

Year 7 transition unit: calculation and problem solving

Unit objectives

The objectives for this unit are:

- A Understand and use decimal notation and place value; multiply and divide integers and decimals by 10, 100, 1000, and explain the effect.
- B Understand negative numbers as positions on a number line; order, add and subtract positive and negative integers in context.
- C Consolidate the rapid recall of number facts, including positive integer complements to 100 and multiplication facts to 10×10 , and quickly derive associated division facts.
- D Use standard column procedures to add and subtract whole numbers and decimals with up to two places.
- E Multiply and divide three-digit by two-digit whole numbers; extend to multiplying and dividing decimals with one or two places by single-digit whole numbers.
- F Enter numbers in a calculator and interpret the display in different contexts (decimals, money, metric measures).
- G Solve word problems and investigate in the context of number; compare and evaluate solutions.

These objectives build on key objectives in Year 6. It is important that pupils practise and extend their calculation strategies in Year 7 and become more efficient and proficient and that they are taught to select methods appropriate to the context.

Calculator skills will have been introduced to pupils in Year 6; they are expected to use calculators effectively.

Pupils attaining at least level 4 in Key Stage 2 are expected to:

- extend written methods to:
 - column addition and subtraction of numbers involving decimals
 - short multiplication and division of numbers involving decimals
 - long multiplication of a three-digit by a two-digit integer
- identify and use the appropriate operations (including combinations of operations) to solve word problems involving numbers and quantities, and explain methods and reasoning.

Differentiation

The notes for the unit indicate possible support and extension ideas, referencing *Springboard 7* and the Framework's supplement of examples which provides extension examples across Years 7, 8 and 9. Examples can be chosen as appropriate.

Resources

Lesson 1: Counting stick, number fans or mini-whiteboards, large double-sided coins (paper/card) with values $7p$ and $-2p$ on one coin and $5p$ and $-3p$ on the other coin.

Lesson 2: Resource sheet 1 *Number cards*, three or four of the double-sided coins per pair of pupils

Lesson 3: OHT 1 *Target number grid*, OHT 2 *Equivalent products*, Resource sheet 2 *Calculations*, Resource sheet 3 *Errors in calculations*

Lesson 4: OHP calculator, set of calculators (one between two pupils), Resource sheet 4 *Problems in the millions!*

Lesson 5: Resource sheet 5 *Largest calculations*, Resource sheet 6 *Largest product*

Key mathematical terms and notation

difference, explain, integer, minus, negative (e.g. -6), plus, positive (e.g. $+6$), reasoning, sum, systematic

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Autumn term

Five lessons

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- Understand negative numbers as positions on a number line; order, add and subtract positive and negative integers in context.
- Consolidate the rapid recall of number facts, including positive integer complements to 100 and multiplication facts to 10×10 , and quickly derive associated division facts.
- Use standard column methods to add and subtract whole numbers and decimals with up to two places.
- **Multiply and divide three-digit by two-digit whole numbers; extend to multiplying and dividing decimals with one or two places by single-digit whole numbers.**
- Enter numbers in a calculator and interpret the display in different contexts (decimals, money, metric measures).
- **Solve word problems and investigate** in the context of number; compare and evaluate solutions.

Link objectives

- Carry out short multiplication and division of numbers involving decimals.
- Carry out long multiplication of a three-digit by a two-digit number.
- Identify and use appropriate operations (including combinations of operations) to solve problems involving numbers and quantities, and explain methods and reasoning.
- Choose and use appropriate number operations to solve problems and appropriate ways of calculating.
- Develop calculator skills and use a calculator effectively.

- Add, subtract, multiply and divide integers.
- **Multiply and divide integers and decimals such as 0.6 and 0.06; understand where to position the decimal point by considering equivalent calculations.**
- 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.
- Give solutions to an appropriate degree of accuracy

Key objectives are in bold.