Division Prior Assessment Question 6

Objective: I can express a remainder as a decimal in the context of money.

NASMD 3: 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.
NASDM 8: solve problems involving addition, subtraction, multiplication and division
NFDP 9: use written division methods in cases where the answer has up to two decimal places

Teacher Input Ideas:

Set up a whole class context that links to a theme or topic the children are learning about or introduce in an engaging context. Such as the classroom could be set up as restaurant tables. Each table could be set up with table cloths, food or pictures of food. Each table to have a range of number of seats or images of people (3,4,5 and 6 at each table). On each table, one set of the purple, green and yellow activity tags to be cut up and displayed. This context can be used for the introduction and the main activities.

Inform the children that they are at a restaurant and they have been eating a meal with their friends. They have all ordered different things and now the bill/total price have been given to them (total amounts/bills are the price tags on each coloured activity). Ask the children to share some of the amounts with the class that they have on their table (there should be yellow, green and purple tags on each table and children can be mixed with children completing a different coloured activity). Now we want to share the bill equally. Encourage the children to notice how many children are on their table and that they need to divide the total of the bill by how many children there are (you could introduce that we are working out the average each person should pay).

Display £72 on the board. Ask the children to now work out how much each person on their table needs to play (all tables should have either 3,4,5, or 6 children on. This number is divisible by all those amounts). Discuss how the children have worked this out. Some children should have suggested mental methods such as 72 divided by 3, 4 or 6. Now look together at 72 divided by 5. Encourage the children to suggest how they can work this out. Some children may be able to work out mentally. Look at using a written method:

```
    1 4 . 4
   _____
5 | 7 ²2 . ²0 0
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Talk through how the decimal point is introduced. Discuss how 72 is the same as 72.00. Encourage the children to look at how amounts are carried over into the next column. Discuss how we could say 14.4 what is the value of this in money? Is it £14.04 or is it £14.40? Discuss strategies such as writing 72 as 72.00 in advance for the context of money, or instead of writing 14 remainder 2, we want to work out the remainder as a decimal so we place a decimal point and carry amounts over.

Now introduce £25.50. Either select an amount together (such as 3) or let children try for how many people they have on their table (must be 3,5 or 6)

```
    0 8 . 5 0
   _____
      ²2   ¹1
3 | 2 5 . 5 0
```

```
    0 4 . 2 5
   _____
      ²2   ¹1 ³3
6 | 2 5 . 5 0
```

Now look at dividing by 4

```
    0 6 . 3 7 5
   _____
      ²2   ¹1 ³3 ²2
4 | 2 5 . 5 0 0
```

Discuss how we have created a number with 3 decimal places. Discuss this in the context of money. Can you get such an amount? Discuss how this can be done if we were to use a different context but for money we write to 2 decimal places. What would you do in this situation in a restaurant? How much would you pay each?

Ideas for different contexts:
- savings to spend on Christmas presents or birthday presents for friends/ family
- Tickets to theatre shows for Christmas
- Tickets for days out
- Restaurant meals
- Train/bus fares (travel expenses)
- Family shopping bills

Practice Activities

Purple Practice: Most suited for children who made errors in Q6 of the prior learning assessment and need to further secure dividing with decimals to 2 decimal places.

Practical activity: Using the same context introduced as above, place a set of purple tags onto each table. Either place a large number at each table or that many chairs at each table for the children to sit at and divide by. The tables should have 3,4,5,6 either displayed or that many chairs as all price tags on the purple sheet are divisible by 3,4,5, and 6. All purple tags ensure that an amount up to 2 decimal places has been created. The children also need to think about if the amount is to one decimal place how this will be written in the content of money.

Green Practice: Most suited for children who could answer Q6 correctly on the prior learning assessment.

The activity should be set up as above but green tags should also be placed onto the tables. Children should select the green tags to divided decimals by whole amounts and begin to express any remainders as decimals. Not all green price tags are divisible by 3,4,5 and 6. Most are, but there are some that create 3 or more decimal places. Talk to the children about this. What does this show us in the context of money? What would they do in this situation when sharing the bill equally.

Yellow Practice Most suited for children who could answer Q6 correctly on the prior learning assessment and are ready to discuss the use of reoccurring decimal digits.

Children could be challenged to sort the yellow price tags into ones that are and ones that are not divisible by 3,4,5 and 6 (in the context of money). Discuss how the children have sorted these? What are they looking for? How did they perform the division sum? What challenges did they find? Look at when reoccurring 3 comes up, what this means. Do the children know when to stop? Introduce how this can be shown with a dot over the 3 in the second decimal place. Discuss what people do in different situations with this. Is 1 pound equally shared by 3? Often people round, but if three people put in 33p to make 1 pound would we have enough?

Mastery The children need to explore the best way to purchase tickets to an aquarium for a family of 5. The children should explore different combinations of tickets and work out which is the best value for money per person.

Encourage children to share their strategies as to how they will work out which one is the best value per person. How are they going to go about this and how will they prove this?

The children may suggest adding the ticket combinations together and then dividing by 5 to see how much each person costs. Encourage the children to suggest ways to record their findings to ensure they have tried all combinations and found the best one.

Answers:

Purple, Green and Yellow: Children to mark work with others or in small groups to discuss how they worked it out.

Mastery:

Possible combinations

- 2 adult single tickets
  3 child single tickets

  = 63.85 ÷ 5 =

  £12.77 pp

- 2 adult tickets
  2 child ticket   and   1 single child ticket

  = 56.95 ÷ 5 =

  £11.39 pp

- family of 4 ticket
  1 child ticket

  = 56.70 ÷ 5 =

  £11.34 pp

- Family of 6 ticket
  58 ÷ 5 =
  £ 11.60 pp

BRICKWORK
Mathematics

Practical activity

£21

£72

£25.80

£56.40

£75

£102

Practical Activity

£93

£102.45

£66.30

£56.40

£56.76

£96.60

Practical activity

£56.40

£24.90

£78.96

£78.60

£104

£150

BRICKWORK
mathematics

The Stranney family decide to go for a day out to an aquarium. There are 5 members in the family. There are 2 adults and 3 children. Below is the price list for the aquarium.

Ticket Prices

1 adult £17.75

1 child £9.45

2 children £12.00

**A small family ticket: £47.25
(2 adults and 2 children)**

**A large family ticket: £58.00
(2 adults and 4 children)**

Which tickets should the Stranney family purchase to ensure they pay the cheapest price per person?

How can you prove you have found the best deal?