CM1 Mathématiques : calcul Mcal L8 p *1 / 3*

**L9. Diviser par un nombre à un chiffre**

CORRECTION

**Programme**

• Calcul posé: mettre en œuvre un algorithme de calcul posé pour la division.

• Vérifier la vraisemblance d’un résultat, notamment en estimant son ordre de grandeur.

• Résoudre des problèmes mettant en jeu les quatre opérations.

**Compétences travaillées**

• Estimer un ordre de grandeur d’un quotient.

• Appliquer une technique opératoire.

• Résoudre des problèmes relevant de la division.

Remarque : Au CE2, la division a été abordée dans des situations simples de partage et de regroupement. La technique opératoire de la division est donc une découverte du CM1: elle nécessite une bonne maitrise des tables de multiplication.

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| *Cherchons*  Six amis ont participé à une chasse aux œufs de Pâques dans le jardin du château de Bouthéon.  A eux six, ils en ont trouvé 76.  **Peuvent**-ils se les partager équitablement ? |  |

Correction

**☞** **Lui faire découvrir** la situation de recherche et lui demander ce que l’on doit chercher:

si chacun des 6 enfants aura le même nombre d’œufs de Pâques.

**☞** **Lui demander**: Comment répondre à cette question?

Si 6 est un diviseur de 76, alors, les amis pourront se partager les œufs équitablement.

➞ Quelle opération allons-nous effectuer pour répondre à cette question? Une division.

➞ Quel nombre va-t-on diviser? 76, le dividende.

➞ Quel nombre va diviser? 6, le diviseur.

**☞** **Tracer la potence** au tableau, et y placer les nombres de la situation de recherche.

**☞** **Lui demander** si le résultat de la division sera compris entre 0 et 10 ou entre 10 et 100. Il est compris entre 10 et 100 car: 6 × 10 = 60 (trop petit).

6 × 100 = 600 (c’est plus que le dividende).

**☞** **Expliquer qu’ainsi**, on peut savoir si le quotient sera un nombre à 1 chiffre ou à 2 chiffres.

**☞** **Placer deux points** à la place du quotient dans la potence

**☞** **Lui faire lire** la leçon et **lui demander** d’appliquer au tableau la même technique en l’oralisant:

**L9. Diviser par un nombre à un chiffre**

**On cherche à diviser 97** par **8.**

☞ Avant de poser la division, **on évalue** **le nombre de chiffres** du quotient.

8 × **10** < **97** < 8 × **100**

**Le quotient** sera compris entre 10 et 100 : il aura donc **deux chiffres**.

☞ Pour trouver **le nombre de** **dizaines** **du quotient**, on divise les dizaines du **dividende** par **8**.

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| ➊ **On partage les dizaines :**  Dans 9, combien de fois 8 ?  8 × **1** = 8. Cela fait **1** dizaine au quotient.  9 - 8 = 1. Il reste 1 dizaine  *On vérifie que 1 < 8,* on peut poursuivre | 009 |

☞ Pour trouver le nombre **d’unités**, on **abaisse** les **7 unités** du dividende.

Avec la dizaine restante, cela fait **17 unités**. On divise ce nombre par **8**.

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| ➋  **On partage les unités :**  Dans 17, combien de fois 8 ?  8 × **2** = 16. Cela fait **2 unités** au quotient.  17 - 16 = 1. Il reste 1 unité.  *On vérifie que 1 < 8.* | 009 |

**💣 Attention !** **Vérifier que :** le reste soit toujours inférieur **au diviseur**. Ici 1 < 8

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| On **vérifie** la division : | (quotient x diviseur) + reste = dividende |

**(12 × 8) + 1 = 97.**

− on commence par diviser les dizaines (7) : dans 7, combien de fois 6? 6 × 1 = 6, le chiffre des dizaines au quotient est donc 1;

− on soustrait 6 à 7: il reste 1 dizaine à laquelle on ajoute les 6 unités;

− on divise 16 unités par 6: dans 16 combien de fois 6? 6 × 2 = 12, le chiffre des unités du quotient est donc 2;

− on soustrait 12 à 16: il reste 4 unités.

