

Addition, Subtraction, Multiplication and Division

Maths | Year 6 | Steps to Progression Overview

The aim of this overview is to support teachers using PlanIt Maths to show the most logical sequence to teach each area of maths. We also want to fully support teachers who use the **White Rose Maths** scheme of learning to make full use of the resources available within PlanIt Maths. Whenever possible, lesson packs have been matched to each of the small steps on the **White Rose Maths** scheme of learning.

Y6 Yearly Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value		Number: Addition, Subtraction, Multiplication and Division				Fractions				Geometry: Position and Direction	Consolidation
Spring	Number: Decimals	Number: Percentages		Number: Algebra		Measurement: Converting Units	Measurement: Perimeter, Area and Volume		Number: Ratio		Consolidation	
Summer	Geometry: Properties of Shapes		Problem Solving			Statistics		Investigations				Consolidation

Teacher Note:

The White Rose small step **Mental calculations and estimation** appears in more than one sequence of lessons within this unit and is covered within two National Curriculum objectives in our [National Curriculum Overview](#)

: 'perform mental calculations, including with mixed operations and large numbers' and 'use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy'.

Introduction

In Year 6 Addition, Subtraction, Multiplication and Division, children develop their ability to solve problems demanding efficient written and mental methods of calculation and use estimation to check answers to calculations. Children will build upon previous learning of addition and subtraction written methods and use long and short written methods for multiplication and division. Children will begin to use their knowledge of the order of operations to carry out calculations involving the four operations and identify common multiples, common factors and prime numbers.

Resources

In addition to your standard maths resources, you will need: a beanbag, sports equipment, bottle-top lids or large counters, packs of cards with the Jack, Queen and King cards taken out, googly eyes, marbles, scissors and glue sticks.

Assessment Statements

By the end of this unit...

...all children should be able to:

- multiply numbers by a one-digit number using long multiplication;
- solve reasoning questions using the formal method of long multiplication;
- divide numbers by a two-digit number using long division;
- solve one-step division problems, rounding the answer depending on the context;
- divide four-digit numbers by a two-digit number using short division without remainders;
- perform one-step mental calculations with increasingly large numbers;
- solve reasoning questions involving mental addition, subtraction, multiplication and division;
- add and subtract whole numbers using a formal written method;
- correctly use the order of operations to carry out calculations;
- explore the order of operations using brackets;
- find missing numbers using the inverse;
- select the correct operation/s to use and solve a problem, checking the answer using estimation;
- solve one-step problems and check their answer using estimation;
- round numbers to a specified degree of accuracy;
- use rounding to check answers to problems;
- sort one-step problems in a sorting diagram;
- solve two-step problems involving addition and subtraction.

...most children will be able to:

- multiply numbers by a two-digit number using long multiplication;
- divide using a formal written method and use rounding depending on the context;
- solve two-step division problems, rounding the answer depending on the context;
- divide four-digit numbers (with decimals) by a two-digit number using short division;
- practise mental calculations with increasingly large numbers using all four operations;
- perform mental calculations with mixed operations;
- perform two-step mental calculations with increasingly large numbers;
- add and subtract numbers, including decimals, using a formal written method;
- identify missing brackets within a calculation;
- solve two-step problems and check their answer using estimation;
- round a number taking into account the context;
- sort one and two-step problems in a Venn diagram;
- solve multi-step problems involving addition and subtraction.

...some children will be able to:

- solve missing digit problems involving long multiplication;
- divide using a formal written method and use rounding depending on the context in multi-step calculations;
- solve missing digit problems involving long division;
- create comparison sentences involving long division calculations;
- create their own word problems involving addition, subtraction, multiplication and division;
- solve multi-step problems and check their answer using estimation;
- sort and solve one, two and multi-step problems in a Venn diagram;
- solve complex multi-step problems.

Lesson Progression

Addition and Subtraction Multi-Step Problems (1): Pop-Up Shop

NC Statement: solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

White Rose Maths Small Step: Add and subtract whole numbers

Description: Children are introduced to RUCSAC as a method for working through contextual problems requiring them to add and subtract whole numbers. They work through RUCSAC one step at a time, led by the teacher, then decide which operations to use as a class for a range of word problems. Children learn to add and subtract whole numbers.

Addition and Subtraction Multi-Step Problems (2): Open the Box

NC Statement: solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

White Rose Maths Small Step: Add and subtract whole numbers

Description: Using RUSCAC, children are guided through multi-step problems, working out how many steps are required. They then complete differentiated multi-step problems independently. Children learn to add and subtract whole numbers.

Addition and Subtraction Multi-Step Problems (3): Multi-Step Problems Reasoning

NC Statement: solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

White Rose Maths Small Step: Add and subtract whole numbers

Description: As a class, children complete a series of multi-step reasoning problems with increasingly large numbers of steps required to solve them. They move on to complete problems in pairs, where they are required to explain if a given answer is correct through checking each step. Children learn to add and subtract whole numbers.

Long Multiplication (1): Tell a Joke

NC Statement: multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

White Rose Maths Small Step: Multiply up to a 4-digit by 1-digit number

Description: Children revise the long multiplication method to multiply a 4-digit number by a 1-digit number by identifying incorrect answers from children on the Lesson Presentation. Children then find the punchline to a joke by performing multiplications and using the answers to crack a code. Children learn to multiply up to a 4-digit by 1-digit number.

Long Multiplication (2): Multiplication Battle

NC Statement: multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

White Rose Maths Small Step: Multiply up to a 4-digit by 1-digit number

Description: Children are introduced to multiplying 3-digit numbers by 2-digit numbers using the formal written method. The method is modelled several times for children to follow and join in with before they move on to work in pairs to practise the method. Children learn to multiply up to a 4-digit by 2-digit number.

Long Multiplication (3): Multiplying Millipede

NC Statement: multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

White Rose Maths Small Step: Multiply up to a 4-digit by 1-digit number

Description: The teacher models how to multiply a 4-digit number by a 2-digit number and children practise this alongside them. Children then apply their long multiplication skills to complete a set of differentiated loop cards. Children learn to multiply up to a 4-digit by 2-digit number.

Long Multiplication (4): Long Multiplication Reasoning

NC Statement: multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication

White Rose Maths Small Step: Multiply up to a 4-digit by 1-digit number

Description: Children apply their knowledge of how to multiply using the formal method of long multiplication to a variety of reasoning and mastery style questions, both teacher-led and independently. Children learn to multiply up to a 4-digit by 2-digit number.

Long Division (1): Jungle Division

NC Statement: divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

White Rose Maths Small Step: Long division (1). Long division (2). Long division (3). Long division (4).

Description: Children are introduced to the formal written method of long division. They have the method modelled by the teacher. This lesson requires children to divide 3-digit numbers by 1-digit numbers as a class and individually, then challenges them to answer a reasoning question in the plenary. Children learn to use long division.

Long Division (2): Monster Maths

NC Statement: divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

White Rose Maths Small Step: Long division (1). Long division (2). Long division (3). Long division (4).

Description: Children begin to divide by 2-digit numbers using the formal written method of long division. They will find decimal remainders to 2 decimal places and are asked to explain their working in the plenary. Children learn to use long division.

Long Division (3): Tic-Tac-Toe Problem Solving

NC Statement: divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

White Rose Maths Small Step: Long division (1). Long division (2). Long division (3). Long division (4).

Description: This lesson asks children to continue practising long division, with the addition of contexts. They will apply the formal written method to a range of scenarios and decide when to round a remainder up or down as appropriate. Children learn to use long division.

Long Division (4): Long Division Reasoning

NC Statement: divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

White Rose Maths Small Step: Long division (1). Long division (2). Long division (3). Long division (4).

Description: Children are taken step by step through a variety of reasoning and mastery level long division problems. They will complete an activity sheet, guided by the teacher, then move on to working in a pair. They will be shown how to take relevant information from a longer word problem and decide if they need to find a remainder, decimal remainder or round their answer. Children learn to use **long division**.

Short Division (1): Gone Fishing

NC Statement: divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context

White Rose Maths Small Step:
Short division

Description: Children have short division modelled for them, dividing by single-digit numbers. They are presented with short division problems in context, led by the teacher, then practise their method through playing a fishing game. Children learn to use **short division**.

Short Division (2): Engines Ready

NC Statement: divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context

White Rose Maths Small Step:
Short division

Description: Children have short division modelled for them, dividing 4-digit numbers by 2-digit numbers. They are presented with short division problems in context, led by the teacher. They will also decide whether to round remainders up or down depending on the context, then play a differentiated pairs game. Children learn to use **short division**.

Short Division (3): Inspector Clue

NC Statement: divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context

White Rose Maths Small Step:
Short division

Description: Children are asked to search for clues in contextual division problems to help them decide whether their remainders need rounding up or down. They will be challenged to set their own division problems for a partner. Children learn to use **short division**.

Short Division (4): Short Division Reasoning

NC Statement: divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context

White Rose Maths Small Step:
Short division

Description: Children are asked to solve a variety of reasoning and mastery level questions using short division. They will be taken through problems with a teacher to pick out the relevant information for each context, then complete differentiated word problems independently. Children learn to use **short division**.

Mental Calculations (1): Number Puzzle

NC Statement: perform mental calculations, including with mixed operations and large numbers

White Rose Maths Small Step: Mental calculations and estimation

Description: Children are asked to choose the most appropriate strategies for mentally calculating using increasingly large numbers, before applying them as a class. They are encouraged to explain why they chose a particular method. They use mental calculations and estimation in pairs to complete the Number Puzzle activity. Children learn to perform mental calculations and estimation.

Mental Calculations (2): Players, Are You Ready?

NC Statement: perform mental calculations, including with mixed operations and large numbers

White Rose Maths Small Step: Mental calculations and estimation

Description: Children recap how to choose an appropriate mental method. They use mental calculations and estimation to solve problems involving increasingly large numbers and all four operations. In pairs, children compete with each other to complete a 4-in-a-row game. Children learn to perform mental calculations and estimation.

Mental Calculations (3): Code Busters

NC Statement: perform mental calculations, including with mixed operations and large numbers

White Rose Maths Small Step: Mental calculations and estimation

Description: Children recap how to choose an appropriate mental method. They use the strategies learned in previous lessons to solve problems involving increasingly large numbers and all four operations in context. Children apply RUCSAC to work through word problems which reveal an answer through cracking a code. Children learn to perform mental calculations and estimation.

Mental Calculations (4): Gotta Find Em All!

NC Statement: perform mental calculations, including with mixed operations and large numbers

White Rose Maths Small Step: Mental calculations and estimation

Description: Children look more in depth at the reasons for picking certain strategies when performing mental calculations. In pairs, they will compete in a star grid battleships-style game, performing mental calculations to uncover squares on a grid. As a plenary, they will be asked to explain why an answer is incorrect, drawing on their knowledge of order of operations. Children learn to perform mental calculations and estimation.

Mental Calculations (5): Calcu-late!

NC Statement: perform mental calculations, including with mixed operations and large numbers

White Rose Maths Small Step: Mental calculations and estimation

Description: Children review mental strategies, in particular making notes on the important information in a problem and the order of steps needed. They play a simple board game in pairs that requires them to perform mental calculations and estimation. Children learn to perform mental calculations and estimation.

Mental Calculations (6): Mental Calculations Reasoning

NC Statement: perform mental calculations, including with mixed operations and large numbers

White Rose Maths Small Step: Mental calculations and estimation

Description: Children apply their knowledge of mental calculations and estimation to a variety of reasoning questions. They will work through a number of problems as a class, guided by a teacher, before tackling problems independently. Finally, they will look at the answers as a class and discuss why answers are incorrect or correct. Children learn to perform mental calculations and estimation.

Common Factors, Multiples and Prime Numbers (1): Fun Factory

NC Statement: identify common factors, common multiples and prime numbers

White Rose Maths Small Step: Common factors

Description: Children are introduced to 'factor' as a piece of mathematical vocabulary and are asked to find common factors shared by two numbers and record these in a diagram. Children learn to identify and use common factors.

Common Factors, Multiples and Prime Numbers (2): Marine Multiples

NC Statement: identify common factors, common multiples and prime numbers

White Rose Maths Small Step: Common multiples

Description: Children are reminded of the word 'multiple' and find common multiples of numbers rolled on a dice. They discuss 'lowest common multiple'. In pairs, they will complete a painting-by-numbers-style activity using their knowledge of common multiples before moving on to problems involving common multiples in context. Children learn to identify and use common multiples.

Common Factors, Multiples and Prime Numbers (3): Prime Detectives

NC Statement: identify common factors, common multiples and prime numbers

White Rose Maths Small Step: Primes

Description: Children are introduced to prime numbers and are given a timed task to find as many as they can in five minutes, followed by a whole-class activity where they identify consecutive primes. Detective skills are put into practice to reveal a saboteur using their knowledge of prime numbers. Finally, children generate their own prime numbers using the digits given. Children learn to identify primes.

Common Factors, Multiples and Prime Numbers (4): Common Factors, Common Multiples and

NC Statement: identify common factors, common multiples and prime numbers

White Rose Maths Small Step: Primes. Common factors. Common multiples

Description: Children work through a range of reasoning and contextual problems led and modelled by a teacher involving primes, factors and common multiples. They try similar problems independently and check their answers as a class. Children learn to apply their knowledge of primes, common factors and common multiples.

Order of Operations (1): Pyramid Puzzles

NC Statement: use their knowledge of the order of operations to carry out calculations involving the 4 operations

White Rose Maths Small Step: Order of operations. Add and subtract whole numbers

Description: Children are reminded of the formal written methods for addition and subtraction. They complete number pyramids, adding or subtracting to find the next tier of the pyramid. Children learn about the order of operations.

