Grade 5:
Resources for Developing Grade-Level Fluencies

RELEVANT STANDARD:

5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.

HOW TO USE THESE RESOURCES:

This document provides a set of short activities extracted from Engage NY, an Open Education Resource, to supplement the fluency practice in *GO Math!*. Although many *GO Math!* lessons include "Fluency Builders," they don't always align to grade-level expectations. Teachers are encouraged to use the activities that do align to the above standard and supplement with the resources in this document.

The activities are designed to support students' progress toward the grade-level fluency articulated in 5.NBT.B.5. They are intentionally short, providing educators the flexibility to use them before or after a lesson or anytime during the school day. Many of the sprints and fluency activities review prerequisite skills that will help students reach the proficiency required by the end of the grade. The fluency activities can be repeated as needed throughout the year using different numbers. The resources can be used from the start of the year, as Chapter 1 of *GO Math!* focuses on 5.NBT.B.5.

GRADE-SPECIFIC NOTES:

5.NBT.B.5 is introduced in Chapter 1 of the *GO Math!* materials. Practice on this standard should be distributed throughout the year, to ensure fluency is attained and maintained. A few sample fluency activities are provided to reinforce place value concepts and mental computation. In addition, worksheets with computation practice are provided and should be distributed throughout the year.

ACTIVITIES TO USE TO DEVELOP FLUENCY WITH MULTI-DIGIT MULTIPLICATION USING THE STANDARD ALGORITHM:

Selected Fluency Activities:

1. **MULTIPLY BY 10, 100, AND 1,000** (3 minutes)
   Directions:
   T: (Write 3 × 10.) Say the product.
   S: 30.
   Repeat the process using the following possible sequence: 3 × 100, 3 × 1,000, 5 × 1,000, 0.005 × 1,000, 50 × 100, 0.05 × 100, 30 × 100, 30 × 1,000, 32 × 1,000, 0.32 × 1,000, 52 × 100, 5.2 × 100, 4 × 10, 0.4 × 10, 7 × 100, 72 × 100, and 7.002 × 100.
   EngageNY, Module 2, Lesson 1

2. **MULTIPLY BY MULTIPLES OF 10** (2 minutes)
   Materials: (S) Personal white board
   Directions:
   T: (Write 31 × 10 = .) Say the multiplication sentence.
   S: 31 × 10 = 310.
   T: (Write 310 × 2 = beside 31 × 10 = 310.) Say the multiplication sentence.
   S: 310 × 2 = 620.
   T: (Write 310 × 20 = below 310 × 2 = 620.) Write 310 × 20 as a three-step multiplication sentence, taking out the ten.
   S: 310 × 10 × 2 = 6,200.
   T: Show your personal white board. (Check for accuracy.)
   Direct students to solve using the same method for 23 × 40 and 32 × 30.
   EngageNY, Module 2, Lesson 2
   This activity can be repeated using the same routine with the following sequences of problems:
   - 21 × 40
   - 213 × 30
   - 4,213 × 20

   - 41 × 10
   - 410 × 2
   - 32 × 30
   - 43 × 30

3. **ESTIMATE PRODUCTS** (5 minutes)
   Materials: (S) Personal white board
   Directions:
   T: (Write 421 × 18 ≈ ____ × ____ = ____.) Round 421 to the nearest hundred.
   S: 400.
   T: (Write 421 × 18 ≈ 400 × ____ = ____.) Round 18 to the nearest ten.
   S: 20.
   T: (Write 421 × 18 ≈ 400 × 20 = ____.) What's 400 × 20?
   S: 8,000.
   T: (Write 421 × 18 ≈ 400 × 20 = 8,000.)
   T: (Write 323 × 21 ≈ ____ × ____ = ____.) On your personal white board, write the multiplication sentence rounding each factor to arrive at a reasonable estimate of the product.
   S: (Write 323 × 21 ≈ 300 × 20 = 6,000.)
   Repeat the process and procedure for 1,950 × 42 and 2,480 × 27. Ask students to explain the reasoning behind their estimates.
   EngageNY, Module 2, Lesson 3

This activity can be repeated using the same routine with the following sequences of problems:

- 409 × 21
- 287 × 64
- 3,875 × 92
- 6,130 × 37

- 412 × 231
- 523 × 298
- 684 × 347
- 908 × 297

- 421 × 18
- 323 × 21
- 1,950 × 42
- 2,480 × 27

4. **ESTIMATE PRODUCTS** (4 minutes)

Materials: (S) Estimate Products Pattern Sheet

Note: This fluency activity helps bolster students' understanding of and automaticity with the estimation of products.

