

SPRINGBOARD 6 LESSON 10 FRACTIONS, DECIMALS AND PERCENTAGES 4

TOTAL TIME

30
MINUTES

Objective:

- Use a calculator to convert a fraction to its decimal equivalent and to find a fraction of a quantity

Vocabulary:

- fraction
- decimal fraction
- numerator
- denominator

By the end of the lesson children should be able to:

- convert fractions to decimals;
- calculate a fraction of a number or quantity.

Resources:

- calculators
- whiteboards

ORAL AND MENTAL STARTER

5
MINUTES

Write some fractions on the board, e.g. $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{5}$, $\frac{1}{10}$, $\frac{3}{8}$.

Q: Do you know how to write any of these fractions as decimals?

Remind the children that they should know that $\frac{1}{2} = 0.5$ and that $\frac{1}{10} = 0.1$. Explain that 0.5 and 0.1 are called decimal fractions.

Q: How can we use a calculator to show that $\frac{1}{2} = 0.5$ and that $\frac{1}{10} = 0.1$?

Give out calculators. Establish that $\frac{1}{2}$ means 1 divided by 2 and use the calculators to demonstrate this with children using calculators.

Repeat for $\frac{1}{10}$.

Q: How do we convert $\frac{3}{8}$ to a decimal fraction?

Children work out the equivalent decimal fraction using a calculator. Collect their responses and get them to use their calculator to work out the decimal fraction equivalent of $\frac{7}{16}$. Children show their answer by holding up whiteboards.

Repeat for different fractions.

MAIN TEACHING ACTIVITY

Ask the children 'What is half of 40?' Ask what they divided by to get the answer 20. Repeat this by asking 'What is $\frac{1}{3}$ of 90?' and 'What is $\frac{1}{4}$ of 80?' up to 'What is $\frac{1}{10}$ of 700?'

Establish that when finding a unit fraction we divide by the denominator.

Q: If $\frac{1}{4}$ of 80 is 20, what is $\frac{3}{4}$ of 80?

Establish that we multiply 20 by the numerator 3, to get 60.

Q: What is $\frac{3}{10}$ of 250?

Using their calculators, get the children to find one tenth ($250 \div 10 = 25$) and then three tenths ($25 \times 3 = 75$).

Record this on the board as:

(Find $\frac{1}{10}$) $250 \div 10 = 25$ (Find $\frac{3}{10}$) $25 \times 3 = 75$

Write 680 on the board. Ask the children to find $\frac{1}{10}$ mentally and write (Find $\frac{1}{10}$) $680 \div 10 = 68$, then use their calculator to work out $\frac{4}{10}$, $\frac{9}{10}$, $\frac{3}{10}$ of 680, recording their method and answers on whiteboards.

Discuss the calculations the children did mentally and those they did using a calculator.

Q: How can we find $\frac{5}{6}$ of 300?

Establish that this can be done first by finding $\frac{1}{6}$ of 300, and then multiplying this answer by 5 to get $\frac{5}{6}$. Record as (Find $\frac{1}{6}$) $300 \div 6 = 50$ (Find $\frac{5}{6}$) $50 \times 5 = 250$. Set other questions and get the children to use a mix of mental and calculator methods.

PLENARY

Write 490 kg on the board.

Q: How can we find $\frac{4}{7}$ of this quantity?

Take children's responses and show how the two earlier calculations can be written as one calculation: $(490 \div 7) \times 4 = 280$

Q: The answer is 280 what?

Highlight the need to include the units in the answer.

Ask the children to now work out $\frac{2}{7}$ of 490 kg.

Write down:

$$\frac{1}{7} \text{ of } 490 \text{ kg} = 70 \text{ kg}$$

$$\frac{2}{7} \text{ of } 490 \text{ kg} = 140 \text{ kg}$$

$$\frac{4}{7} \text{ of } 490 \text{ kg} = 280 \text{ kg}$$

Q: What do the answers add up to?

Q: Why?

Remind the children that they have found 1 + 2 + 4 sevenths altogether, this is seven sevenths, and the total is 490 kg.

Remember:

You find a fraction of a number or quantity by first dividing the quantity by the denominator and then multiplying by the numerator.

Always include units in your answer.

**LESSON 10 RELATED TEST QUESTION
1998 TEST B (CALCULATOR) PAPER****20**

Calculate 24% of 525



1 mark

MARK SCHEME

126

ANALYSIS OF CHILDREN'S ANSWERS

- The most common error was to regard the percentage as a fraction $\frac{1}{24}$. Only about half of children working at Level 5 and 13% at Level 4 responded correctly.
- Children had few strategies to solve this question using a calculator.

IMPLICATIONS FOR PLANNING

- Children need to be taught how to use the calculator to find percentages of a quantity. They need to be taught when it is appropriate to do so and when a mental method might be better, for example, when finding 10% of 500.
- Children need to be taught a checking strategy, in this case recognising that 24% is close to $\frac{1}{4}$ and $\frac{1}{4}$ of 500 is 125.
- Children who recognise that 24% can be represented as $\frac{24}{100}$ should be encouraged to find 24% by finding $\frac{24}{100}$ using $(525 \div 100) \times 24$.