Supporting progression through Key Stage 3

School transfer can be socially and emotionally difficult for many pupils. Many schools have recognised this and have effective arrangements to help pupils to make a successful start at secondary or high school.

Research indicates that schools do not always focus sufficiently on the academic start pupils make in their new school – building on what pupils have achieved in mathematics in their previous school year and maintaining high expectations while supporting pupils in a new environment. One way of achieving this is to help pupils demonstrate their understanding of a particular concept and to use the information gained from this to judge the pitch of subsequent work.

These transition lessons have been developed to support transfer from middle to upper schools but will also support year-on-year transition in Key Stage 3 for all secondary schools.

Three pairs of transition lessons are available:

- **Fractions, decimals and percentages (Year 7)**
  two lessons towards the end of Year 7

- **Fractions, decimals and percentages (Year 8)**
  two lessons near the beginning of Year 8

- **Thinking proportionally (Year 8)**
  two lessons for the end of Year 8 that link with the Year 9 unit on proportional reasoning in *Interacting with mathematics in Key Stage 3*.

The transition lessons form part of existing units in the *Sample medium-term plans for mathematics* (DfES 0504/2001) and are related to two of the mini-packs in *Interacting with mathematics in Key Stage 3*: multiplicative relationships (Year 8) and proportional reasoning (Year 9) (Year 8: DfES 0220/2002; Year 9: DfES 0588/2002). The transition lessons set out to provide useful information about pupils' attainment in proportional reasoning. The section below, 'Objectives and links', indicates the links with the sample plans and the mini-packs.

The lessons, each 50 to 60 minutes long, follow a familiar structure. The oral and mental starter is often linked to work in the main teaching in the lesson, where associated problems are set and developed. The plenary sessions draw together pupils' ideas and often introduce an extension to the task that requires pupils to apply what they have learned in the lesson. The later plenary sessions focus on assessment to help pupils to recognise what they can do and what they might continue to strive to achieve.

A key feature of these lessons is the drawing together of earlier teaching and learning. The emphasis is on enabling pupils to use and apply what they have already learned about solving problems, testing a hypothesis and presenting an argument to justify their decisions. The lessons set some of the work in similar contexts. Pupils are encouraged to work collaboratively and to develop their thinking skills.

Opportunities for assessment, based on key objectives, are built into the plenary sessions. Assessment sheets are provided; these help pupils to recognise their progress and will provide useful information for their next mathematics teacher.

Summary

The transition lessons are intended to ensure that:

- pupils experience a lesson structure they are familiar with and understand;
- pupils are able to build on their early successes and demonstrate what they know, understand and can do in the context of the work they did in Year 7 and Year 8;
- there is consistency in teaching approaches that will help pupils to respond to new teachers in new surroundings;
- teachers are better informed about pupils' strengths and weaknesses and can use the lessons to plan teaching programmes that meet the needs of their pupils;
- there is greater continuity and progression and less repetition of work.

For the transition units to succeed, middle schools should pass on to the secondary school pupils' work from the lessons and their self-assessment sheets.

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Objectives and links	This section sets out how the transition lessons might support progression through Key Stage 3 and how they link with objectives in the *Framework for teaching mathematics: Years 7, 8 and 9* (DfES 0020/2001), units in the *Sample medium-term plans for mathematics* (DfES 0504/2001) and two of the mini-packs in *Interacting with mathematics in Key Stage 3* (Year 8: DfES 0220/2002; Year 9: DfES 0588/2002).

For each pair of transition lessons and the corresponding mini-packs, objectives from the mathematics Framework are given. Key objectives are in **bold**; extension objectives for Year 9 pupils are in *italics*. |

Year 7 summer term

Part of Year 7 Number 5 (transition lessons N5.1 and N5.2)

Fractions, decimals and percentages (Year 7)

- Consolidate and **extend mental methods to include decimals, fractions and percentages**, accompanied where appropriate by suitable jottings; solve simple word problems mentally.

- **Recognise the equivalence of percentages, fractions and decimals**.

Year 8 autumn term

Part of Year 8 Number 2 (transition lessons N2.1 and N2.2)

Fractions, decimals and percentages (Year 8)

- Begin to **use the equivalence of fractions, decimals and percentages to compare proportions.**

- Recall known facts, including fraction to decimal conversions; use known facts to derive unknown facts, including products such as 0.7 and 6, and 0.03 and 8.

- Consolidate and extend mental methods of calculation, working with decimals, fractions and percentages; solve word problems mentally.

Year 8 spring term

From *Interacting with mathematics in Key Stage 3* (Year 8 mini-pack)

Year 8 multiplicative relationships

- Understand multiplication and division of integers and decimals; use the laws of arithmetic and inverse operations; check a result by considering whether it is of the right order of magnitude.

- Use division to convert a fraction to a decimal; calculate fractions of quantities; multiply (and divide) an integer by a fraction.

- Interpret percentage as the operator 'so many hundredths of' and express one given number as a percentage of another; **use the equivalence of fractions, decimals and percentages to compare proportions; calculate percentages and find the outcome of a given percentage increase or decrease.**

- Consolidate understanding of the relationship between ratio and proportion; reduce a ratio to its simplest form, including a ratio expressed in different units, recognising links with fraction notation; **divide a quantity into two or more parts in a given ratio; use the unitary method to solve simple word problems involving ratio and direct proportion.**

- **Identify the necessary information to solve a problem**, using the correct notation and appropriate diagrams.

- Solve more complex problems by breaking them into smaller steps, choosing and using efficient techniques for calculation.

- Suggest extensions to problems, conjecture and generalise; identify exceptional cases or counter-examples.

Year 8 summer term

Part of Year 8
Solving problems
(transition lessons
P1.1 and P1.2)

Thinking proportionally

- **Identify the necessary information to solve a problem; represent problems and interpret solutions in algebraic, geometric or graphical form**, using correct notation.

- **Use logical argument to establish the truth of a statement.**

- Suggest extensions to problems, conjecture and generalise.

- Consolidate understanding of the relationship between ratio and proportion; reduce a ratio to its simplest form, including a ratio expressed in different units, recognising links with fraction notation.

Year 9 autumn term

From *Interacting with mathematics in Key Stage 3* (Year 9 mini-pack)

Year 9 proportional reasoning

- Understand the effects of multiplying and dividing by numbers between 0 and 1; use the laws of arithmetic and inverse operations; *recognise and use reciprocals*.

- Enter numbers into a calculator and interpret the display in context (negative numbers, fractions, decimals, percentages, money, metric measures, time).

- Recognise when fractions or percentages are needed to compare proportions; solve problems involving percentage changes.

- **Use proportional reasoning to solve a problem, choosing the correct numbers to take as 100%, or as a whole;** *understand and use proportionality and calculate the result of any proportional change using multiplicative methods; understand the implications of enlargement for area and volume;* compare two ratios; interpret and use ratio in a range of contexts, including solving word problems.

- Enlarge 2-D shapes; *recognise the similarity of the resulting shapes; identify the scale factor of an enlargement as the ratio of the lengths of any two corresponding line segments; recognise that enlargements preserve angle but not length.*

- Solve increasingly demanding problems and evaluate solutions; explore connections in mathematics across a range of contexts: number, algebra, shape, space and measures and handling data; *generate fuller solutions*.

- Represent problems and synthesise information in algebraic, geometric or graphical form; move from one form to another to gain a different perspective on the problem.

- Suggest extensions to problems, conjecture and generalise; identify exceptional cases or counter-examples, explaining why; *justify generalisations, arguments or solutions; pose extra constraints and investigate whether particular cases can be generalised further*.