1) If $x = 15$, what is the value of $3x$?   **45**

2) 62% of the sweets in a bag a red.   **38%**

What percentage of the sweets are not red?

3) Multiply 4.7 by 5   **23.5**

4) Add 2,999 to 18,346   **21,345**

White Rose Maths

RECALL

Qu	1st	2nd	3rd	4th	5th	10th	20th	100th	nth
1	6	11	16	21					
2	7	11	15	19					
3	5	12	19	26					
4	4	12	20	28					

I challenge YOU to do it!

Qu	1st	2nd	3rd	4th	5th	10th	20th	100th	nth
5	20	35	50						
6	31	38	45						
7	45	100	155						
8	0.75	1.10	1.45	1.80					
8	1	4	9	16					

I CAN MAKE GENERALISATIONS ABOUT SINGLE STEP NUMBER PATTERNS AND EXPRESS THEM ALGEBRAICALLY

PROPERTIES OF NUMBER (21IV)

LEARNING HABITS?
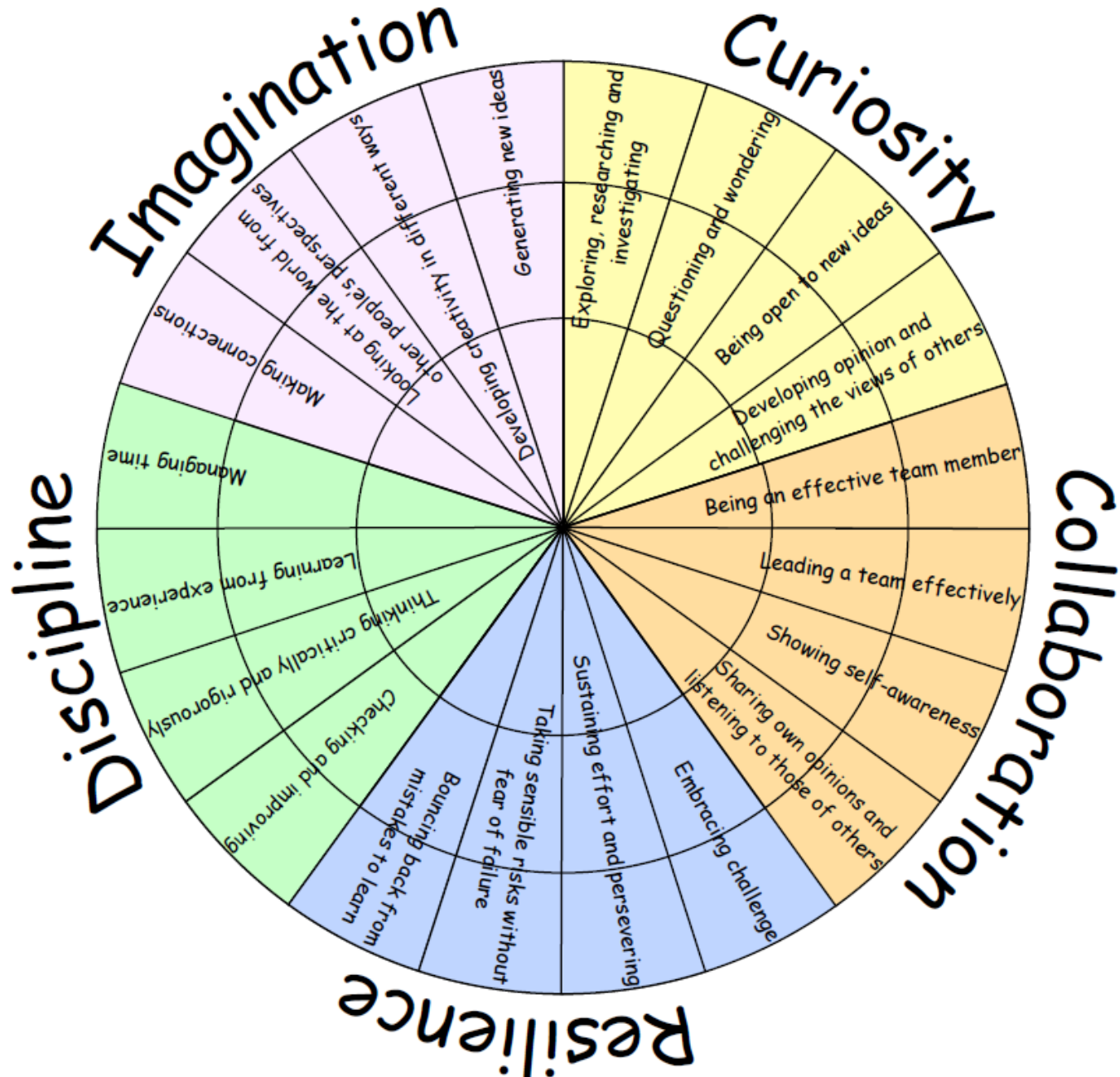
GUIDED PRACTICE

Luke thinks of a number.

