GRADE 8 MATHEMATICS

Grades 5 to 8 Blackline Masters

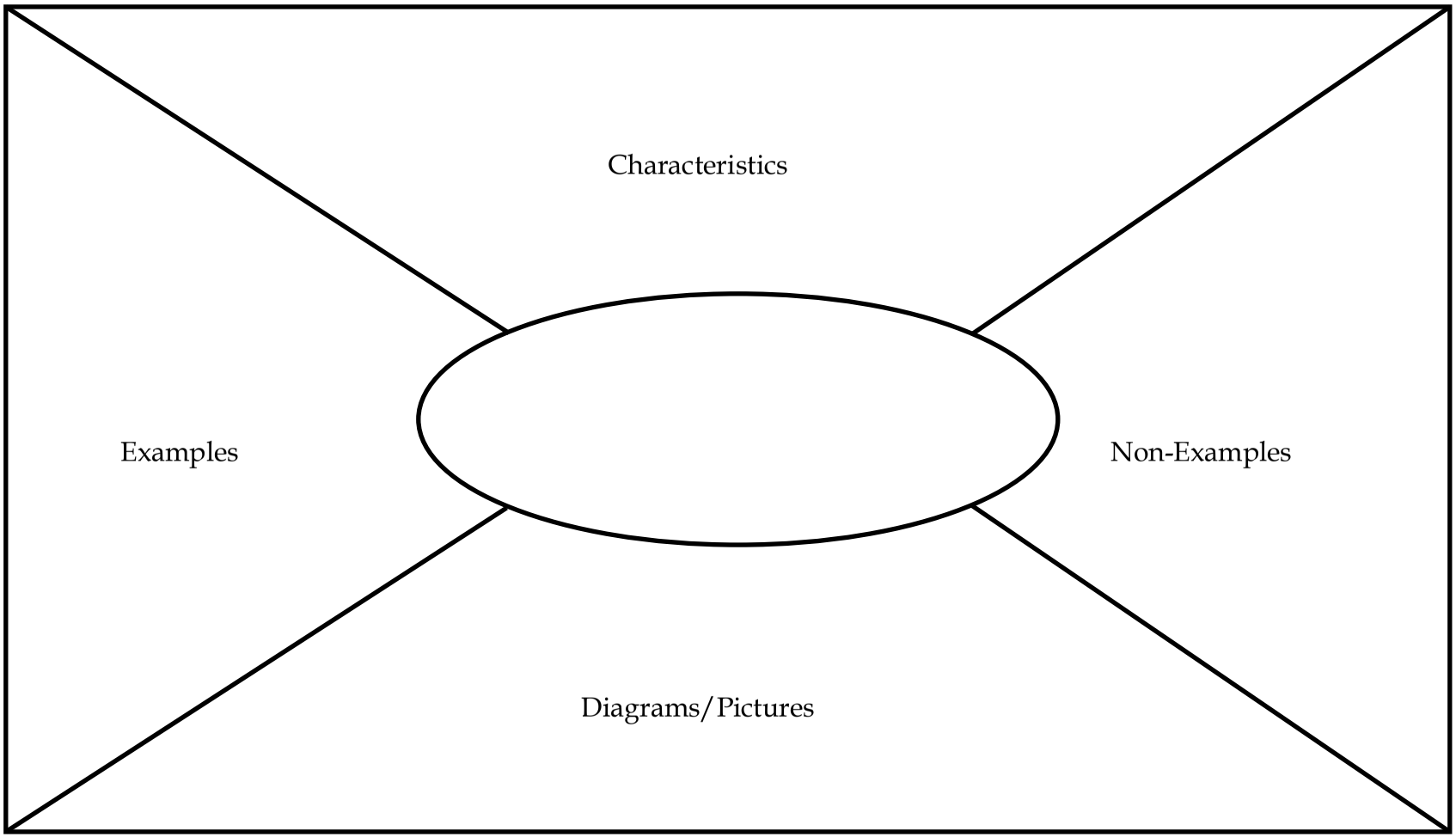
BLM 5—8.1: Observation Form

Students:	Date:	Activity:
Observation:		
Possible Actions:		

Students:	Date:	Activity:
Observation:		
Possible Actions:		

Students:	Date:	Activity:
Observation:		
Possible Actions:		

BLM 5—8.2: Concept Description Sheet #1



BLM 5—8.3: Concept Description Sheet #2

Concept	
Description	Example
Diagram	Non-Example

Concept	
Description	Example
Diagram	Non-Example

BLM 5—8.4: How I Worked in My Group

Name _____

Date _____

Task _____

	Comments
I took turns	
I participated	
I encouraged others	
I shared materials	
I stayed with my group	
I listened	
I accomplished the task	

