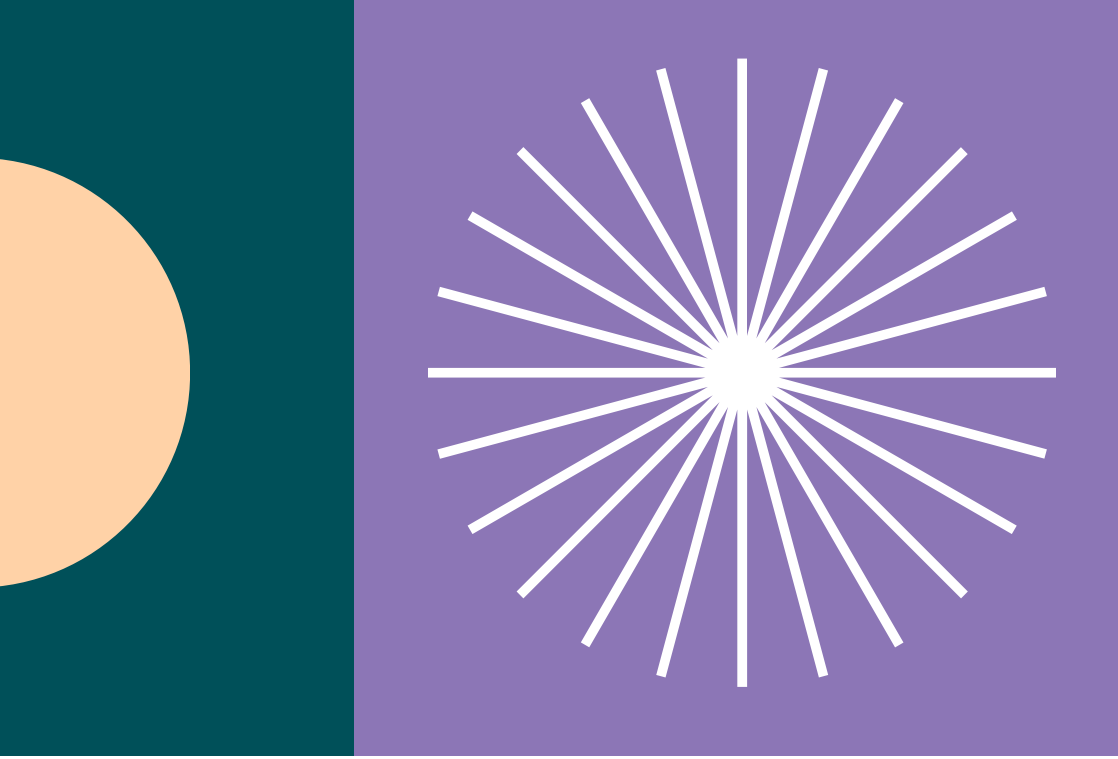

Understanding the KS2–KS3 Mathematics Transition: Implications for Underserved Pupils and Effective Practice

by Vanessa Roper, Lucy Herbert, Rebekah Gear and Dirk Smith

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CHAPTER 1: LITERATURE REVIEW

01 RESEARCH RATIONALE AND DETERMINING DEFINITIONS

The transition from primary to secondary school represents a pivotal moment in pupils' educational trajectories. Evidence consistently shows that this period is associated with dips in attainment, confidence, and engagement, particularly in mathematics (Jindal-Snape et al 2020). Recently Research from the Observatory for Mathematics Education (OfME 2025) highlights the transition as a moment of significant academic and emotional disruption, with implications for long-term outcomes. This is further affirmed by Cook (2024) who concludes that the transition to secondary school can disrupt pupils' sense of belonging and academic identity, with the greatest impact on those already vulnerable to underachievement.

Within this study, the term "disadvantaged pupils" refers to pupils who face socioeconomic or structural barriers that limit access to educational opportunities. This includes pupils eligible for Free School Meals, looked-after pupils, and those experiencing wider forms of social or economic deprivation. Importantly, disadvantage reflects contextual inequalities rather than differences in ability or potential. Within our study context, we acknowledge that "disadvantaged" is a label applied to children and young people, and that the term underserved may be more appropriate within our research context. As Taylor (2021) argued, deficit labels can obscure structural inequalities and misrepresent young people's lived experiences. This reinforces the understanding that children and young people are not unequally able but unequally experienced with their outcomes shaped by the opportunities, resources, and conditions around them rather than by any inherent limitation. This will be explored more deeply through this study within the context of transition between KS2 and KS3 in mathematics.

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Mathematics is a subject where these challenges are experienced as a consequence of both the curricular and pedagogical cliff edge being especially pronounced. This is highlighted by the National Centre for Excellence in the Teaching of Mathematics (NCETM), which identifies the KS2–KS3 transition as a critical point where discontinuity in curriculum, pedagogy, and expectations can undermine progression, if not carefully managed (NCETM 2024). Furthermore, while Coker (2024) describes the general "transition dip" in mathematics attainment and attitudes, broader research evidence suggests that underserved pupils are disproportionately affected by this experience during their primary to secondary transition, consequence of how this phase can deepen social inequalities (Matiti 2024).

