Reasoning and Problem Solving
Place Value Consolidation – Year 5

National Curriculum Objectives

Mathematics Year 5: Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
Mathematics Year 5: Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
Mathematics Year 5: Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
Mathematics Year 5: Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
Mathematics Year 5: Solve number problems and practical problems that involve all of the above
Mathematics Year 5: Read Roman numerals to 1000 (M) and recognise years written in Roman numerals

About This Resource

This resource is aimed at Year 5 Expected and has been designed to give children the opportunity to consolidate the skills they have learned in Autumn Block 1 – Place Value.

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

Numbers to 100,000
Counting in 10s, 100s, 1,000s, 10,000s and 100,000s
Compare and order numbers to a million
Negative numbers
Roman Numerals to 1,000
Round numbers to one million

More Year 5 Place Value resources.

Did you like this resource? Don't forget to review it on our website.

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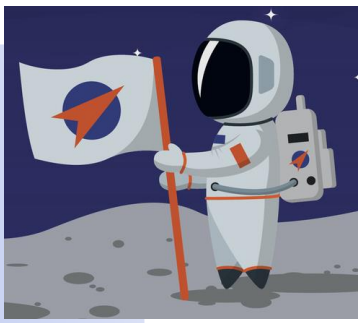
Congratulations! You have been selected from the hundreds of applications to lead the exciting new mission to find a galaxy far away.



From: Mr Armstrong(space-discovery.org.uk)
Sent: 03 December 2050 12:57:12
Subject: Exciting Mission

Dear Captain Smith

I have looked at your career so far and the space missions you have been involved in and I am pleased to tell you that you have been selected to lead a new mission to find a galaxy far away. The mission leaves as soon as all crew have arrived!

You have reached Space Discovery Headquarters and as captain of the mission it is time to put your crew together. The optimum age for an astronaut is 25 to 35. Complete the table below to find out which astronauts would fit into this category (You might want to check the date on the e-mail). Use the example below to correctly format your answers.

1.

	Date of Birth	Clue	Age
Astronaut 1	_ _ / _ _ / _ _	80 thousands, 9 hundreds and 31 ones	
Astronaut 2	_ _ / _ _ / _ _	90 thousands, 1 thousand, 1 hundred and 23 ones	
Astronaut 3	_ _ / _ _ / _ _	10 thousands, 817 ones	
Astronaut 4	_ _ / _ _ / _ _	61 thousands, 2 tens and 7 ones	
Astronaut 5	_ _ / _ _ / _ _	70 thousands, 72 tens and 0 ones	
Astronaut 6	_ _ / _ _ / _ _	30 thousands, 9 hundreds, 2 tens and 2 ones	
You	01/06/16	10 thousands, 6 hundreds and 16 ones	34

Which astronauts would fit the age range?

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Now you have identified some possible crew members for your mission, you need to think about weight.

The shuttle has a maximum load of 3 people with a maximum weight capacity of 275,000g. It will be a long mission so you need to allow for the weight of astronauts to fluctuate. They could lose up to 10,000g or gain 1,000g.

2.

Item	Loss	Current weight (g)	Gain
Astronaut 1		82,553	
Astronaut 2		105,346	
Astronaut 3		78,436	
Astronaut 4		99,815	
Astronaut 5		134,432	
Astronaut 6		112,567	
You		84,887	

Using ALL the information you have, which 2 astronauts will you take with you?

Brilliant! Now you have the crew identified, it's time to pack the shuttle.
As always with these missions, weight is very important.

3. Items have been rounded to the nearest 100g and 1000g.
What could be the actual weight of the item?

Actual weight of water	Rounded to the nearest 100g	Rounded to the nearest 1,000g
	8,100g	8,000g

Actual weight of food	Rounded to the nearest 100g	Rounded to the nearest 1,000g
	10,300g	10,000g

Actual weight of rucksacks	Rounded to the nearest 100g	Rounded to the nearest 1,000g
	15,700g	16,000g

Actual weight of toolkit	Rounded to the nearest 100g	Rounded to the nearest 1,000g
	3,200g	3,000g

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At last, everything is ready and it's launch day.

10... 9... 8... 7... 6... 5... 4... 3... 2... 1... Take off!!!

You are now leading the mission to discover new planets in a galaxy far away.

It isn't long before Astronaut 2 spots something to the port side on the radar and you move the shuttle towards the mass. It looks like a planet so you instruct your crew to start taking readings...

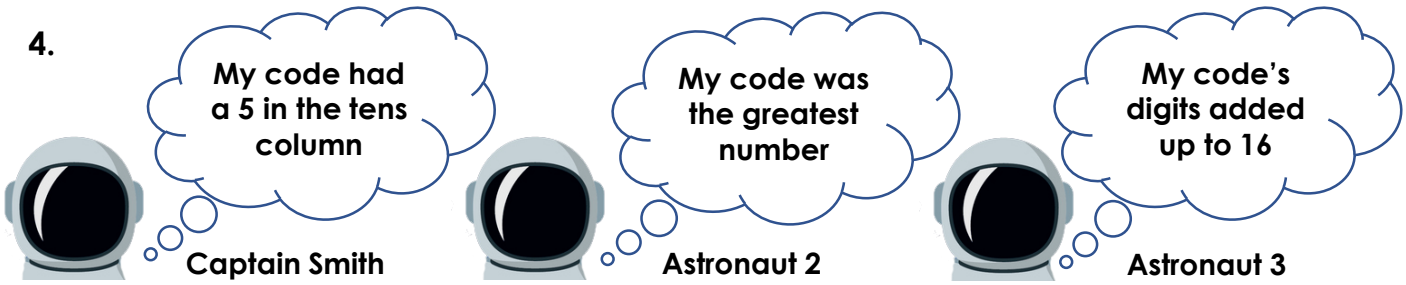
Name: Planet 1
Distance from Earth: 123,682 km
Temperature: 260°C

Great find crew! Let's change direction and see if we can find any further planets. Just as the crew were going to give up for the night a small spec appeared on the radar once again. You move the shuttle towards the mass and find another planet.

