# Teaching for Mastery

How would you memorise this number?

25811141720

Key focus points:

- National curriculum aims and expectations
- Mastery teaching and learning of Mathematics
- A model lesson
- How you can support your children at home

"A high-quality mathematics education provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject."

National Curriculum

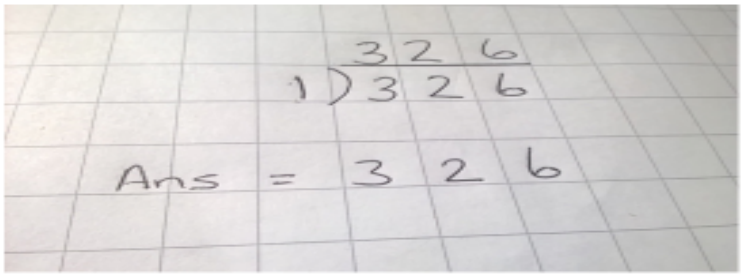
**"fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately."

National Curriculum

MathsHUBS

## KS2 Arithmetic Paper

$$326 \div 1 =$$




Does this demonstrate mastery?

## Example of thinking fluently

"The sum of 18 and 7 is 25, because if you add 2 from the 7 to 18 it makes 20 and then there is 5 more to add on, so it equals 25."

## Example Year 4 Place Value Challenge

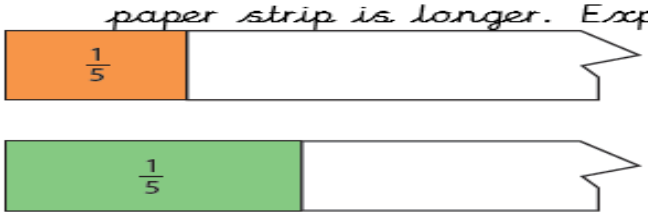
Sometimes, always or never?
A 4 digit number with 700 tens will be greater than one with 6 thousands. Explain.

**"solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions."

National Curriculum

## Example Year 4 Fractions Challenge

1. Two paper strips are ripped. Identify which original paper strip is longer. Explain your answer.




2. Think: Which line is longer?

First: $\frac{1}{2}$

Second: $\frac{1}{3}$

**"reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language."

National Curriculum

## Example Year 3 Addition and Subtraction

Which is greater a or b? How much greater?

$$a + 150 = b - 150$$

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.
National Curriculum

## Example Year 4 Multiplication

Pip worked eight days at £899 per day. Paul only worked for five days and earned £1499 per day. Who earned more? Explain how you could calculate this mentally?

Example Year 6 Algebra

Toby is finding a pair of numbers to fit the equation;

$2a + b = 15$

Both letters represent whole numbers.

Toby states, "One of the numbers must be odd and one must be even."

Do you agree with Toby? Explain your reasoning.

Example Year 6 Measure

A jar contains 30 sweets.


The weight of the jar and sweets is 620g.

David eats 12 sweets.

The weight of the jar and sweets is now 440g.

How much does the jar weigh?

# Part 2

## Mastery approach to the teaching and learning of Mathematics

The Mastery approach

- Achievable for all
- **Deep** and sustainable learning
- The ability to build on something that has already been sufficiently mastered
- The ability to reason about a concept and make connections
- Factual, procedural and conceptual fluency

**Mastery is understanding, not just doing**

The Mastery approach

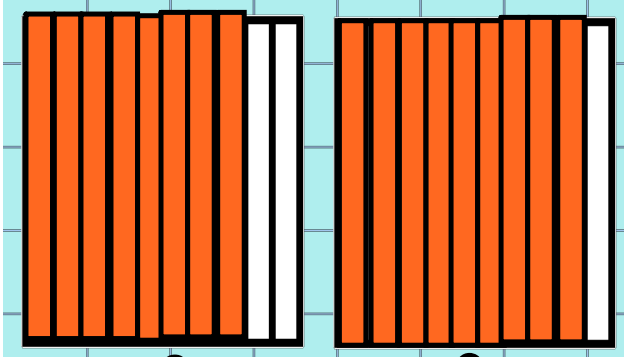
Factual – I know that
Procedural – I know how
Conceptual – I know why