The following discourses and international evidence base underpin the rationale for this project's focus on underserved Year 7 pupils, who are not currently making expected progress in mathematics. This literature review provides a context for this study, whilst examining the nature of this cited: "transition dip" (Coker 2024), the specific vulnerabilities of underserved pupils, the role of curriculum and pedagogical continuity, and the importance of challenge and enrichment.

02 THE NATURE OF THE KS2–KS3 TRANSITION IN MATHEMATICS

There is a substantial body of evidence that identifies a decline in mathematical attainment and engagement during the first year of secondary school. Nationally, both Coker (2024) and OfME (2024) describes a pattern in which pupils' confidence and performance often fall shortly after transition, with underserved pupils experiencing this more significantly. This is reported as a consequence of pupils frequently struggling to adjust to new routines, expectations, pedagogical approaches and teaching styles, which can disrupt learning momentum.

International research indicates a similar picture. Such studies highlight that conceptual understanding can stall or regress when pupils encounter abrupt changes in curriculum structure or pedagogical approach (Bicknell and Riley 2012 and Jindal-Snape et al 2020). These discourses note that whilst these dips are not inevitable, they tend to emerge where continuity within this transition is weak.

One of the most widely cited contributors to the transition dip is curricular and pedagogical discontinuity. Many secondary schools adopt a "fresh start" approach, retesting pupils and sometimes disregarding KS2 data (Bicknell and Riley 2012). While intended to ensure accurate baselining, this can lead to unnecessary repetition of content, reduced challenge, and a sense among pupils that their prior learning is not valued, which is pivotal in supporting the development of pupils' foundation of knowledge (NCETM 2024).

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Furthermore, it is also cited that in some instances secondary teachers often lack confidence in primary school assessment data, leading to conservative placement decisions and a tendency to reteach topics already mastered. There is further evidence to indicate that a misalignment in representations, models, and mathematical language between phases can create cognitive overload and hinder conceptual understanding and progression within mathematics. Attard (2012) highlights that students often perceive a marked shift in mathematics teaching and learning practices when they transition to secondary school, including disruptions in teacher–student interactions and classroom expectations, which can challenge engagement in new learning environments. Finally, Cook (2024) adds that structural differences between primary and secondary classrooms, including increased departmentalisation and reduced personalisation, can exacerbate these discontinuities.

Transition is not only a curricular shift but also a relational one. Such changes in teacher–student relationships, classroom norms, and peer groups can significantly affect pupils' sense of belonging (OfME 2025). This is particularly important in mathematics, where mathematical identity becomes more fixed during early adolescence. Pupils may experience reduced individual attention in secondary mathematics lessons, which can impact confidence. Coker (2024) notes that confidence and self-belief are key predictors of progress, and regression in these areas can quickly translate into lower attainment and stagnated progression. Furthermore, it is suggested that pupils' mathematical identity is shaped by early KS3 experiences, making the first year of secondary school a critical period for sustaining engagement (Bicknell and Riley 2012).

03 EXPERIENCES OF TRANSITION

In order to consider how transition affects different groups of pupils this study is situated to acknowledge that "disadvantaged" is a label placed on children and young people. The term underserved is often more appropriate, recognising that pupils are not unequally able but unequally experienced with their educational journeys shaped by the opportunities available to them. This distinction is reinforced across the research base, which consistently shows that social deprivation is not simply a background characteristic but a lived experience that becomes more pronounced during the move from primary to secondary school (Matiti 2024). Studies highlight that organisational change, curricular discontinuity, and shifts in relationships can heighten existing inequalities, making the transition period a moment where structural underservedness is most acutely experienced (Matiti 2024).

Underserved pupils face multiple, intersecting challenges during transition. Socioeconomic disadvantage has been identified as a significant risk factor for transition dips, with these pupils more likely to experience lower prior attainment and reduced access to enrichment (Jindal-Snape et al 2020, Coker 2024 and Cook 2024). The research indicates that underserved pupils often have fewer opportunities to develop the resilience and self-advocacy skills that support successful transition. The NCETM (2024) develops this further, in the context of schooling experiences, adding that variation in feeder school experiences, such as differences in curriculum schemes, mastery approaches, or use of manipulatives, can create challenges in the KS2–KS3 transition. This affirms how such organisational and relational disruptions can be particularly destabilising for pupils who are deemed underserved (OfME 2025).

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Furthermore, grouping practices in Year 7 mathematics can significantly shape pupils' experiences and outcomes. Cook (2024) notes that early setting decisions, often based on limited or re-tested data, can perpetuate inequality by placing pupils in lower sets with reduced access to high-quality teaching and enrichment. In addition, research highlights that grouping influences pupils' mathematical identity and sense of belonging (Bicknell and Riley 2012).

