Reasoning and Problem Solving
Multiplication And Division Consolidation – Year 4

National Curriculum Objectives:

Mathematics Year 4: (4C6a) Recall multiplication division facts for multiplication tables up to 12 × 12
Mathematics Year 4: (4N1) Count in multiples of 6, 7, 9, 25 and 1,000
Mathematics Year 4: (4c6b) Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
Mathematics Year 4: (4C8) Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects

About this Resource:

This resource is aimed at Year 4 Expected and has been designed to give children the opportunity to consolidate the skills they have learned in Autumn Block 4 – Multiplication And Division.

The questions are based on a selection of the same 'small steps' that are addressed in the block, but are presented in a different way so children can work through the pack independently and demonstrate their understanding and skills.

Small Steps:

Multiply by 10
Multiply by 100
Divide by 10
Divide by 100
Multiply by 1 and 0
Multiply and divide by 6
6 times table and division facts
Multiply and divide by 9
9 times table and division facts
Multiply and divide by 7
7 times table and division facts

More Year 4 Multiplication and Division resources

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Doctor Doppelganger has finished making his cloning liquid! He's going to use it to make a monster which will be able to make copies of itself! He wants to use his army of slime monsters to take over the world! He wants everything, everywhere to look exactly the same! How would that be?

As the first great, green monster oozes out of his lab, Doctor Doppelganger gives it an order.

"Copy yourself! Split... and split again!"

The monster wobbles and jerks. With a horrible sucking sound it splits apart! Now there are two monsters!

1a. If 5 monsters each split into 10 monsters, how many monsters will there be?

1b. If 3 monsters each split into 10 monsters, and then all of those monsters each split into 10 monsters, how many monsters will there be?

1c. If 7 monsters each split into 100 monsters, how many monsters will there be?

1d. Which group of monsters would be bigger: if 4 monsters each split into 10 monsters, and then all of those monsters split into 10 monsters; or if 8 monsters all split into 100 monsters? Why?

Miles away at Montgomery Manor, the Countess got a message on her supercomputer. It was from the police.

"Doppelganger has made his monsters. They are all over London. We need your help NOW!"

The Countess knew she needed to call the other members of The Alliance. She needed everyone if she was going to save the city. She called them in.

The Countess

She's part of the Royal Family, but spends most of her time fighting crime. She uses her money and her brain to create amazing gadgets!

Bounce

Able to change into rubber, Bounce takes risks. Cocky and fearless, he cannot be hurt by impact. He just bounces off things!

The Twins

The Twins can speak to each other inside their minds. They can also teleport, but only to where the other one is!

Furnace

Furnace is a blacksmith. Incredibly strong, he wears thick metal armour designed for battle. Oh, and he can breathe fire.

Glass

Glass can make her body almost completely see-through. That means she can sneak into almost anywhere!

One by one the heroes and heroines arrived at Montgomery Manor and were let in by Jenkins, the Countess' butler. Passing through a secret passageway behind a giant painting, they each arrived at the door to Alliance HQ. They had to type a number into a keypad to unlock the door.

2. Who got their number right and who got their number wrong? What mistakes have been made?

When the whole of The Alliance was inside, the Countess explained what was happening.

"We need to come up with a plan," she said.
"We should just smash them!" growled Furnace, fire glowing in his eyes. "All six of us should go and fight these snotty-looking slimeballs!"
"It depends on how many monsters we've got to fight..."

3. Complete the table to show how many monsters the six heroes might have to fight altogether and individually. The first one has been done for you.

How many monsters each?	How many in total?
6	36
	48
3	
9	
	72
	42
10	

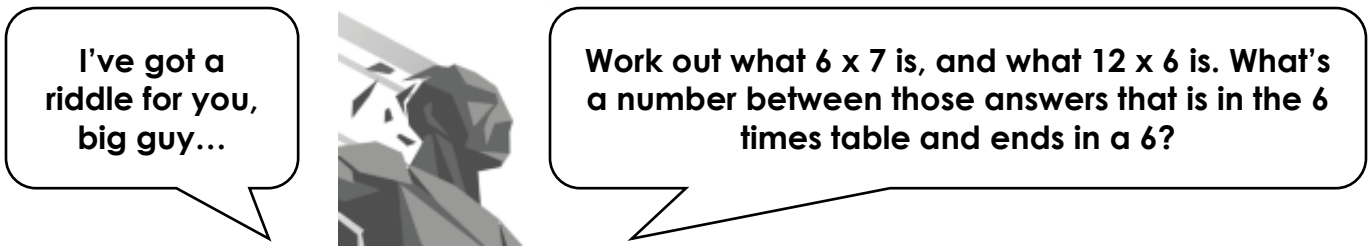
"Well there are a lot more than 72 monsters out there," said the Countess. "We can't take them all on at once. We'll need to be sneaky about this!"