**Mastery is understanding, not just doing**

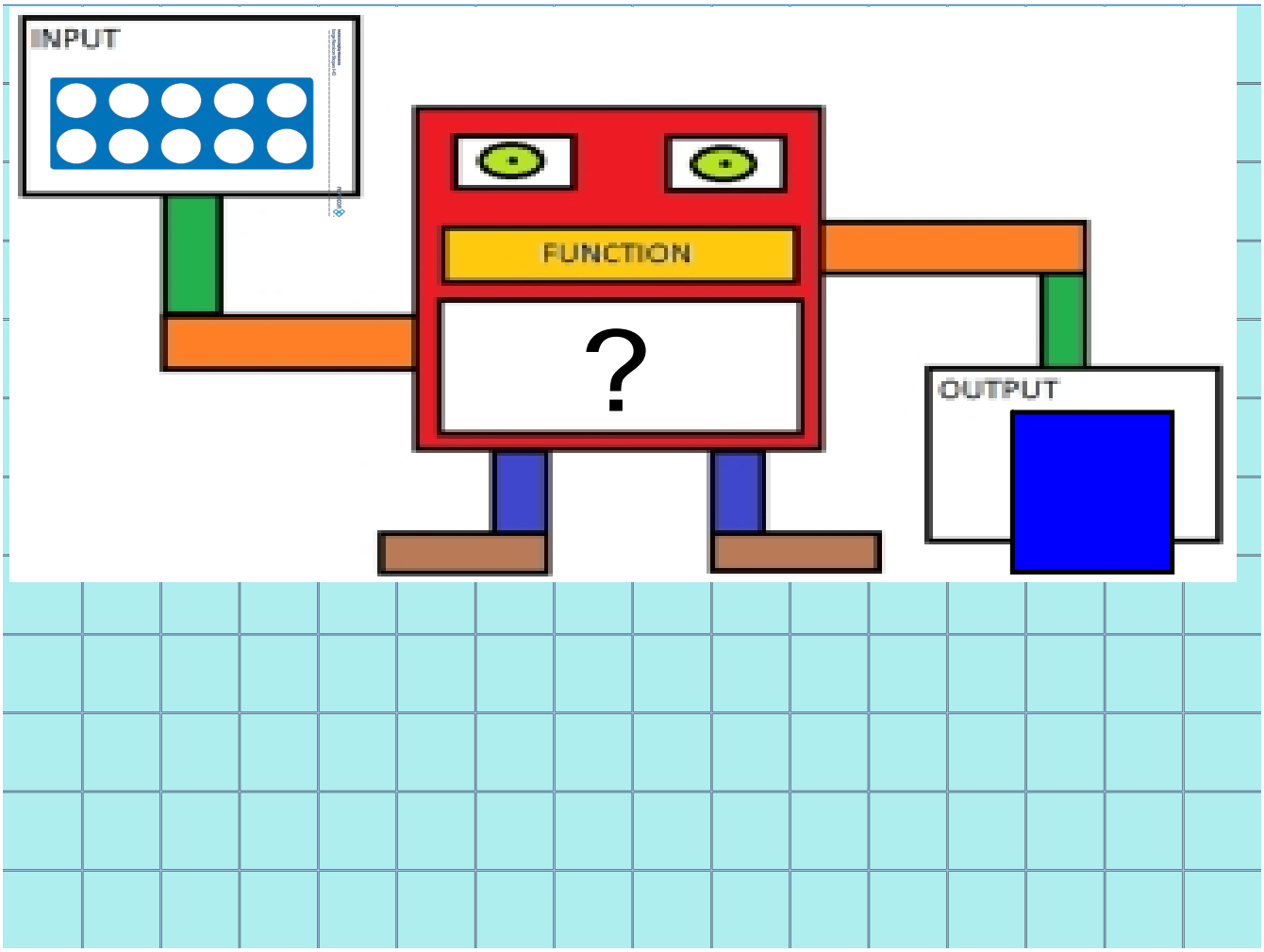
## Part 3 -Model Lesson

- Year 3
- Previously learnt about fractions
- Don't fully understand tenths

What comes next? How do you know?