Il est important qu’il comprenne ce que sont le quotient et le reste.

➞ Combien chaque ami aura-t-il d’œufs? Chaque ami aura 12 œufs c’est le quotient, résultat de la division.

➞ Que représente le nombre 4 en bas à gauche de la potence? Il s’agit du reste: après distribution équitable, il restera 4 œufs de Pâques dans le panier qui ne seront pas distribués.

**☞** **Le questionner** pour l’amener à vérifier le résultat de la division par la multiplication:

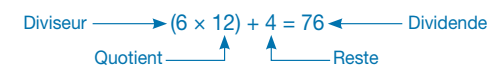
➞ Combien d’œufs ont finalement été distribués?

6 × 12 = 72. 72 œufs ont été distribués.

➞ Comment retrouver le bon nombre d’œufs (c’est-à-dire les 76 œufs trouvés)? Il faut ajouter aux œufs distribués les œufs restant dans le panier, c’est à dire le reste :

72 + 4 = 76.

Conclure:



Difficultés éventuelles

• La technique de la division à un chiffre n’est pas très difficile si l’on connait ses tables. Pour les élèves les plus en difficulté, leur laisser les tables de multiplication à portée de main.

• L’autre difficulté est la division d’un nombre à 3 chiffres dont le chiffre des centaines est inférieur au diviseur (ex.: 468: 6). Traiter ce cas.

*Evaluer le nombre de chiffres du quotient*

**☺ Exercice 1 : Observe** les encadrements et **complète** la phrase.

Ex: 74 : 4 🡪 4 x 1O < 74 < 4 x 1OO Le quotient aura 2 chiffres

94 : 7 🡪 7 x 10 < 94 < 7 x 100 Le quotient aura … chiffres.

b. 836 : 6 🡪 6 x 100 < 836 < 6 x 1000 Le quotient aura … chiffres.

c. 914 : 8 🡪 8 x 100 < 914 < 8 x 1000 Le quotient aura … chiffres.

d.1256 : 9 🡪 9 x 100 < 1256 < 9 x 1000 Le quotient aura … chiffres.

e. 85 : 3 🡪 3 x 10 < 85 < 3 x 100 Le quotient aura … chiffres.

f. 7123 : 5 🡪 5 x 1000 < 7123 < 5 x 10 000 Le quotient aura … chiffres.

Correction

a. Le quotient aura 2 chiffres.

b. Le quotient aura 3 chiffres.

c. Le quotient aura 3 chiffres.

d. Le quotient aura 3 chiffres.

e. Le quotient aura 2 chiffres.

f. Le quotient aura 4 chiffres

**☺ Exercice 2 :** Parmi les quotients proposés, choisis celui qui convient. **Justifie** ta réponse

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| Ex : 97 : 4 |  | | 16 car le quotient a 2 chiffres. |
| 1. 89 : 4 2. 76 : 3 3. 647 : 5 4. 914 :7 | |  | |

Correction

a. 89: 4 22 car le quotient a 2 chiffres.

b. 76: 3 25 car le quotient a 2 chiffres.

c. 647: 5 129 car le quotient a 3 chiffres.

d. 914: 7 130 car le quotient a 3 chiffres.

**😐 Exercice 3 :** Problème

656 colis sont répartis dans trois camions pour être envoyés.

Chaque camion va transporter: environ 20 colis ? 200 colis ? 2 000 colis ?

Correction

656: 3

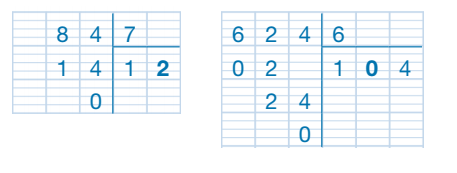
Chaque camion va transporter environ 200 colis.