Order of Operations (2): Colour Me In

NC Statement: use their knowledge of the order of operations to carry out calculations involving the 4 operations

White Rose Maths Small Step: Order of operations. Add and subtract whole numbers

Description: Children practise using the formal written method for addition and subtraction. They complete calculations with increasingly large numbers to complete a paint-by-numbers-style activity. Children learn about the order of operations.

Order of Operations (3): Monster Multiplication

NC Statement: use their knowledge of the order of operations to carry out calculations involving the 4 operations

White Rose Maths Small Step: Order of operations. Multiply up to a 4-digit by 1-digit number

Description: Children recap long multiplication with a teacher leading, then independently work across a variety of tasks. Children learn about the **order of operations**.

Order of Operations (4): Division Doughnuts

NC Statement: use their knowledge of the order of operations to carry out calculations involving the 4 operations

White Rose Maths Small Step: Order of operations. Long division (1). Long division (2). Long division (3). Long division (4). Short division

Description: Children recap long and short division methods, including contextual word problems, led by a teacher. They move on to a differentiated independent task. Children learn about the **order of operations**.

Order of Operations (5): Bonkers BODMAS

NC Statement: use their knowledge of the order of operations to carry out calculations involving the 4 operations

White Rose Maths Small Step: Order of operations

Description: Children are introduced to the correct order of operations where there are multiple steps to a problem, using BODMAS to remember. They will apply this rule to some practice questions before working independently. Children learn about the **order of operations**.

Order of Operations (6): Bonkers Brackets

NC Statement: use their knowledge of the order of operations to carry out calculations involving the 4 operations

White Rose Maths Small Step: Order of operations

Description: Children are introduced to performing calculations inside brackets first when looking at the order of operations. They work through teacher-led examples and complete similar work independently. In the plenary, children are invited to add operations to make the calculations correct. Children learn about the **order of operations**.

Order of Operations (7): Bonkers Brackets 2

NC Statement: use their knowledge of the order of operations to carry out calculations involving the 4 operations

White Rose Maths Small Step: Order of operations

Description: Children apply their knowledge of brackets from the previous lesson to add missing brackets from multistep calculations to make them correct. As a class, they then consider how the location of brackets can change an answer drastically and use < and > symbols to show this. Children learn about the **order of operations**.

Order of Operations (8): Order of Operations Reasoning

NC Statement: use their knowledge of the order of operations to carry out calculations involving the 4 operations

White Rose Maths Small Step: Order of operations

Description: Children are guided through a selection of contextual problems requiring BODMAS to help solve them. They apply their knowledge of order of operations to a variety of reasoning and mastery questions. Children learn about the **order of operations**.

Solve Problems (1): The Vault

NC Statement: solve problems involving addition, subtraction, multiplication and division

White Rose Maths Small Step:
Reasoning from known facts

Description: Children are reminded of the term 'inverse' and how we can use inverse operations to find missing numbers. They work in pairs to complete a missing number pyramid puzzle, before solving missing number problems to reveal a code to the vault. Children learn about reasoning from known facts.

Solve Problems (2): Problem Sorter

NC Statement: solve problems involving addition, subtraction, multiplication and division

White Rose Maths Small Step:
Reasoning from known facts

Description: Children complete quiz-show-style multiple-choice word problems. They will be asked to identify the operations needed in a range of problems by moving to the correct sign in the classroom, before independently working through a variety of problems. Children learn about reasoning from known facts.

Solve Problems (3): Cupcake Creator

NC Statement: solve problems involving addition, subtraction, multiplication and division

White Rose Maths Small Step:
Reasoning from known facts

Description: Children apply their known facts to a range of baking problems. They will work in pairs to complete problems in context to complete a cake. Children learn about reasoning from known facts.

Solve Problems (4): Games Galore

NC Statement: solve problems involving addition, subtraction, multiplication and division

White Rose Maths Small Step:
Reasoning from known facts

Description: Children briefly review how to apply RUCSAC to a word problem and use estimation to check answers. They quickly match a problem to a correct answer using estimation and move on to playing a problem-solving game in pairs. They are also tasked with writing their own problems to add to the game. Children learn about reasoning from known facts.

Solve Problems (5): Problem Solving Reasoning

NC Statement: solve problems involving addition, subtraction, multiplication and division

White Rose Maths Small Step:
Reasoning from known facts

Description: Children are led by a teacher through a series or longer multi-step problems, each involving more than one operation, some including measures and money. They then independently solve problems and show their working for each one. They are given the opportunity to see the correct answers and working for each on the Lesson Presentation. Children learn about reasoning from known facts.

Estimation (1): Tabletop Olympics

NC Statement: use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

White Rose Maths Small Step:
Mental calculations and estimation

Description: By looking at various pictorial representations, children are asked to estimate values and explain their answers. They are asked to perform mental calculations and use estimation to check their answers to record times and distances in sporting events. Children learn to apply mental calculations and estimation.

Estimation (2): The Dog Chewed My Home Learning

NC Statement: use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

White Rose Maths Small Step:
Mental calculations and estimation

Description: Children discuss the usefulness of rounding numbers when checking answers, as a form of estimation. They use rounding to check answers, choosing an appropriate degree of accuracy. Independently, children perform calculations, explain how they would use rounding and estimation to check their answer and use this information to decide if their answer looks correct. Children learn how to use estimation.

Estimation (3): Estimation Reasoning


NC Statement: use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

White Rose Maths Small Step:
Mental calculations and estimation


Description: In pairs, children practise using estimation in context, then calculate the accurate answer to see if their estimation was close. They independently tackle mastery-style reasoning questions and work through their answers to self-assess after. Children learn how to use estimation.

★
★
★

Create a two-step calculation to match the corresponding answer.




★
★
★


$$\begin{array}{r} 15 \\ \times 4.7 \\ - 6.45 \end{array}$$


★
★
★

Create a two-step calculation to match the corresponding answer.




★
★
★


$$\begin{array}{r} 20 \\ \times 23.05 \\ + 64.367 \end{array}$$


★
★
★

Create a two-step calculation to match the corresponding answer.




★
★
★


$$\begin{array}{r} (145.45 \\ + 59.04) \\ \times 4 \end{array}$$


★
★
★

Create a two-step calculation to match the corresponding answer.



★
★
★

$$\begin{array}{r} 549 \\ - (45.5 + 29.3 \\ + 385) \end{array}$$


= 17.55

= 64.05

= 389

= 525.367

= 14 590

= 817.96

= 904.03

= 89.2

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Extra Challenge Answers

Question	Answer
Create a two-step calculation to match the corresponding answer (child's own answer).	
	17.55
$15 \times 4.7 - 6.45 =$	
	64.05
Create a two-step calculation to match the corresponding answer (child's own answer).	
	389
$20 \times 23.05 + 64.367 =$	
	525.367
Create a two-step calculation to match the corresponding answer (child's own answer).	
	14 590

$(145.45 + 59.04) \times 4 =$	
	817.96
Create a two-step calculation to match the corresponding answer (child's own answer).	
	904.03
$549 - (45.5 + 29.3 + 385) =$	
	89.2

Blank ThHTO Place Value Chart

Thousands Th	Hundreds H	Tens T	Ones O

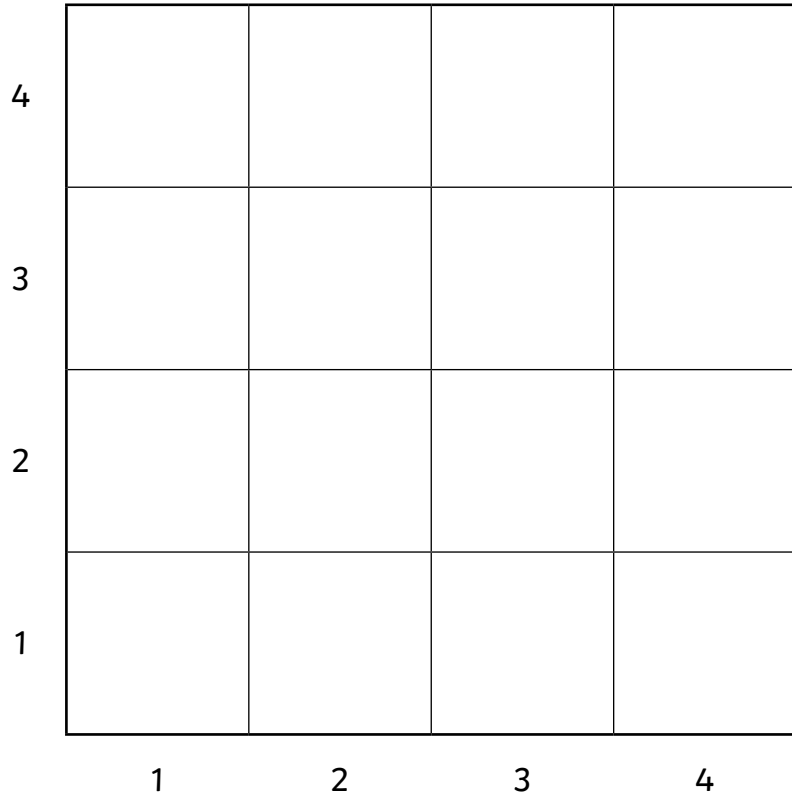


Star Grid Game

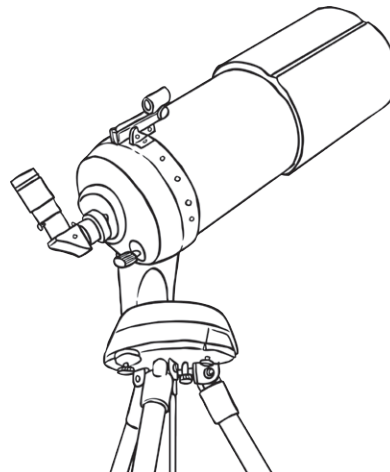
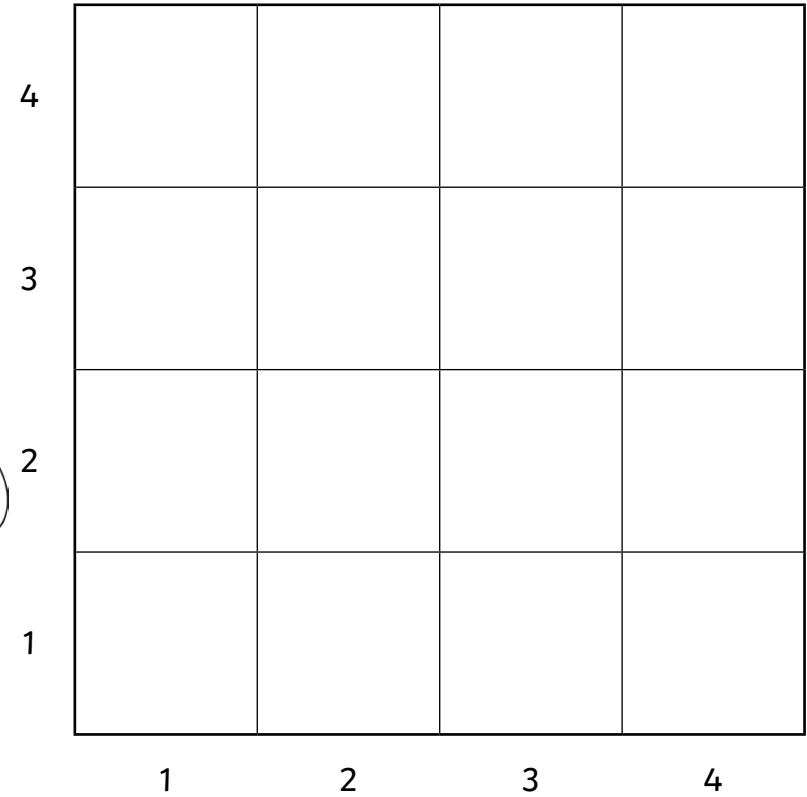
I can perform mental calculations with mixed operations.



Hide your three stars on this grid in different coordinate squares.



Use this grid to help you find your partner's stars.