The Alliance came up with a plan. Twin Two, Furnace, Glass and Bounce would go to Doctor Doppelganger's lab. Glass would sneak in while the others distracted the guards. They would catch the Doctor and teleport him back to Alliance HQ using Twin Two's powers. Twin One and the Countess would wait at Montgomery Manor. Twin One needed to be there so his twin could teleport back. The Countess would watch everything using one of her spy drones.

Outside Doctor Doppelganger's lab, Bounce and the other heroes needed to see how many slime guards they would be facing.

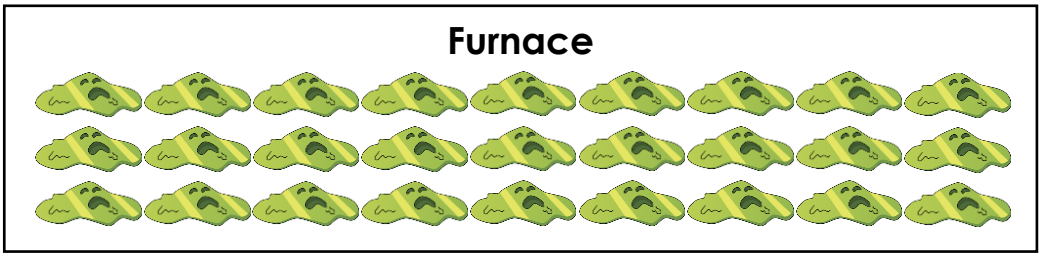
"Bounce me, mate," Bounce smirked to Furnace.

With a growl, Furnace slammed Bounce against the floor and the rubbery hero flew into the air. He got high enough to count all the guards! When he landed, he wanted to have a bit of fun with Furnace.



4. Help Furnace work out how many slime guards are at the lab.

The heroes began to fight the slime guards. They stacked up the monsters they defeated in layers of 9.



Twin Two

Bounce

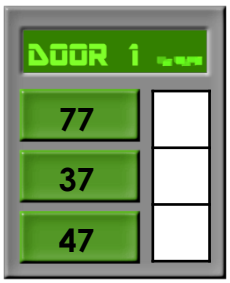
5a. Look at the stacks of slime monsters. How many groups of 9 are there in total?

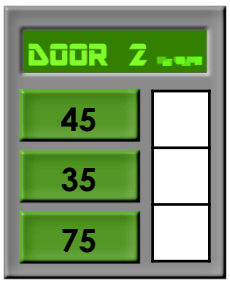
5b. How many monsters out of the 66 who were guarding Doppelganger's lab still need to be defeated and stacked up?

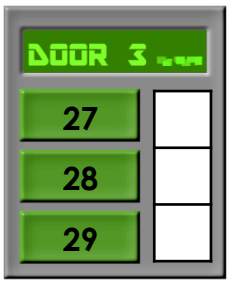
Glass snuck past the guards while they were distracted. She had to make her way through Doppelganger's lab so she could grab him and take him back to Alliance HQ. She heard the Countess' voice in her Alliance ear implant.

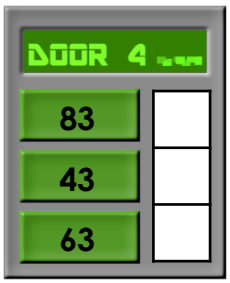
"I've hacked into Doppelganger's computers," said the Countess, "All you need to do to get through each door is press the button with a multiple of 7 on it. Good luck!"

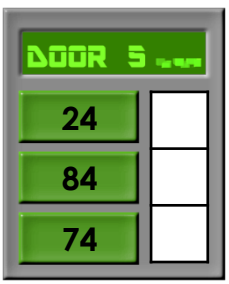
6. Tick which buttons Glass needs to press to open the doors.

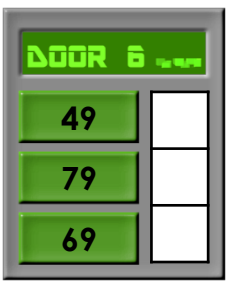


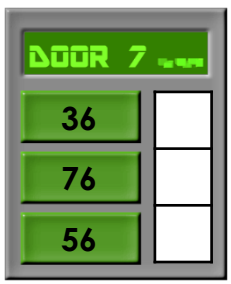












"We've got you!" cried Glass as she grabbed Doctor Doppelganger.
"Ready for a little journey?" asked Twin Two, grabbing hold of Doppelganger. "I'll warn you, this might feel a little odd."

BBBWWWYYYYEEEEUUUUUUUUPPPPP! Twin Two and Doppelganger disappeared, teleporting back to Twin One and Alliance HQ. By the time the rest of the team joined them back at Montgomery Manor, the Countess was already working on something.

"We found a data drive on Doppelganger which will tell us how to stop his slime monsters from multiplying," she said. "If only I could crack the code!"

7. The left hand column tells you the sum of two numbers. The right hand column tells you the product of those two numbers. Work out what each set of two numbers is to find the passcode and get into the data drive!