*Poser la division*

**☺ Exercice 4 :** **Vérifie** les divisions et **repose** celle(s) qui comporte (nt) des erreurs.

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Correction



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| **☺ Exercice 5 :** Problème  Combiens de cartons de 6 bouteilles peut-on remplir avec 94 bouteilles ? Restera-t-il des bouteilles ?  Correction  94: 6 = ?  Le nombre de chiffre au quotient est :  6x10 < 94 < 6x 100 donc 2 chiffres au quotient.  quotient = 15 reste = 4  On peut remplir 15 cartons de 6 bouteilles avec 94 bouteilles et il restera 4 bouteilles. | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  | **9** | **4** |  | **6** |  | | - | **6** |  |  | **1** |  | |  | 3 |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  | **9** | **4** |  | **6** |  | | - | **6** |  |  | **1** | 5 | |  | 3 | 4 |  |  |  | | - | 3 | 0 |  |  |  | |  | 0 | 4 |  |  |  | |

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| **☺ Exercice 6 :** Problème  Combien de bouquets de 7 roses peut-on faire avec 86 roses ? restera-t-il des roses ?  Correction  86 : 7 = ?  Le nombre de chiffre au quotient est :  7x10 < 86 < 7x100 donc 2 chiffres au quotient.  quotient = 12 reste = 2  On peut faire 12 bouquets de 7 roses avec 86 roses et il restera 2 roses. | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  | **8** | **6** |  | **7** |  | | - | **7** |  |  | **1** |  | |  | 1 |  |  |  |  | |  |  |  |  |  |  | |  |  |  |  |  |  | | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  | |  | **8** | **6** |  | **7** |  | | - | **7** |  |  | **1** | 2 | |  | 1 | 6 |  |  |  | | - | 1 | 4 |  |  |  | |  | 0 | 2 |  |  |  | |

**😐 Exercice 7 :** Problème

Séréna coupe un ruban de 525 cm en quatre morceaux de même longueur.

Calcule la longueur en cm de chaque morceau.

Restera-t-il du ruban ?

Correction

525 : 4 = ?

Le nombre de chiffre au quotient est :

4x100 < 525 < 4x1000 donc 3 chiffres au quotient.

quotient = 131 reste = 1

Chaque morceau aura une longueur de 131 cm et il restera 1 cm.

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**😐 Exercice 8 :** Problème

Un confiseur a préparé 680 macarons. Combien de boites de 8 macarons peut-il vendre ? lui en restera-t-il ?

Correction

680 : 8 = ?

Le nombre de chiffre au quotient est :

8x10 < 680 < 8x100 donc 2 chiffres au quotient.

680: 8 = 85. Il peut vendre 85 boites de 8 macarons et il n’en restera pas

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| **😐 Exercice 9 :** Problème  Lucie a fait des taches en écrivant ses divisions.  **Recopie**-les en écrivant les chiffres manquants. | Correction |

**😐 Exercice 10 :** **Pose** les divisions puis **calcule**.

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| 544 : 3  Le nombre de chiffre au quotient est :  3x100 < 544 < 3x1000 donc 3 chiffres au quotient.  544: 3 = 181  Reste 1. | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  | **5** | **4** | **4** |  | **3** |  |  | | - | 3 |  |  |  | 1 | 8 | 1 | |  | 2 | 4 |  |  |  |  |  | | - | 2 | 4 |  |  |  |  |  | |  | 0 | 0 | 4 |  |  |  |  | |  |  | - | 3 |  |  |  |  | |  |  |  | 1 |  |  |  |  | | 925 : 4  Le nombre de chiffre au quotient est :  4x100 < 925 < 4x1000 donc 3 chiffres au quotient.  925 : 4 = 231  Reste 1. | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  | **9** | **2** | **5** |  | **4** |  |  | | - | 8 |  |  |  | 2 | 3 | 1 | |  | 1 | 2 |  |  |  |  |  | | - | 1 | 2 |  |  |  |  |  | |  | 0 | 0 | 5 |  |  |  |  | |  |  | - | 4 |  |  |  |  | |  |  |  | 1 |  |  |  |  | |