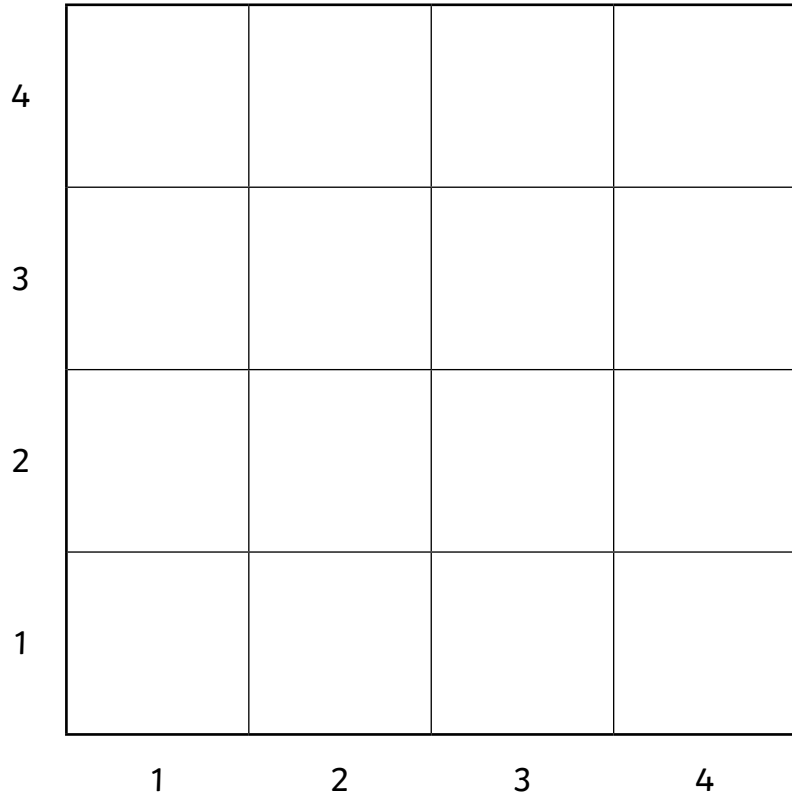


Star Grid Game

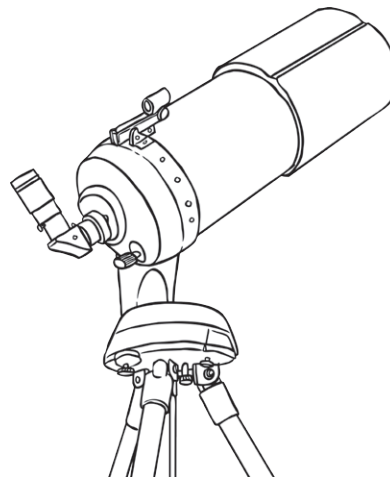
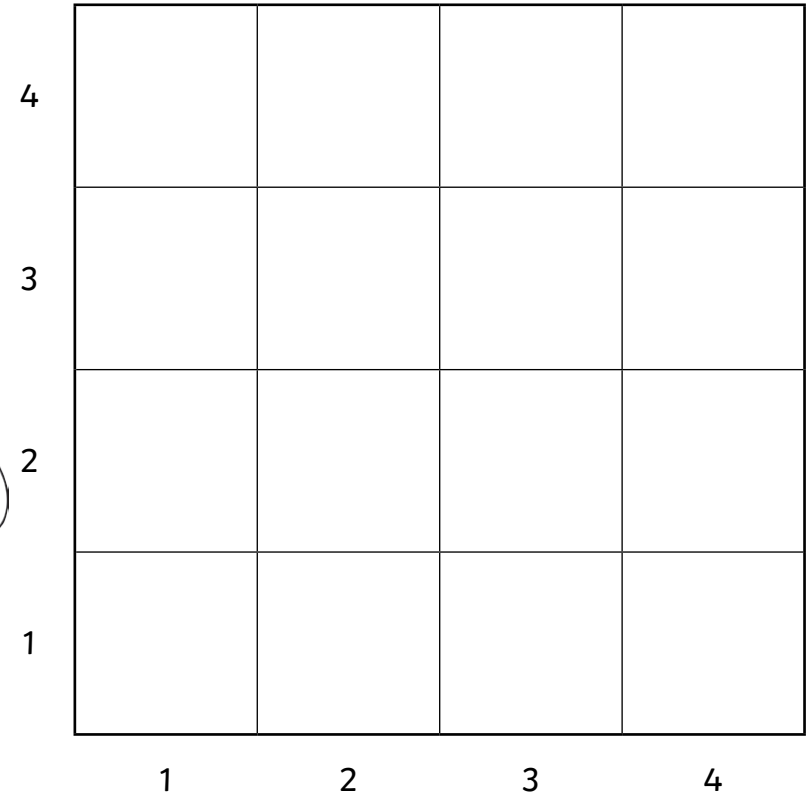
I can perform mental calculations with mixed operations.



Hide your three stars on this grid in different coordinate squares.



Use this grid to help you find your partner's stars.



Player One Card

Choose a question from your pack to complete. Once completed, your partner will check the answer using the answer sheet included in their pack. If your answer is correct, you may choose a coordinate to find your partner's hidden stars. Repeat again with your partner. You have your partner's answer sheet included in your pack to check their answers. The first person to find all their partner's hidden stars wins!

You can use a whiteboard or a piece of paper to jot key numbers.

1) $\begin{array}{r} 310.55 \\ + 2459 \\ + 259.46 \end{array}$	2) $\begin{array}{r} 254.7 \\ \div 10 \\ + 359.09 \end{array}$	3) $\begin{array}{r} 32.4 \\ \times 4 \\ - 18.17 \end{array}$	4) $\begin{array}{r} 55.3 \\ \times 4 \\ + 334.43 \end{array}$
5) $\begin{array}{r} 2700 \\ \div 3 \\ \times 40 \end{array}$	6) $\begin{array}{r} 315 \\ \div 15 \\ \times 2.5 \end{array}$	7) $\begin{array}{r} 83.4 \\ \times 8 \\ - 450 \end{array}$	8) $\begin{array}{r} 48.15 \\ \times 10 \\ + 40.81 \end{array}$
9) $\begin{array}{r} 175.5 \\ \div 5 \\ \times 1000 \end{array}$	10) $\begin{array}{r} 3.51 \\ + 9.38 \\ + 1.04 \end{array}$	11) $\begin{array}{r} 104.5 \\ - 50 \\ - 0.45 \end{array}$	12) $\begin{array}{r} 8.99 \\ + 76.4 \\ + 25.0 \end{array}$
13) $\begin{array}{r} 15 \\ \times 3.5 \\ + 7.05 \end{array}$	14) $\begin{array}{r} 11.4 \\ \times 8 \\ - 54.5 \end{array}$	15) $\begin{array}{r} 90 \\ \div 4 \\ + 4.003 \end{array}$	16) $\begin{array}{r} 56.5 \\ + 382.4 \\ - 101.5 \end{array}$

Player 2's answers

- 1) 35 000
- 2) 13.93
- 3) 54.05
- 4) 110.39
- 5) 59.55
- 6) 36.7
- 7) 26.503
- 8) 337.4
- 9) 3029.01
- 10) 384.56
- 11) 111.43
- 12) 555.63
- 13) 36 000
- 14) 52.5
- 15) 217.2
- 16) 522.31

Player Two Card

Choose a question from your pack to complete. Once completed, your partner will check the answer using the answer sheet included in their pack. If your answer is correct, you may choose a coordinate to find your partner's hidden stars. Repeat again with your partner. You have your partner's answer sheet included in your pack to check their answers. The first person to find all their partner's hidden stars wins!

You can use a whiteboard or a piece of paper to jot key numbers.

1) $\begin{array}{r} 175.5 \\ \div 5 \\ \times 1000 \end{array}$	2) $\begin{array}{r} 3.51 \\ + 9.38 \\ + 1.04 \end{array}$	3) $\begin{array}{r} 104.5 \\ - 50 \\ - 0.45 \end{array}$	4) $\begin{array}{r} 8.99 \\ + 76.4 \\ + 25.0 \end{array}$
5) $\begin{array}{r} 15 \\ \times 3.5 \\ + 7.05 \end{array}$	6) $\begin{array}{r} 11.4 \\ \times 8 \\ - 54.5 \end{array}$	7) $\begin{array}{r} 90 \\ \div 4 \\ + 4.003 \end{array}$	8) $\begin{array}{r} 56.5 \\ + 382.4 \\ - 101.5 \end{array}$
9) $\begin{array}{r} 310.55 \\ + 2459 \\ + 259.46 \end{array}$	10) $\begin{array}{r} 254.7 \\ \div 10 \\ + 359.09 \end{array}$	11) $\begin{array}{r} 32.4 \\ \times 4 \\ - 18.17 \end{array}$	12) $\begin{array}{r} 55.3 \\ \times 4 \\ + 334.43 \end{array}$
13) $\begin{array}{r} 2700 \\ \div 3 \\ \times 40 \end{array}$	14) $\begin{array}{r} 315 \\ \div 15 \\ \times 2.5 \end{array}$	15) $\begin{array}{r} 83.4 \\ \times 8 \\ - 450 \end{array}$	16) $\begin{array}{r} 48.15 \\ \times 10 \\ + 40.81 \end{array}$

Player 1's answers

- 1) 3029.01
- 2) 384.56
- 3) 111.43
- 4) 555.63
- 5) 36 000
- 6) 52.5
- 7) 217.2
- 8) 522.31
- 9) 35 100
- 10) 13.93
- 11) 54.05
- 12) 110.39
- 13) 59.55
- 14) 36.7
- 15) 26.503
- 16) 337.4

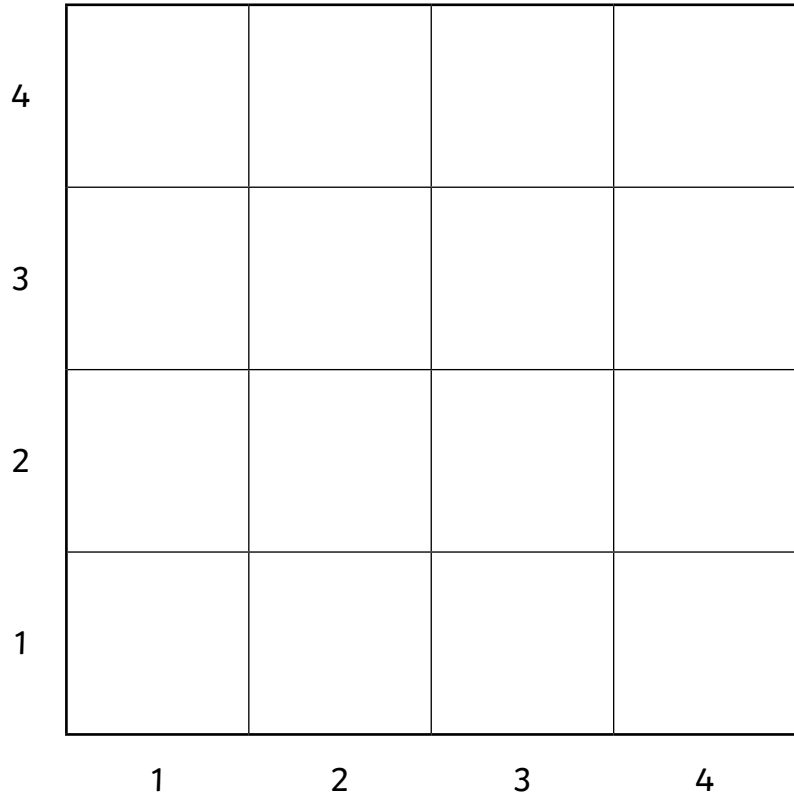


Star Grid Game

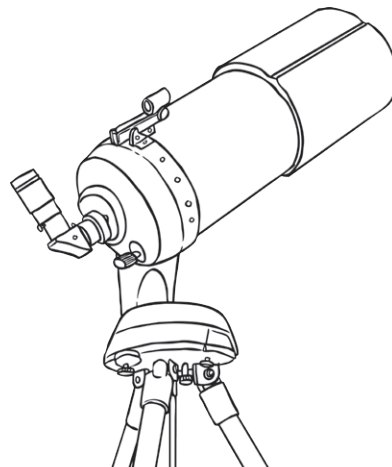
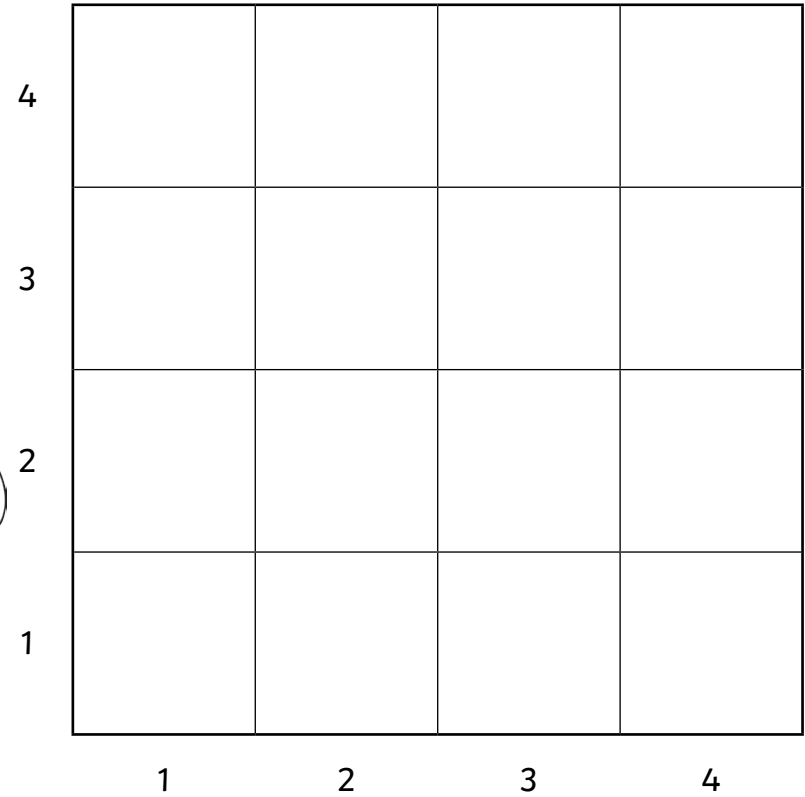
I can perform mental calculations with mixed operations.



Hide your three stars on this grid in different coordinate squares.



Use this grid to help you find your partner's stars.



