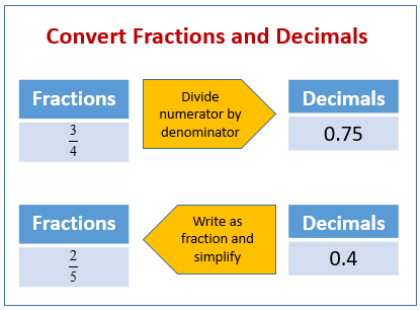
TRANSFORMATIONS



RATIO AND PROPORTION



FRACTIONS AND DECIMALS

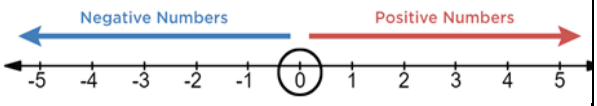


Top 5 focus sessions for coaching

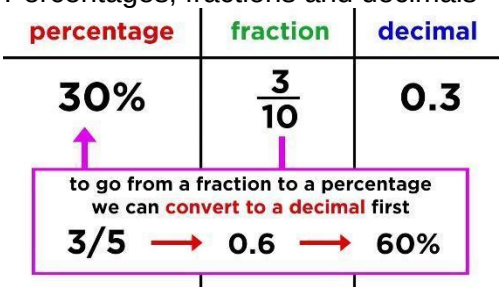
Session	Focus
2	
3	
4	
5	
6	

My Maths Self-Assessment (Functional Skills) ……

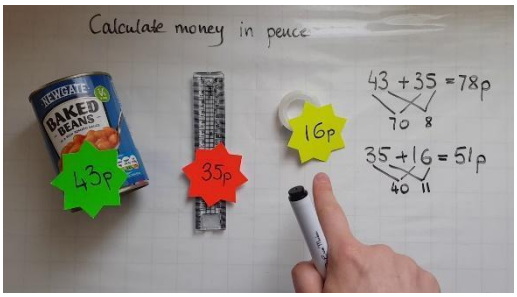
Positive and Negative numbers



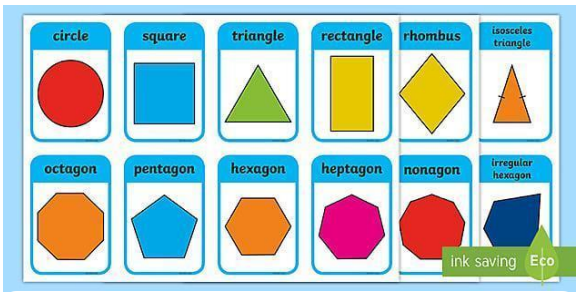
Percentages, fractions and decimals



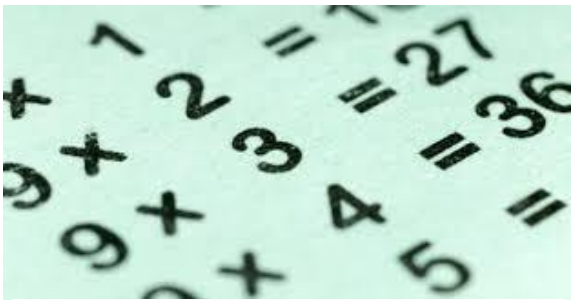
Calculating Money



2D Shapes



Multiplication



Division

100 ÷ 10 =

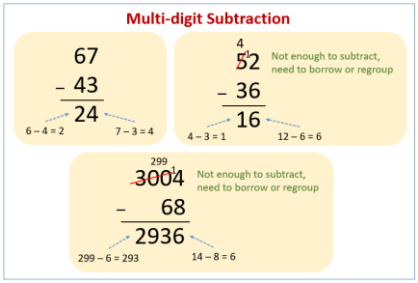
24 ÷ 3 =

14 ÷ 2 =

80 ÷ 8 =

55 ÷ 5 =

Subtraction

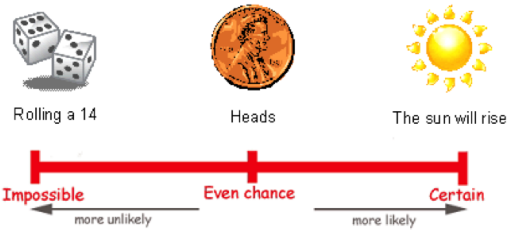


Addition

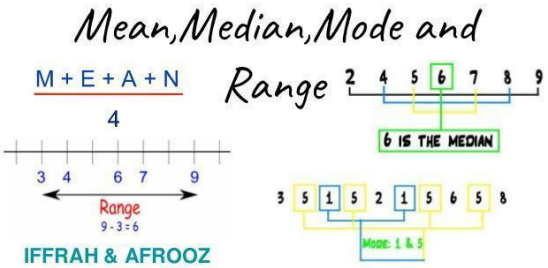
20 + 7 =	20 + 7 = 27
18 + 8 =	18 + 8 = 26
19 + 8 =	19 + 8 = 27

3D shapes, Area and Volume

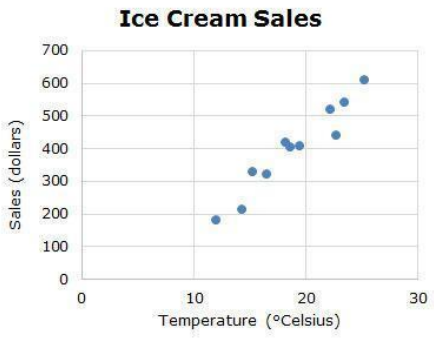
Probability



Mean, Median, Mode and Range



Graphs and data



Top 5 focus sessions for coaching

Session	Focus
2	
3	
4	
5	
6	

Appendix 2 - Student learner journal

Maths Centre for Excellence
Coaching Sessions

Introduction

Put simply, coaching is a process that aims to improve performance and focuses on the ‘here and now’ rather than on the distant past or future.

In coaching, fundamentally, the coach is helping the individual to improve their own performance: in other words, helping them to learn.

Will I get anything from it?

Not only will you be helping someone else develop their skills but you’ll get a lot from it, too. Coaching can support you with creating new skills and allow you the opportunity to develop your existing skills.

Getting in touch