He divides it by 2 and then adds 6.

He divides the result by 3.

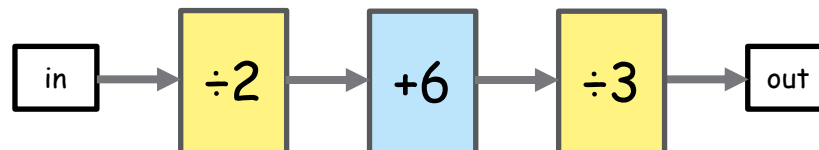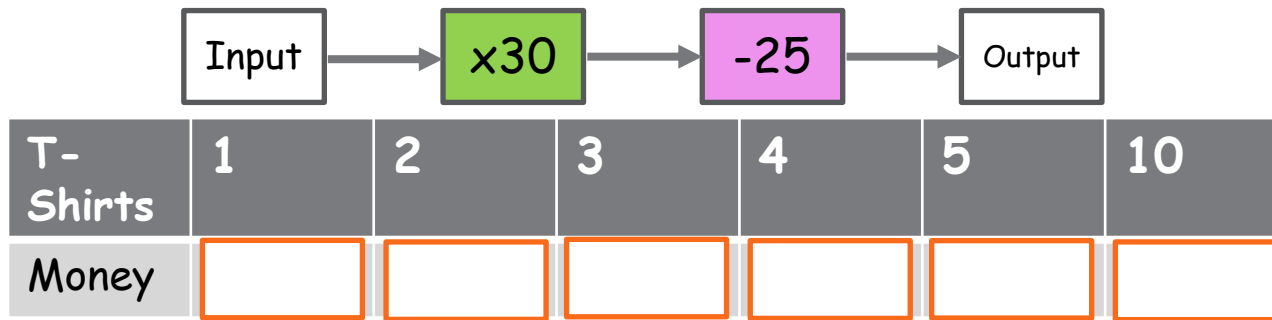His final answer is 4.5.

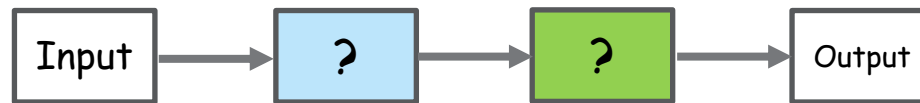What did he start with? ☐

Luke

Can you write this algebraically?

3 B4 Me - help

in → ÷2 → +6 → ÷3 → out

I had to pay £25 for a sewing machine. I then make t-shirts and sell them for £30 each. Work out how much money I make for each t-shirt.

Input → ×30 → -25 → Output

T-Shirts	1	2	3	4	5	10
Money						

I think of a number. I add 5 and then multiply by 6. I end up with 72. What did I start with?

Input → ? → ? → Output

It costs £3 to hire a boat. It then costs £1.50 per 10 minutes. I want to hire a boat for 40 minutes. How much will it cost me?

Input → ? → ? → Output

No. of minutes	10	20	30	40
Cost				

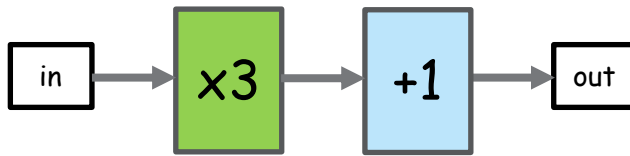**1)** A sequence begins with 4.
The next number is found by adding 3.
Mr Newton says that 30 will be in the sequence.
Is he correct? Explain.

2) Here is a function machine:

in → ×3 → +1 → out

Can 30 be the Output if whole numbers are used as the Input?

3) Mr Hall writes an equation:
n x 3 + 1
What would the 10th number in the sequence be?

4) Mrs Greaves thinks of a number.
She multiples it by 5 and then subtracts 3.
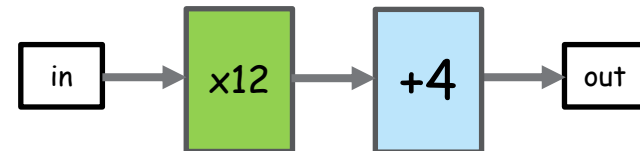Her final answer is 27.
a) What number did she start with?

b) Mr Hall's final answer is 87. What did he start with?

5) Tickets for a concert cost £12 each.
There is a £4 charge for buying tickets.
a) How much would 3 tickets cost?

b) If I had £70, how many tickets could I buy?

c) Ms Hall says that you could use this function machine:

in → ×12 → +4 → out

Do you agree with her? Why?

DIVE DEEPER 2

6) Here is a rule for cooking a chicken:

Cooking time = 30 minutes plus an extra 50 minutes for each kilogram

a) How many minutes will it take to cook a 3kg chicken?
b) What is the mass of a chicken that takes 155 minutes to cook?