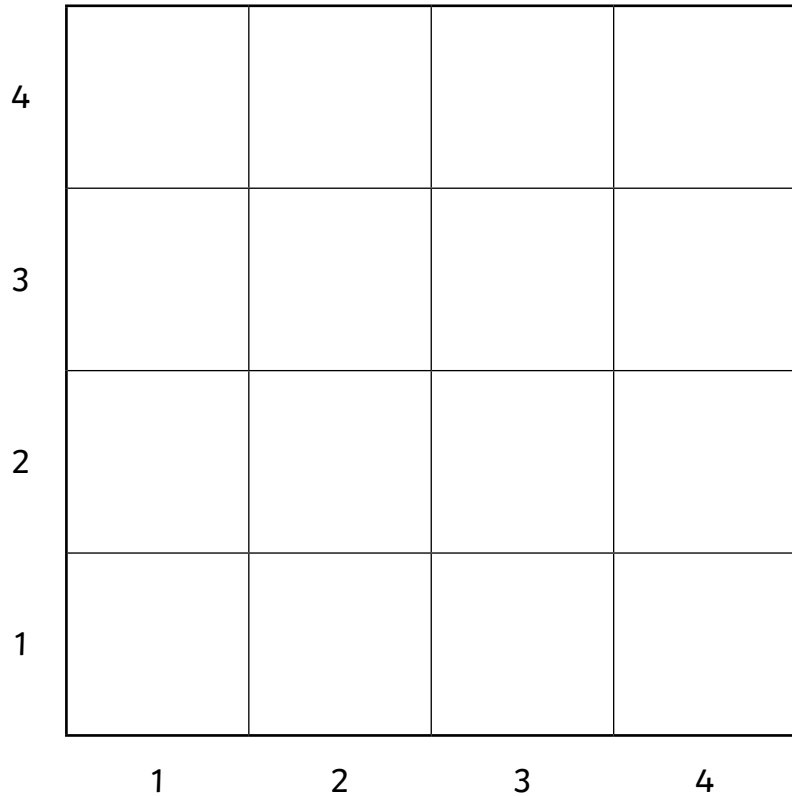


Star Grid Game

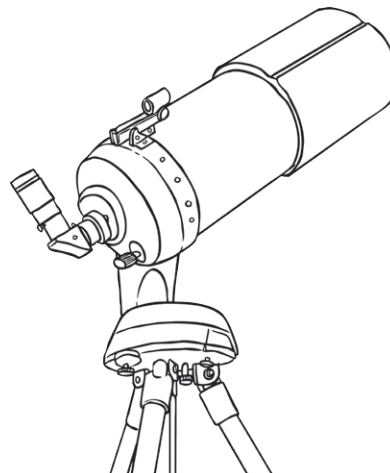
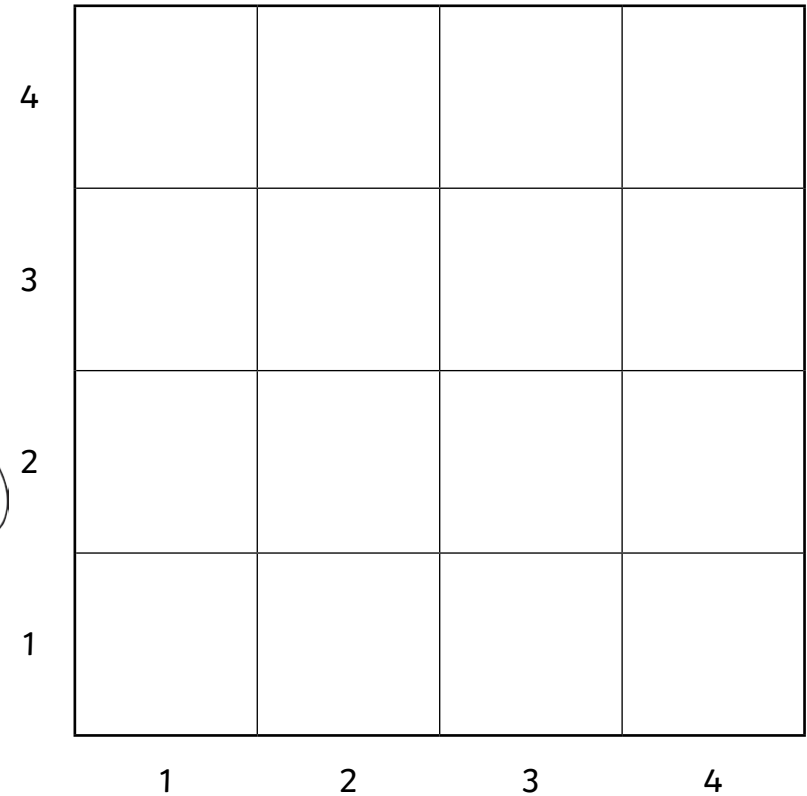
I can perform mental calculations with mixed operations.



Hide your three stars on this grid in different coordinate squares.



Use this grid to help you find your partner's stars.



Player One Card

Choose a question from your pack to complete. Once completed, your partner will check the answer using the answer sheet included in their pack. If your answer is correct, you may choose a coordinate to find your partner's hidden stars. Repeat again with your partner. You have your partner's answer sheet included in your pack to check their answers. The first person to find all their partner's hidden stars wins!

You can use a whiteboard or a piece of paper to jot key numbers.

1) $\begin{array}{r} 5843 \\ + 1050 \\ - 59 \end{array}$	2) $\begin{array}{r} 1540 \\ \div 10 \\ + 156 \end{array}$	3) $\begin{array}{r} 13 \\ \times 4 \\ - 21 \end{array}$	4) $\begin{array}{r} 63 \\ \times 4 \\ + 20 \end{array}$
5) $\begin{array}{r} 120 \\ \div 3 \\ \times 2 \end{array}$	6) $\begin{array}{r} 78 \\ \div 2 \\ \div 3 \end{array}$	7) $\begin{array}{r} 72 \\ \times 4 \\ - 50 \end{array}$	8) $\begin{array}{r} 485 \\ \times 10 \\ + 395 \end{array}$
9) $\begin{array}{r} 155 \\ \div 5 \\ + 149 \end{array}$	10) $\begin{array}{r} 45 \\ + 98 \\ + 154 \end{array}$	11) $\begin{array}{r} 198 \\ - 48 \\ - 48 \end{array}$	12) $\begin{array}{r} 8994 \\ + 7643 \\ + 150 \end{array}$
13) $\begin{array}{r} 1500 \\ \div 4 \\ + 25 \end{array}$	14) $\begin{array}{r} 23 \\ \times 8 \\ - 63 \end{array}$	15) $\begin{array}{r} 154 \\ \div 2 \\ \times 3 \end{array}$	16) $\begin{array}{r} 2845 \\ + 3824 \\ - 1015 \end{array}$

Player 2's answers

- 1) 180
- 2) 297
- 3) 102
- 4) 16 787
- 5) 400
- 6) 121
- 7) 231
- 8) 5654
- 9) 6834
- 10) 310
- 11) 31
- 12) 272
- 13) 80
- 14) 13
- 15) 238
- 16) 5245

Player Two Card

Choose a question from your pack to complete. Once completed, your partner will check the answer using the answer sheet included in their pack. If your answer is correct, you may choose a coordinate to find your partner's hidden stars. Repeat again with your partner. You have your partner's answer sheet included in your pack to check their answers. The first person to find all their partner's hidden stars wins!

You can use a whiteboard or a piece of paper to jot key numbers.

1) $\begin{array}{r} 155 \\ \div 5 \\ + 149 \end{array}$	2) $\begin{array}{r} 45 \\ + 98 \\ + 154 \end{array}$	3) $\begin{array}{r} 198 \\ - 48 \\ - 48 \end{array}$	4) $\begin{array}{r} 8994 \\ + 7643 \\ + 150 \end{array}$
5) $\begin{array}{r} 1500 \\ \div 4 \\ + 25 \end{array}$	6) $\begin{array}{r} 23 \\ \times 8 \\ - 63 \end{array}$	7) $\begin{array}{r} 154 \\ \div 2 \\ \times 3 \end{array}$	8) $\begin{array}{r} 2845 \\ + 3824 \\ - 1015 \end{array}$
9) $\begin{array}{r} 5843 \\ + 1050 \\ - 59 \end{array}$	10) $\begin{array}{r} 1540 \\ \div 10 \\ + 156 \end{array}$	11) $\begin{array}{r} 13 \\ \times 4 \\ - 21 \end{array}$	12) $\begin{array}{r} 63 \\ \times 4 \\ + 20 \end{array}$
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Player 1's answers

- 1) 6834
- 2) 310
- 3) 31
- 4) 272
- 5) 80
- 6) 13
- 7) 238
- 8) 5245
- 9) 180
- 10) 297
- 11) 102
- 12) 16 787
- 13) 400
- 14) 121
- 15) 231
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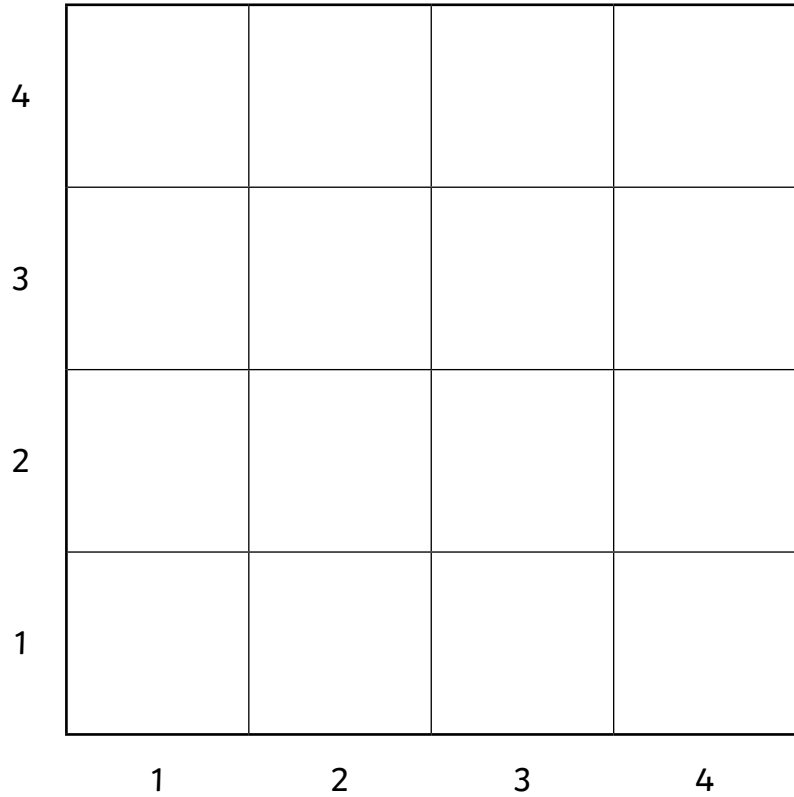


Star Grid Game

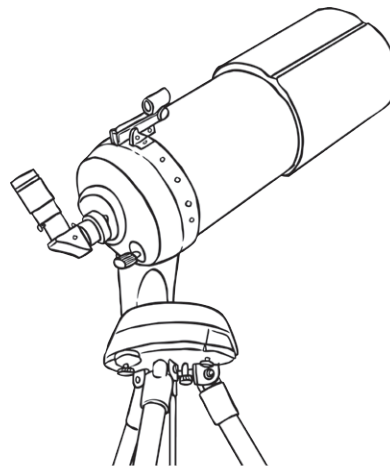
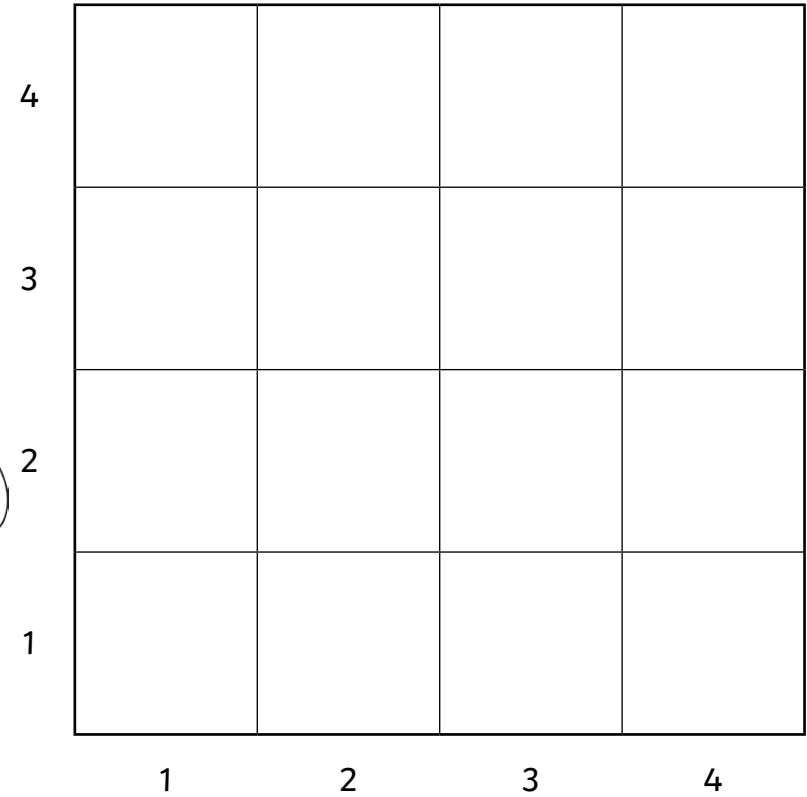
I can perform mental calculations with mixed operations.



Hide your three stars on this grid in different coordinate squares.



Use this grid to help you find your partner's stars.