$\frac{8}{10}$ $\frac{9}{10}$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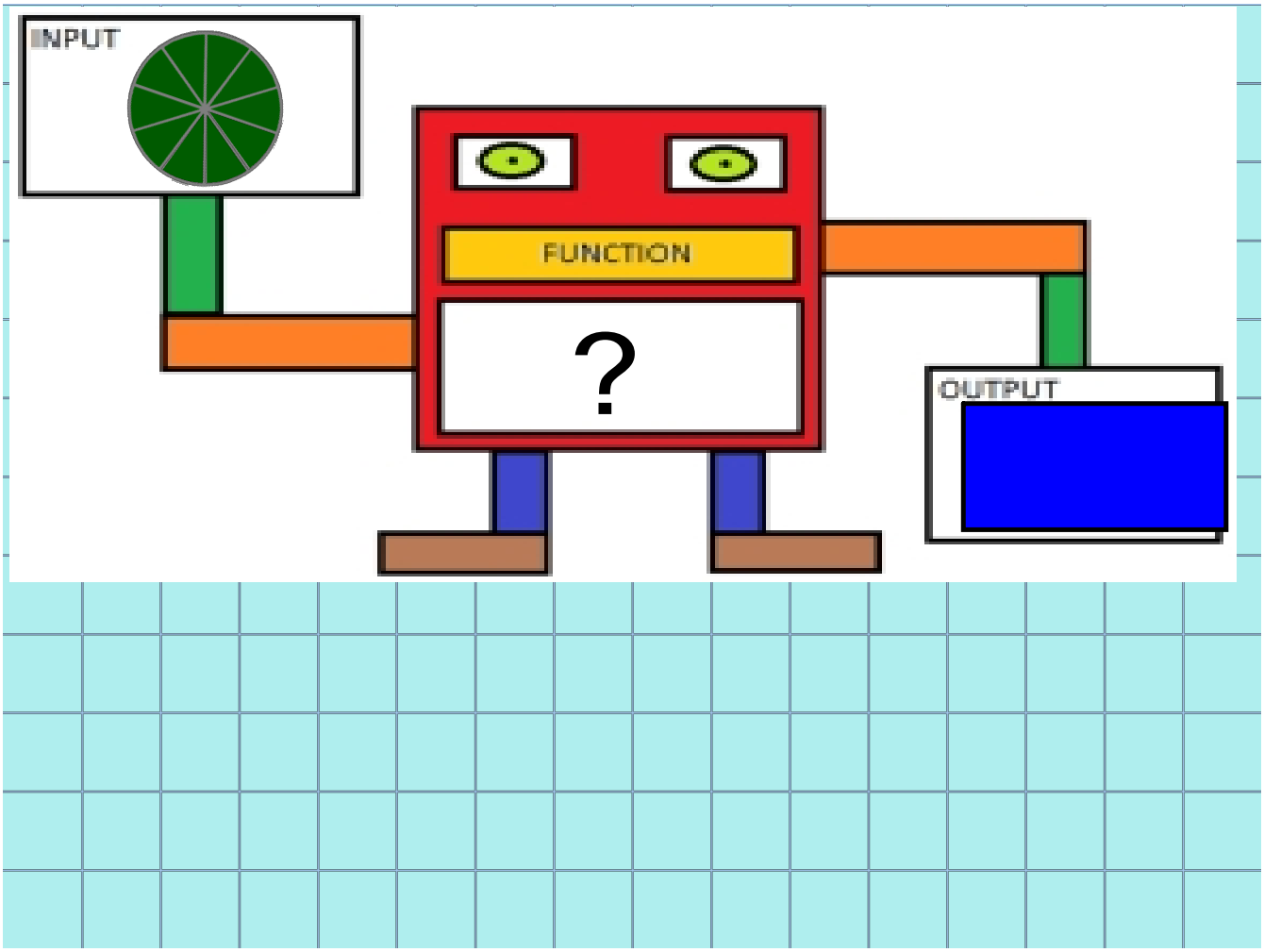
FUNCTION
?
OUTPUT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