To overcome this, the NCETM (2024) advocates for mixed-attainment approaches within a teaching for mastery pedagogical framework, arguing that these can support equity and conceptual depth. Coker (2024) adds to this, claiming grouping interacts with confidence and challenge, with lower sets often receiving narrower, more procedural curricula.

04. KEY LEVERS FOR IMPROVING TRANSITION

Curriculum continuity is consistently identified as a key lever for improving transition outcomes. The NCETM (2024) emphasises the importance of coherence across KS2 and KS3, particularly through shared representations, models and mathematical language. Where pupils encounter familiar structures, including number lines, bar models or consistent terminology, secondary teachers are better positioned to build on prior learning rather than repeat it, supporting progression.

International evidence also highlights the importance of pedagogical alignment. Attard (2012) indicates that shifts in teaching approach between primary and secondary mathematics can affect pupils' engagement and adjustment, suggesting that greater alignment may support conceptual continuity. Similarly, Bicknell and Riley (2012) show that discontinuities in curriculum sequencing and 'fresh start' practices can limit opportunities to consolidate fluency and deepen understanding. This is reinforced by Cook (2024) positioning continuity as a core principle of effective transition, arguing that alignment in expectations, language and curriculum design reduces the likelihood of disruption to learning trajectories.

Cross-phase collaboration emerges as a recurring theme across the literature. The NCETM (2024) highlights the impact of Year 5–8 working groups, joint planning and shared professional development in smoothing transition and promoting curriculum coherence. Such collaborative structures help establish shared expectations and reduce fragmentation between phases. This is synthesised by Cook (2024) who notes that professional dialogue between primary and secondary teachers can strengthen understanding of pupils' prior learning, supporting more informed planning and placement decisions.

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Similarly, Coker (2024) provides case study examples in which structured collaboration and targeted transition support were associated with improved pupil confidence and reduced attainment dips. This affirms the significance of communication between phases contributes not only to academic continuity but also to relational stability, supporting pupils' sense of security during organisational change (OfME, 2025).

There is some research which focuses on underserved pupils who achieved Greater Depth (GD) at KS2. Bicknell and Riley (2012) previously suggested that high prior attainers often experience reduced challenge at KS3, particularly when secondary schools reteach KS2 content or adopt conservative grouping practices. The NCETM (2024) similarly cautions that unnecessary repetition of familiar material at the start of KS3 can reduce engagement for previously high-attaining pupils. Furthermore, Coker (2024) emphasises that maintaining challenge is essential for sustaining confidence and preventing dips in motivation.

Consequently, this study focuses on the lived experiences of underserved pupils who achieved Greater Depth at KS2, as they may represent a 'hidden risk' group within KS2 to KS3 transition research. Despite high prior attainment, these pupils may be especially vulnerable to practices that dilute challenge or fail to build on prior learning, potentially contributing to the widening attainment gap observed in secondary mathematics. Investigating this subgroup enables exploration of how transition structures either sustain or constrain high academic potential. This will be compared with the lived experiences of those pupils who achieved expected at the end of KS2 to provide a control group.

05. IMPLICATIONS FOR THE RISE PROJECT

TURNING THEORY INTO PRACTICE

The transition from KS2 to KS3 is a critical moment that shapes pupils' mathematical trajectories. Underserved pupils face heightened risks; however, the literature indicates that these risks are not inevitable. Cross-phase alignment, challenge, enrichment, and relational pedagogy emerge as key factors in supporting successful transition. By foregrounding these elements, this pilot project has strong potential to deepen understanding of the factors that influence outcomes for underserved Year 7 pupils, with the ambition of shaping scalable, equity-driven models for secondary school settings.

CHAPTER 2: INQUIRY FRAMEWORK

01 RESEARCH DESIGN

Across the literature, several consistent levers for improving transition outcomes emerge:

- curriculum continuity through shared representations;
- language and sequencing across KS2 and KS3;
- cross-phase collaboration via joint planning, shared assessment and professional dialogue;
- sustained challenge and enrichment to ensure all pupils, including previously Greater Depth underserved pupilss, experience depth and extension;
- relational pedagogy that strengthens belonging, confidence and mathematical identity;
- equitable grouping practices that avoid premature or rigid setting based on limited attainment data.

To explore the reality of such levels this study adopts a qualitative, close-to-practice research design (BERA 2018), using semi-structured interviews with pupils to explore how underserved pupils experience the KS2–KS3 mathematics transition. A qualitative approach was selected given the study's focus on lived experience, identity, belonging, and the contextual factors that shape pupils' engagement with mathematics during transition. The pilot draws on two groups of pupils: those who reached the Expected Standard at KS2 and a comparison group who attained Greater Depth, enabling analysis across attainment profiles.

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Semi-structured interviews will be conducted with participating Year 7 pupils. These interviews will provide accounts of how pupils perceive challenge, continuity, and their own mathematical identity, during this period of change. The semi-structured format allows for consistency across interviews while also enabling participants to introduce issues that are meaningful to them. Kara et al. (2021) encourage educational researchers to incorporate creative methods into their research design, arguing that non-traditional approaches can enrich data collection and offer insights that may not surface through conventional interviews alone. Drawing on this perspective, a comic-strip activity was integrated into the pupil interviews schedule in order to capture individual experiences of the factors shaping their transition in a more expressive and accessible way.