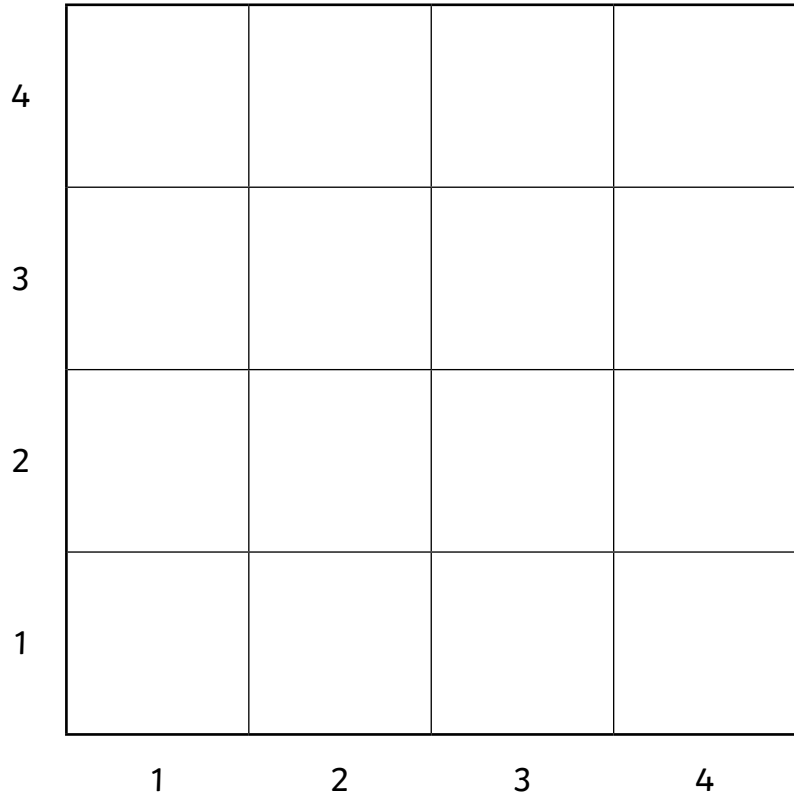


Star Grid Game

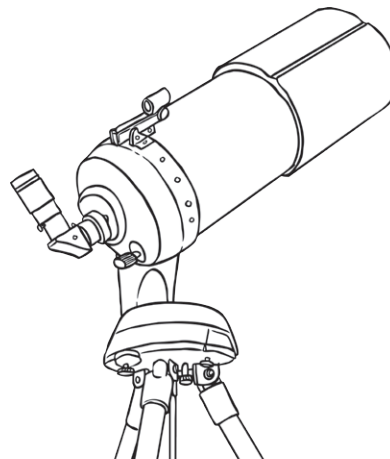
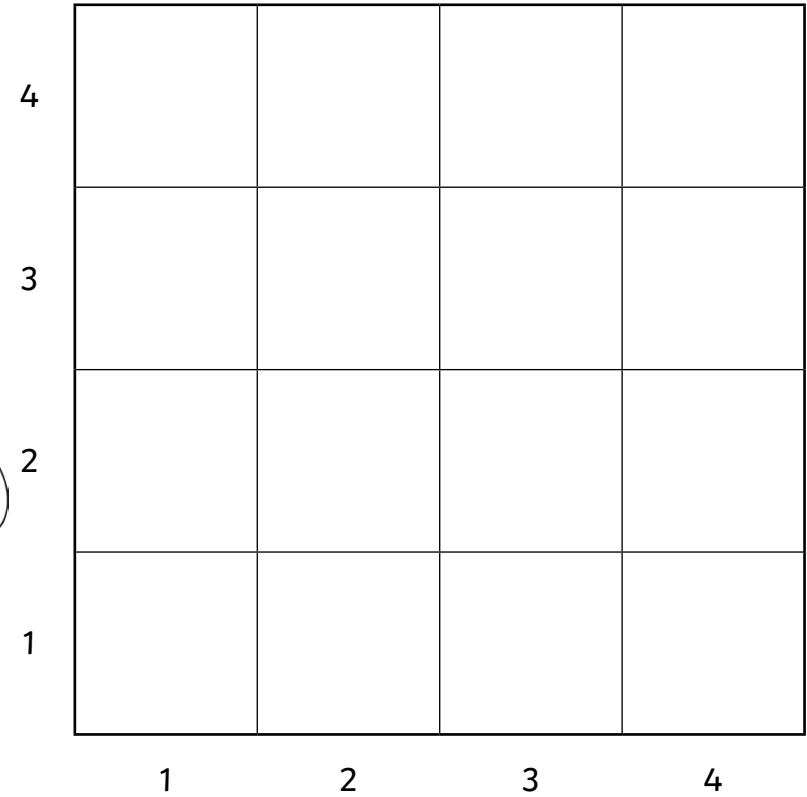
I can perform mental calculations with mixed operations.



Hide your three stars on this grid in different coordinate squares.



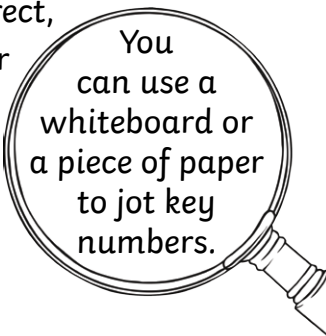
Use this grid to help you find your partner's stars.





Player One Card

Choose a question from your pack to complete. Once completed, your partner will check the answer using the answer sheet included in their pack. If your answer is correct, you may choose a coordinate to find your partner's hidden stars. Repeat again with your partner. You have your partner's answer sheet included in your pack to check their answers. The first person to find all their partner's hidden stars wins!



1) $\begin{array}{r} 280.50 \\ + 5829 \\ + 154.4 \end{array}$	2) $\begin{array}{r} 25430 \\ \div 10 \\ + 124.7 \end{array}$	3) $\begin{array}{r} 23.1 \\ \times 4 \\ - 15.2 \end{array}$	4) $\begin{array}{r} 53.5 \\ \times 4 \\ + 20.75 \end{array}$
5) $\begin{array}{r} 1800 \\ \div 3 \\ \times 20 \end{array}$	6) $\begin{array}{r} 879 \\ \div 3 \\ + 33 \end{array}$	7) $\begin{array}{r} 71 \\ \times 8 \\ - 50.5 \end{array}$	8) $\begin{array}{r} 48.5 \\ \times 10 \\ + 495 \end{array}$
9) $\begin{array}{r} 55.5 \\ \div 5 \\ \times 100 \end{array}$	10) $\begin{array}{r} 4.5 \\ + 9.8 \\ + 15.4 \end{array}$	11) $\begin{array}{r} 1045 \\ - 50 \\ - 4.5 \end{array}$	12) $\begin{array}{r} 89.9 \\ + 76.4 \\ + 15.0 \end{array}$
13) $\begin{array}{r} 15 \\ \times 2.5 \\ + 15 \end{array}$	14) $\begin{array}{r} 2.3 \\ \times 8 \\ - 4.7 \end{array}$	15) $\begin{array}{r} 90 \\ \div 4 \\ + 78.5 \end{array}$	16) $\begin{array}{r} 284.5 \\ + 3824 \\ - 101.5 \end{array}$

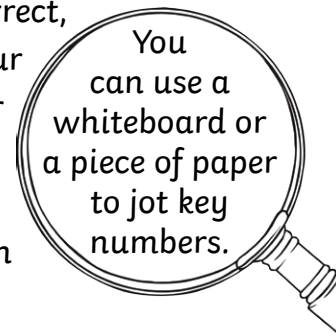
Player 2's answers

- 1) 1110
- 2) 29.7
- 3) 990.5
- 4) 181.3
- 5) 52.5
- 6) 13.7
- 7) 101
- 8) 4007
- 9) 6263.9
- 10) 2667.7
- 11) 77.2
- 12) 234.75
- 13) 12 000
- 14) 326
- 15) 517.5
- 16) 980



Player Two Card

Choose a question from your pack to complete. Once completed, your partner will check the answer using the answer sheet included in their pack. If your answer is correct, you may choose a coordinate to find your partner's hidden stars. Repeat again with your partner. You have your partner's answer sheet included in your pack to check their answers. The first person to find all their partner's hidden stars wins!



1) $\begin{array}{r} 55.5 \\ \div 5 \\ \times 100 \end{array}$	2) $\begin{array}{r} 4.5 \\ + 9.8 \\ + 15.4 \end{array}$	3) $\begin{array}{r} 1045 \\ - 50 \\ - 4.5 \end{array}$	4) $\begin{array}{r} 89.9 \\ + 76.4 \\ + 15.0 \end{array}$
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13) $\begin{array}{r} 1800 \\ \div 3 \\ \times 20 \end{array}$	14) $\begin{array}{r} 879 \\ \div 3 \\ + 33 \end{array}$	15) $\begin{array}{r} 71 \\ \times 8 \\ - 50.5 \end{array}$	16) $\begin{array}{r} 48.5 \\ \times 10 \\ + 495 \end{array}$

Player 1's answers














- 1) 6263.9
- 2) 2667.7
- 3) 77.2
- 4) 234.75
- 5) 12 000
- 6) 326
- 7) 517.5
- 8) 980
- 9) 1110
- 10) 29.7
- 11) 990.5
- 12) 181.3
- 13) 52.5
- 14) 13.7
- 15) 101
- 16) 4007

Addition, Subtraction, Multiplication and Division: Gotta Find Em All!

<p>Aim: Perform mental calculations, including with mixed operations and large numbers.</p> <p>I can perform mental calculations with mixed operations.</p>	<p>Success Criteria: I can partition a variety of numbers.</p> <p>I can add or subtract the nearest multiple of 10 or 100 then adjust.</p> <p>I can identify near doubles.</p> <p>I can use repeated doubling or halving.</p>	<p>Resources: Lesson Pack</p>
<p>Key/New Words: Multiple, add, plus, subtract, minus, take away, sum, total, nearest, partition, partitioning, repeated steps, mental, strategy, adjust, nearest multiple, doubling, halving, equivalent calculation, multiply, multiplication, lots of, groups of, divide, division.</p>	<p>I can solve problems using known number facts.</p>	<p>Preparation: Differentiated Star Grid Game - 1 per pair Extra Challenge Activity Sheet - as required Blank ThHTO Place Value Chart - as required</p>

Prior Learning: It will be helpful if children have a secure understanding of place value, multiplication facts and corresponding number facts.

Learning Sequence

	<p>How Much More? Say a length, e.g. 7.67m to the class. The children then say how much is needed in metres to make the next metre, e.g. 0.33m and the next multiple of ten metre, e.g. 2.33m. Repeat with other units of measurement, e.g. litres and kilograms.</p>	
	<p>Star Training: Revise mental strategies on the Lesson Presentation. Repeat with additional examples if necessary.</p>	
	<p>Puzzle Points: Split the class into two groups. Using the Lesson Presentation, the children work together in their groups to calculate the answer to the series of questions on the board. The first group to answer the question chooses a box from the slide which will reveal points awarded. The group with the most points wins. <i>Can the children explain how they completed the calculation? Which mental calculation method did they choose? Did anybody use a different mental calculation method?</i></p>	
	<p>Gotta Find Em All! Explain to the children that they will be playing a find and sink game. In pairs, the children mark the locations of three stars on their Star Grid Game. Taking turns, each child selects a calculation card. The child completes the calculation. If the answer is correct, they can select a coordinate on the grid to find their partner's stars. The first person to find to find all their partner's stars wins.</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="213 1312 580 1666">  <p>In pairs, the children take turns to complete calculations by selecting and using an appropriate mental calculation method to answer the two-step whole number calculations. Support can be given through the use of a Blank ThHTO Place Value Chart for children to make jottings on.</p> </div> <div data-bbox="612 1312 979 1576">  <p>In pairs, the children take turns to complete calculations by selecting and using an appropriate mental calculation method to answer the two-step whole number and simple decimal calculations.</p> </div> <div data-bbox="1011 1312 1378 1666">  <p>In pairs, the children take turns to complete calculations by selecting and using an appropriate mental calculation method to answer the two-step whole number and decimal calculations. An Extra Challenge Activity Sheet is provided as an extension activity if required.</p> </div> </div>	
	<p>True or False: Using the Lesson Presentation, show children a range of missing number calculations. The children have to prove or disprove the statements relating to the calculation. Can children use reasoning to explain why an answer is correct or incorrect? Can children explain their method of working?</p>	

Masterit

Playit: Let your children practise their mental skills using this

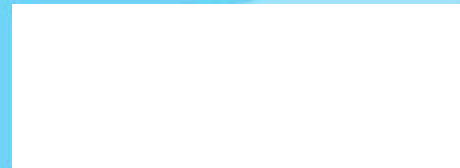
Quizit: Children have a go at answering the questions on this fabulous



Maths

Addition, Subtraction,
Multiplication and Division

Gotta Find Em All!



Aim

- I can perform mental calculations with mixed operations.