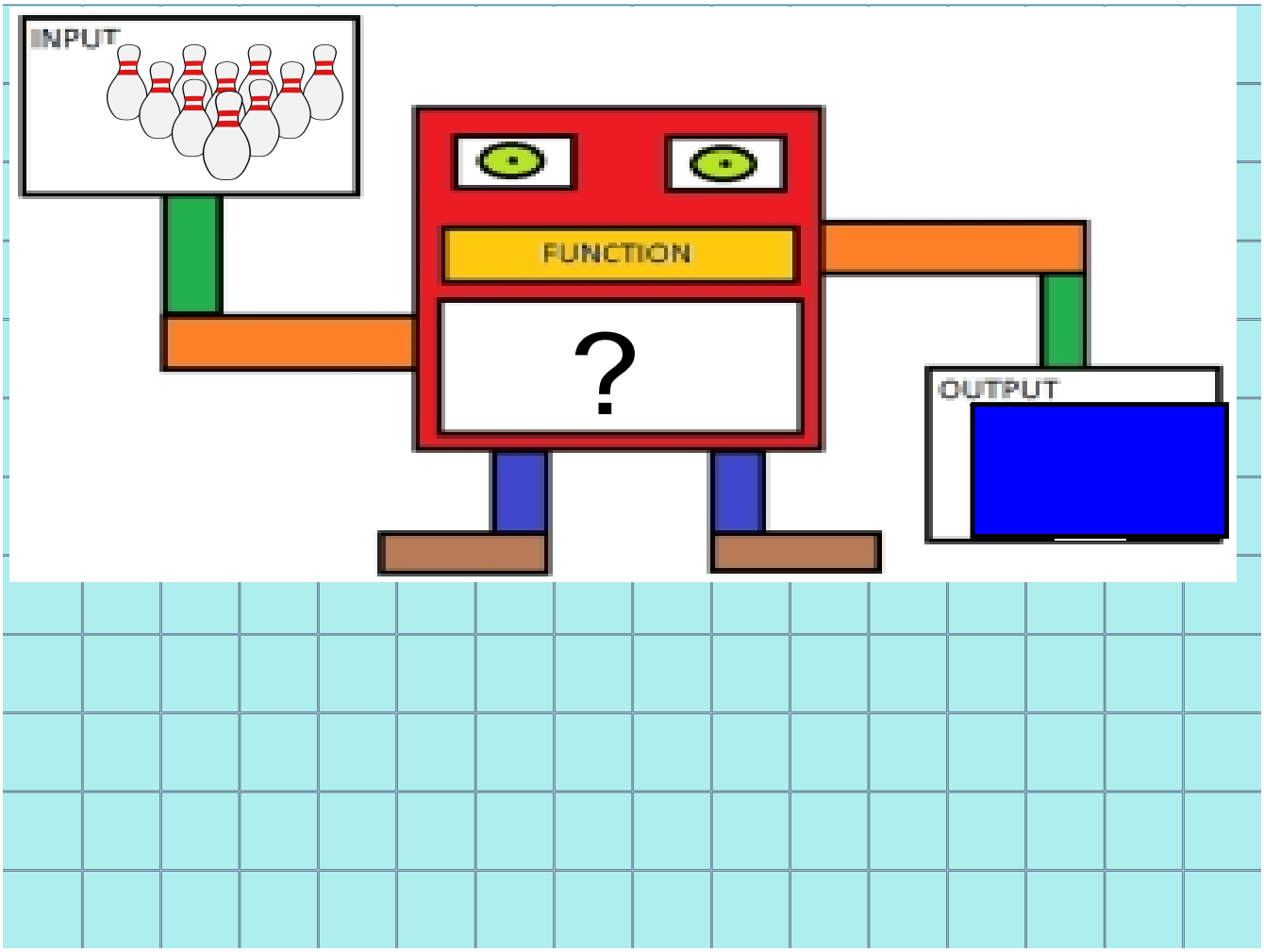
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