BLM 5–8.5: Number Cards

0	1	2	3	4
5	6	7	8	9

BLM 5–8.6: Blank Hundred Squares

BLM 5–8.7: Place-Value Chart—Whole Numbers

hundreds	tens	ones
Millions		

hundreds	tens	ones
Thousands		

hundreds	tens	ones
Ones		

BLM 5—8.8: Mental Math Strategies

The following list compiles mental math strategies as found in the *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes*. **Note:** This resource is meant for teacher information, not as a list of strategies that students should memorize.

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7
1.N.10.	2.N.8. 2.N.10.	3.N.6. 3.N.7. 3.N.10. 3.N.11. 3.N.12.	4.N.4. 4.N.5. 4.N.6. 4.N.11.	5.N.2. 5.N.3. 5.N.4.	6.N.8.	7.N.2.

Grade	Concept	Strategy	Meaning	Example
1	Addition	Counting on	Students begin with a number and count on to get the sum. Students should begin to recognize that beginning with the larger of the two addends is generally most efficient.	*for* 3 + 5 *think* 5 + 1 + 1 + 1 *is* 8; *think* 5, 6, 7, 8
1	Subtraction	Counting back	Students begin with the minuend and count back to find the difference.	*for* 6 – 2 *think* 6 – 1 – 1 *is* 4; *think* 6, 5, 4
1, 2	Addition	Using one more	Starting from a known fact and adding one more.	*for* 8 + 5 *if you know* 8 + 4 *is* 12 *and one more is* 13
1, 2	Addition	Using one less	Starting from a known fact and taking one away.	*for* 8 + 6 *if you know* 8 + 7 *is* 15 *and one less is* 14
1, 2,	Addition Subtraction	Making 10	Students use combinations that add up to ten and can extend this to multiples of ten in later grades.	4 + ____ *is* 10 7 + ____ *is* 10; *so* 23 + ____ *is* 30

(continued)

BLM 5–8.8: Mental Math Strategies (Continued)

Grade	Concept	Strategy	Meaning	Example
1	Addition Subtraction	Starting from known doubles	Students need to work to know their doubles facts.	2 + 2 *is* 4 *and* 4 – 2 *is* 2
1, 2, 3	Subtraction	Using addition to subtract	This is a form of part-part-whole representation. Thinking of addition as: part + part = whole Thinking of subtraction as: whole – part = part	*for* 12 – 5 *think* 5 + ____ = 12 *so* 12 – 5 *is* 7
2	Addition Subtraction	The zero property of addition	Knowing that adding 0 to an addend does not change its value, and taking 0 from a minuend does not change the value.	0 + 5 = 5; 11 – 0 = 11
2, 3	Addition Subtraction	Using doubles	Students learn doubles, and use this to extend facts: using doubles doubles plus one (or two) doubles minus one (or two)	*for* 5 + 7 *think* 6 + 6 *is* 12; *for* 5 + 7 *think* 5 + 5 + 2 *is* 12 *for* 5 + 7 *think* 7 + 7 – 2 *is* 12
2, 3	Addition Subtraction	Building on known doubles	Students learn doubles, and use this to extend facts.	*for* 7 + 8 *think* 7 + 7 *is* 14 *so* 7 + 8 *is* 14 + 1 *is* 15
3	Addition	Adding from left to right	Using place value understanding to add 2-digit numerals.	*for* 25 + 33 *think* 20 + 30 *and* 5 + 3 *is* 50 + 8 *or* 58

(continued)

BLM 5—8.8: Mental Math Strategies (Continued)

Grade	Concept	Strategy	Meaning	Example
3	Addition Subtraction	Making 10	Students use combinations that add up to ten to calculate other math facts and can extend this to multiples of ten in later grades.	*for* 8 + 5 *think* 8 + 2 + 3 *is* 10 + 3 *or* 13
3	Addition Subtraction	Compensation	Using other known math facts and compensating. For example, adding 2 to an addend and taking 2 away from the sum.	*for* 25 + 33 *think* 25 + 35 – 2 *is* 60 – 2 *or* 58
3	Addition	Commutative property	Switching the order of the two numbers being added will not affect the sum.	4 + 3 *is the same as* 3 + 4
3, 4 (decimals)	Addition Subtraction	Compatible numbers	Compatible numbers are friendly numbers (often associated with compatible numbers to 5 or 10).	*for* 4 + 3 *students may think* 4 + 1 *is* 5 *and 2 more makes* 7
3	Multiplication Division	Array	Using an ordered arrangement to show multiplication or division (similar to area).	*for* 3 x 4 *think* •••• •••• •••• *for* 12 ÷ 3 *think* •••• •••• ••••
3	Multiplication	Commutative property	Switching the order of the two numbers being multiplied will not affect the product.	4 x 5 *is the same as* 5 x 4
3	Multiplication	Skip-counting	Using the concept of multiplication as a series of equal grouping to determine a product.	*for* 4 x 2 *think* 2, 4, 6, 8 *so* 4 x 2 *is* 8
4	Multiplication	Zero property of multipli-cation	Multiplying a factor by zero will always result in zero.	30 x 0 *is* 0 0 x 15 *is* 0