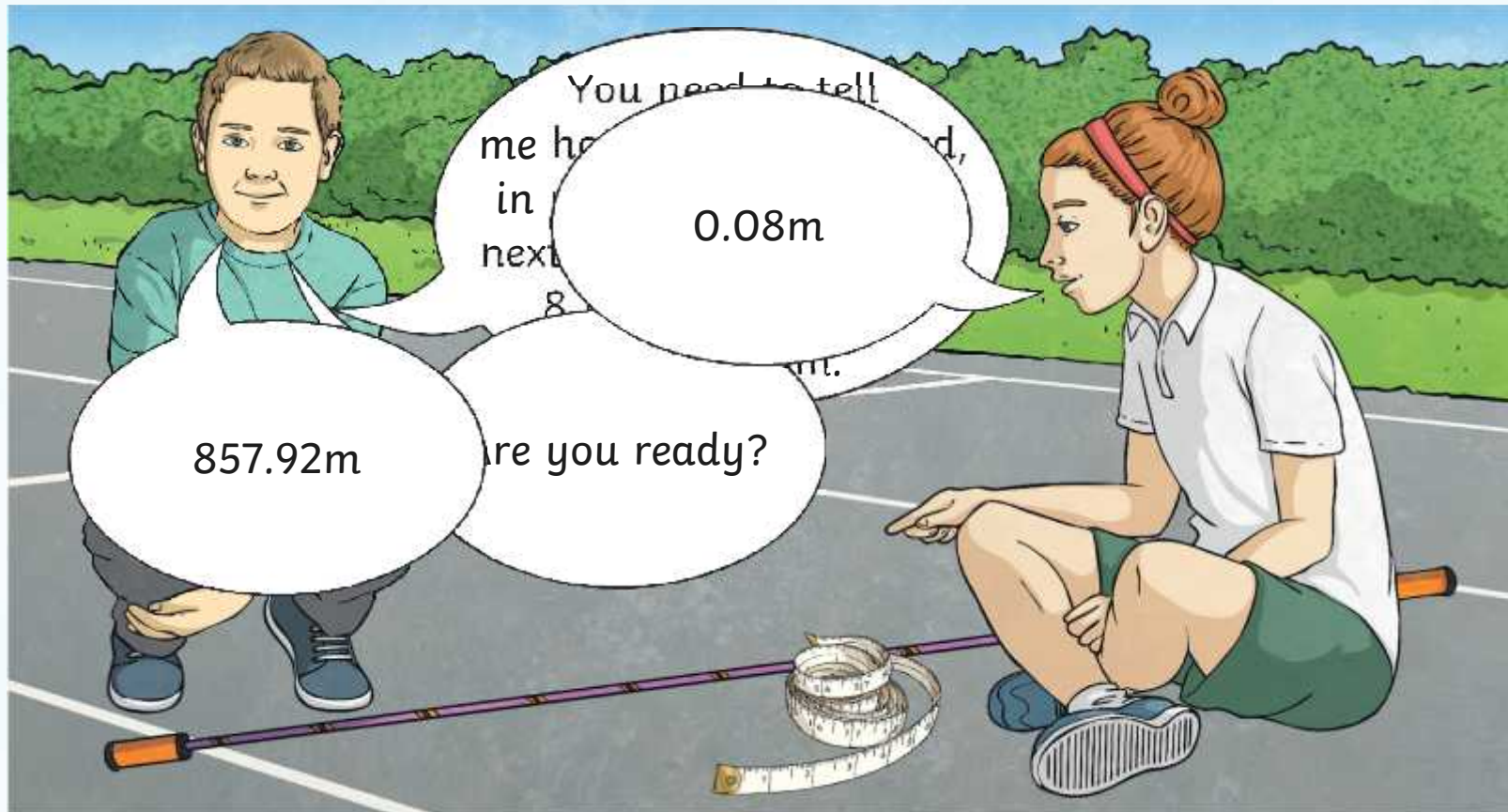
Success Criteria

- I can partition a variety of numbers.
- I can add or subtract the nearest multiple of 10 or 100 then adjust.
- I can identify near doubles.
- I can use repeated doubling or halving.
- I can solve problems using known number facts.

How Much More?



I will say a length, e.g. 7.67m.



Star Training

Some calculations we can do in our head mentally. We can write notes to help us remember key numbers while working out the answer.



Star Training

Which strategy will be most useful when completing this calculation?

$$457.6 + 384.5 = 842.1$$

So add the hundreds first.
To make this easier to work out, we
can use the method partitioning.
Then add the tens.

$457.6 + 300 = 757.6$
This involves partitioning into
hundreds, tens, ones and tenths,
adding the hundreds first.
Lastly, add the tenths.

$$757.6 + 80 = 837.6$$

$$837.6 + 4 = 841.6$$

$$841.6 + 0.5 = 842.1$$

The answer is 842.1.

Star Training

Which strategy will be most useful when completing this calculation?

$$5935 - 485.5 = 5449.5$$

So subtract the hundreds first
We can use partitioning when
subtracting.

$$5935 - 400 = 5535$$

Then subtract the tens.

$$5535 - 80 = 5455$$

This involves partitioning into
hundreds, ten, ones and tenths,
Next, subtract the ones.

$$5455 - 5 = 5450$$

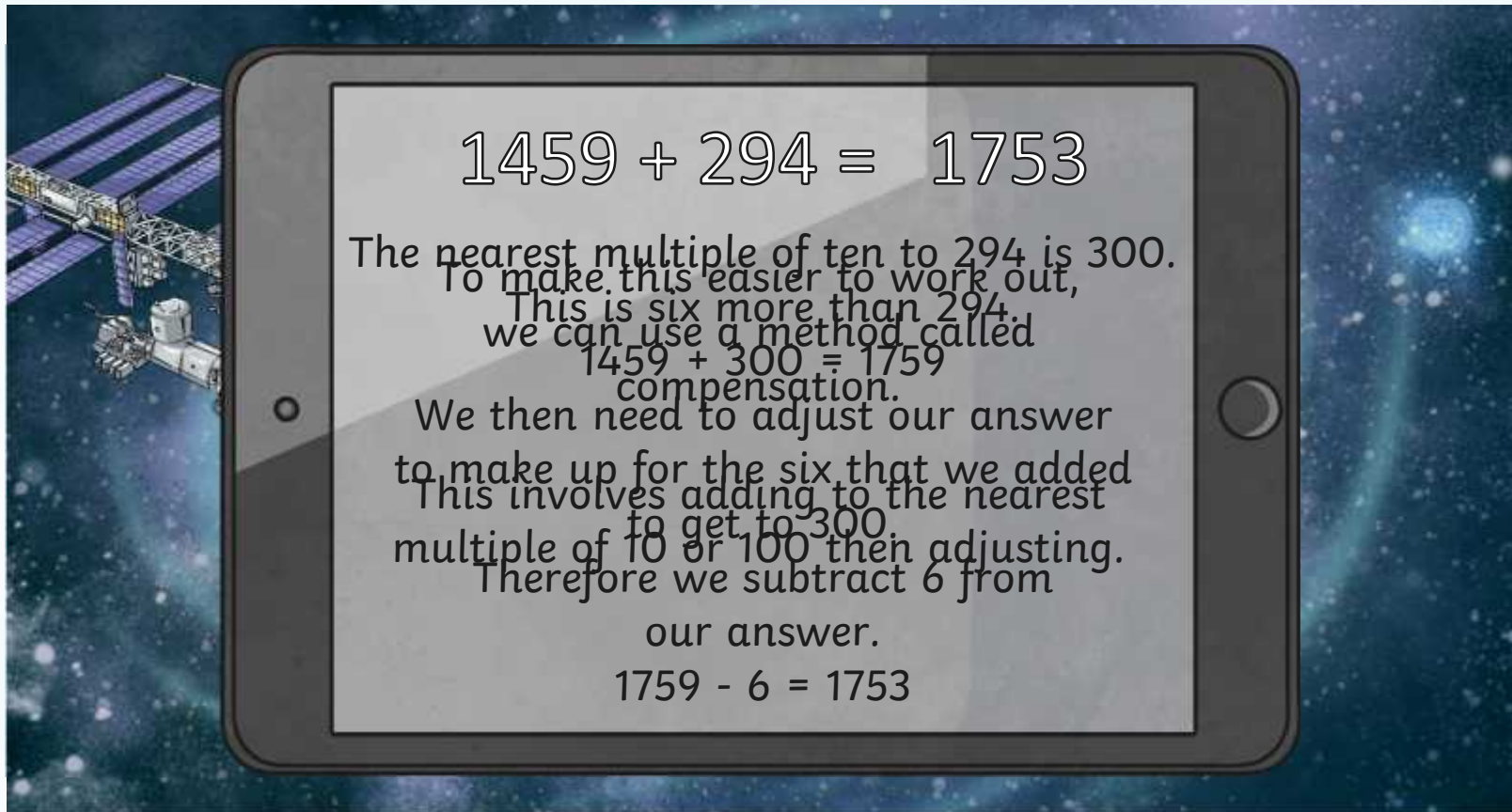
subtracting the hundreds first.
Lastly subtract the tenths.

$$5450 - 0.5 = 5449.5$$

The answer is 5449.5.

Star Training

Which strategy will be most useful when completing this calculation?

A tablet is shown against a space background with a satellite on the left and stars on the right. The tablet screen displays the following text:

$1459 + 294 = 1753$

The nearest multiple of ten to 294 is 300.
To make this easier to work out,
This is six more than 294.
we can use a method called
 $1459 + 300 = 1759$
compensation.

We then need to adjust our answer
to make up for the six that we added
This involves adding to the nearest
multiple of 10 or 100 then adjusting.
Therefore we subtract 6 from
our answer.
 $1759 - 6 = 1753$

Star Training

Which strategy will be most useful when completing this calculation?

$$68.9 - 45 = 23.9$$

So the nearest multiple of 10 to 68.9 is 70. This is 1.1 more than 68.9.
We can also use compensation when subtracting.
 $70 - 45 = 25$

We then need to adjust our answer to make up for the 1.1 that we didn't subtract to get to 70.
This involves subtracting to the nearest multiple of 10 or 100 then adjusting.

Therefore we subtract 1.1 from our answer.

$$25 - 1.1 = 23.9$$

Star Training

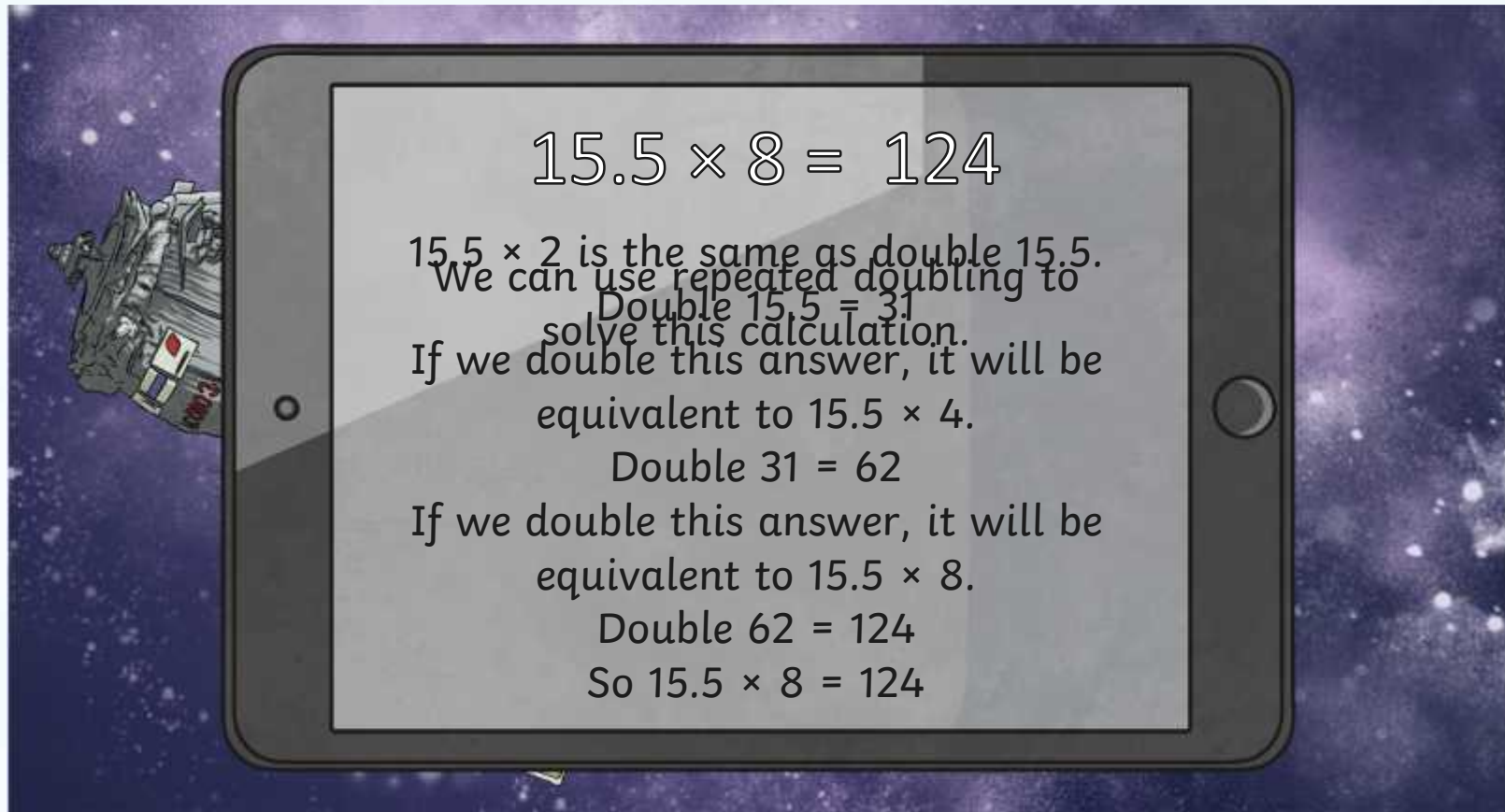
Which strategy will be most useful when completing this calculation?

$$164.5 + 170.1 = 334.6$$

Double 164.5
To make this easier to work out, we
can use the method near doubles.
 $164.5 + 164.5 = 329$
We then need to adjust, as we needed
to add 170.1 not 164.5.
This involves doubling, then
Therefore we add 5.6 onto our answer.
adjusting.
 $329 + 5.6 = 334.6$

Star Training

Which strategy will be most useful when completing this calculation?



$15.5 \times 8 = 124$

15.5×2 is the same as double 15.5.
We can use repeated doubling to solve this calculation.

Double $15.5 = 31$

If we double this answer, it will be equivalent to 15.5×4 .