We're always here if you've got a question or if you want to tell us what you've been up to. You can get hold of us by ringing 01752 305040 or if it's easier, email mathscoe@cityplym.ac.uk

And last, but not least, we hope you enjoy your coaching experience.

Best wishes,

The maths centre for excellence team

What to expect

Session 1 - Getting to know you

Session 2 - Memory skills and brain yoga

Session 3 - Critical thinking

Session 4 - You are Awesome

Session 5 - Maths, Me and My future

Session 6 - Coffee, cake and catch up

Sites we like and useful links

Who are we

There's a lot to think about before you start your journey with us at City College Plymouth and a lot to take in when you're on your way. A good support network can make all the difference.

The entire College team is here to support, advise and guide you. Whatever stage of student life you're at, our goal is to give you all the information you need to make the choices that are right for you

The Centres for Excellence in Maths is a national programme funded by the Department for Education (DfE) and managed on its behalf by the Education and Training Foundation (ETF) with a range of delivery partners, including the Association of Colleges. It aims to deliver a step change in maths teaching up to Level 2 in post-16 settings to help increase the number of young people leaving compulsory education with basic maths skills, up to GCSE and equivalent level.

City College Plymouth is one of just 21 National Centres for Excellence in Maths. Each Centre for Excellence is led by an exceptional Post-16 institution with the commitment, capacity and leadership skills required to drive innovation and improvement in their institution and beyond.

