



Exploding Dots™

HANDOUTS

Experience 5: Division

<u>Handout A: Division and Remainders</u>	2
<u>Solutions to Handout A</u>	3
<u>Handout B: Wild Explorations</u>	6

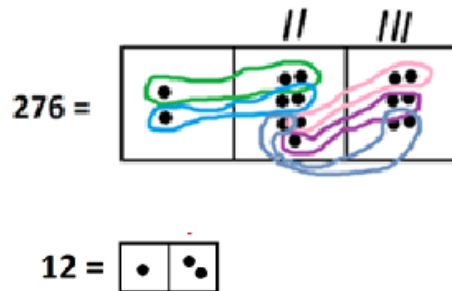
Exploding Dots

Experience 5: Division

Access videos of all *Exploding Dots* lessons at: <http://gdaymath.com/courses/exploding-dots/>

Handout A: *Division and Remainders*

This picture shows that $276 \div 12$ equals 23.

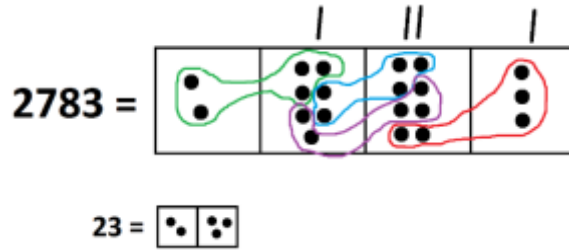


Here are some practice questions you might, or might not, want to try.

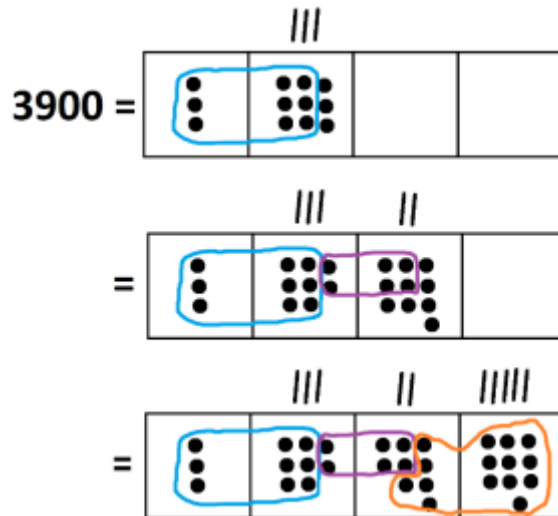
1. Compute $2783 \div 23$ by the dots-and-boxes approach by hand.
2. Compute $3900 \div 12$.
3. Compute $46632 \div 201$.
4. Show that $31533 \div 101$ equals 312 with a remainder of 21.
5. Compute $2789 \div 11$.
6. Compute $4366 \div 14$.
7. Compute $5481 \div 131$.
8. Compute $61230 \div 5$.

Solutions to Handout A

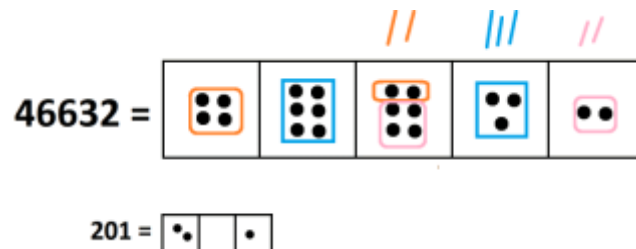
1. $2783 \div 23 = 121$



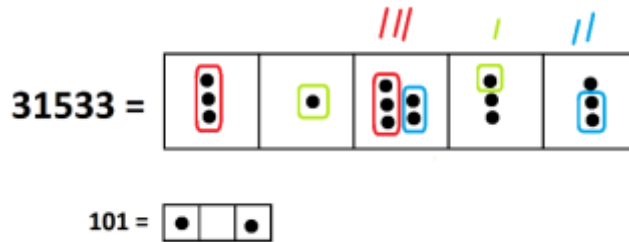
2. $3900 \div 12 = 325$. We need some unexploding along the way. (And can you see how I am getting efficient with my loop drawing?)



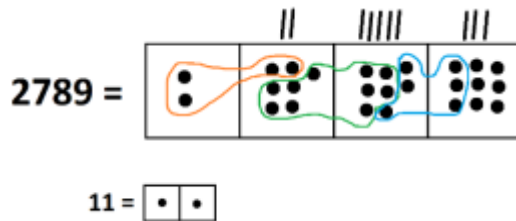
3. $46632 \div 201 = 232$.