Double $31 = 62$

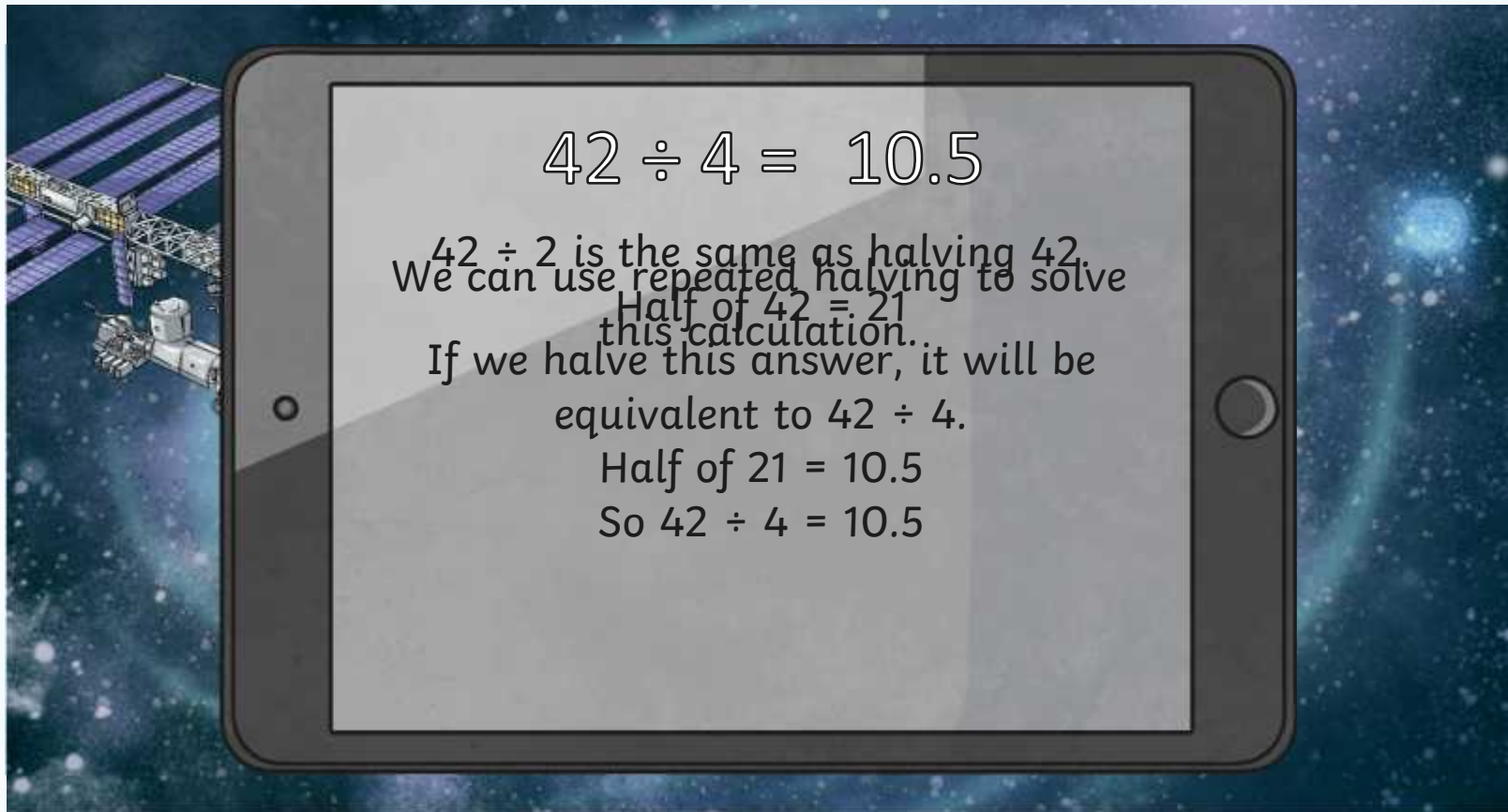
If we double this answer, it will be equivalent to 15.5×8 .

Double $62 = 124$

So $15.5 \times 8 = 124$

Star Training

Which strategy will be most useful when completing this calculation?

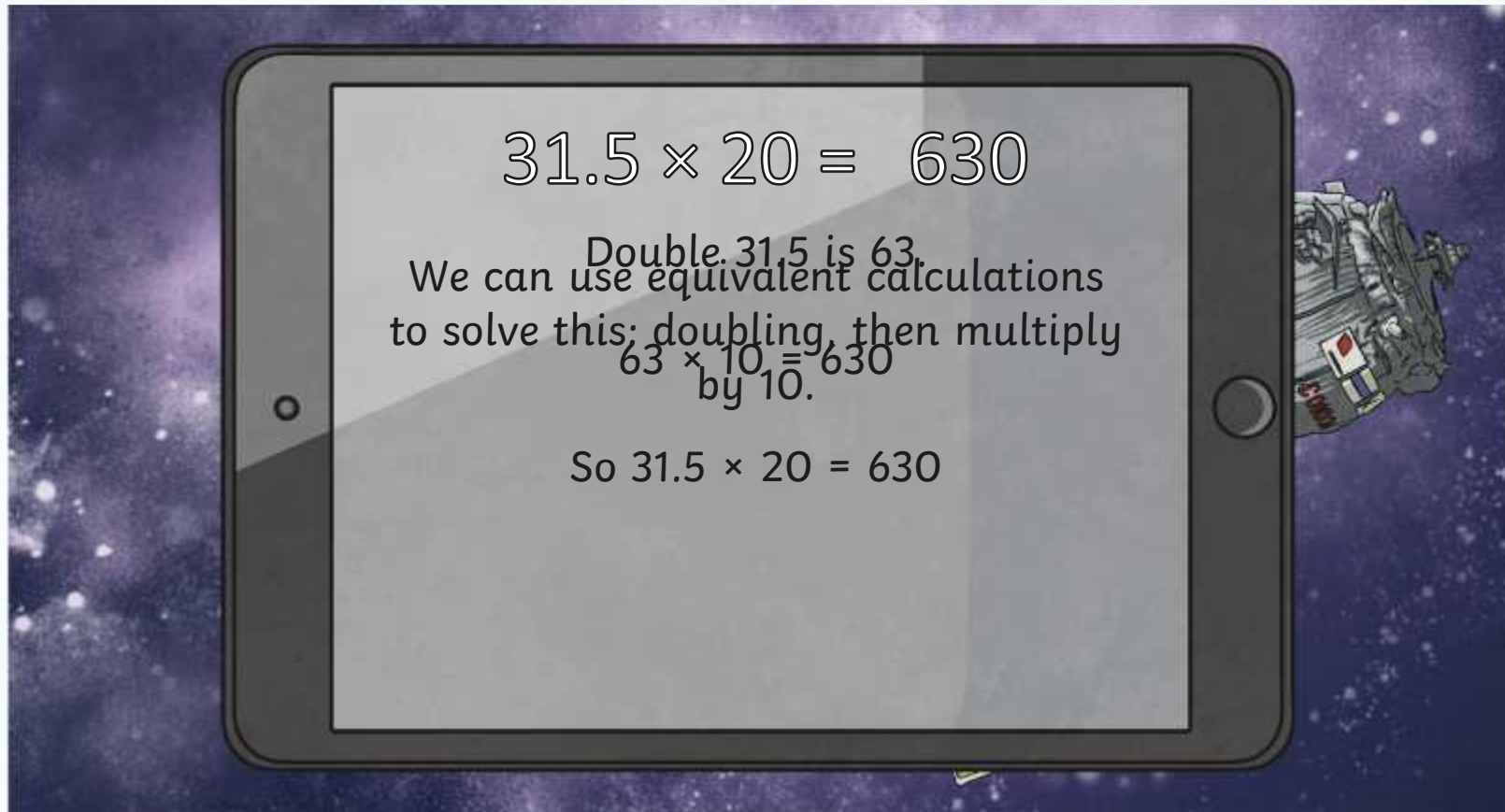


$42 \div 4 = 10.5$

$42 \div 2$ is the same as halving 42.
We can use repeated halving to solve this calculation.
Half of 42 = 21
If we halve this answer, it will be equivalent to $42 \div 4$.
Half of 21 = 10.5
So $42 \div 4 = 10.5$

Star Training

Which strategy will be most useful when completing this calculation?



$31.5 \times 20 = 630$

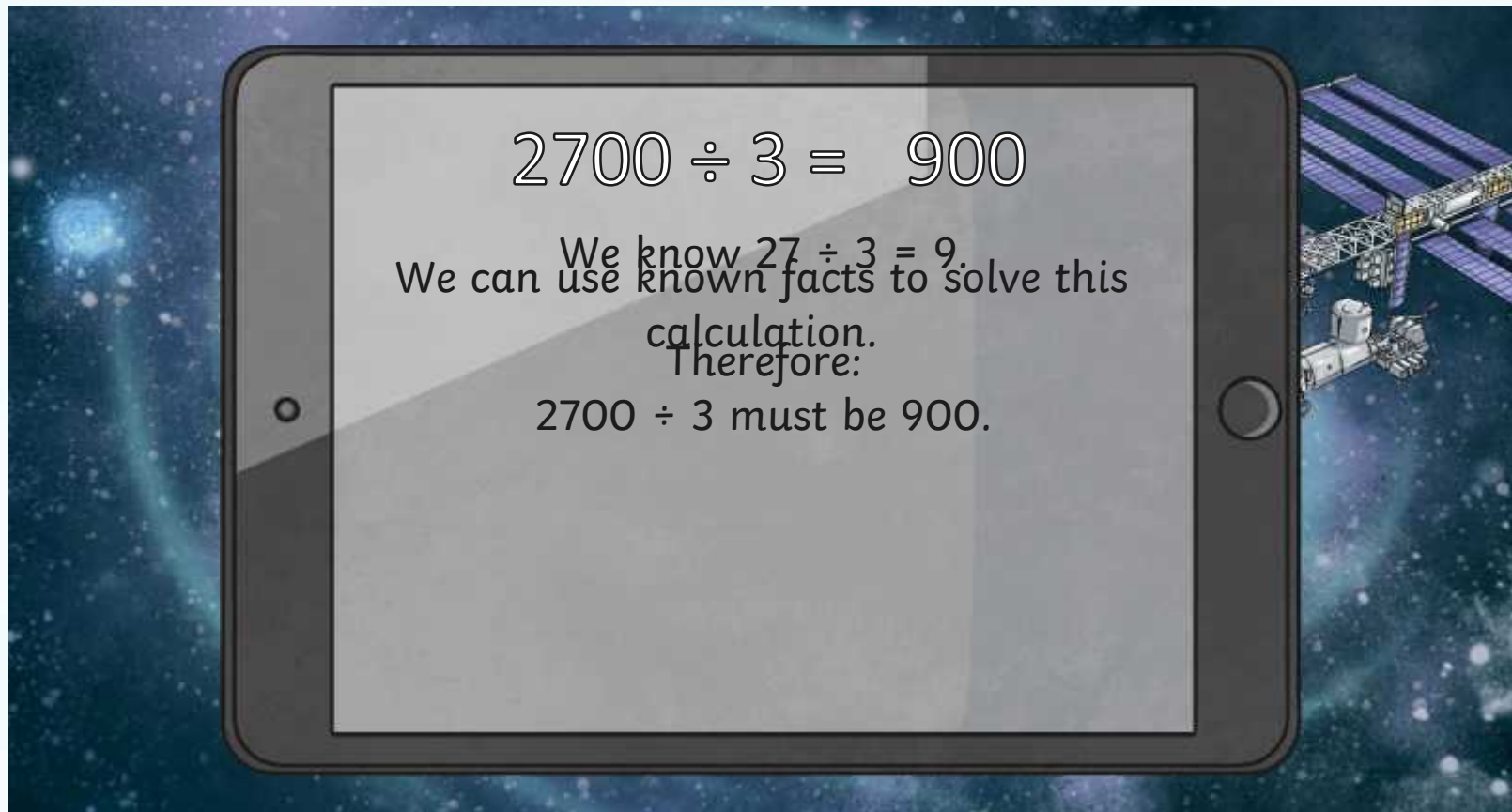
Double 31.5 is 63.
We can use equivalent calculations
to solve this: doubling, then multiply
by 10.

$63 \times 10 = 630$

So $31.5 \times 20 = 630$

Star Training

Which strategy will be most useful when completing this calculation?