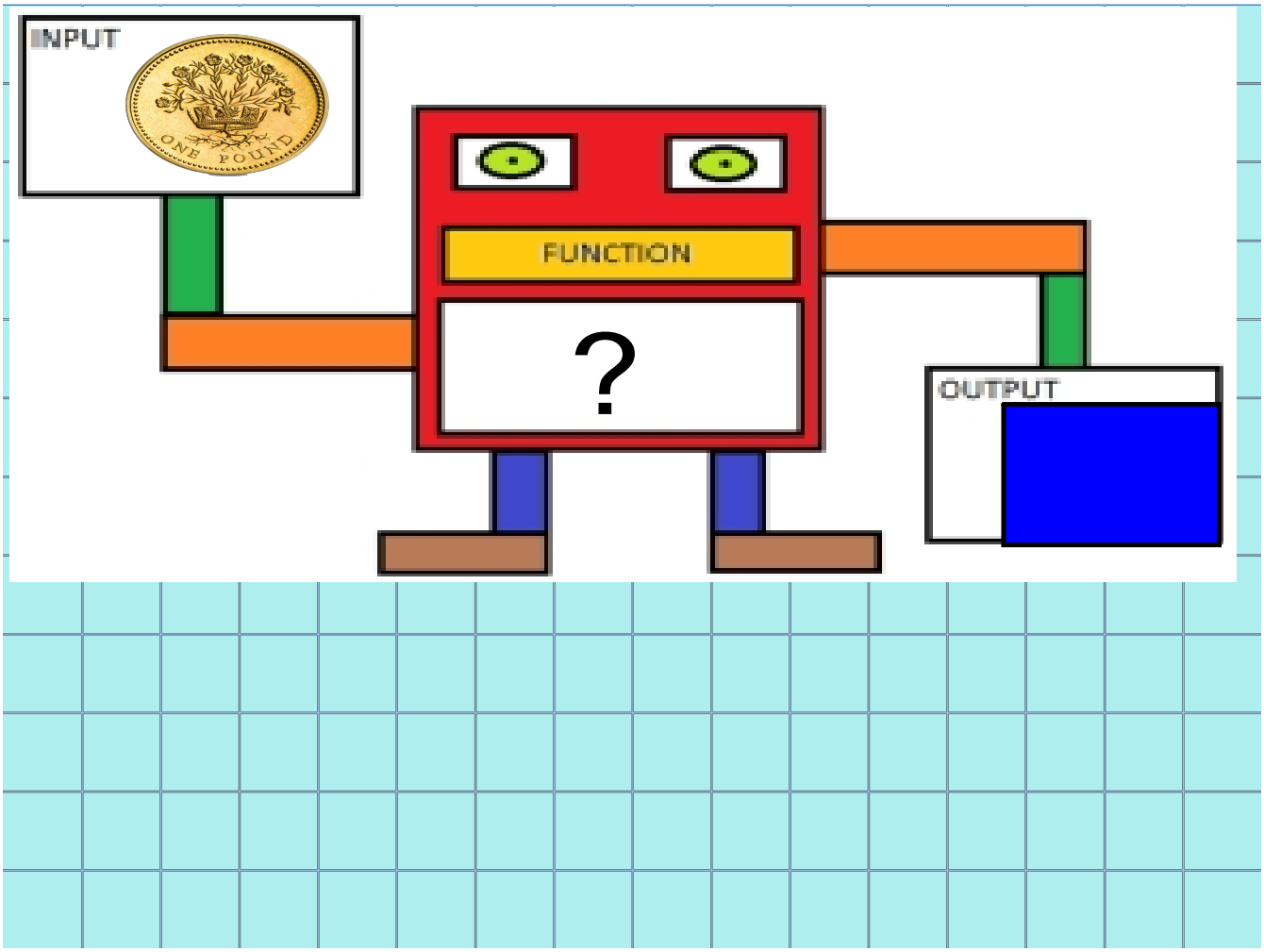
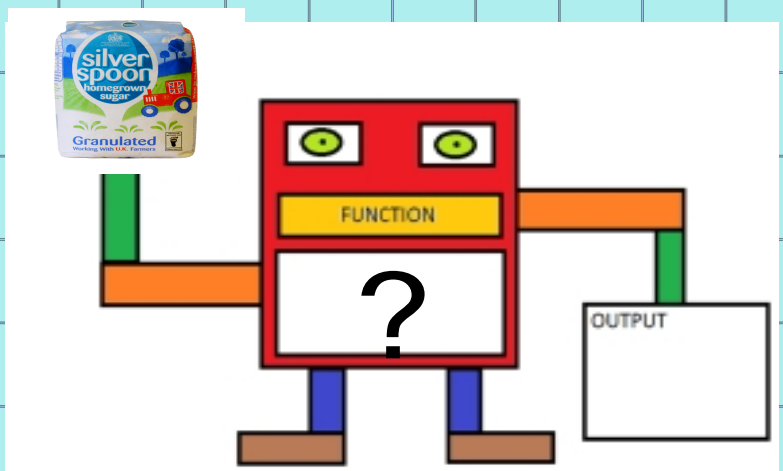
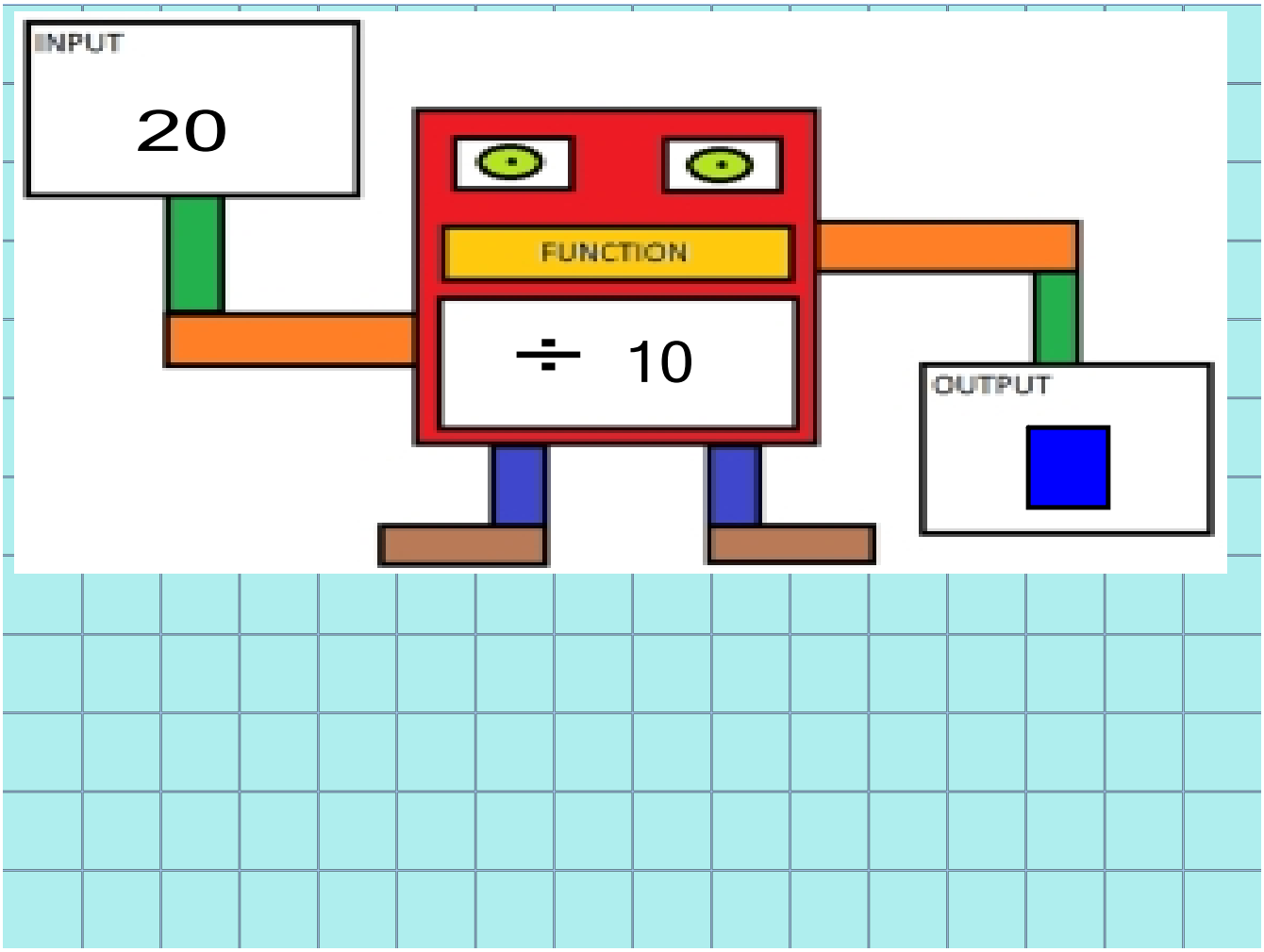