What to expect

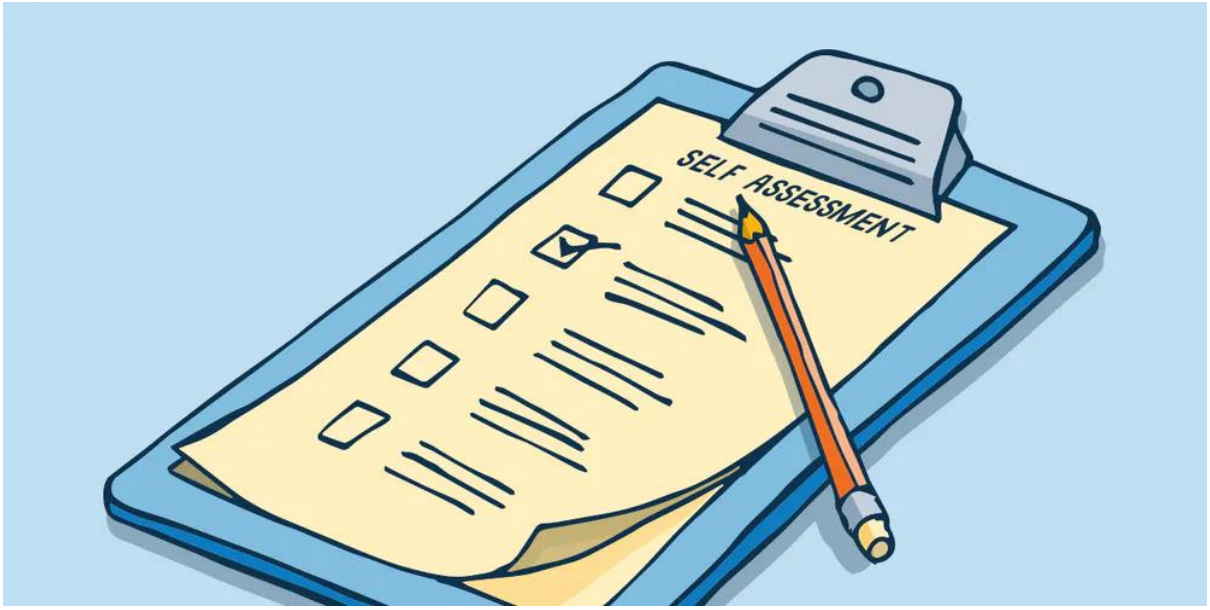
You will meet up with your 'coach' once a month for 6 months for half an hour. During these sessions you will have the opportunity to look at some math in a bit more detail, complete some activities and have a chance to reflect on your own learning and talk through any issues or concerns you may have.

You will be provided with prompts to help you with this but there will be a focus on you to think critically about your future.

The sessions will help you set personal goals and support you to achieve them, taking into account where you are now, looking at all your options and plotting a way forward.

Session 1

Use this page to make notes that you may find helpful



Getting to know you and goal setting.

This session will be a good opportunity to get to know your coach and find out a bit more about the next 6 sessions.

Complete this quick questionnaire which will pair you with an animal that will give you an insight into your learning style and suggest some strengths and weaknesses: https://icould.com/buzz-quiz/ Once completed and you've had a chat with your coach set yourself a goal.

Name:

My Goal is:

Steps to reaching my goal (at least 2)

1.
2.
3.
4.

Two things that will help me reach my goal:

1.
2.

I will know I have reached my goal because:

Reflection 1

Date: **Session No**.:

Activity used and/or topics discussed:
Outcome of the session - What have I learned or got out of the session
On a scale of 1 - 10 (1 being not at all and 10 being super confident) how confident are feeling about your maths qualification
What did you find good about this session?
What will you do in the coming weeks to help achieve your goal
What is the date and venue of the next meeting?

Session 2

Maths focus and notes page

Memory skills and brain Yoga.

This session will give you a couple of activities that will help with your memory skills and provide an opportunity to reflect on what has happened since your last meeting.

What's in the box?

You will be shown a box with 20 items in. You will have 20 seconds to look in the box and then you will be asked to right down as many as you can remember. Don't worry about how many you get. But if you practice this you'll start to see progress in you memory retention

What's in the box?

Brain Yoga

Take your left hand, make a fist, and extend your thumb; holding this, do the same with your right, only extend your little pinky. Now change them so it's left pinky and right thumb. The coordination involved will strengthen neural connections, which will help develop the memory!

For more memory activities check out our useful sites sections at the end of this booklet.

Reflection 2

Date: **Session No**.:

Activity used and/or topics discussed:
Outcome of the session - What have I learned or got out of the session
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Session 3

Maths focus and notes page ….

Critical thinking.

Critical thinking is clear, rational, logical, and independent thinking. It's about improving thinking by analyzing, assessing, and reconstructing how we think. You can apply critical thinking to any kind of subject, problem, or situation you choose.

Aliens have landed!

You are conducting a tour for aliens who are visiting Plymouth and observing humans. You're all in their spaceship when you fly over Home Park. One of the aliens is confused, and turns to you for help. Try answering as many of these questions as you can:

What is a game, and why do humans play them?