Sum	Product	Numbers
13	36	
17	72	
12	27	
10	9	
21	108	
19	90	

"I'm in!" cried the Countess. "Now let's see… Ah! Here it is! The ingredients for a liquid which will reverse the multiplication of the monsters!"

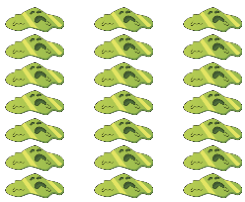
The lab at Montgomery Manor whirred into life. In no time at all, The Alliance had the liquid they needed to stop the slime monsters for good!

The Countess poured the liquid into a special dart, loaded it into her sniper rifle and headed to Doppelganger's lab.

When she got there, she looked for the first monster. It was not hard to find as it was larger than all the others. The Countess checked her rifle. She took aim … The dart flew straight into the first monster, and then the strangest thing started to happen...

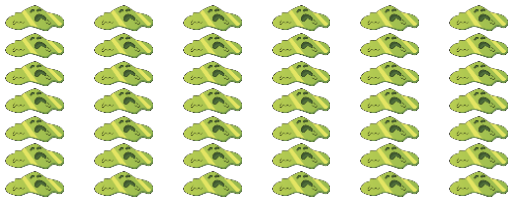
First the monsters nearby, and then monsters from all over London, began to slide towards the first monster and get sucked into its body! The dart had worked! Soon there was only the first monster left, and it could not multiply any more!

8. Here are four groups of monsters that are being sucked back into the first monster. Each group is in columns of 7. Write the fact family for each group.



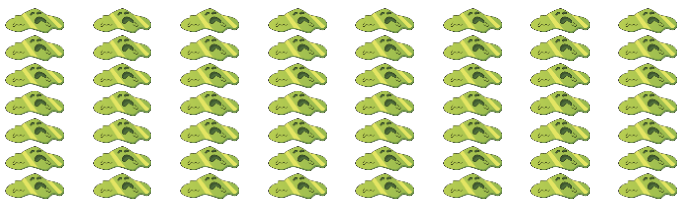
A.

	x		=	
	x		=	
	÷		=	
	÷		=	



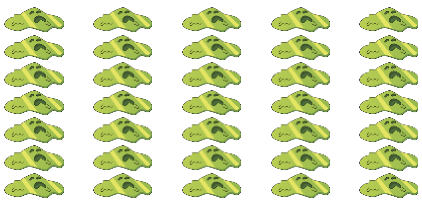
B.

	x		=	
	x		=	
	÷		=	
	÷		=	



C.

	x		=	
	x		=	
	÷		=	
	÷		=	



D.

	x		=	
	x		=	
	÷		=	
	÷		=	

9. Using the facts you have just written, explain how you know that 22 x 7 = 154.

"Another successful job for The Alliance!" cheered the Countess.

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1a. 5 x 10 = 50 monsters
1b. 30 x 10 x 10 = 300 monsters
1c. 7 x 100 = 700 monsters
1d. The second group (8 monsters splitting into 100 each). The first group of monsters would be 4 x 10 x 10 = 400 monsters. The second group of monsters would be 8 x 100 = 800 monsters.
2. Bounce: Wrong, 7200 ÷ 10 = 720. Bounce has divided by 100, not by 10.
Twin One: Wrong, 440 ÷ 10 = 44. Twin One has multiplied by 10, instead of dividing by 10.
Twin Two: Right
Furnace: Right
Glass: Wrong, 1699 x 0 = 0
3.

How many monsters each?	How many in total?
6	36
8	48
3	18
9	54
12	72
7	42
10	60

4. 6 x 7 = 42, 12 x 6 = 72, 66 is between those numbers, is in the 6 times-table and is the only number fulfilling those criteria which ends in a 6.
5a. There are 7 stacks in total.
5b. 3 monsters still need to be defeated and stacked up. 7 x 9 = 63
66 – 63 = 3 monsters left.
6. door 1 = 77, door 2 = 35, door 3 = 28, door 4 = 63, door 5 = 84, door 6 = 49 and door 7 = 56
7.

Sum	Product	Numbers
13	36	4, 9
17	72	8, 9
12	27	3, 9
10	9	1, 9
21	108	12, 9
19	90	10, 9

8. A. 7 x 3 = 21, 3 x 7 = 21, 21 ÷ 3 = 7, 21 ÷ 7 = 3
B. 6 x 7 = 42, 7 x 6 = 42, 42 ÷ 6 = 7, 42 ÷ 7 = 6
C. 8 x 7 = 56, 7 x 8 = 56, 56 ÷ 7 = 8, 56 ÷ 8 = 7
D. 7 x 5 = 35, 5 x 7 = 35, 35 ÷ 5 = 7, 35 ÷ 7 = 5
9. The numbers of columns of 7 (3, 5, 8 and 6 from question 8) when added together equal 22; the multiples of 7 (21, 42, 56 and 35 from question 8) when added together equal 154. So there are 22 columns of 7 in total, and 154 monsters in total, so 22 x 7 = 154.