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| 807  : 6  Le nombre de chiffre au quotient est :  6x100 < 807 < 6x1000 donc 3 chiffres au quotient.  807: 6 = 134  Reste 3. | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  | **8** | **0** | **7** |  | **6** |  |  | | - | 6 |  |  |  | 1 | 3 | 4 | |  | 2 | 0 |  |  |  |  |  | | - | 1 | 8 |  |  |  |  |  | |  | 0 | 2 | 7 |  |  |  |  | |  | - | 2 | 4 |  |  |  |  | |  |  | 0 | 3 |  |  |  |  | | 734 : 5  Le nombre de chiffre au quotient est :  5x100 < 734 < 5x1000 donc 3 chiffres au quotient.  734 : 5 = 146  Reste 4. | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  | **7** | **3** | **4** |  | **5** |  |  | | - | 5 |  |  |  | 1 | 4 | 6 | |  | 2 | 3 |  |  |  |  |  | | - | 2 | 0 |  |  |  |  |  | |  | 0 | 3 | 4 |  |  |  |  | |  | - | 3 | 0 |  |  |  |  | |  |  | 0 | 4 |  |  |  |  | |

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| 695  : 4  Le nombre de chiffre au quotient est :  4x100 < 695 < 4x1000 donc 3 chiffres au quotient.  695: 4 = 173  Reste 3. | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  | **6** | **9** | **5** |  | **4** |  |  | | - | 4 |  |  |  | 1 | 7 | 3 | |  | 2 | 9 |  |  |  |  |  | | - | 2 | 8 |  |  |  |  |  | |  | 0 | 1 | 5 |  |  |  |  | |  | - | 1 | 2 |  |  |  |  | |  |  | 0 | 3 |  |  |  |  | | 485 : 3  Le nombre de chiffre au quotient est :  3x100 < 485 < 3x1000 donc 3 chiffres au quotient.  485 : 3 = 161  Reste 2. | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  | **4** | **8** | **5** |  | **3** |  |  | | - | 3 |  |  |  | 1 | 6 | 1 | |  | 1 | 8 |  |  |  |  |  | | - | 1 | 8 |  |  |  |  |  | |  | 0 | 0 | 5 |  |  |  |  | |  |  | - | 3 |  |  |  |  | |  |  | 0 | 2 |  |  |  |  | |

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| 742  : 6  Le nombre de chiffre au quotient est :  7x100 < 742 < 7x1000 donc 3 chiffres au quotient.  742: 6 = 123  Reste 4. | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  | **7** | **4** | **2** |  | **6** |  |  | | - | 6 |  |  |  | 1 | 2 | 3 | |  | 1 | 4 |  |  |  |  |  | | - | 1 | 2 |  |  |  |  |  | |  | 0 | 2 | 2 |  |  |  |  | |  | - | 1 | 8 |  |  |  |  | |  |  | 0 | 4 |  |  |  |  | | 436 : 5  Le nombre de chiffre au quotient est :  5x10 < 436 < 5x100 donc 2 chiffres au quotient.  485 : 3 = 87  Reste 1. | **Remarque :**  Dans 4 on ne peut pas faire des paquets de 5, il faut donc prendre 43   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | |  | **4** | **3** | **6** |  | **5** |  | | - | 4 | 0 |  |  | 8 | 7 | |  | 0 | 3 | 6 |  |  |  | |  | - | 3 | 5 |  |  |  | |  |  | 0 | 1 |  |  |  | |

