

Fluency Activities

Grade 8

Eighth Grade Fluency Activities

Math fluency activities in Imagine+ Math help students develop accuracy, efficiency, and flexibility in mathematical thinking. They provide structured practice to strengthen number sense, reinforce foundational skills, and build automaticity with key math concepts. Fluency activities increase student confidence by engaging them in problem-solving, developing a deeper understanding of mathematical relationships, and preparing them for more complex tasks.

Some activities require materials found in your classroom.

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Activity 1

Decimal Detective

Topic/Concept

Compare and Order Decimals

Objective

Students will classify decimals as rational or irrational and place them in order on a number line using estimation and reasoning.

Materials

- Index cards with decimals (terminating, repeating, and non-repeating)
- Number line taped to the classroom wall(s)

Steps

1. Hand to each student (or pair of students) a card with a decimal (e.g., 0.333..., 3.14).
2. Students classify the number as rational or irrational and justify their choice.
3. They place the number on the classroom number line as accurately as possible.
4. The class reviews placements, discussing errors and strategies for estimation.

Resource List

- A list of various decimals (least to greatest):

0.125	1.50
0.30	1.666...
0.45	2.25
0.707	2.5
0.75	2.718281...
0.8	3.14
1.05	3.141592...
1.2	3.333...
1.333...	4.125
1.414213...	5.090909...

Topic/Concept

Graphing Lines from Slope

Objective

Students will graph lines from a given slope and y -intercept by using rise over run and identifying whether the relationship is proportional.

Materials

- Large grid taped on the classroom floor (masking tape works well)
- Slopes printed on index cards (e.g., slope = $\frac{1}{2}$, slope = -2 , slope = 3)
- Starting “ y -intercept” markers (sticky notes with numbers)

Steps

1. Place students in pairs. One student is the “walker,” and the other is the “recorder.”
2. Each pair receives a slope card and a y -intercept card.
3. The walker starts at the intercept on the taped axis and uses “rise over run” steps to create the line physically.
4. The recorder marks each point with sticky notes.
5. After a few steps, students step back, discuss whether the line is proportional (does it pass through the origin?), and record observations.
6. Rotate roles so everyone gets practice.

Resource List

- Slope and y -intercept card pairs (write each as a pair)
These are varied but still classroom-friendly for “walk” steps.

$$m = \frac{1}{2}, b = 0$$

$$m = \frac{1}{2}, b = 2$$

$$m = 1, b = -1$$

$$m = 1, b = 3$$

$$m = 2, b = 0$$

$$m = 2, b = -2$$

$$m = 3, b = 1$$

$$m = -1, b = 0$$

$$m = -1, b = 4$$

$$m = -2, b = 0$$

$$m = -2, b = -3$$

$$m = -1, b = 0$$

$$m = \frac{3}{4}, b = 0$$

$$m = \frac{3}{4}, b = 2$$

$$m = -\frac{1}{2}, b = 0$$

$$m = -\frac{1}{2}, b = -2$$

Activity 3

Which One Works?

Topic/Concept

Identify Values by Substitution

Objective

Students will substitute given values into equations and inequalities to determine which values make each statement true.

Materials

- A set of equations/inequalities displayed on the board (or slides)
- A list of 3–4 possible values for the variable under each equation (mixed correct/incorrect)

Steps

1. Present an equation (e.g., $3x - 4 = 11$) along with possible solutions ($x = 3$, $x = 5$, $x = 7$).
2. Students work individually or in pairs to test each value quickly (substitution).
3. They identify which value(s) make the equation or inequality true.
4. After a few rounds, challenge students to generate their own “Which One Works?” problem for a partner group.
5. Wrap up by discussing efficient strategies—why solving directly can be quicker than testing values.

Resource List

- Sample prompts:

1. $3x - 4 = 11$ ($x = 3, 5, 7$)

- a. $x = 3$: $9 - 4 = 5$ ✗
- b. $x = 5$: $15 - 4 = 11$ ✓
- c. $x = 7$: $21 - 4 = 17$ ✗

2. $2(x + 3) = 18$ ($x = 4, 6, 9$)

- a. $x = 4$: $2(7) = 14$ ✗
- b. $x = 6$: $2(9) = 18$ ✓
- c. $x = 9$: $2(12) = 24$ ✗

3. $5x - 2 > 18$ ($x = 3, 4, 5, 6$)

