

Year 5 Lesson Guide

Think, Solve, Succeed: Maths and Careers in Action

Context

This primary school resource aims to extend children's understanding of the job opportunities that await them in their local community and beyond. It particularly stresses the value of applying mathematics in real-life employment contexts, both to further their view of the relevance of mathematics and to increase the sense of fulfilment in undertaking meaningful employment. Positioned on this backdrop, the resource comes as one of a series of lessons that provide a school with an engaging and impactful dimension to their 'problem-solving' curriculum. Central to the experience children gain from the resource is the sense of visiting a local business or organisation; in this case, Komatsu, and we extend our thanks to them.

This resource has been made in collaboration between North East Combined Authority, Winning With Numbers, Komatsu UK, Bloemfontein Primary School and Greenland Community Primary School.



North East Combined Authority Careers Team

Did you know that by the age of five and six, children begin to form career-limiting perceptions based on factors such as their gender and background? Career related learning in a primary setting is about exploring how we open up possibilities, broaden horizons and help children and their families see that anything is possible. Through its Primary Network, the North East Combined Authority is supporting primary schools in our region to create meaningful careers-related learning that will raise aspirations, challenge stereotypes and help children connect the classroom to the world around them. This offer is entirely free to all schools in the North East.

By joining the Primary Network, your school will benefit from one-to-one support to undertake a careers education self-assessment audit and to develop a careers action plan.

In addition to individual support, schools also have access to:

- Regular network meetings (both local and regional) to help develop effective communities of practice
- CPD and training opportunities
- Access to the North East Ambition website, containing resources, case studies and links to careers-related learning providers.

To join the Primary Network, email:
goodcareers@northeast-ca.gov.uk



Winning With Numbers

Winning With Numbers is a number curriculum and learning platform that ensures all children are fluent and confident with number. Winning With Numbers is a 'Phonics for Maths' approach used by schools across the country. It provides a school with access to a structured and systematic programme, ensuring every child acquires basic and essential number fluency. This primary maths programme identifies 300 pieces of number knowledge and puts them in a straight-line sequence of learning. All 300 parts come with a comprehensive suite of digital teaching, learning and training resources.

For more information visit:

www.numbers.com or email WWN@hardingeducation.com



Komatsu

Komatsu is renowned for building machines that meet societal needs. Initially established to provide jobs for the local community, Komatsu has grown into a global company with a diverse workforce. They innovate in technology, creating smart construction equipment, autonomous mining trucks, and even conceptualizing lunar excavators. Komatsu's products support essential industries like forestry, construction, and mining. Their commitment to community and sustainability drives their mission to create value together, ensuring a future where people, businesses, and the planet thrive.

Year 5

This resource centres on the use of a video that teachers can play in class. The video takes the children through the intentions described above and culminates in a virtual visit to the Komatsu plant where we meet an employee called Nathaniel. The children are tasked with supporting Nathaniel in his work. This necessitates some problem-solving and reasoning, as well as making 'real-life' considerations regarding the context. Teachers are urged to pause the video where suggested, allowing children space to think through each part of the scenario for themselves. The notes below can be used as a prompt for the teacher in 'being ready' to support children who need guidance to solve the problems. Naturally, teachers are encouraged to scaffold, adapt and extend the activities to suit their own children's needs, asking children to represent their thinking using a variety of images, symbols and words. Much of the expected thinking can be revisited, strengthening the learning, by altering the numbers or the employment scenarios; asking, 'What if...?'.

Profiles and information about the jobs mentioned in this resource can be found by searching the [National Career Service Explore Careers](#) website. This can be used to facilitate further discussion with pupils about jobs that they are interested in.

Year 5 National Curriculum links

Y5/6 NC introduction

Pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation.

Statutory

- Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
- Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- Solve number and practical problems that involve the above
- Solve problems involving addition, subtraction, multiplication and division
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
- Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal
- Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25
- Solve problems involving number up to three decimal places

Non-statutory

Using a variety of representations, including measures, pupils become fluent in the order and place value of numbers beyond 1000. Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers.

Discussion Opportunity

What is the difference between manufacturing and advanced manufacturing?

What type of skills do you think a design engineer would need to do their job well?

Tip

At each 'pause point' it may be useful to rewind the video slightly to display the mathematical problem or visualisation that is being discussed.

Pause 1: Point out to children the 'top-hat' from the video. This is the circular metal base that allows the cabin and arm to rotate 360 degrees to give the digger extra functionality.

Here we guide children to see that they need to reduce all measurements by 10%. Start by allowing children to make their own jottings, seeing if children layout their workings clearly and methodically. Use the accompanying sheet as a back-up for those that struggle to organise their work well.

Children could be using their ability to divide decimal numbers by 10, as a means for finding the 10% they need to subtract from the total.

Children would be wise to recognise that the paint cost per squared meter won't change as the digger size decreases, but the amount of paint will. Hence the actual cost of the total paint required should be recalculated.

Note that the cabin panel to bolt-hole distance can be converted to cm to avoid going into a 4dp number. Alternatively, it can be thought of as 864 mm to avoid using decimal numbers at all for that measurement.



Pause 2: Pause 2: As we move to take a further 1% off the size of the digger design, children should be calculating 1% from the original measurements (not the new 90% measurements). However, once calculated, the 1% should be subtracted from the 90%. For those students that need a given structure, use the accompanying sheet. There is a space ready for the extra 1% calculations - as seen in the completed version below:

KOMATSU

	100%	10%	90%	1%	89%
weight	6000kg	600kg	5400kg	60kg	5340kg
height	4.3m	0.43m	3.87m	0.043m	3.827m
width	2.1m	0.21m	1.89m	0.021m	1.869m
top-hat	1300mm	130mm	1170mm	13mm	1157mm
paint	3.9m ²	0.39m ²	3.51m ²	0.039m ²	3.471m ²
cabin panel to bolt-hole	0.864m 864mm	86.4mm	777.6mm	8.64mm	768.96mm

Discussion Opportunity

- Did you enjoy helping Alex with his work today at Komatsu?
- What did you like about this job?
- Would you be interested in working at a place like this when you grow up? Why?



KOMATSU

	100%	10%	90%		
weight	6000kg				
height	4.3m				
width	2.1m				
top-hat	1300mm				
paint	3.9m ²				
cabin panel to bolt-hole	0.864m 864mm				

KOMATSU

	100%	10%	90%		
weight	6000kg				
height	4.3m				
width	2.1m				
top-hat	1300mm				
paint	3.9m ²				
cabin panel to bolt-hole	0.864m 864mm				

KOMATSU

	100%	10%	90%		
weight	6000kg				
height	4.3m				
width	2.1m				
top-hat	1300mm				
paint	3.9m ²				
cabin panel to bolt-hole	0.864m 864mm				