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| **😐 Exercice 11 :** **Reproduis** et **complète** le tableau.   |  |  |  |  | | --- | --- | --- | --- | | dividende | diviseur | quotient | reste | | 835 | 6 |  |  | |  | 5 | 85 | 1 | | 742 | 4 |  |  | |  | 8 | 54 | 3 | | Correction   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | dividende | diviseur | quotient | reste | | **a** | 835 | 6 | **139** | **1** | | **b** | **426** | 5 | 85 | 1 | | **c** | 742 | 4 | **185** | **2** | | **d** | **435** | 8 | 54 | 3 | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| a : Il faut faire la division 835 : 6  Le nombre de chiffre au quotient est :  6x100 < 835 < 6x1000 donc 3 chiffres au quotient.  835: 6 = 139  Reste 1. | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  | **8** | **3** | **5** |  | **6** |  |  | | - | 6 |  |  |  | 1 | 3 | 9 | |  | 2 | 13 |  |  |  |  |  | | - | 1+1 | 8 |  |  |  |  |  | |  | 0 | 5 | 5 |  |  |  |  | |  | - | 5 | 4 |  |  |  |  | |  |  | 0 | 1 |  |  |  |  | | b : comme  dividende = (quotient x diviseur) + reste  on calcule d’abord la multiplication 54 x 8 | |
| |  |  |  | | --- | --- | --- | | 4 | 2 |  | |  | 8 | 5 | | x |  | 5 | | 4 | 2 | 5 | | On ajoute ensuite le reste : 425 + 1 = 426 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| c : Il faut faire la division 742 : 4  Le nombre de chiffre au quotient est :  4x100 < 742 < 4x1000 donc 3 chiffres au quotient.  742: 4 = 185  Reste 2. | |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  |  | |  | **7** | **4** | **2** |  | **4** |  |  | | - | 4 |  |  |  | 1 | 8 | 5 | |  | 3 | 4 |  |  |  |  |  | | - | 3 | 2 |  |  |  |  |  | |  | 0 | 2 | 2 |  |  |  |  | |  | - | 2 | 0 |  |  |  |  | |  |  | 0 | 2 |  |  |  |  | | d : comme  dividende = (quotient x diviseur) + reste  on calcule d’abord la multiplication 85 x 5 | |
| |  |  |  | | --- | --- | --- | | 4 | 3 |  | |  | 5 | 4 | | x |  | 8 | | 4 | 3 | 2 | | On ajoute ensuite le reste : 432 + 3 = 435 |

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| **😐 Exercice 12 :** Problème  L’école du coteau organise une course de relais pour ses 72 élèves de CM1.  1er Combien d’équipes de 3 élèves peut-on faire ? De 4 élèves ? De 6 élèves ?  2ème Peut-on faire des équipes de 5 élèves ? Pourquoi ? | Correction  a. 72: 3 = 24. On peut faire 24 équipes de 3 élèves.  72: 4 = 18. On peut faire 18 équipes de 4 élèves.  72: 6 = 12. On peut faire 12 équipes de 6 élèves.  b. 5 × 14 < 72 < 5 × 15. On ne peut pas faire des équipes de 5 élèves car 72 n’est pas un multiple de 5. |

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| **😐 Exercice 13 :** Problème  En 1973, un navigateur a fait le tour du monde à la voile en solitaire en 169 jours. Ce record a été battu en 1989 : 125 jours.  **Calcule** en combien de semaines ces deux record ont été effectués | Correction  169: 7 =? q = 24 r = 1  Le record de 1973 a été effectué en 24 semaines et un jour.  125: 7 =? q = 17 r = 6  Le record de 1989 a été effectué en 17 semaines et 6 jours. |

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| Défi Math  65 539  **Divise** ce nombre par 2, jusqu’à obtenir un quotient égal à 1.  Combien de division as-tu effectués ? | Correction  5536: 2 = 32768 ➞ 32768: 2 = 16384  16384: 2 = 8192 ➞ 8192: 2 = 4096  4096: 2 = 2048 ➞ 2048: 2 = 1024  1024: 2 = 512 ➞512: 2 = 256  256: 2 = 128 ➞ 128: 2 = 64 ➞ 64: 2 = 32  32: 2 = 16 ➞ 16: 2 = 8 ➞ 8: 2 = 4  4: 2 = 2 ➞ 2: 2 = 1  On doit diviser ce nombre 16 fois |