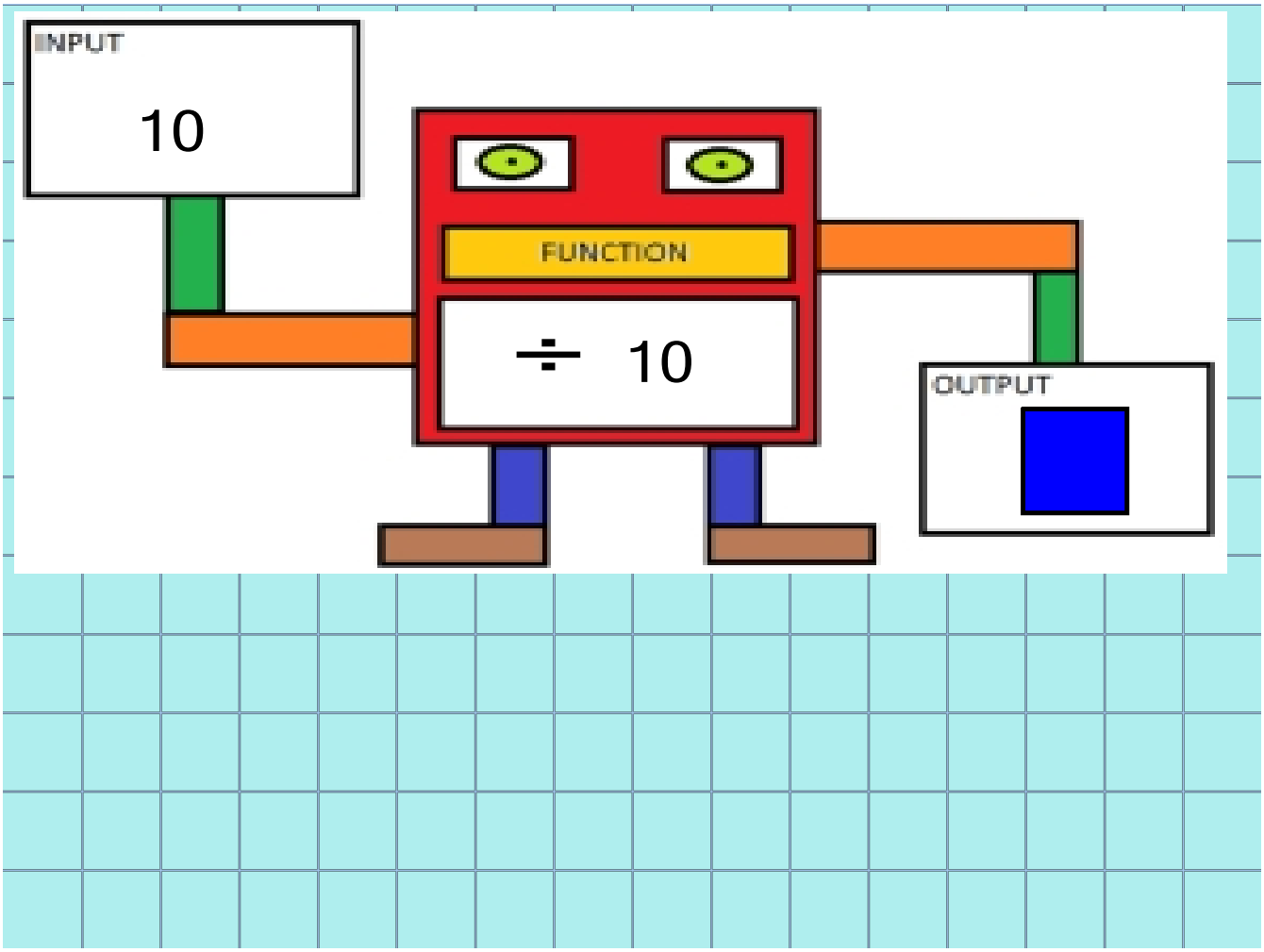
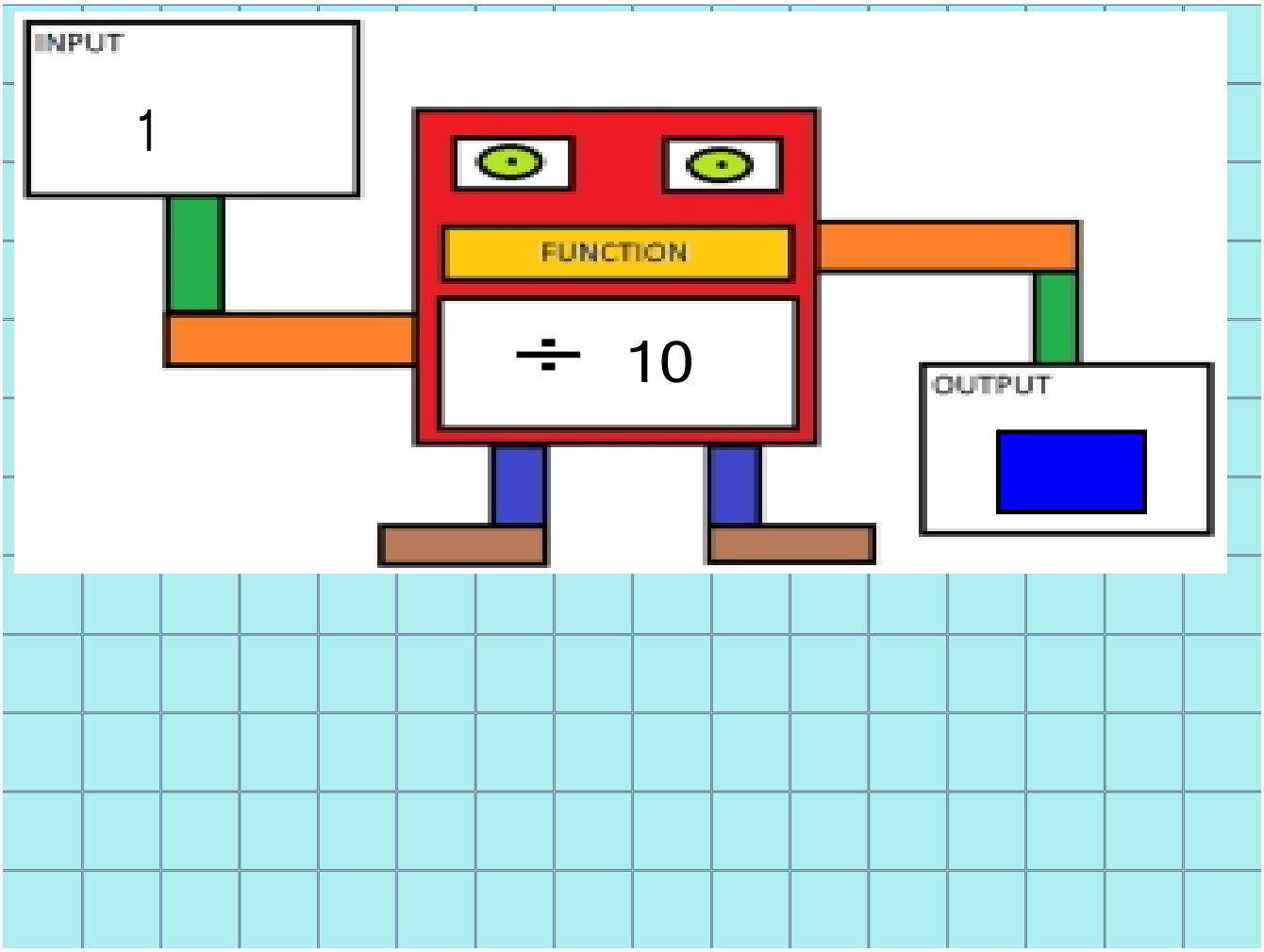