Name: Planet 2
Distance from Earth: 196,211 km
Temperature: 35°C

After a very long day and readings for two new planets, it's time to get some sleep. Oh no! The rucksacks are locked and the codes are back at base. Solve the clues from what the astronauts remember to help the crew unlock their padlocks

4.



DLXII	DLVII	CDXVI	CCXCV	CXLIX

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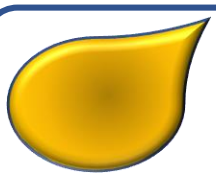
Thank goodness, sleep at last! You and Astronaut 2 climb into your bunks for some well earned rest whilst Astronaut 3 keeps watch.

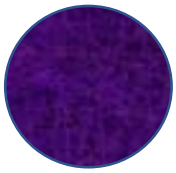
BUMP…… a meteoroid hits the shuttle and you are suddenly awoken. It feels like minutes, although hours have passed as Astronaut 2 is now on watch. He tells you that he has seen another mass on the radar and you join him as you steer towards it.



Name: Planet 3
Distance from Earth: 57,934 km
Temperature: 4°C

Another new planet! What a busy mission! You command the shuttle as Astronaut 2 takes readings.

You get caught in a meteor storm and the shuttle is damaged. You must cut the mission short and return to base for repairs.

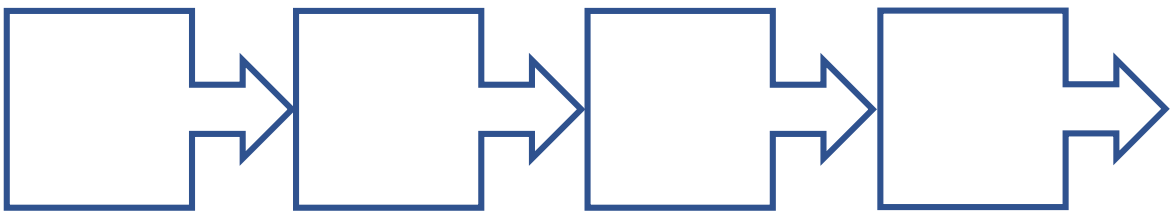


Name: Planet 4
Distance from Earth: 75,206 km
Temperature: 13°C

As the days pass you find another planet before …

You contact mission control and inform them of your plans. They ask you to return to the galaxy as quickly as the shuttle can be fixed. You start to plan for your return.

5. Plot your route so that you visit the closest planets to Earth first.



You check the forecast for your next mission and there is a drastic temperature drop of 15° expected across the galaxy.

6. What could this mean for the planets you have discovered?

Name: Planet 1 Temp:	Name: Planet 2 Temp:	Name: Planet 3 Temp:	Name: Planet 4 Temp:

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1.

Planet	Date of Birth	Clue	Age
Astronaut 1	08/09/31	80 thousands, 9 hundreds and 31 ones	19
Astronaut 2	09/11/23	90 thousands, 1 thousand, 1 hundred and 23 ones	27
Astronaut 3	01/08/17	10 thousands, 817 ones	33
Astronaut 4	06/10/27	61 thousands, 2 tens and 7 ones	23
Astronaut 5	07/07/20	70 thousands, 72 tens and 0 ones	30
Astronaut 6	03/09/22	30 thousands, 9 hundreds, 2 tens and 2 ones	28

Astronauts 2, 3, 5 and 6 fit the age range.

2.

Item	Loss	Current weight (g)	Gain
Astronaut 1	72,553	82,553	83,553
Astronaut 2	95,346	105,346	106,346
Astronaut 3	68,436	78,436	79,436
Astronaut 4	89,815	99,815	100,815
Astronaut 5	124,432	134,432	135,432
Astronaut 6	102,567	112,567	113,567
You	74,887	84,887	85,887

Astronauts 2 and 3 need to be chosen to be both in the age range and crew weight limit.

3. Water – number between 8,050g and 8,149g
Rucksacks - number between 15,650g and 15,749g
Food - number between 10,250g and 10,349g
Tools - number between 3,150g and 3,249g

4.

DLXII	DLVII	CDXVI	CCXCV	CXLIX
562	557	416	295	149

Captain Smith – DLVII, Astronaut 2 – DLXII, Astronaut 3 - CCXCV

5. Planet 3: 57,934; Planet 4: 75,206; Planet 1: 123,682; Planet 2: 196,211

6.

Name: Planet 1 Temp: 245°	Name: Planet 2 Temp: 20°	Name: Planet 3 Temp: -11°	Name: Planet 4 Temp: -2°