Directions:

Distribute the Estimate Products pattern sheet, and give students two minutes to do as many problems as they can. Probe the room, correcting misunderstandings and encouraging students to use mental math strategies. When estimating, allow students flexibility when approximating factors. For example, when estimating the product of 23 × 42, a student may find that 25 × 40 or 20 × 40 are both logical approximations.

EngageNY, Module 2, Lesson 5

5. **MULTIPLY BY MULTIPLES OF 100** (4 minutes)

Materials: (S) Personal white board

Note: This review fluency activity helps preserve skills students learned and mastered in Module 1 and lays the groundwork for future concepts.

Directions:

T: (Write 31 × 100 = ____.) Say the multiplication sentence with the answer.
S: 31 × 100 = 3,100.
T: (Write 3,100 × 2 = ____ below 31 × 100 = 3,100.) Say the multiplication sentence.
S: 3,100 × 2 = 6,200.
T: (Write 31 × 200 = ____ below 3,100 × 2 = 6,200.) Say 31 × 200 as a three-step multiplication sentence, taking out the hundred.
S: 31 × 100 × 2 = 6,200.
T: (Write 31 × 200 = 6,200.)
Direct students to solve using the same method for 24 × 300 and 34 × 200.

EngageNY, Module 2, Lesson 5

This activity can be repeated using the same routine with the following sequence of problems:

- 21 × 400
- 312 × 300,
- 2,314 × 200

6. **MULTIPLY** (4 minutes)

Materials: (S) Personal white boards

Note: This fluency activity reviews year-long fluency standards.

Directions:

T: Solve 34× 21 using the standard algorithm.
S: (Solve 34 ×21 using the standard algorithm. The product is 714.)
Continue the process for 234 ×21, 46 ×32, 146 32, and 537 ×35.

EngageNY, Module 6, Lesson 4

This activity can be repeated using the same routine with the following sequences of problems:

- 45 × 31
- 345 × 31
- 47 × 23
- 247 × 23
- 753 × 35

- 45 × 25
- 345 × 25
- 59 × 23
- 149 × 23
- 756 × 43

- 49 × 43
- 249 × 43
- 67 × 32
- 867 × 32
- 938 × 27

- 68 × 43
- 368 × 43
- 76 × 54
- 876 × 54
- 978 × 86

- 43 × 23
- 543 × 23
- 49 × 32
- 249 × 32
- 954 × 25

- 34 × 24
- 134 × 24
- 46 × 42
- 346 × 42
- 768 × 37

- 57 × 37
- 457 × 37
- 68 × 43
- 568 × 43
- 749 × 72

- 97 × 64
- 897 × 64
- 89 × 67
- 789 × 67
- 698 × 86

SPRINTS:

- All 5th grade sprints related to 5.NBT.B.5 can be found in Appendix A

Directions for Administration of Sprints

A Sprint has two parts, A and B, with closely related problems on each. Each part is organized into four quadrants that move from simple to complex. This builds a challenge into each Sprint for every learner. Before the lesson, print Sprint A and Sprint B on two separate sheets of paper. Students complete the two parts of the Sprint in quick succession with the goal of improving for the second part, even if only by one more. With practice, the following routine takes about 9 minutes.