INPUT
ONE POUND
FUNCTION
?
OUTPUT

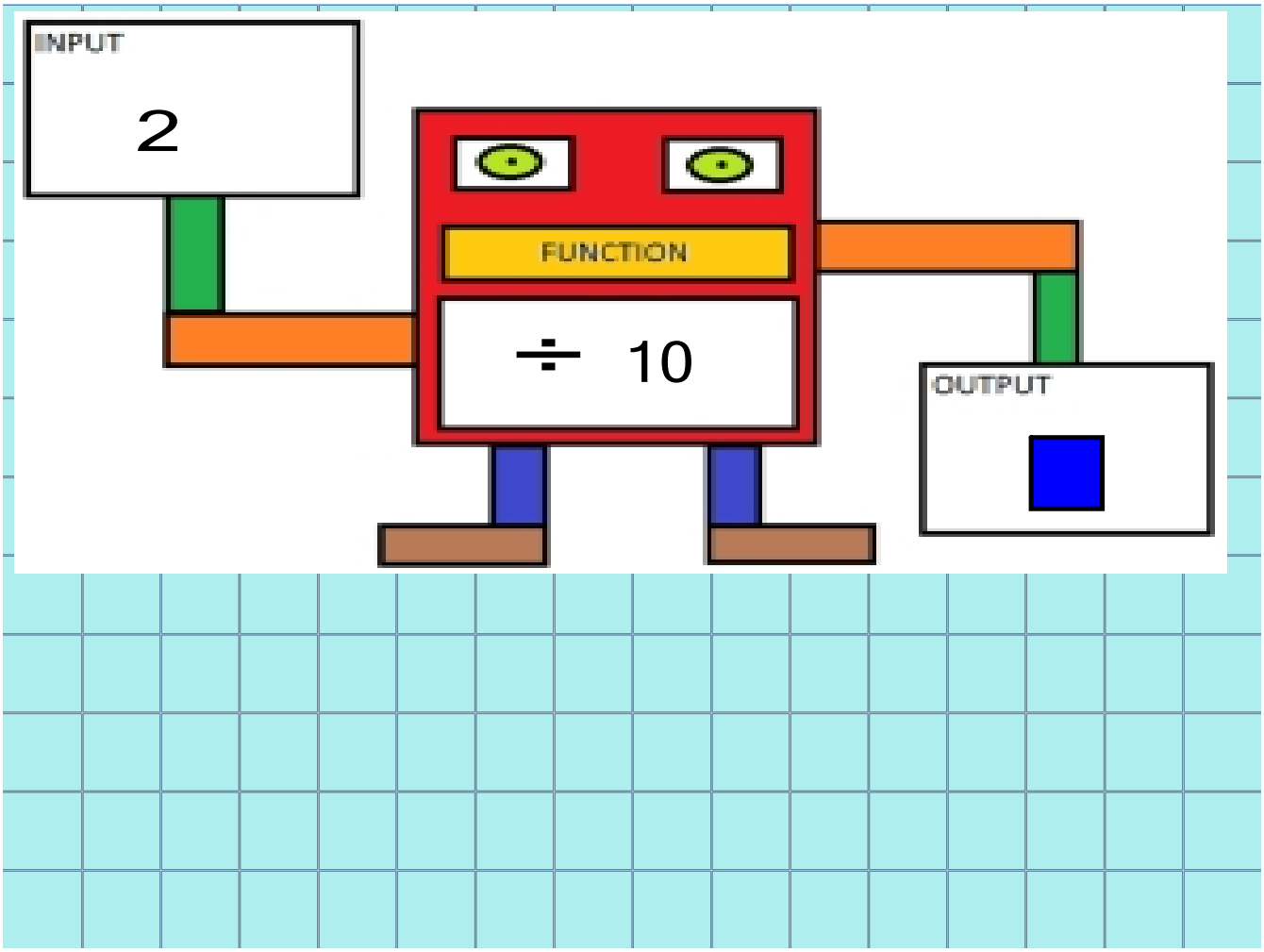
# What do you predict? Why?



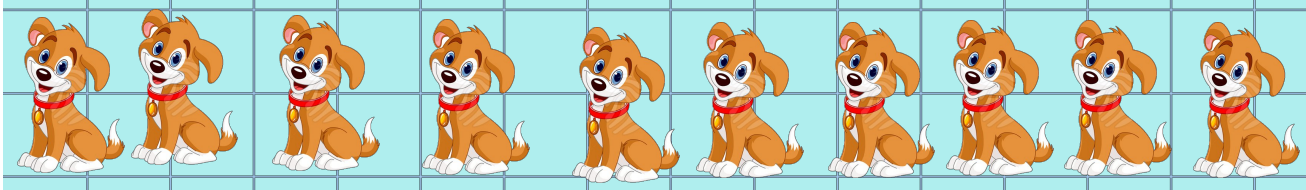

INPUT
20
FUNCTION
÷ 10
OUTPUT


INPUT
10
FUNCTION
÷ 10
OUTPUT

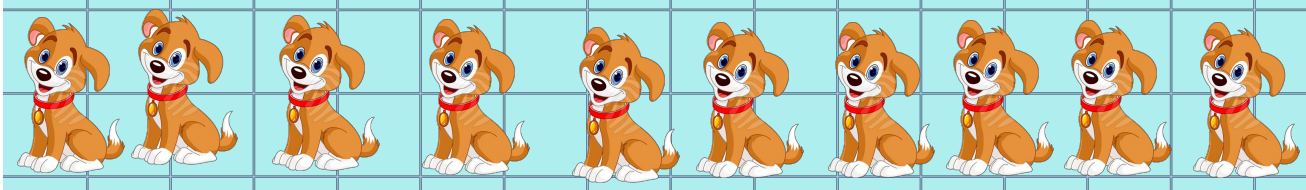

INPUT
1
FUNCTION
÷ 10
OUTPUT


INPUT
2
FUNCTION
÷ 10
OUTPUT

10 dogs share equally 1 tin of dog food.
How much food do they each get?

10 dogs share equally 3 tins of dog food.
How much food do they each get?

Pauline says they each get 3. Is she correct? Captain CC!

$\frac{}{30}$

# Part 4

## How you can support your child at home

Make Maths real to build conceptual understanding:

- Time
- Money
- Mass
- Capacity
- Length

# Fluency