

GRADE 6 · THE NUMBER SYSTEM · ANSWER KEY

ORDERING RATIONAL NUMBERS

Today's goal: I can demonstrate understanding of ordering of rational numbers.



How to use this key. Problem numbers match the student sheets. Each answer shows the steps and the slip Mr DJ sees most, so a wrong answer tells you what to reteach. Pepper levels: **Mild** warm-up, **Medium** stretch, **Spicy** challenge, **Extra** big brain.

Practice

8 problems + Mr DJ's worked example

Use: During the lesson after the mini-lesson/deck. Item 7 is the debt item — it separates 'greater number' from 'bigger amount' and sets up absolute value next. **Timing:** 15–25 min · pairs or independent · circulate on 7–9. Items 1–3 fluency, 4–6 application, 7–9 reasoning.

- 1 –2 2 –6, –4, 3 3 $-\frac{1}{4}$ 4 Yes — $5 \div 2 = 2.5$, so they are the same point 5 –0.6 6 $-3/4$, $-\frac{1}{2}$, $-\frac{1}{4}$, 0
7 –50 and –20; Ben's –20 is the greater number; Ana owes more 8 No — –0.3 is GREATER

1 **MILD** Greater: –7 or –2?

–2

1. –2 sits farther right.

Watch for: Chose –7 by digit size.

2 **MILD** Order –4, 3, –6?

–6, –4, 3

1. Most negative first.

Watch for: Wrote –4, –6, 3.

3 **MEDIUM** Greater: $-\frac{1}{2}$ or $-\frac{1}{4}$?

$-\frac{1}{4}$

- $\frac{1}{2} = 0.5$ and $\frac{1}{4} = 0.25$.
- 0.5 is farther left than –0.25.
- So $-\frac{1}{4}$ is greater.

Watch for: Chose $-\frac{1}{2}$ because $\frac{1}{2} > \frac{1}{4}$. That is true for positives; the sign reverses the comparison.

4 **MEDIUM** Is –2.5 the same as $-5/2$?

Yes — $5 \div 2 = 2.5$, so they are the same point

- $-5/2 = -2.5$.
- Same value, two notations, one location on the number line.

Watch for: Said no because they 'look different.' Convert before deciding.

5 **MEDIUM** Greater: $-3/4$ or –0.6?

–0.6

- $-3/4 = -0.75$.
- 0.75 is farther left than –0.6.
- So –0.6 is greater.

Watch for: Compared $3/4$ with 0.6 as positives, or compared the digits 75 and 6 directly.

6 **SPICY** Order $-\frac{1}{2}$, $-3/4$, 0, $-\frac{1}{4}$?

$-3/4$, $-\frac{1}{2}$, $-\frac{1}{4}$, 0

- Convert: –0.75, –0.5, –0.25, 0.
- Most negative (farthest left) first.
- $-3/4$, $-\frac{1}{2}$, $-\frac{1}{4}$, 0.

Watch for: Ordered by denominator or by digit size, giving $-\frac{1}{4}$, $-\frac{1}{2}$, $-3/4$.

7 **SPICY** Ana owes \$50, Ben owes \$20 — greater number? owes more?

-50 and -20; Ben's -20 is the greater number; Ana owes more

1. Ana: -50. Ben: -20.
2. -20 sits farther right, so $-20 > -50$ — Ben has the greater balance.
3. But Ana owes MORE, because her debt is farther from zero.
4. 'Greater number' and 'bigger debt' are opposite here — that is what the negative sign does.

Watch for: Said Ana has the greater number because $50 > 20$. Size of debt is distance from zero; greater number is position on the line.

8 **EXTRA SPICY** Kai: $-0.3 < -0.30001$?

No — -0.3 is GREATER

1. Write -0.3 as -0.30000.
2. -0.30001 is slightly farther from zero, so slightly farther left.
3. Therefore $-0.3 > -0.30001$. Length of the digit string does not decide value.

Watch for: Used 'longer number is bigger,' then compounded it by not accounting for the negative sign.

Homework

7 problems + Mr DJ's worked example

Use: Parallels the practice sheet one-to-one. Item 7 mirrors the exit ticket's two-phrasings item. **Timing:** ~15 min at home · independent · review item 7 as the next-day warm-up.

1 -1

2 -8, -3, 5

3 $-1/3$

4 Yes — $3 \div 2 = 1.5$

5 -0.7

6 $-2/3$, $-\frac{1}{2}$, $-\frac{1}{4}$, 0

7 Tuesday was warmer; -3 is the greater number — both point to Tuesday

1 **MILD** Greater: -6 or -1?

-1

1. -1 is farther right.

Watch for: Chose -6 by digit size.

2 **MILD** Order -3, 5, -8?

-8, -3, 5

1. Most negative first.

Watch for: Wrote -3, -8, 5.