SPRINT A

Place Sprint A face down on student desks, and instruct students not to look at the problems until a signal is given.
T: You will have 60 seconds to do as many problems as you can. I do not expect you to finish all of them, just as many as you can, trying for your personal best.
T: Take your mark! Get set! THINK!
Students turn papers over and work furiously to finish as many problems as they can in 60 seconds. Time precisely.
T: Stop! Circle the last problem you completed. I will read just the answers. If you got the answer right, call out "Yes!" If you made a mistake, circle it. Ready?
Repeat to the end of Sprint A or until no student has a correct answer.
T: Now, at the top of the page, write the number of problems you got correct. This is your personal goal for Sprint B.
T: How many of you got one right? (All hands should go up.)
T: Keep your hand up until I say a number that is one more than the number you got right. So, if you got 14 right, when I say 15, your hand goes down. Ready?
T: (Continue quickly.) How many got two right? Three? Four? Five? (Continue until all hands are down.)
If the class needs more practice with Sprint A, continue with the optional routine presented below.
T: Take one minute to do more problems on this half of the Sprint.
As students work, the student who scored highest on Sprint A might pass out Sprint B.
T: Stop! I will read just the answers. If you got it right, call out "Yes!" If you made a mistake, circle it. Ready?
Read the answers to the first half again as students stand.
Movement: To keep the energy and fun going, do a stretch or a movement game in between Sprints.

SPRINT B

Place Sprint B face down on student desks, and instruct students not to look at the problems until a signal is given. Repeat the procedure for Sprint A up through the show of hands for how many correct answers.
T: Stand up if you got more correct on the second Sprint than on the first.
S: (Stand.)
T: Keep standing until I say the number that tells how many more you got right on Sprint B. If you got three more right on Sprint B than on Sprint A, when I say three, you sit down. Ready?
Call out numbers, starting with one. Students sit as the number by which they improved is called. Students may take Sprints home.

COMPUTATION PRACTICE:

- Multiply a three-digit by a two-digit number
- Multiply a three-digit by a three-digit number
- Multiply a four-digit by a two-digit number
- Multiply a four-digit by a three-digit number

Appendix A

A

Correct _____

Multiply.

1	12 x 10 =		23	34 x 10 =	
2	14 x 10 =		24	134 x 10 =	
3	15 x 10 =		25	234 x 10 =	
4	17 x 10 =		26	334 x 10 =	
5	81 x 10 =		27	834 x 10 =	
6	10 x 81 =		28	10 x 834 =	
7	21 x 10 =		29	45 x 10 =	
8	22 x 10 =		30	145 x 10 =	
9	23 x 10 =		31	245 x 10 =	
10	29 x 10 =		32	345 x 10 =	
11	92 x 10 =		33	945 x 10 =	
12	10 x 92 =		34	56 x 10 =	
13	18 x 10 =		35	456 x 10 =	
14	19 x 10 =		36	556 x 10 =	
15	20 x 10 =		37	950 x 10 =	
16	30 x 10 =		38	10 x 950 =	
17	40 x 10 =		39	16 x 10 =	
18	80 x 10 =		40	10 x 60 =	
19	10 x 80 =		41	493 x 10 =	
20	10 x 50 =		42	10 x 84 =	
21	10 x 90 =		43	96 x 10 =	
22	10 x 70 =		44	10 x 580 =	

B Improvement _____ # Correct _____

Multiply.

1	13 x 10 =		23	43 x 10 =	
2	14 x 10 =		24	143 x 10 =	
3	15 x 10 =		25	243 x 10 =	
4	19 x 10 =		26	343 x 10 =	
5	91 x 10 =		27	743 x 10 =	
6	10 x 91 =		28	10 x 743 =	
7	31 x 10 =		29	54 x 10 =	
8	32 x 10 =		30	154 x 10 =	
9	33 x 10 =		31	254 x 10 =	
10	38 x 10 =		32	354 x 10 =	
11	83 x 10 =		33	854 x 10 =	
12	10 x 83 =		34	65 x 10 =	
13	28 x 10 =		35	465 x 10 =	
14	29 x 10 =		36	565 x 10 =	
15	30 x 10 =		37	960 x 10 =	
16	40 x 10 =		38	10 x 960 =	
17	50 x 10 =		39	17 x 10 =	
18	90 x 10 =		40	10 x 70 =	
19	10 x 90 =		41	582 x 10 =	
20	10 x 20 =		42	10 x 73 =	
21	10 x 60 =		43	98 x 10 =	
22	10 x 80 =		44	10 x 470 =	