The study is informed by participatory principles, recognising pupils as experts in their own experience. This aligns with the literature emphasising that underserved pupils are not unequally able but unequally experienced, and that transition is shaped by relational, organisational, and pedagogical factors. Interview data will therefore be analysed thematically to identify patterns in how pupils and teachers understand the transition, the challenges they encounter, and the conditions that support or hinder progression.

A subsequent phase of the study could incorporate the perspectives of mathematics teachers to deepen understanding of the organisational and pedagogical factors shaping transition. Semi-structured interviews with teachers would enable exploration of how they interpret KS2 information, perceive the needs of underserved learners, and make decisions about curriculum continuity, grouping, and challenge in Year 7. Bringing teacher insights into dialogue with pupil accounts would support a more holistic analysis of the transition system and strengthen the development of region-specific, scalable models of practice for the pilot.

02 PUPIL INTERVIEW SCHEDULE

HOW THE INTERVIEW ACTIVITY CONNECTS WITH THE RESEARCH THEMES

Interview Activity	Purpose	Linked Research Themes
Warm-up prompts	Build rapport; surface early emotional responses to mathematics alongside a confidence rating scale	Transition-related anxiety and belonging (OfME 2025; Jindal-Snape et al. 2020); Mathematical identity (Coker 2024; Bicknell & Riley 2012)
Comic Strip: "My Mathematics Journey"	Explore lived experience of transition through narrative and imagery	Transition dip in confidence and identity (Coker 2024; Cook 2024); Discontinuity in pedagogy and expectations (NCETM 2024; Attard 2012); Underserved pupils' lived experience (Matiti 2024; Taylor 2021)

02 PUPIL INTERVIEW SCHEDULE

Interview Activity	Purpose	Linked Research Themes
Mathematics in action: "Show Me How You Think"	Surface continuity/discontinuity in representations, models, and language	Curriculum continuity (NCETM 2024); Misalignment in models and language (Bicknell & Riley 2012); Cognitive overload during transition (Attard 2012)
Sorting Cards: "What Helps / What Makes It Hard"	Identify perceived barriers and enablers	Barriers for underserved pupils (Jindal-Snape et al. 2020; Coker 2024); Grouping practices and inequity (Cook 2024; Bicknell & Riley 2012); Challenge and enrichment (NCETM 2024; Coker 2024)
Closing Reflection	Capture agency, aspirations, and perceived needs	Identity formation and agency (Bicknell & Riley 2012); Challenge and motivation (Coker 2024; NCETM 2024)

Interview Schedule

Format

- Semi-structured interview (30-40 minutes)
- Includes creative tasks: drawing, comic strip, sorting cards, and a simple maths prompt
- Designed to reduce cognitive load and support expression beyond language

01.

WARM UP (2-3 MINUTES)

Purpose: Build rapport, reduce anxiety, ease into the conversation.

- "Tell me about something you've enjoyed learning recently; it doesn't have to be maths."
- "If maths were a weather pattern today, what would it be?"

(Child chooses: sunny, cloudy, stormy, etc.)

- Conduct a confidence rating scale:

Not confident at all	Slightly Confident	Somewhat Confident	Quite Confident	Extremely Confident
1	2	3	4	5

02.

COMIC STRIP: "MY MATHS JOURNEY" (10 MINUTES)

Materials: Blank comic strip with 3–4 frames.

Prompt:

"Here's a little comic strip. Can you draw or sketch what maths felt like in Year 6, what it felt like when you first started Year 7, and what it feels like now?"

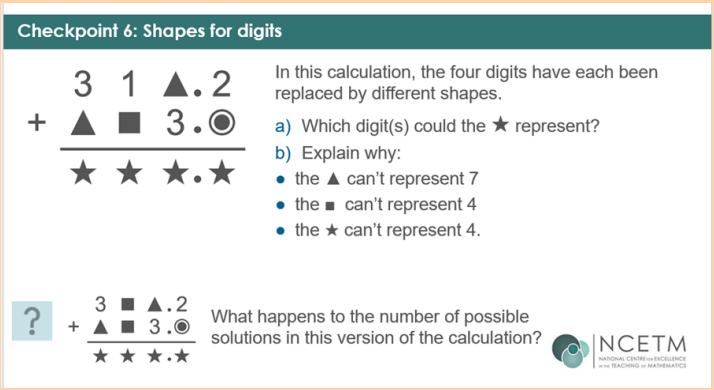
Follow-up questions:

- "What's happening in this frame?"
- "What changed between these two frames?"
- "Is there anything missing that you'd add if you had more boxes?"

03.