3 **MEDIUM** Greater: $-2/3$ or $-1/3$?

$-1/3$

1. $2/3 \approx 0.67$ and $1/3 \approx 0.33$.
2. -0.67 is farther left than -0.33.
3. So $-1/3$ is greater.

Watch for: Chose $-2/3$ because $2/3 > 1/3$ — true for positives, reversed by the sign.

4 **MEDIUM** Is -1.5 the same as $-3/2$?

Yes — $3 \div 2 = 1.5$

1. Same value, different notation, same point on the line.

Watch for: Said no because the forms differ.

5 **MEDIUM** Greater: $-4/5$ or -0.7 ?

-0.7

1. $-4/5 = -0.8$.
2. -0.8 is farther left than -0.7 .
3. So -0.7 is greater.

Watch for: Compared as positives, or compared $4/5$ with 7 directly.

6 **SPICY** Order $-1/4$, $-2/3$, 0, $-1/2$?

$-2/3$, $-1/2$, $-1/4$, 0

1. Convert: -0.67 , -0.5 , -0.25 , 0.
2. Farthest left first.

Watch for: Ordered by denominator, giving $-1/4$, $-1/2$, $-2/3$.

7 **SPICY** -15°C Monday vs -3°C Tuesday?

Tuesday was warmer; -3 is the greater number — both point to Tuesday

1. -3 sits farther right than -15 , so -3 is greater.
2. Greater on the temperature line means warmer.
3. Both questions identify Tuesday; the answers must agree.

Watch for: Called Monday the greater number because $15 > 3$, while also (correctly) calling Tuesday warmer — a contradiction that reveals the misconception.

Exit Ticket

4 problems

Use: End of the ordering lesson. 5–8 min, independent. Builds on the number-line skill (the “Rational numbers on the number line” sheet (Grade 6)). **Timing:** 5–8 min · independent. Item 4 forces the two phrasings to agree; a student who answers inconsistently has the misconception even if one half looks right.

1 -3 2 -5 , -1 , 0, 2 3 -0.5

4 -12°C is colder; -4 is the greater number — same question because greater = warmer = farther right

1 **MILD** Greater: -8 or -3 ?

-3

1. On a number line, -3 sits to the right of -8 .
2. Farther right = greater, so $-3 > -8$.
3. The digit 8 tells you distance from zero, not size.

Watch for: Chose -8 because $8 > 3$. On the negative side, a larger digit means a SMALLER number.

2 **MEDIUM** Order -5 , 2, -1 , 0 least to greatest?

-5 , -1 , 0, 2

1. Negatives come first, most-negative leftmost: -5 , then -1 .
2. Then 0, then the positive 2.

Watch for: Wrote -1 , -5 , 0, 2 — ordered the negatives by digit size instead of position.

3 **MEDIUM** Greater: -0.5 or -0.75 ?

-0.5

1. -0.75 is farther from zero, so farther left.
2. -0.5 sits to its right, so $-0.5 > -0.75$.

Watch for: Chose -0.75 because $75 > 5$. Compare positions, and note $0.5 = 0.50$, which is less than 0.75.

4 **SPICY** -12°C vs -4°C — colder? greater?

-12°C is colder; -4 is the greater number — same question because greater = warmer = farther right

1. -12 sits farther left than -4 , so -12 is less.
2. Less on the temperature line means colder.
3. So ‘which is colder’ and ‘which is the smaller number’ are the same question.

Watch for: Said -12 is the greater number because $12 > 4$, then contradicted themselves by correctly calling it colder. The two answers must agree.

Slide	Time	What to do
1	0:00	Frame the skill: one rule, applied to every form of rational number.
2	1:00	Hook — poll it. Many will say -8 . Do not correct yet; the number line does the correcting.
3	3:00	State the single rule. Then the key clarification: the digit measures DISTANCE from zero, not value.
4	5:00	WE1 — resolve the hook on a drawn line so position, not argument, settles it.
5	7:00	WE2 — converting mixed forms. Students who compare $\frac{3}{4}$ with 0.6 by eye get it backwards.
6	11:00	The debt distinction. This is the bridge to absolute value tomorrow — bigger debt = greater distance from zero, even though the number is smaller.
7		Show the problem and the slip. Pairs: what went wrong, and what is the right answer? Take two answers before moving on.
8		Solve it together, one step at a time. It is also the worked example at the top of the practice sheet, so students can look back at it.
9	9:00	CFU — all-student response. Answer -5 , -1 , 0 , 2 . Watch for -1 before -5 . Whiteboards: everyone tries Mild, then climbs. These are #1, #3, #6 on the practice sheet.
10		Fingers up: 3 = got it, 2 = almost, 1 = not yet. Pull the 1s for a quick reteach while everyone else starts the practice sheet.
11	13:00	Launch the in-class practice sheet. Launch the practice sheet. Exit ticket in the last 5–8 minutes.