Number Correct: _____

A

Multiply by 10, 100, and 1,000

1.	9 × 10 =	
2.	9 × 100 =	
3.	9 × 1,000 =	
4.	8 × 10 =	
5.	80 × 10 =	
6.	80 × 100 =	
7.	80 × 1,000 =	
8.	7 × 10 =	
9.	70 × 10 =	
10.	700 × 10 =	
11.	700 × 100 =	
12.	700 × 1,000 =	
13.	2 × 10 =	
14.	30 × 10 =	
15.	32 × 10 =	
16.	4 × 10 =	
17.	50 × 10 =	
18.	54 × 10 =	
19.	37 × 10 =	
20.	84 × 10 =	
21.	84 × 100 =	
22.	84 × 1,000 =	
23.	73 × 1,000 =	
24.	60 × 10 =	
25.	600 × 10 =	
26.	600 × 100 =	
27.	65 × 100 =	
28.	652 × 100 =	
29.	342 × 100 =	
30.	800 × 100 =	
31.	800 × 1,000 =	
32.	860 × 1,000 =	
33.	867 × 1,000 =	
34.	492 × 1,000 =	
35.	34 × 10 =	
36.	629 × 10 =	
37.	94 × 100 =	
38.	238 × 100 =	
39.	47 × 1,000 =	
40.	294 × 1,000 =	
41.	174 × 100 =	
42.	285 × 1,000 =	
43.	951 × 100 =	
44.	129 × 1,000 =	

B

Number Correct: _____

Improvement: _____

Multiply by 10, 100, and 1,000

1.	8 × 10 =	
2.	8 × 100 =	
3.	8 × 1,000 =	
4.	7 × 10 =	
5.	70 × 10 =	
6.	70 × 100 =	
7.	70 × 1,000 =	
8.	6 × 10 =	
9.	60 × 10 =	
10.	600 × 10 =	
11.	600 × 100 =	
12.	600 × 1,000 =	
13.	3 × 10 =	
14.	20 × 10 =	
15.	23 × 10 =	
16.	5 × 10 =	
17.	40 × 10 =	
18.	45 × 10 =	
19.	73 × 10 =	
20.	48 × 10 =	
21.	48 × 100 =	
22.	48 × 1,000 =	
23.	37 × 1,000 =	
24.	50 × 10 =	
25.	500 × 10 =	
26.	500 × 100 =	
27.	56 × 100 =	
28.	562 × 100 =	
29.	432 × 100 =	
30.	700 × 100 =	
31.	700 × 1,000 =	
32.	760 × 1,000 =	
33.	765 × 1,000 =	
34.	942 × 1,000 =	
35.	74 × 10 =	
36.	269 × 10 =	
37.	49 × 100 =	
38.	328 × 100 =	
39.	37 × 1,000 =	
40.	924 × 1,000 =	
41.	147 × 100 =	
42.	825 × 1,000 =	
43.	651 × 100 =	
44.	192 × 1,000 =	

A

Number Correct: _____

Multiply by Multiples of 10 and 100

1.	2 × 10 =	
2.	12 × 10 =	
3.	12 × 100 =	
4.	4 × 10 =	
5.	34 × 10 =	
6.	34 × 100 =	
7.	7 × 10 =	
8.	27 × 10 =	
9.	27 × 100 =	
10.	3 × 10 =	
11.	3 × 2 =	
12.	3 × 20 =	
13.	13 × 10 =	
14.	13 × 2 =	
15.	13 × 20 =	
16.	13 × 100 =	
17.	13 × 200 =	
18.	2 × 4 =	
19.	22 × 4 =	
20.	22 × 40 =	
21.	22 × 400 =	
22.	33 × 2 =	

23.	33 × 20 =	
24.	33 × 200 =	
25.	24 × 10 =	
26.	24 × 20 =	
27.	24 × 100 =	
28.	24 × 200 =	
29.	23 × 30 =	
30.	23 × 300 =	
31.	71 × 2 =	
32.	71 × 20 =	
33.	14 × 2=	
34.	14 × 3 =	
35.	14 × 30 =	
36.	14 × 300 =	
37.	82 × 20 =	
38.	15 × 300 =	
39.	71 × 600 =	
40.	18 × 40 =	
41.	75 × 30 =	
42.	84 × 300 =	
43.	87 × 60 =	
44.	79 × 800 =	