(continued)

BLM 5—8.8: Mental Math Strategies (Continued)

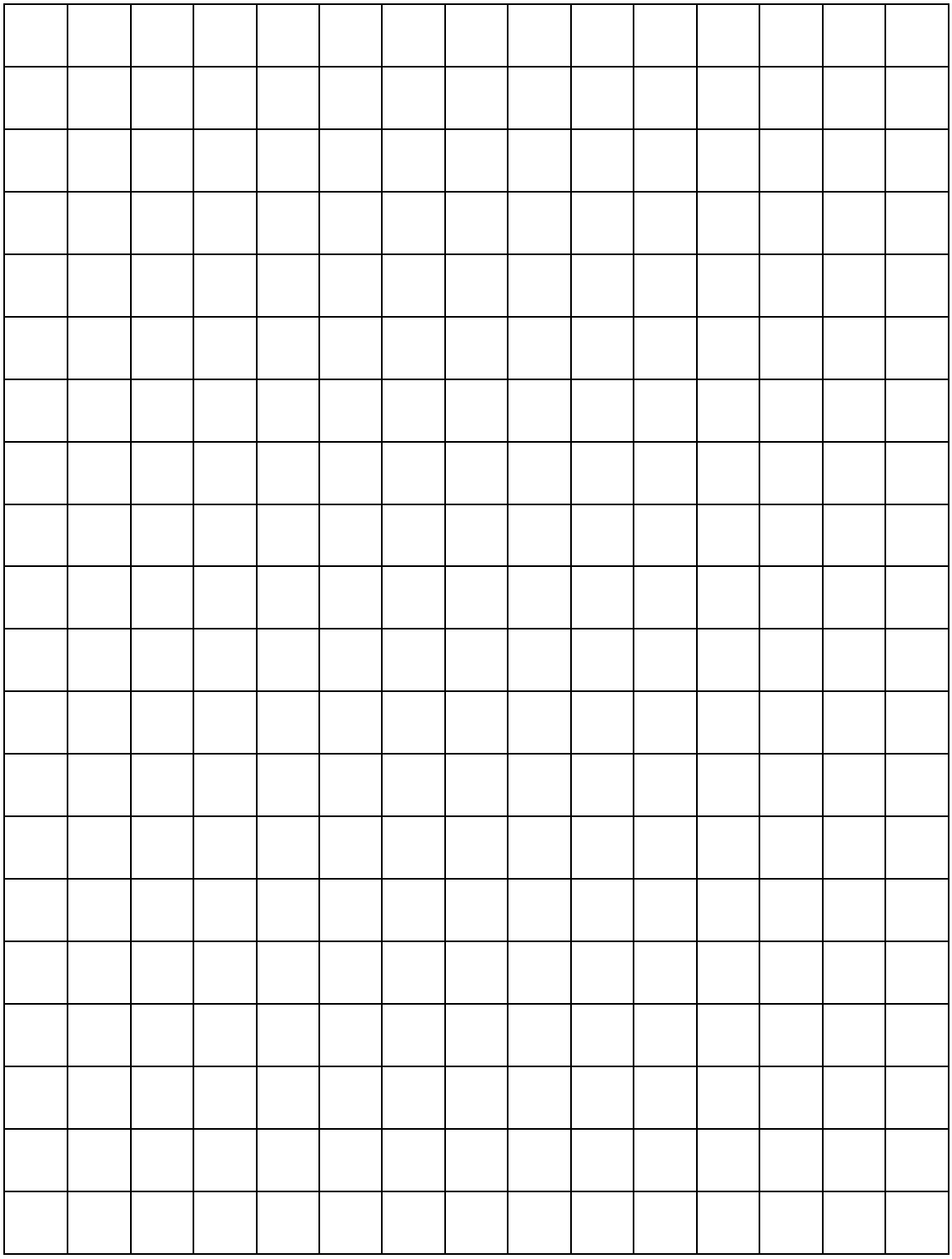
Grade	Concept	Strategy	Meaning	Example
4	Multiplication Division	Multiplicative identity	Multiplying (dividing) a factor (dividend) by one will not change its value.	1 x 12 *is* 12 21 ÷ 1 *is* 21
4. 5	Multiplication Division	Skip-counting from a known fact	Similar to the counting on strategy for addition. Using a known fact and skip counting forward or backward to determine the answer.	*for* 3 x 8 *think* 3 x 5 *is* 15 *and skip count by threes* 15, 18, 21, 24
4, 5	Multiplication Division	Doubling or halving	Using known facts and doubling or halving them to determine the answer.	*for* 7 x 4, *think the double of* 7 x 2 *is* 28 *for* 48 ÷ 6, *think the double of* 24 ÷ 6 *is* 8
4	Multiplication Division	Using the pattern for 9s	Knowing the first digit of the answer is one less than the non-nine factor and the sum of the product's digits is nine.	*for* 7 x 9 *think one less than* 7 *is* 6 *and* 6 *plus* 3 *is nine, so* 7 x 9 *is* 63
4, 5	Multiplication	Repeated doubling	Continually doubling to get to an answer.	*for* 3 x 8, *think* 3 x 2 *is* 6, 6 x 2 *is* 12, 12 x 2 *is* 24
4	Division	Using multiplication to divide	This is a form of part-part-whole representation. Thinking of multiplication as: part x part = whole Thinking of division as: whole ÷ part = part	*for* 35 ÷ 7 *think* 7 x ____ = 35 *so* 35 ÷ 7 *is* 5
4, 5	Multiplication	Distributive property	In arithmetic or algebra, when you distribute a factor across the brackets: $a \times (b + c) = a \times b + a \times c$ $(a + b) \times (c + d) = ac + ad + bc + bd$	*for* 2 x 154 *think* 2 x 100 *plus* 2 x 50 *plus* 2 x 4 *is* 200 + 100 + 8 *or* 308