- a. $x = 3$: $15 - 2 = 13$ ✗
- b. $x = 4$: $20 - 2 = 18$ ✗ (*not > 18*)
- c. $x = 5$: $25 - 2 = 23$ ✓
- d. $x = 6$: $30 - 2 = 28$ ✓

4. $\frac{x}{3} - 2 = 1$ ($x = 6, 9, 12$)

- a. $x = 6$: $2 - 2 = 0$ ✗
- b. $x = 9$: $3 - 2 = 1$ ✓
- c. $x = 12$: $4 - 2 = 2$ ✗

5. $-2x + 7 \leq 1$ ($x = 2, 3, 4, 5$)

- a. $x = 2$: $-4 + 7 = 3$ ✗
- b. $x = 3$: $-6 + 7 = 1$ ✓
- c. $x = 4$: $-8 + 7 = -1$ ✓
- d. $x = 5$: $-10 + 7 = -3$ ✓

Activity 4

Transformation Relay

Topic/Concept

Geometric Transformations on a Plane

Objective

Students will apply translations, rotations, reflections, and dilations to transform a figure on a coordinate grid and describe the effect on its coordinates.

Materials

- Graph paper
- Transformation Instruction Cards

Steps

1. Students work in teams with graph paper.
2. Each team draws a shape (teacher-directed if needed) and receives a set of transformation instructions.
3. Teams perform the transformations step by step, passing the paper after each move.
4. Teams discuss the final shape to check accuracy.

Resource List

- Transformation Instruction Cards (2–3 steps each)

Transformation Instruction Cards

CARD 1

Step 1: Translate **right 4** units

Step 2: Translate **up 2** units

CARD 2

Step 1: Reflect over the **x-axis**

Step 2: Translate **left 3** units

CARD 3

Step 1: Reflect over the **y-axis**

Step 2: Translate **down 2** units

CARD 4

Step 1: Rotate **90° clockwise**
about the **origin**

Step 2: Translate **up 3** units

CARD 5

Step 1: Rotate **90° counterclockwise**
about the **origin**

Step 2: Translate **right 2** units

CARD 6

Step 1: Translate **left 5** units

Step 2: Reflect over the **x-axis**

Step 3: Translate **up 1** unit

CARD 7

Step 1: Dilate by a factor of **2**
about the **origin**

Step 2: Translate **down 3** units

CARD 8

Step 1: Dilate by a factor of $\frac{1}{2}$
about the **origin**

Step 2: Translate **right 6** units

CARD 9

Step 1: Translate **up 4** units

Step 2: Reflect over the **y-axis**

Step 3: Translate **left 1** unit

CARD 10

Step 1: Rotate **180°** about the **origin**

Step 2: Translate **right 3** units

Step 3: Translate **down 1** unit

Topic/Concept

Comparing Simple and Compound Interest

Objective

Students will calculate and compare simple and compound interest to determine which option grows savings faster over time.

Materials

- Spreadsheet software or graph paper
- Scenarios with relatable contexts (e.g., “Saving for new sneakers,” “Buying the latest phone,” “Gaming console fund”)
- Current interest rate information

Steps

1. Present students with a scenario: “You want \$400 sneakers. If you save \$100 now, which grows faster—simple or compound interest?”
2. In pairs, students use the spreadsheet (or graph paper) to calculate balances with simple vs. compound interest over several months or years.
3. They graph or compare results, discussing which method gets them to their goal faster.
4. Groups share findings and reflect: “Why does compounding make such a difference over time?”
5. **Extend:** Use multiple scenarios, and students discuss which would be a better choice as far as interest in a given amount of time.

Resource List

- Sample scenarios: Ask, “Which earns more: simple or compound (monthly)?”

Sneaker Savings:

You deposit \$100 at 5% for 3 years.

- Simple: \$115.00
- Compound (monthly): \$116.15 ✓

Phone Upgrade Fund:

You deposit \$250 at 4% for 2 years.

- Simple: \$270.00
- Compound (monthly): \$270.79 ✓

Gaming Console Goal:

You deposit \$180 at 6% for 18 months.

- Simple: \$196.20
- Compound (monthly): \$196.91 ✓

Bike Savings:

You deposit \$300 at 3% for 4 years.

- Simple: \$336.00
- Compound (monthly): \$338.20 ✓

Travel Account:

You deposit \$60 at 8% for 1 year.

- Simple: \$64.80
- Compound (monthly): \$64.98 ✓

College/Trade School Starter:

You deposit \$500 at 5% for 5 years.

- Simple: \$625.00
- Compound (monthly): \$641.68 ✓