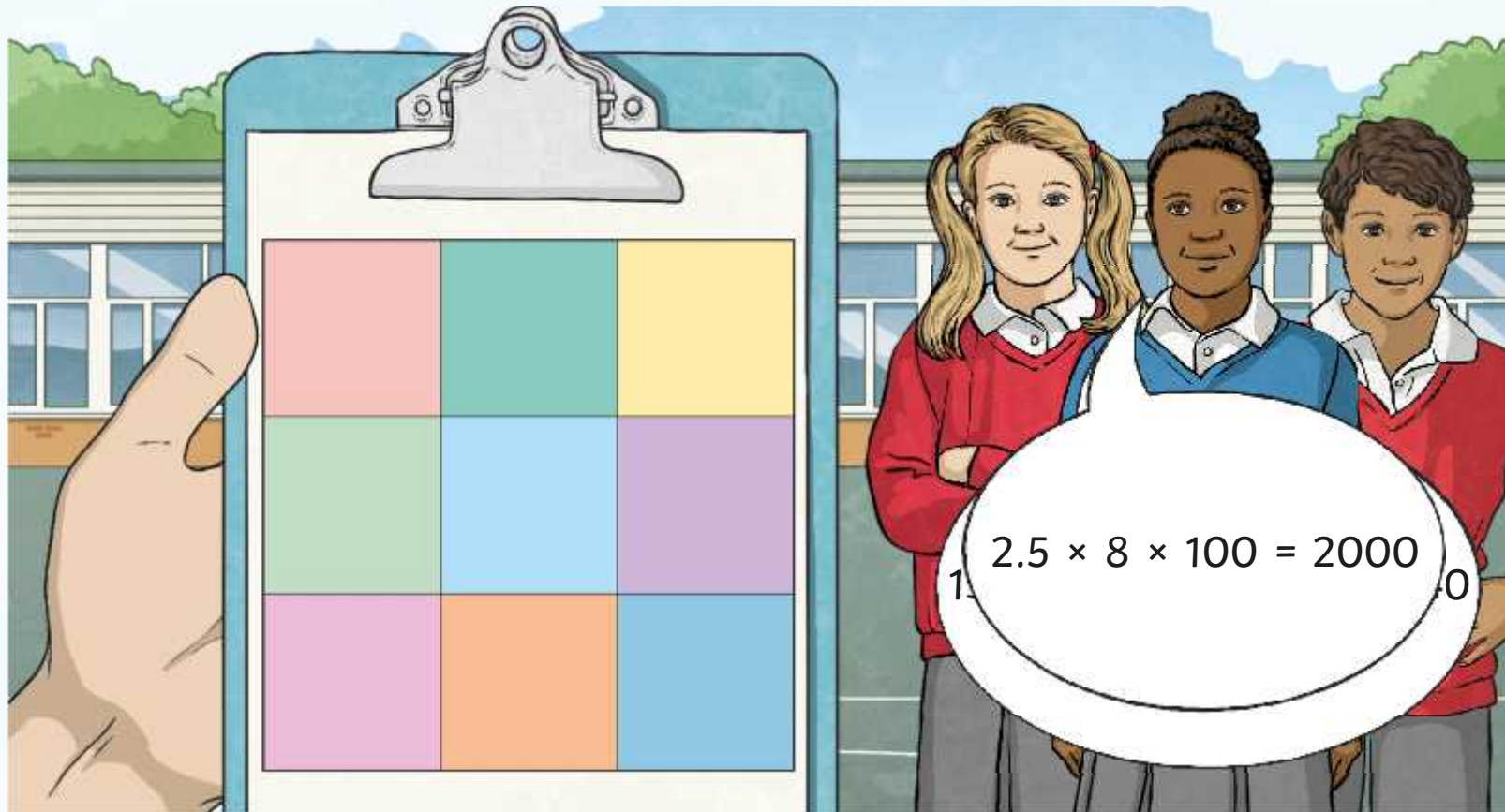
$2700 \div 3 = 900$

We know $27 \div 3 = 9$.
We can use known facts to solve this calculation.
Therefore:
 $2700 \div 3$ must be 900.

Puzzle Points




Select a box within the grid and answer the question correctly to collect the points. Click on the speech bubble to reveal the answer.



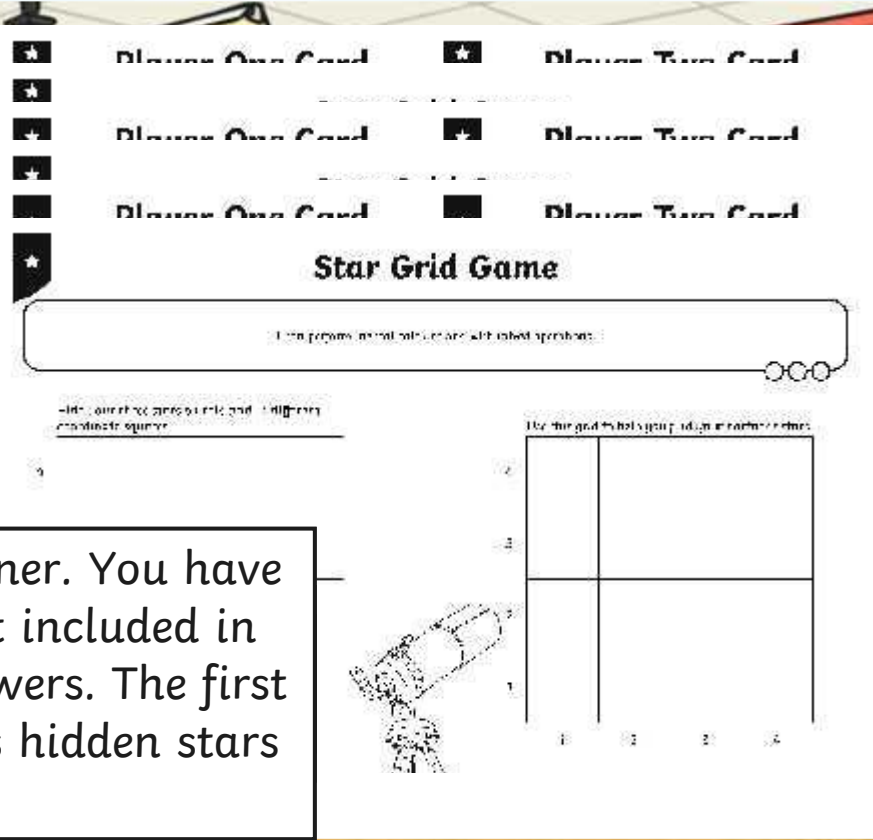
Gotta Find Em All!



You will be playing a find and sink game in pairs.



Repeat again with your partner. You have your partner's answer sheet included in your pack to check their answers. The first person to find their partner's hidden stars wins!



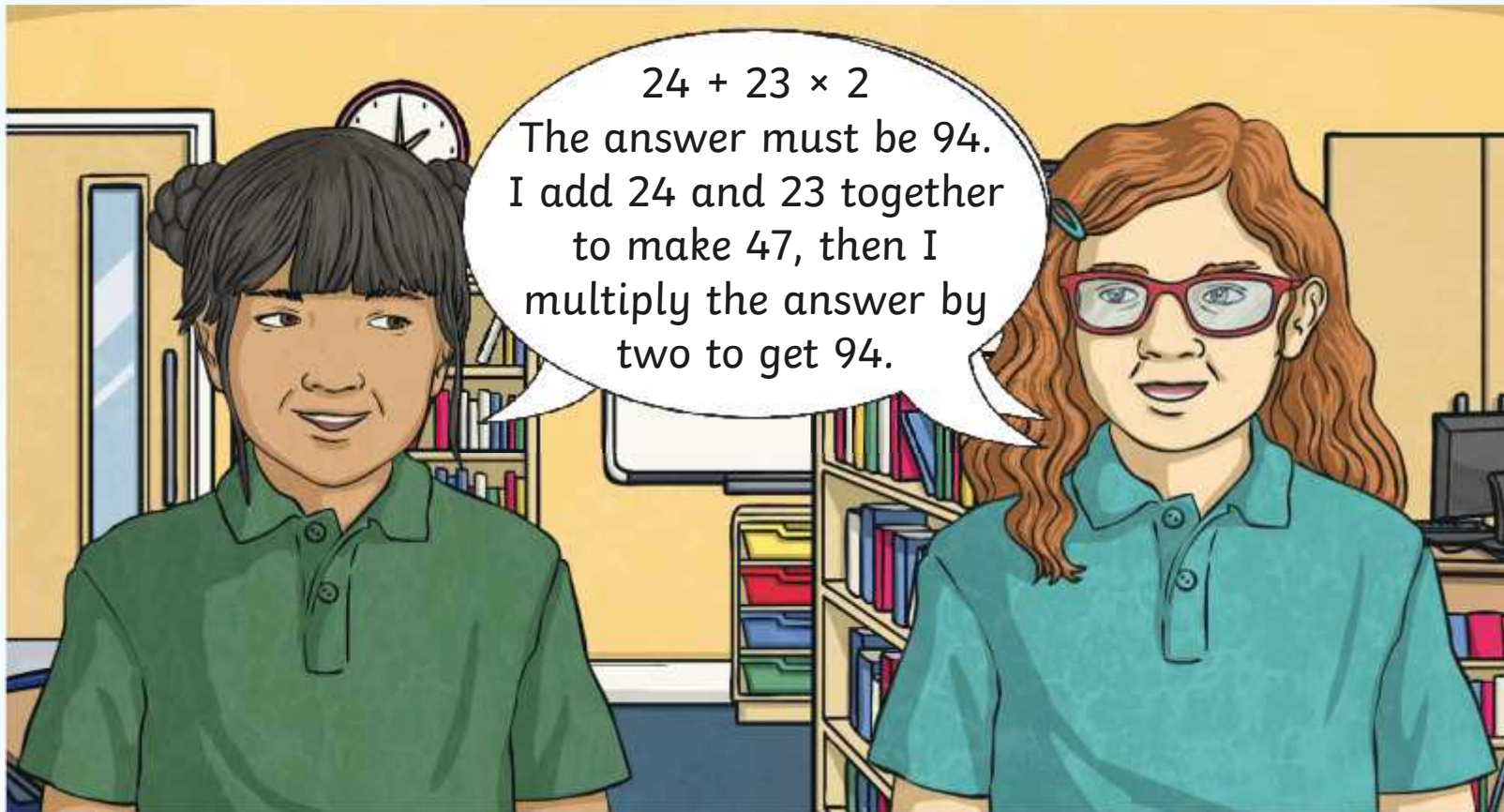
The worksheet includes the following text and graphics:

- Three rows of cards labeled "Player One Card" and "Player Two Card", each with a star icon.
- Section title: **Star Grid Game**
- Instruction: "I can prepare a star grid and hide stars with robot speech bubbles."
- Instruction: "I can search for my partner's stars and hide my own star grid speech bubbles."
- Instruction: "Use the grid to help you hide your partner's stars."
- A 2x4 grid with columns labeled 1, 2, 3, 4 and rows labeled 1, 2.
- An illustration of a robot.

True or False



Are the statements true or false?
Explain your answer.



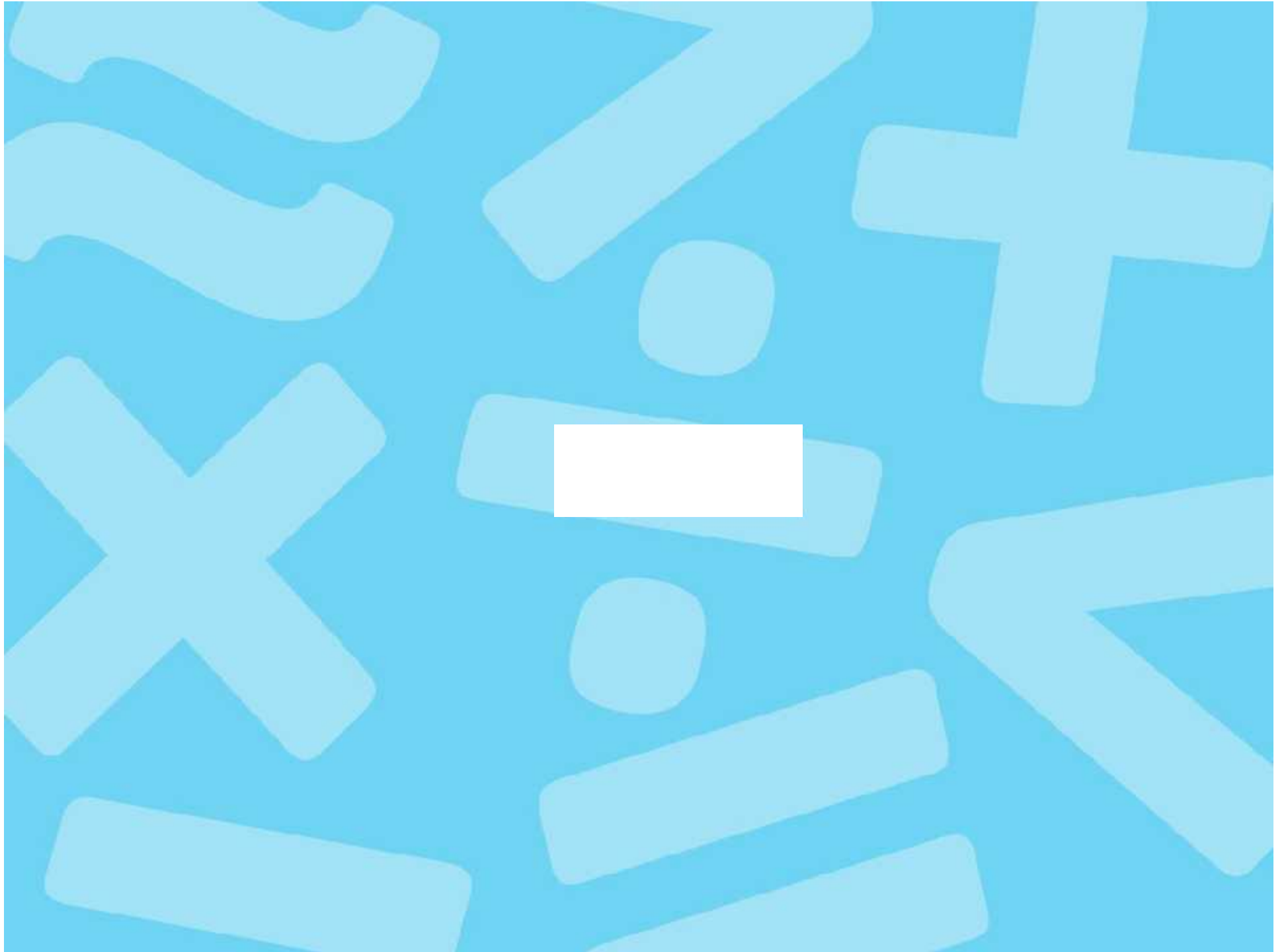
Aim



- I can perform mental calculations with mixed operations.

Success Criteria

- I can partition a variety of numbers.
- I can add or subtract the nearest multiple of 10 or 100 then adjust.
- I can identify near doubles.
- I can use repeated doubling or halving.
- I can solve problems using known number facts.



Addition, Subtraction, Multiplication and Division |
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I can use repeated doubling or halving.		
I can solve problems using known number facts.		

Addition, Subtraction, Multiplication and Division |
Gotta Find Em All!

I can perform mental calculations with mixed operations.		
I can partition a variety of numbers.		
I can add or subtract the nearest multiple of 10 or 100 then adjust.		
I can identify near doubles.		
I can use repeated doubling or halving.		
I can solve problems using known number facts.		