MATHEMATICS IN ACTION: "SHOW ME HOW YOU THINK" (5 MINUTES)

Materials: See the mathematics task sourced from NCETM Checkpoints .
Prompt:
"I'm not checking if you're right or wrong, I'm interested in how you think. Can you show me how you'd start this?"



Follow-up questions:

- "Is this similar to how you learned in Year 6?"
- "Does this look like what you do in Year 7 maths?"
- "What helps you when the maths looks different?"

SOURCE: NCETM CHECKPOINT 6 ARITHMETIC PROCEDURES (2021/22)

04. SORTING CARDS: "WHAT HELPS / WHAT MAKES IT HARD" (5 MINUTES)

Materials: Cards with the following words:

- working with others
- teacher explanations
- challenge
- going too fast
- going too slow
- new maths words
- confidence
- tests
- groupings/sets
- using equipment
- feeling known
- feeling lost

Prompt:
"Sort these into three piles:

1. Helps me
2. Makes it harder
3. Not sure / depends"

Follow-up questions:

- "Tell me about one card you put in 'helps me'."
- "Tell me about one that makes it harder."
- "Is there anything missing from the cards?"

05. CLOSING REFLECTION (2 MINUTES)

- "If you could change one thing about maths in Year 7, what would it be?"
- "What's something you're proud of in maths this year?"

CHAPTER 3: RESEARCH FINDINGS

01 PARTICIPATING SCHOOL'S CONTEXT

This study draws on data from three secondary schools with distinct demographic profiles and organisational structures. These contextual differences are important in understanding how pupils experience the KS2–KS3 mathematics transition, particularly in relation to grouping practices, curriculum continuity, and relational stability.

01.

- Pupil Premium: 20%
- Age range: 11–18
- Context: Medium–large comprehensive (~1500 pupils) with a mixed intake. All feeder primaries are within the same MAT, supporting structural continuity.
- Grouping: Mixed-attainment classes in Year 7.
- Participants: Six pupils. Group A, 3 pupils with KS2 scores of 110+. Group B 3 pupils with KS2 scaled scores of 107 or 108. All pupils now assessed at significantly below or below expected progress in internal assessments.

01 CONTINUED

02.

- Pupil Premium: 11%
- Age range: 11–18
- Context: Large comprehensive (~2000 pupils) with an affluent intake. Feeder primaries have informal ties but are not part of the same trust.
- Grouping: Tutor-group teaching until October half term, followed by three ability bands.
- Participants: Five pupils, all with KS2 scaled scores 107+. Their assessment data showed a mixture of in-line, below, and significantly below progress.

03.

- Pupil Premium: 42%
- Age range: 11–16
- Context: Small comprehensive (~1000 pupils) with a highly disadvantaged intake. Feeder primaries have developing relationships with the school.
- Grouping: Fully setted mathematics from the start of Year 7.
- Participants: Two pupils, both with KS2 scaled scores of 110+. Both were below or significantly below expected progress.

Data Sources

Across all schools, the following evidence was analysed:

- Confidence rating scales (Year 6 vs Year 7)
- Comic-strip "Mathematics Journey" drawings
- NCETM Checkpoint 6 problem-solving task
- Sorting activity ("Helps me / Makes it harder / Not sure")
- Semi-structured interview transcripts

*To protect anonymity, no direct quotations are used in this chapter.

02 THEMATIC ANALYSIS

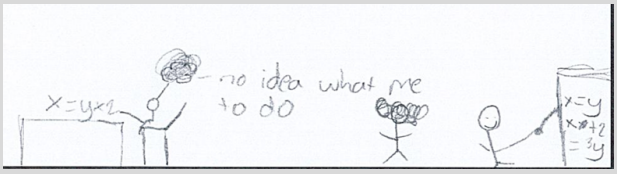
The thematic analysis identified four themes that shaped pupils' experiences of the KS2–KS3 mathematics transition. These themes included: a confidence dip and impact on mathematical identity; discontinutiy between curiculum and pedagogy; impact on sense of belonging and the challenge of pace.

THEME 1: A CONSISTENT DIP IN CONFIDENCE AND MATHEMATICAL IDENTITY

Across all schools, pupils' confidence ratings declined from Year 6 to Year 7. This pattern was evident regardless of prior attainment or school context. Pupils frequently described Year 6 as a period of familiarity, predictability, and relational security. Their comic-strip drawings often depicted smiling faces, calm classrooms, and a sense of ease.

By contrast, Year 7 was associated with uncertainty, increased difficulty, and reduced confidence. Pupils in all settings described feeling less sure of themselves, particularly when encountering new topics such as algebra or multi-step procedures. This aligns with Coker's (2024) description of the "transition dip" and with Bicknell and Riley's (2012) argument that mathematical identity becomes more fragile during early KS3.

The NCETM Checkpoint task further highlighted this shift. While pupils could articulate strategies, many expressed uncertainty about whether their reasoning was "correct," reflecting the cognitive overload described by Attard (2012) when representations and expectations shift abruptly.