(continued)

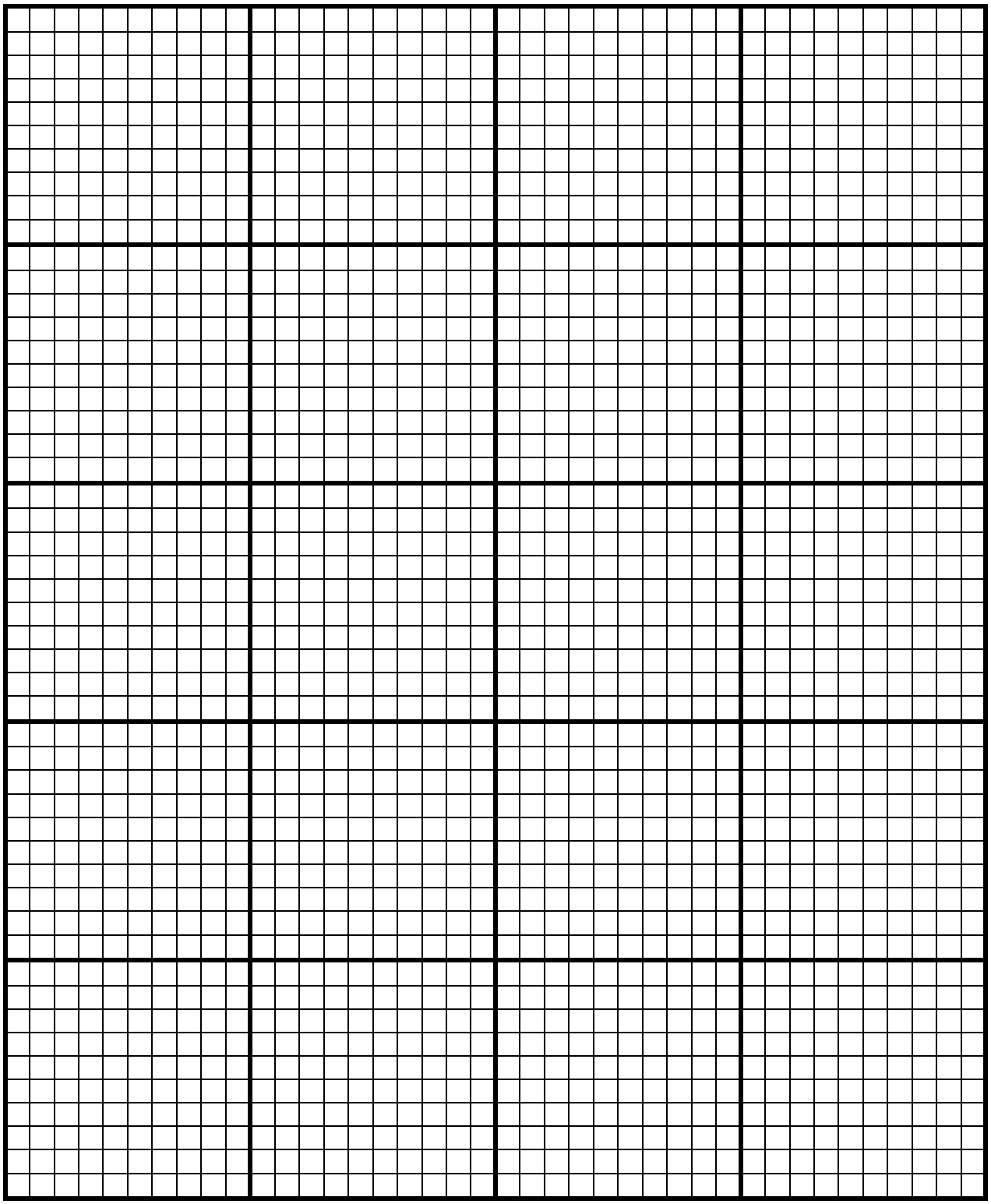
BLM 5–8.8: Mental Math Strategies (Continued)