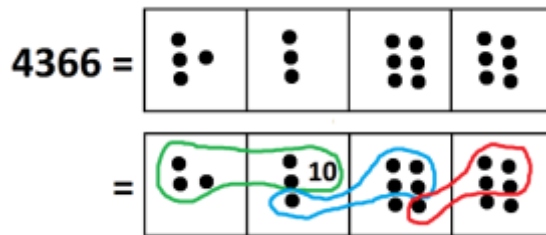
4. $31533 \div 101 = 312$ with a remainder of 21. That is, $31533 \div 101 = 312 + \frac{21}{101}$



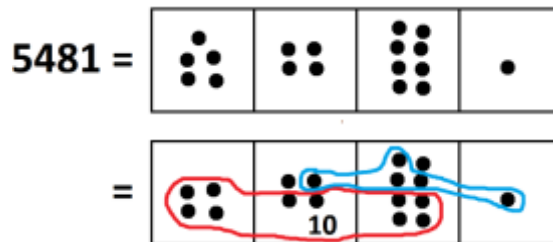
5. We have $2789 \div 11 = 253$ with a remainder of 6. That is, $2789 \div 11 = 253 + \frac{6}{11}$.



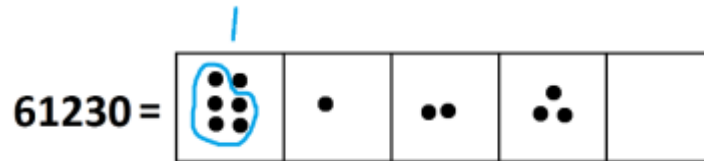
6. $4366 \div 14 = 311 + \frac{12}{14}$.



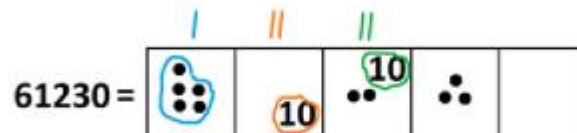
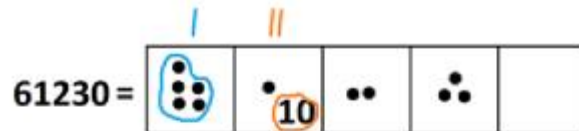
7. $5481 \div 131 = 41 + \frac{110}{131}$.



8. We certainly see one group of five right away.



Let's perform some unexplorations. (And let's write numbers rather than draw lots of dots. Drawing dots gets tedious!)



We see $61230 \div 5 = 12246$.

Exploding Dots

Experience 5: Division

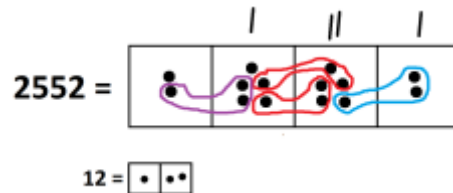
Access videos of all *Exploding Dots* lessons at: <http://gdaymath.com/courses/exploding-dots/>

Handout B: WILD EXPLORATIONS

Here is a “big question” investigation you might want to explore, or just think about. Have fun!

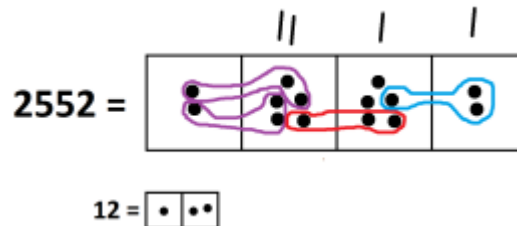
EXPLORATION: LEFT TO RIGHT? RIGHT TO LEFT? ANY ORDER?

When asked to compute $2552 \div 12$, Kaleb drew this picture, which he got from identifying groups of twelve working right to left.



He said the answer to $2552 \div 12$ is 121 with a remainder of 1100.

Mabel, on the other hand, identified groups of twelve from left to right in her diagram for the problem.



She concluded that $2552 \div 12$ is 211 with a remainder of 20. Both Kaleb and Mabel are mathematically correct, but their teacher pointed out that most people would expect an answer with smaller remainders: both 1100 and 20 would likely be considered strange remainders for a problem about division by twelve. She also showed Kaleb and Mabel the answer to the problem that is printed in the textbook.

$$2552 \div 12 = 212 \text{ R } 8$$

How could Kaleb and Mabel each continue work on their diagrams to have this textbook answer appear?