02 CONTINUED

THEME 2: DISCONTINUITY IN CURRICULUM, PEDAGOGY, AND REPRESENTATIONS

Pupils across all three schools reported a marked change in the nature of mathematics learning between KS2 and KS3. Their drawings and interview responses suggested:

1. A shift from hands-on, resource-rich environments in Year 6 to more formal, worksheet-based approaches in Year 7
2. Reduced use of manipulatives and visual models
3. Increased emphasis on independent work and silent classrooms
4. Faster pacing and more frequent topic changes

These findings reflect the discontinuities identified by NCETM (2024) and Attard (2012). Pupils in all schools described the Year 7 curriculum as "harder," but the underlying issue appeared to be not difficulty alone, but the change in pedagogical approach. Many pupils described Year 6 as "relaxed" or "fun," whereas Year 7 felt more rigid and less personalised.

The sorting activity reinforced this: "new maths words," "going too fast," and "feeling lost" were consistently placed in the "makes it harder" category.

Maths in Year 7

02 CONTINUED

THEME 3: THE CENTRALITY OF RELATIONSHIPS AND BELONGING

Relational factors emerged as a major determinant of pupils' transition experiences. Pupils across all schools described Year 6 as a space where they felt known, supported, and able to ask for help. In Year 7, the shift to multiple teachers, larger classes, and reduced individual attention created feelings of uncertainty.

This aligns with OfME (2025), Cook (2024), and Matiti (2024), who emphasise that transition is as much relational as academic. Pupils in setted schools (Schools 2 and 3) particularly highlighted the challenge of adjusting to new peers and teachers after grouping changes.

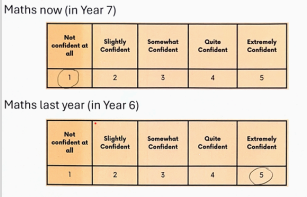
The sorting activity showed that "teacher explanations," "working with others," and "feeling known" were consistently placed in the "helps me" category, reinforcing the importance of relational pedagogy.

THEME 4: CHALLENGE, PACE, AND THE EXPERIENCE OF BEING "STRETCHED"

Across all schools, pupils described Year 7 mathematics as more challenging. However, the nature of this challenge varied:

- Some pupils (particularly in higher sets) described challenge as motivating and linked to progress
- Others experienced challenge as overwhelming, particularly when combined with fast pacing or limited support

This reflects Coker's (2024) argument that challenge must be accompanied by relational support and pedagogical clarity. Pupils' drawings often depicted Year 7 as "busy," "complex," or "confusing," suggesting that challenge without continuity can undermine confidence.



03 THE IMPACT OF MIXED ATTAINMENT GROUPINGS

A comparative analysis of the three schools revealed notable differences in pupils' experiences linked to grouping practices.

MIXED-ATTAINMENT (SCHOOL 1)

Mixed-Attainment (School 1)
Pupils in School 1 reported:

- Greater opportunities to work with a range of peers
- A stronger sense of belonging and reduced anxiety
- More consistent teacher relationships
- Less disruption to peer groups

These findings align with NCETM (2024), which advocates mixed-attainment teaching as a lever for equity and conceptual depth. Pupils' confidence dips were present but less pronounced than in Schools 2 and 3.

SETTING AFTER HALF TERM (SCHOOL 2)

Pupils in School 2 experienced:

- A second "mini-transition" when sets were introduced
- Increased anxiety about placement and comparison
- A sense of instability due to changing teachers and peers

This reflects Cook's (2024) concerns about early setting based on limited data and its impact on identity and belonging.

03 CONTINUED

FULLY SETTED (SCHOOL 3)

Pupils in School 3 described:

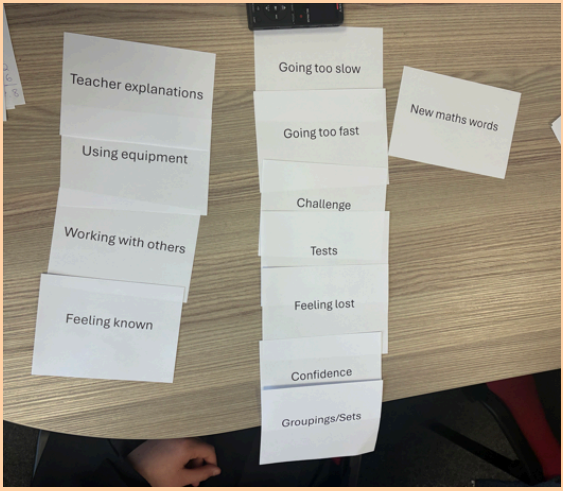
- Feeling less known by teachers
- Increased pressure to "keep up"
- Reduced access to support due to larger class sizes and single-teacher models
- A sharper decline in confidence

These experiences mirror Bicknell and Riley's (2012) findings that setting can reinforce inequity and narrow the curriculum for some learners.