Grade	Concept	Strategy	Meaning	Example
5	Division	Repeated halving	Continually halving to get a number.	*for* 32 ÷ 4, *think* 32 ÷ 2 *is* 16 *and* 16 ÷ 2 *is* 8 *so* 32 ÷ 4 *is* 8
5	Multiplication	Annexing zeros	When multiplying by a factor of 10 (or a power of ten), taking off the zeros to determine the product and adding them back on.	*for* 4 x 700, *think* 4 x 7 *is* 28 *and add two zeros to make* 2800
5	Multiplication	Halving and doubling	Halving one factor and doubling the other.	*for* 24 x 4, *think* 48 x 2 *is* 96
6, 7	Division	Dividing by multiples of ten	When dividing by 10, 100, etc., the dividend becomes smaller by 1, 2, etc. place value positions.	*for* 76.3 ÷ 10 *think* 76.3 *should become smaller by one place value position so* 76.3 ÷ 10 *is* 7.63

BLM 5–8.9: Centimetre Grid Paper



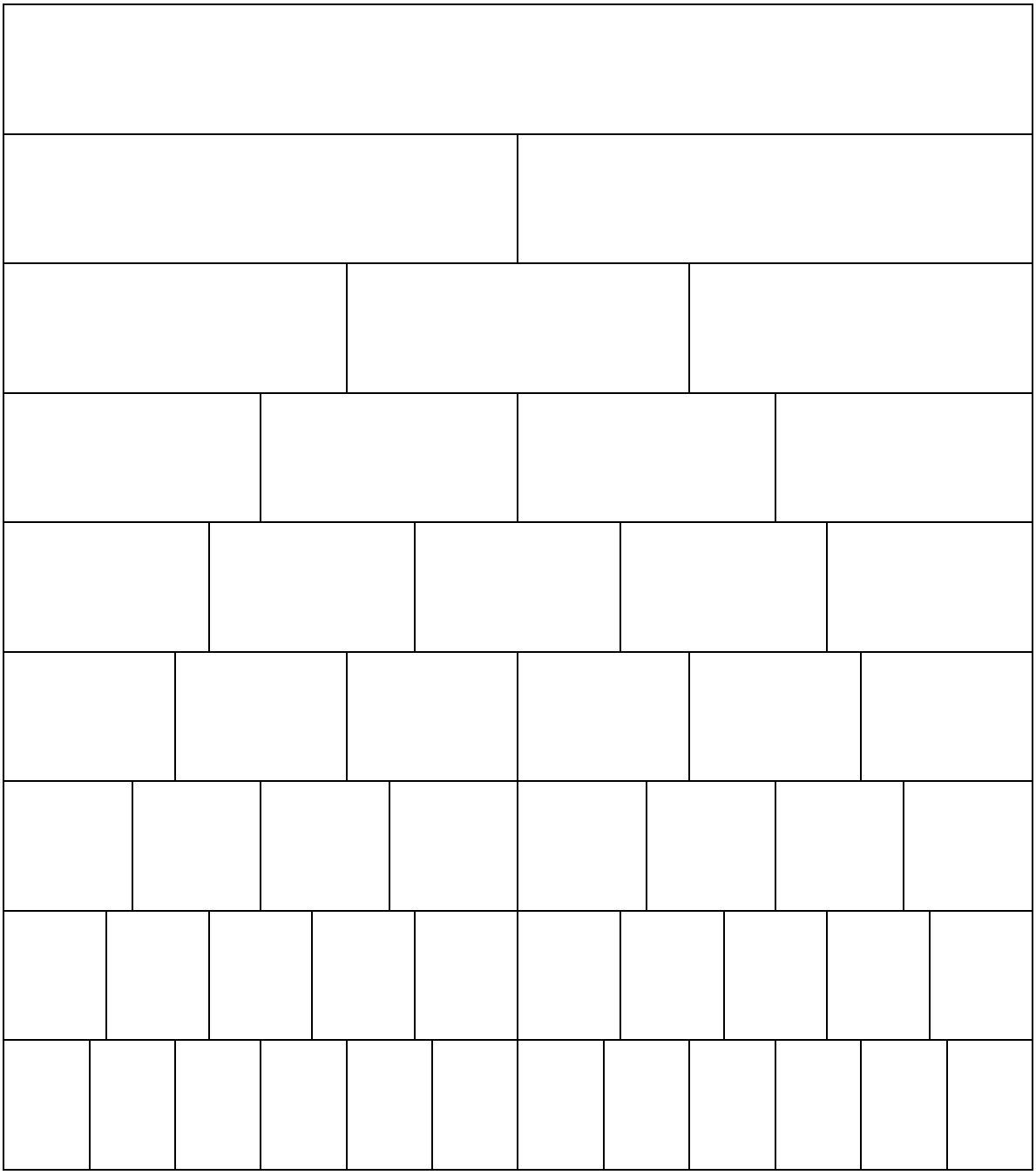
BLM 5–8.10: Base-Ten Grid Paper



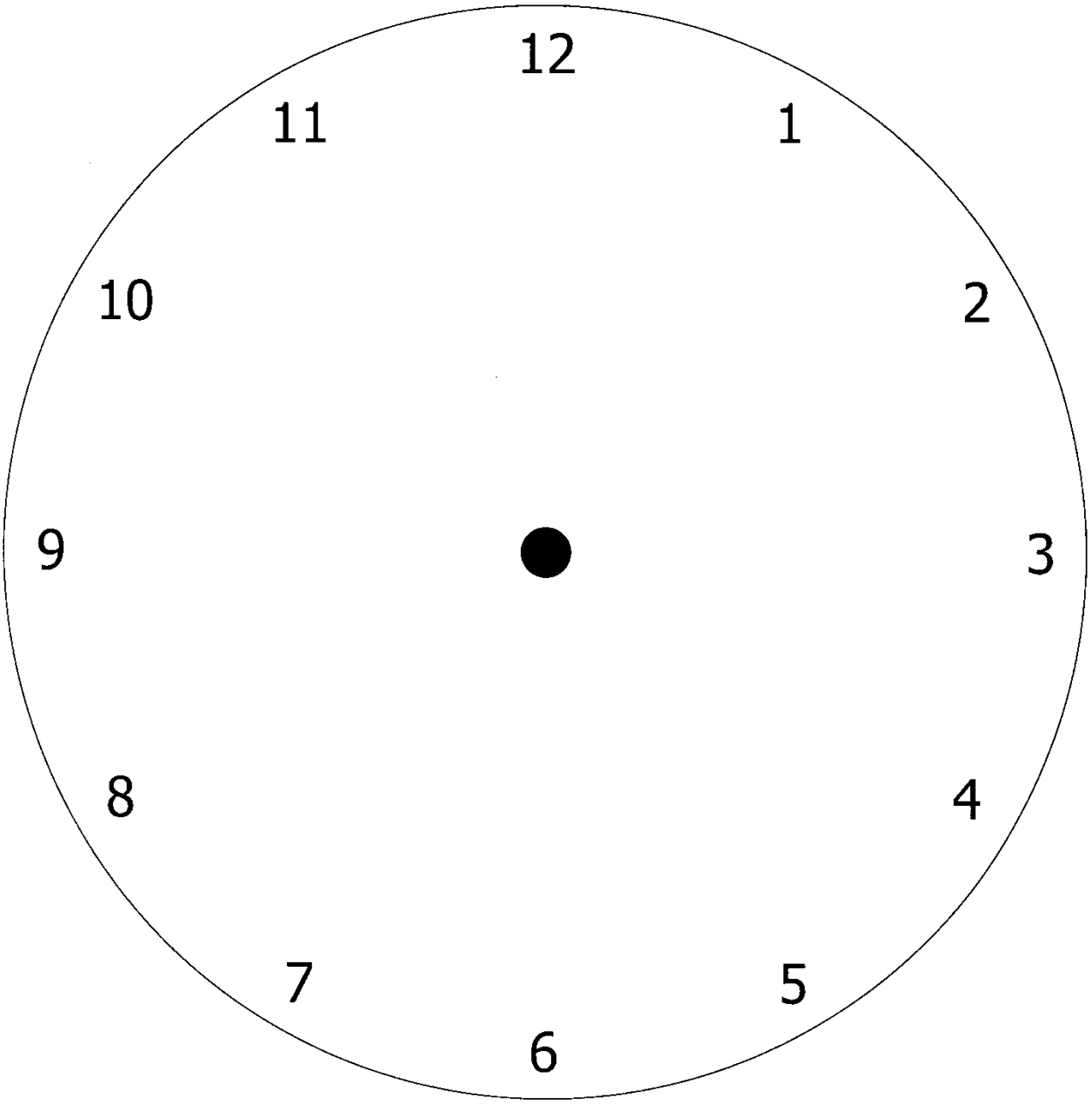
BLM 5–8.11: Multiplication Table

×	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30	36	42	48	54
7	0	7	14	21	28	35	42	49	56	63
8	0	8	16	24	32	40	48	56	64	72
9	0	9	18	27	36	45	54	63	72	81

