Go to one of the whiteboards around the room with your table group and solve the problem.

Regular whiteboard rules apply.

No calculators needed.

$4.75 \times 10^7 + 8.2 \times 10^5$

Expand and Add

$47{,}500{,}000 + 820{,}000$

$= 48{,}320{,}000 = 4.832 \times 10^7$

What if we don't expand?

$4.75 \times 10^7 + 8.2 \times 10^5$

12.95×10^{12}

We know this is not correct when comparing to the answer from expanding.

Try Again:

$4.75 \times 10^7 + 8.2 \times 10^{5+2}$ Let's get the exponents the same

$4.75 \times 10^7 + 0.082 \times 10^7$

4.832×10^7

$475 \times 10^5 + 8.2 \times 10^5$

483.2×10^5

4.832×10^7 proper form

Do we prefer using the larger or smaller exponent?

Scientific Notation Review

Proper Form: $a \times 10^{b}$

↑ greater than 1 and less than 10

What if? 24×10^{4}

2.4×10^{3} or 2.4×10^{5}

Scientific Notation

6000 = 6×10^{3}

18,500 = 1.85×10^{4}

0.004 = 4.0×10^{-3}

0.0000721 = 7.21×10^{-5}

567×10^{4} = 5.67×10^{6}

Write in Standard Form

$2.73 \times 10^4 =$ 27300. = 27,300

need to add 4 place values

$4 \times 10^6 =$ 4,000,000

$2 \times 10^{-2} =$ ~~0.002~~ or 0.02 ???

$4.32 \times 10^{-4} =$ 0.000432

Operations with Scientific Notation

$4.2 \times 10^{2-1} + 1 \times 10^{1} =$

$42 \times 10^{1} + 1 \times 10^{1} = 43 \times 10^{1}$ ← need to add 1

remove a 10's place

4.3×10^{2}

6.3×10^{3} + $5.9 \times 10^{-1+4}$

$6.3 \times 10^{3} + 0.00059 \times 10^{3} = 6.30059 \times 10^{3}$

$2.5 \times 10^{7} + 1.3 \times 10^{7} = 3.8 \times 10^{7}$

$(2.5 + 1.3) \times 10^{7}$

$6 \times 10^{7} + 7 \times 10^{7} = 13 \times 10^{7} = 1.3 \times 10^{8}$

$2 \times 10^{6} + 5 \times 10^{5} =$

Operations with Scientific Notation - Practice

Addition and Subtraction

Before numbers in scientific notation can be added or subtracted, the exponents must be equal.

Not equal — Equal

$(3.4 \times 10^2) + (4.57 \times 10^3) = (0.34 \times 10^3) + (4.57 \times 10^3)$

The decimal is moved to the left to increase the exponent.

$= (0.34 + 4.57) \times 10^3$

$= 4.91 \times 10^3$

1. $(9.19 \times 10^3) + (2.3 \times 10^4)$

2. $(5 \times 10^4) - (4 \times 10^2)$

3. $(6.75 \times 10^4) - (2 \times 10^1)$

4. $(1.2 \times 10^{-3}) + (8.9 \times 10^{-3})$

5. $(9.99 \times 10^{-2}) - (1.2 \times 10^{-3})$

6. $(4.3 \times 10^7) - (7.5 \times 10^5)$

7. $(2.345 \times 10^2) + (1.31 \times 10^0)$

8. $(7.5 \times 10^{-2}) - (2 \times 10^{-4})$

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Classwork

Addition and Subtraction With Scientific Notation

Date_____ Period____

Simplify. Write each answer in scientific notation.

1) $3.1 \times 10^{3} + 4.3 \times 10^{3}$

2) $3 \times 10^{1} + 6.4 \times 10^{2}$

3) $2.4 \times 10^{4} + 5.57 \times 10^{3}$

4) $5 \times 10^{-2} + 1.6 \times 10^{-3}$

5) $2.5 \times 10^{1} + 6.14 \times 10^{4}$

6) $7 \times 10^{-1} + 6.4 \times 10^{-5}$

7) $5 \times 10^{-3} + 3.3 \times 10^{-6}$

8) $8 \times 10^{-1} + 6.9 \times 10^{3}$

9) $1.39 \times 10^{5} - 4 \times 10^{2}$

10) $2.74 \times 10^{-1} - 6.53 \times 10^{-4}$

11) $8.14 \times 10^{5} - 7.8 \times 10^{2}$

12) $6.36 \times 10^{3} - 5.8 \times 10^{-1}$

13) $5.1 \times 10^{-1} + 0.38 \times 10^{4}$

14) $5.9 \times 10^{-2} - 0.078 \times 10^{3}$

Homework

Finish classwork