B

Number Correct: _____

Improvement: _____

Multiply by Multiples of 10 and 100

1.	3 × 10 =	
2.	13 × 10 =	
3.	13 × 100 =	
4.	5 × 10 =	
5.	35 × 10 =	
6.	35 × 100 =	
7.	8 × 10 =	
8.	28 × 10 =	
9.	28 × 100 =	
10.	4 × 10 =	
11.	4 × 2 =	
12.	4 × 20 =	
13.	14 × 10 =	
14.	14 × 2 =	
15.	14 × 20 =	
16.	14 × 100 =	
17.	14 × 200 =	
18.	2 × 3 =	
19.	22 × 3 =	
20.	22 × 30 =	
21.	22 × 300 =	
22.	44 × 2 =	
23.	44 × 20 =	
24.	44 × 200 =	
25.	42 × 10 =	
26.	42 × 20 =	
27.	42 × 100 =	
28.	42 × 200 =	
29.	32 × 30 =	
30.	32 × 300 =	
31.	81 × 2 =	
32.	81 × 20 =	
33.	13 × 3 =	
34.	13 × 4 =	
35.	13 × 40 =	
36.	13 × 400 =	
37.	72 × 30 =	
38.	15 × 300 =	
39.	81 × 600 =	
40.	16 × 40 =	
41.	65 × 30 =	
42.	48 × 300 =	
43.	89 × 60 =	
44.	76 × 800 =	

A

Number Correct: _____

Multiply by Multiples of 10 and 100

1.	2 × 10 =	
2.	12 × 10 =	
3.	12 × 100 =	
4.	4 × 10 =	
5.	34 × 10 =	
6.	34 × 100 =	
7.	7 × 10 =	
8.	27 × 10 =	
9.	27 × 100 =	
10.	3 × 10 =	
11.	3 × 2 =	
12.	3 × 20 =	
13.	13 × 10 =	
14.	13 × 2 =	
15.	13 × 20 =	
16.	13 × 100 =	
17.	13 × 200 =	
18.	2 × 4 =	
19.	22 × 4 =	
20.	22 × 40 =	
21.	22 × 400 =	
22.	33 × 2 =	

23.	33 × 20 =	
24.	33 × 200 =	
25.	24 × 10 =	
26.	24 × 20 =	
27.	24 × 100 =	
28.	24 × 200 =	
29.	23 × 30 =	
30.	23 × 300 =	
31.	71 × 2 =	
32.	71 × 20 =	
33.	14 × 2=	
34.	14 × 3 =	
35.	14 × 30 =	
36.	14 × 300 =	
37.	82 × 20 =	
38.	15 × 300 =	
39.	71 × 600 =	
40.	18 × 40 =	
41.	75 × 30 =	
42.	84 × 300 =	
43.	87 × 60 =	
44.	79 × 800 =	

B

Number Correct: _____

Improvement: _____

Multiply by Multiples of 10 and 100

1.	3 × 10 =	
2.	13 × 10 =	
3.	13 × 100 =	
4.	5 × 10 =	
5.	35 × 10 =	
6.	35 × 100 =	
7.	8 × 10 =	
8.	28 × 10 =	
9.	28 × 100 =	
10.	4 × 10 =	
11.	4 × 2 =	
12.	4 × 20 =	
13.	14 × 10 =	
14.	14 × 2 =	
15.	14 × 20 =	
16.	14 × 100 =	
17.	14 × 200 =	
18.	2 × 3 =	
19.	22 × 3 =	
20.	22 × 30 =	
21.	22 × 300 =	
22.	44 × 2 =	

23.	44 × 20 =	
24.	44 × 200 =	
25.	42 × 10 =	
26.	42 × 20 =	
27.	42 × 100 =	
28.	42 × 200 =	
29.	32 × 30 =	
30.	32 × 300 =	
31.	81 × 2 =	
32.	81 × 20 =	
33.	13 × 3 =	
34.	13 × 4 =	
35.	13 × 40 =	
36.	13 × 400 =	
37.	72 × 30 =	
38.	15 × 300 =	
39.	81 × 600 =	
40.	16 × 40 =	
41.	65 × 30 =	
42.	48 × 300 =	
43.	89 × 60 =	
44.	76 × 800 =	