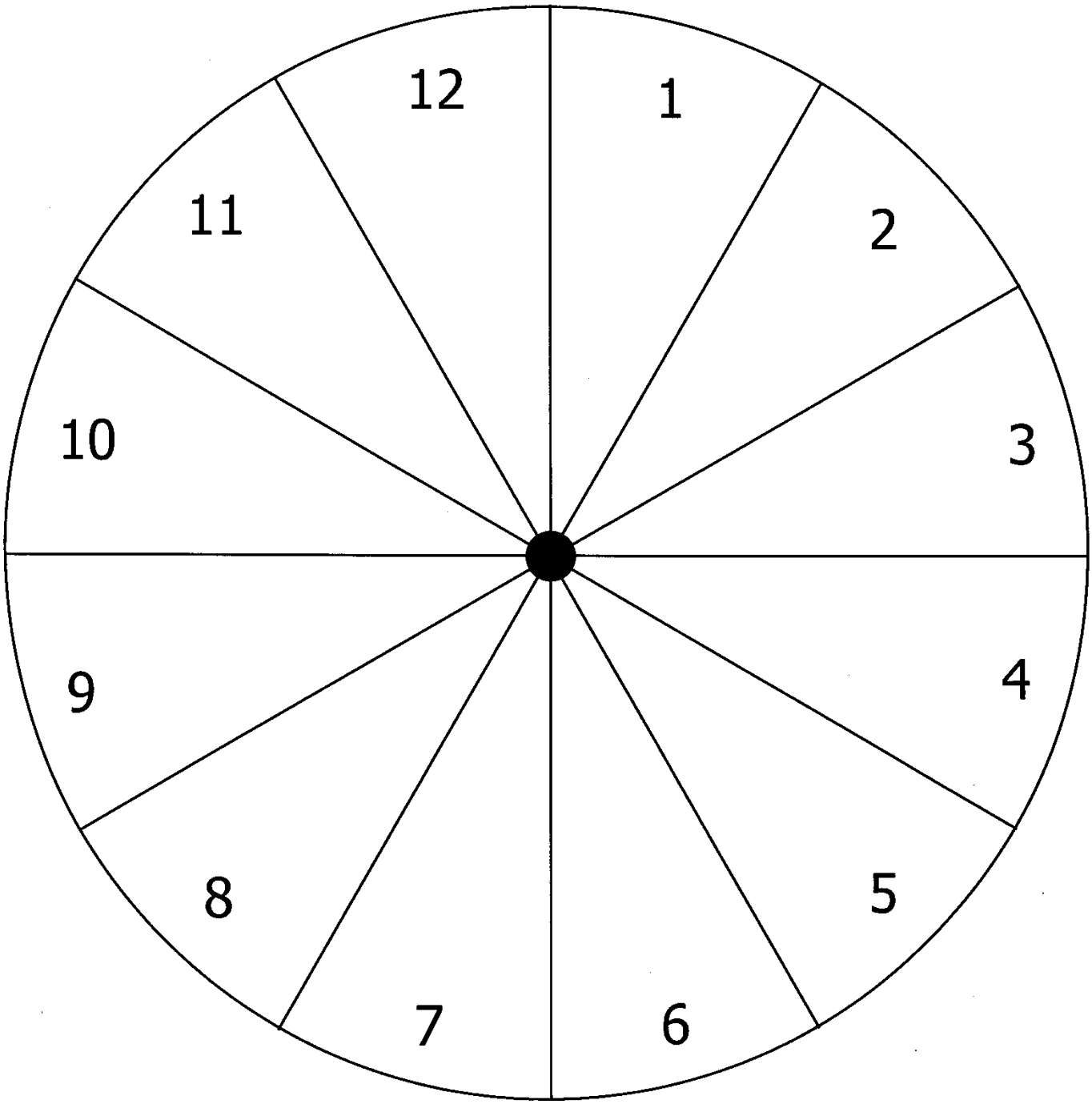
BLM 5–8.12: Fraction Bars