CROSS-SCHOOL COMPARISON

Across all evidence sources:

- Mixed-attainment pupils experienced greater relational stability
- Setted pupils experienced greater discontinuity and identity disruption
- Confidence dips were most pronounced in fully setted contexts
- Pupils in mixed-attainment settings described more collaborative learning and greater access to peer support



What helps you / What makes maths hard sorting activity

CHAPTER 4: IMPLICATIONS FOR PRACTICE

01 DISCUSSION

The findings from this study reinforce the literature's central claim: the KS2–KS3 transition is a moment of heightened vulnerability, particularly for underserved pupils. Across all schools, pupils experienced dips in confidence, shifts in identity, and challenges linked to discontinuity in curriculum and pedagogy.

However, the comparative analysis suggests that grouping practices significantly shape the nature and extent of these challenges. Mixed-attainment structures appear to mitigate some of the relational and organisational disruptions that contribute to the transition dip, while setting can amplify them.

The findings also highlight the importance of:

- Curriculum continuity (NCETM 2024)
- Relational pedagogy (OfME 2025; Matiti 2024)
- Sustained challenge with support (Coker 2024)
- Cross-phase collaboration (Cook 2024; NCETM 2024)

These elements are not isolated; they interact to shape pupils' mathematical identity and engagement.

02
KEY RECOMMENDATIONS FOR PRACTICE

Drawing on the findings and the literature, the following recommendations are proposed:

01. STRENGTHEN CURRICULUM CONTINUITY

- Use shared representations (for example: bar models, number lines) across KS2 and KS3
- Avoid unnecessary reteaching of KS2 content
- Build on pupils' prior learning rather than resetting it

02. PRIORITISE RELATIONAL PEDAGOGY

- Establish consistent teacher–pupil relationships where possible
- Use strategies that help pupils feel known (for example: check-ins, targeted feedback)
- Create opportunities for collaborative learning

03. SUPPORT MATHEMATICAL IDENTITY AND CONFIDENCE

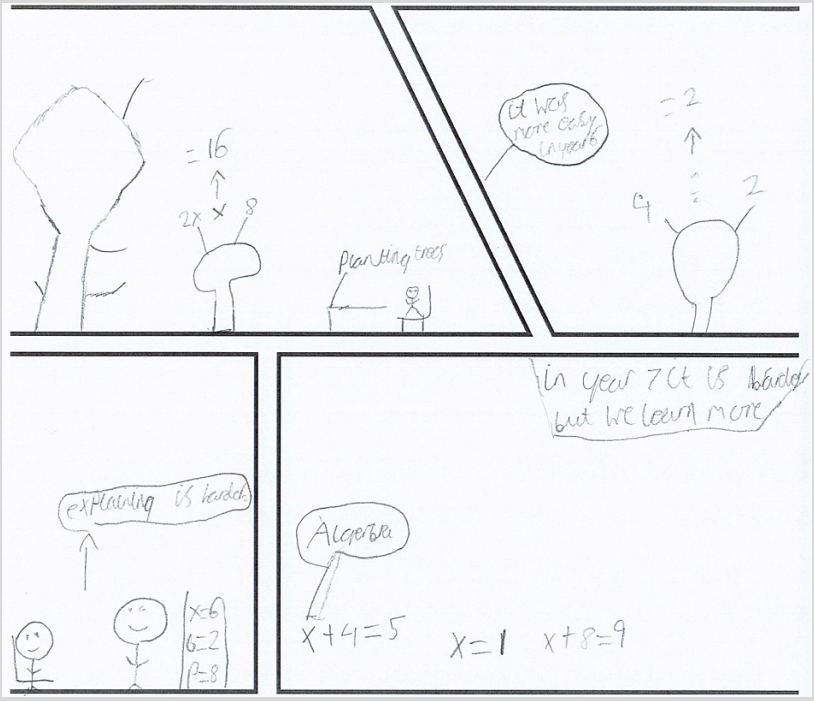
- Provide structured opportunities for success early in Year 7
- Use low-stakes retrieval and problem-solving to build agency
- Make challenge explicit and supportive

04. REVIEW GROUPING PRACTICES

- Delay setting decisions until robust evidence is available
- Consider mixed-attainment approaches in Year 7
- Ensure all groups receive access to rich, conceptually deep mathematics

05. ENHANCE CROSS-PHASE COLLABORATION

- Joint planning between Year 6 and Year 7 teachers
- Shared professional development on representations and pedagogy
- Moderation of KS2 work to build trust in primary data



03 CONCLUSION

The transition from KS2 to KS3 represents a pivotal moment in pupils' mathematical trajectories, and the findings from this pilot study reinforce the complexity and significance of this phase. Across all three schools, pupils described a shift characterised by changes in curriculum structure, pedagogical approach, and relational dynamics. This echoed the national and international evidence base summarised within the literature review. While the specific experiences of pupils varied across contexts, several consistent patterns emerged that illuminate how organisational structures, grouping practices, and classroom cultures shape the early secondary mathematics experience.