7) Marina bakes cakes and sells them in bags.
She uses the formula to work out how much to charge for one bag of cakes:

Cost = number of cakes x 20p + 15p for the bag

a) How much will a bag of 12 cakes cost?
b) Olivia buys some cakes for £5.15. How many cakes does she buy?

8) Liam thinks of a number:
He multiplies the number by 5 and then subtracts 60.
His answer equals the number he started with.
What was the number Liam started with?

9) Mr Pratt has to pay 50p to get on the tram. He is then charged 30p for each mile he has to travel.

a) How much will it cost to travel 5 miles?

b) How far can he travel if he has £6?

DIVE DEEPER 3

10) Max starts with £50 in the bank.
He saves £4 each week.
He would like to buy an Xbox for £199.
How long will it take to save up enough money?

11) An electrician charges the following rates:

cost in pounds = £45 plus £42 per hour

a) How much will the electrician chare for a job which took 2 hours 30 minutes?

b) If a job cost £136, how long did it take?

12) A boat hire company charges the following:

Motor boats:
£1.50 + 25p per 10 minutes

Sasha pays £3.25.
She goes out at 3.20pm.
What time must she **return**?

13) Alfie has some photographs printed.
The cost is £2.50 for postage and 12 pence for each print.
Alfie uses this formula to find the cost (C) in pence:

$$C = 250 + 12n$$

n stands for the number of photographs.
The total cost for Alfie is £6.70.
How many photographs does he have printed?

DIVE DEEPER 1 - ANS

1) A sequence begins with 4. The next number is found by multiplying adding 3.
Mr Newton says that 30 will be in the sequence.
No: 4, 7, …22, 25, 28, 31

2) Here is a function machine:

Input ➔ X3 ➔ +1 ➔ Output

Can 30 be the Output if whole numbers are used as the Input? No! What could the input be to get an output of 30?

3) Mr Hall writes an equation:
n x 3 + 1

What would the 10th number in the sequence be? 31

4) Mrs Greaves thinks of a number.
She multiples it by 5 and then subtracts 3.
Her final answer is 27.
a) What number did she start with? 6

b) Mr Hall's final answer is 87. What did he start with? 18

5) Tickets for a concert cost £12 each.
There is a £4 charge for buying tickets.

a) How much would 3 tickets cost? £40

b) If I had £70, how many tickets could I buy? (£70 – £4) ÷ £12 = 5 r £6 ∴ 5 tickets

c) Ms Hall says that you could use this function machine:

Number of tickets ➔ x12 ➔ +4 ➔ cost

Yes – each ticket costs £12, then add £4

DIVE DEEPER 2 - ANSWERS

6) Here is a rule for cooking a chicken:

Cooking time = 30 minutes plus an extra 50 minutes for each kilogram

a) How many minutes will it take to cook a 3kg chicken? 180 minutes
b) What is the mass of a chicken that takes 155 minutes to cook? 2.5kg

7) Marina bakes cakes and sells them in bags.
She uses the formula to work out how much to charge for one bag of cakes:

Cost = number of cakes x 20p + 15p for the bag

a) How much will a bag of 12 cakes cost? £2.55
b) Olivia buys a bag of cakes for £5.15. How many cakes are in the bag? 25

8) Liam thinks of a number:
He multiplies the number by 5 and then subtracts 60.
His answer equals the number he started with.
What was the number Liam started with? 15

9) Mr Pratt has to pay 50p to get on the tram.
He is then charged 30p for each mile he has to travel.

a) Mile ➔ x30 ➔ +50 ➔ cost (pence)
b) £2 (200p)
c) (600p – 50p) ÷ 30p = 18 r 10p ∴ 18 miles

DIVE DEEPER 3 - ANSWERS

10) Max starts with £50 in the bank.
He saves £4 each week.
He would like to buy an Xbox for £199.
(£199 - £50) ÷ £4 = 37 r 1 ∴ 38 weeks

11) An electrician charges the following rates:

cost in pounds = £45 plus £42 per hour

a) 2 hours 30 minutes = £45 + £42 x 2.5 = £45 + £105 = £150
b) £136 - £45 ÷ £42 = $2\frac{1}{6}$ ➜ 2 hrs 10 minutes

12) A boat hire company charges the following:

Motor boats:
£1.50 + 25p per 10 minutes

Sasha pays £3.25.
She goes out at 3.20pm.
What time must she **return**?
4.30pm

13) Alfie has some photographs printed.
The cost is £2.50 for postage and 12 pence for each print.
Alfie uses this formula to find the cost (C) in pence:

C = 250 + 12n
n stands for the number of photographs.
The total cost for Alfie is £6.70.
670 = 250 + 12n ➜ n = 420 ÷ 12 = 35

SELF-ASSESSMENT

- Some will even explain how they can change two-step machines into one-step machines

- Some will explain how changing the steps affects the output

- Most will be able to do the inverse of two-step machines

- All will find the answers for two-step machines