Move On Up: Learning Chunk – Entry 3 numeracy

A learning chunk is not a session plan. It provides a series of teaching and learning ideas around a skill(s) area. It is intended that teachers can select and adapt the ideas to meet the requirements of their learners in different contexts.

Estimating

Curriculum references: N1/3.8, MSS1/E3.5, MSS1 /E3.6, MSS1/E3.7

Context: Being confident with estimating is a vital skill for learners to help them to check answers and to decide if answers calculated are reasonable or not. They will also use estimating in everyday or work contexts to estimate time, costs, distances, etc. Learners at Entry 3 will often have more skills than they realise and will build confidence from understanding how valuable a skill using estimating effectively can be.

Teaching approach	Teaching and learning ideas	Resources
Whole group warm up/ mental maths activities – to get learners active and to build their confidence with using estimation to help work out if calculations are right.	**On the right track?** • Teacher gives a calculation and possible answer. Learners decide by estimating if they think the answer is 'on the right track' or not, i.e. is approximately right. They could indicate this by thumbs up/down or by writing on an individual whiteboard, e.g. *17 x 42* *714* **Variations of 'On the right track?'** • The question could be given as a situation in words rather than a numerical calculation, so the learners need to work out what to calculate before they estimate the answer. The answers could include units as well as the numerical answer so learners need to decide if an answer in that unit makes sense for the question given, e.g. *A TV costs £360. If Jim saves £12 a week, how long will it take him to save up for the TV?* *Answer: £30* *Learners would need to decide if the number 30 is reasonable and if an answer in pounds makes sense.*	• Individual whiteboards and wipe off pens, if required. • Questions in words which involve calculations using +, -, x, ÷. • Interactive whiteboard may be useful to project the questions on to a screen so learners can see as well as hear them.

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Whole group warm up/ mental maths activities – to get learners active and to build their confidence with using estimation to help work out if calculations are right.	**In the region** • Teacher gives a calculation and the learners, by estimating, write down a rough answer as quickly as they can. They see who can get closest to the actual answer. **Variation of 'In the region'** • The activity could be contextualised, e.g. by setting it in a garden centre if working with horticulture students. Using a price list, learners could take turns to pick an agreed number of items and then all learners have to estimate the total cost of those items. Again the nearest to the actual answer wins. **Same or not?** • Being confident to work with multiples of ten is a very useful skill when estimating to check answers. This is a warm-up activity which encourages learners to practise this skill. • The teacher gives a calculation involving multiples of 10, 100, etc., and a possible answer. Learners indicate by thumbs up/down if the two are the same or not, e.g. *20 x 40* *800* **Variation of 'Same or not?'** • Learners put mixed up paired cards face down and take it in turns to turn over two at a time. If the two cards match, they keep the pair. If not, they turn them over again. The winner is the player with most cards at the end.	• Individual whiteboards and wipe off pens, if required. • Set(s) of cards giving calculations involving multiples of 10, 100, etc., and the answers.

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Discussion and work in small groups/pairs – to get learners involved in practical activities to build their skills with estimating, so they feel able to use these to help them to predict/check answers.	• Discuss as a group when learners use estimation. This could be to check if answers they've worked out are reasonable (which is a very important skill, especially when using a calculator), as well as estimation relating to quantity, cost, distance, height, length of time, etc. Discuss **how** they go about estimating different things and encourage them to share strategies. • Check learners are confident about calculating using multiples of 10, 100, etc., so they can confidently and quickly work out examples such as 20 x 30 or 40 x 600. Check that they are also confident to round to the nearest 10, 100, etc. • As a group, discuss how they can use, or do use, these skills to help them work out rough answers to calculations so that they can check that their actual answers are reasonable. • In pairs, give learners some questions to work out. Ask them to estimate each answer first and then work out the actual answer. How easy did they find this? e.g. £450 ÷ 7 *Learners could use their knowledge of the seven times table to estimate an answer of about 60.* **Extension activity** • In pairs or small groups, encourage learners to look at a variety of questions and think of different approaches they could use to help them estimate the answer for each one. e.g. 60% of £124 *Learners could think: 6 x 12 = 72, so it'll be about £72* *or* *It's just a bit more than 50%, which is a half.*	

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	• Do they have similar estimates using the different approaches? What information/knowledge did they use? What worked best in getting close to the actual answer? How did they decide which approach to use? • In pairs or small groups, give learners some questions and suggested answers, some of which are right and some not. Ask them to decide, without working out the answers, which questions they think might be wrong. What did they use to help them to decide? • When they subsequently check the answers (using a calculator), they can then reflect on and discuss any answers they guessed were right which actually weren't. Discuss other ways they can check answers as well as estimating to decide if the answer is reasonable. e.g. 1067 – 849 = 222 *Learners might decide this answer seems reasonable:* *850 + 200-ish = 1050-ish.* *They could add the last two numbers as a check. Do they make the first number? 9 + 2 does not equal 7, so maybe the answer of 222 is not right.*	
Problem-solving/ investigations – to develop learners' awareness and their confidence in using estimating effectively.	• Encourage learners to investigate whether they can guess if their rough answer is going to be bigger or smaller than the actual answer (when calculated). What will affect this? Why might it be useful? • Ask them to investigate how much the estimated answer differs from the actual answer – and how this relates to the rounding choices they made in estimating their answer. Once they are confident with estimating rough answers generally, an extension activity could be to try guessing how much their rough answer will differ from the actual for a series of questions. Do they get better at doing this by trying to guess and then comparing this with the actual answer?	

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Integration of IT	• Use the ROUND function to explore the effects of rounding to different numbers of digits on the relative accuracy of the estimated answer compared to the actual. =ROUND (select cell of original number, -2) will round the original number to the nearest hundred; =ROUND (select cell of original number, -1) rounds it to the nearest 10.	
Embedded/contextualised activities – to encourage learners to practise and use the skills they are learning in contexts relevant to them.	• Estimating distance, time, quantity, cost, etc., is used in a range of vocational and life contexts including driving, DIY, cooking, shopping, retail/warehousing (stock amounts) and horticulture (planting distances). • Learners select and use an appropriate price list (menu, catalogue, DIY store prices) to work out the estimated cost of an agreed number of items, decide if they have enough money to pay for these from a given amount – and if so estimate the change. • The ability to estimate rough answers and to gauge if an answer is reasonable or not is a vital skill in most calculations and can be applied to calculations which relate to whatever context(s) the learners are interested in/motivated to work on. When using a calculator (or spreadsheet) the skill of estimating an answer is particularly important to check the feasibility of answers produced.	• *Skills for Life* Embedded Materials: Hospitality – Hos 3:13–3:14 (pp. 242–250) • *Skills for Life* Learning Materials: – SfL LM/NE3, Unit 1 pp. 10–12 – SfL LM/NL1, Unit 1 p. 24
Application of skills – to build learners' confidence to apply the skills they are learning in real life contexts.	• Encourage learners to identify a relevant context in which they will try using estimation in their everyday/working life. Ask them to report back to the group in a future session, so learners can discuss what they did and how it went.	