The study highlights that confidence, belonging, and perceived challenge are central to pupils' adjustment during trainsition in mathematics. The confidence rating scales, comic-strip narratives, transcripts, and sorting activities collectively reveal that many pupils, regardless of prior attainment, experience a decline in confidence upon entering Year 7. This aligns with Coker's (2024) description of the "transition dip" and with OfME's (2025) framing of transition as a moment of academic and emotional disruption. Pupils frequently attributed this dip to unfamiliar routines, reduced individualised support, and the increased pace and abstraction of KS3 mathematics, reflecting Attard's (2012) findings on pedagogical discontinuity.

The analysis also directs to the importance of relational pedagogy. Pupils across all schools emphasised the role of teacher explanations, opportunities to ask questions, and feeling known within the classroom. These findings resonate with Cook's (2024) argument that belonging and relational stability are foundational to successful transition, particularly for underserved pupils. Where pupils felt supported, listened to, and able to access help, they described greater confidence and engagement.

A further key finding relates to curriculum and pedagogical continuity. The mathematics-in-action task revealed that pupils often encountered unfamiliar representations, models, and language in Year 7, which contributed to cognitive overload, which mirrored concerns raised by NCETM (2024) and Bicknell & Riley (2012). Pupils who had relied heavily on manipulatives or structured visual supports in KS2 described a sense of loss when these were no longer available. Conversely, where continuity was stronger, such as consistent use of whiteboards or familiar problem-solving structures, pupils reported smoother adjustment.

03 CONTINUED

The study also provides important insights into the impact of grouping practices. School 1's mixed-attainment approach appeared to support more stable confidence trajectories, with pupils describing broader access to peer support and fewer feelings of being "behind". In contrast, pupils in Schools 2 and 3, where setting was used, frequently linked reduced confidence to being placed in a particular group, encountering accelerated challenge, or experiencing reduced opportunities for collaborative learning. These findings echo Cook's (2024) caution that early setting can reinforce inequity and Bicknell & Riley's (2012) argument that grouping shapes mathematical identity. Notably, high prior attainers in setted environments sometimes reported reduced challenge or increased anxiety, reinforcing NCETM's (2024) warning that Greater Depth pupils may be particularly vulnerable to disengagement when transition structures fail to build on prior learning.

Taken together, the findings affirm that the KS2–KS3 transition is not a single event but a multi-layered process shaped by curriculum, pedagogy, relationships, and organisational structures. They also demonstrate that underserved pupils, who are not unequally able but unequally experienced (Taylor 2021), encounter particular vulnerabilities during this phase. However, the study also highlights clear suggestions for improving practice and approaches towards the transitions between KS2-3 in mathematics. These include: strengthening cross-phase collaboration, ensuring curriculum continuity, maintaining appropriate challenge, and foregrounding relational pedagogy.

This pilot project contributes to a growing body of evidence that transition practices must be intentionally designed, equity-driven, and grounded in an understanding of pupils' lived experiences. The insights generated here provide a foundation for developing scalable models of practice that support all pupils, and particularly those underserved, to sustain confidence, identity, and progression in mathematics as they move from KS2 to KS3.

04 NEXT STEPS FOR FUTURE RESEARCH

The findings from this pilot study highlight several areas where further inquiry and targeted development work would deepen understanding of the KS2–KS3 mathematics transition and strengthen provision for underserved pupils.

Two strands of next steps are proposed: further research and project development.

01. FURTHER RESEARCH

A natural extension of this study would involve gathering the perspectives of Year 7 mathematics teachers. While this phase foregrounded pupils' lived experiences, teacher interviews would provide insight into:

- how KS2 information is interpreted and used in planning
- the rationale behind grouping decisions
- perceptions of curriculum continuity and challenge
- the organisational and pedagogical constraints shaping transition practices

This would support a more holistic, system-level understanding of transition, consistent with the cross-phase collaboration advocated by NCETM (2024) and Cook (2024).

A second research strand could explore longitudinal pupil experiences, following the same cohort into Year 8 to examine whether confidence, identity, and attainment trajectories stabilise, improve, or continue to diverge. This would provide valuable evidence on the longer-term impact of transition structures

04 CONTINUED

02. PROJECT DEVELOPMENT

The findings also point towards several areas where targeted intervention projects could address the discontinuities and challenges identified by pupils:

- Cross-phase curriculum design, focusing on shared representations, language, and sequencing across Years 5–8
- Mixed-attainment pilot classes in Year 7, particularly in schools currently using early setting
- Relational pedagogy development, supporting teachers to build belonging and confidence during the first term
- Transition units co-designed by KS2 and KS3 teachers, reducing the "fresh start" effect and strengthening continuity
- Professional learning communities across primary and secondary phases, enabling shared planning, moderation, and dialogue

These projects would directly address the structural and pedagogical discontinuities highlighted in the literature (NCETM 2024; Attard 2012; Bicknell & Riley 2012) and evidenced in pupils' accounts.

Together, these next steps offer a clear pathway for scaling the work, strengthening cross-phase coherence, and developing equity-driven models of transition that respond directly to the needs and experiences of underserved pupils.

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