What are "teams" and why are they so important for humans to be part of?

Why is it these games seem to get more attention than other matters on your planet, like disease and poverty?

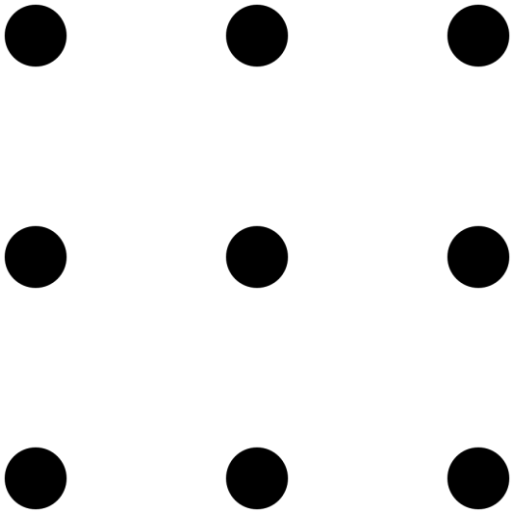
Why do humans get so emotional and even violent when watching games?

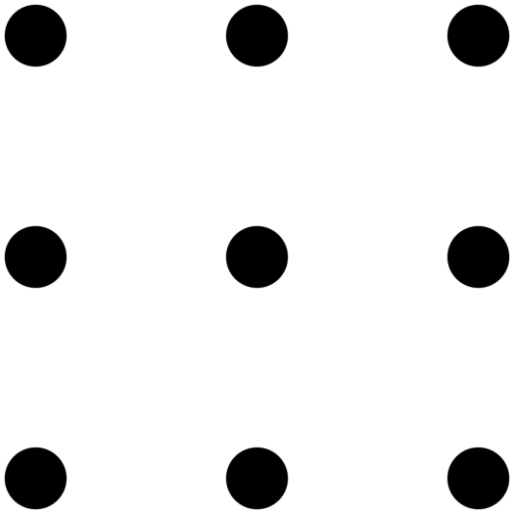
What would happen if no human could ever play these games again?

Joining up the dots!

On the next page you'll find 9 dots. Can you join them all up with either 3 or 4 lines without removing your pen from the paper?

(Hint: Think beyond real and imaginary boundaries with this puzzle, think outside of the box)





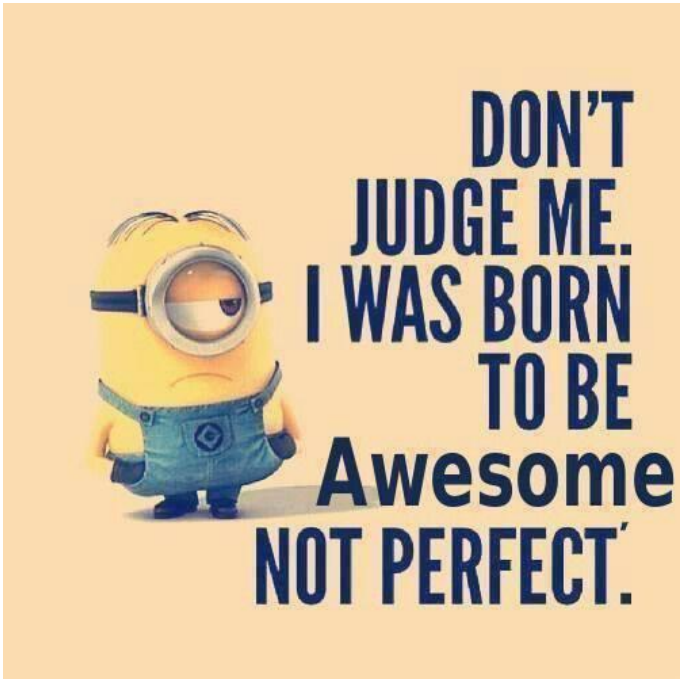
Reflection 3

Date: **Session No**.:

Activity used and/or topics discussed:
Outcome of the session - What have I learned or got out of the session
On a scale of 1 - 10 (1 being not at all and 10 being super confident) how confident are feeling about your maths qualification
What did you find good about this session?
What will you do in the coming weeks to help achieve your goal
What is the date and venue of the next meeting?

Session 4

Maths focus and notes page



You are awesome.

This session is all about you and focussing on positives about yourself.

Elevator pitch

This is an exercise used in business to help you think fast and get your point across. It's all about choosing and using words carefully and persuasively to achieve your goals in any conversation. Today's aim is to sell yourself with a 30-60 second pitch. Make some notes about what you want to say; some ideas and note space are provided below. (It can be tough saying nice things about ourselves but this is the perfect opportunity for some humble bragging)

I'm amazing and fantastic because?

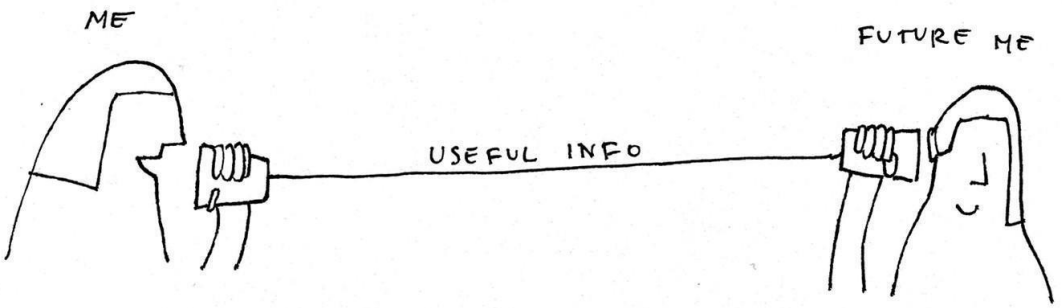
Reflection 4

Date: **Session No**.:

Activity used and/or topics discussed:
Outcome of the session - What have I learned or got out of the session
On a scale of 1 - 10 (1 being not at all and 10 being super confident) how confident are feeling about your maths qualification
What did you find good about this session?
What will you do in the coming weeks to help achieve your goal
What is the date and venue of the next meeting?

Session 5

Maths focus and notes page….



Maths, me and my future

This session we will be exploring what job you want to do in the future and thinking about what math skills you'll be using in that role.

The job I want is:

What maths skills do I think will be used in that role, eg time management, I'll need to know what time to turn up and how long my shift is.

Reflection 5

Date: **Session No**.:

Activity used and/or topics discussed:
Outcome of the session - What have I learned or got out of the session
On a scale of 1 - 10 (1 being not at all and 10 being super confident) how confident are feeling about your maths qualification
What did you find good about this session?
What will you do in the coming weeks to help achieve your goal
What is the date and venue of the next meeting?

Session 6

Maths focus and notes page….

Coffee cake and catch up.

This session will look back at your goals and reflect on the past 6 months and an opportunity to discuss anything that has concerned you or you want to go over in a bit more detail.

Don’t forget you’ll still need to complete your own reflections too.

Reflection 6

Date: **Session No**.:

Activity used and/or topics discussed:
Outcome of the session - What have I learned or got out of the session
On a scale of 1 - 10 (1 being not at all and 10 being super confident) how confident are feeling about your maths qualification
What did you find good about this session?
What will you do in the coming weeks to help achieve your goal
What is the date and venue of the next meeting?

Sites we like and useful links

- https://sites.google.com/cityplym.ac.uk/mathscentreforexcellence/home
- https://studentcentral.cityplym.ac.uk/
- https://www.youtube.com/user/paulmcgeethesumoguy
- https://vle.mathswatch.co.uk/vle/
- https://www.mathsbox.org.uk/index1.php
- https://blogs.cardiff.ac.uk/studentlifecu/tips-on-coping-with-anxiety-before-and-during-exams-2/
- https://www.mathsgenie.co.uk/gcse.html
- https://mathsbot.com/
- https://www.maths4everyone.com/
- https://www.missbsresources.com/maths-resources
- https://allaboutmaths.aqa.org.uk/newspec8300
- https://padlet.com/tessmaths1/knowledgeorganisers
- https://padlet.com/tessmaths1/AOCtaster
- https://padlet.com/tessmaths1/hooks
- https://padlet.com/tessmaths1/worldofrevision
- https://www.onmaths.com/
- https://www.maths4all.org/
- https://www.healthline.com/health/mental-health/brain-exercises
- https://www.everydayhealth.com/longevity/mental-fitness/brain-exercises-for-memory.aspx