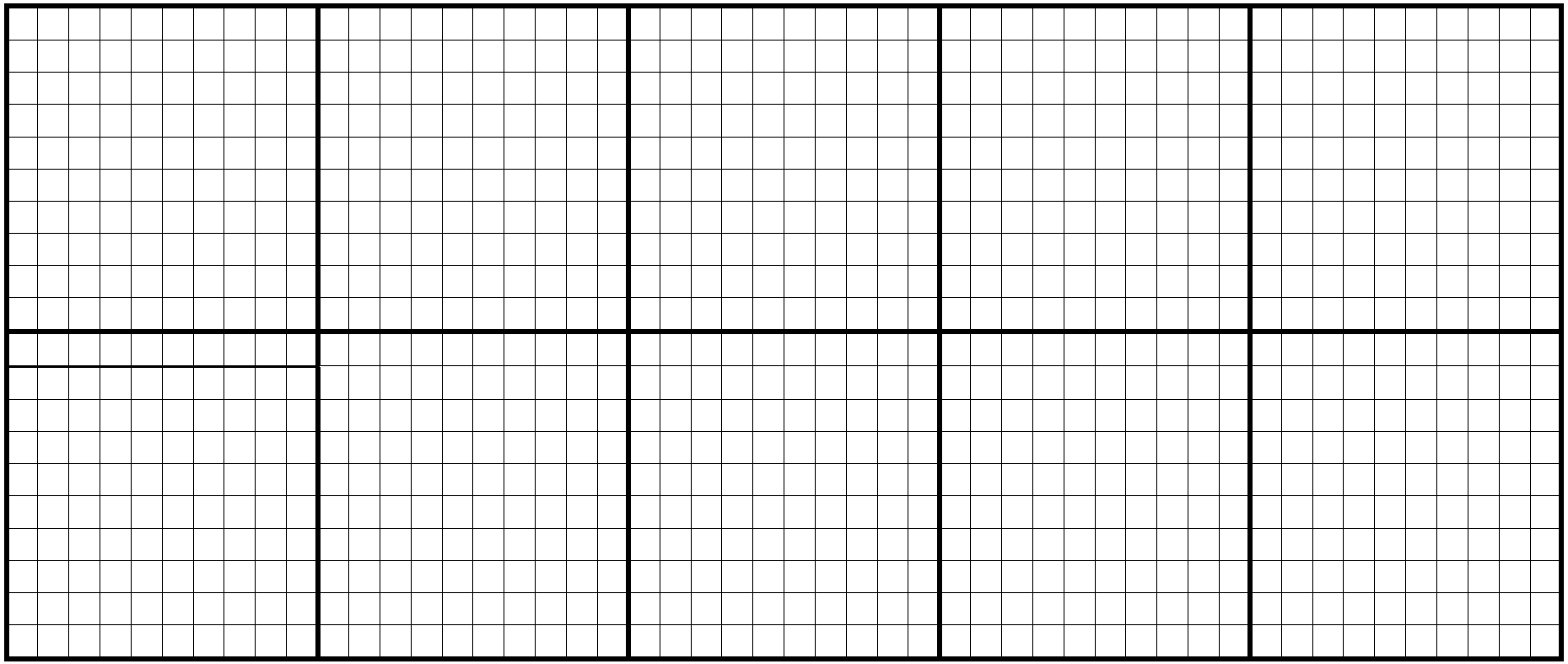
BLM 5–8.13: Clock Face



BLM 5–8.14: Spinner



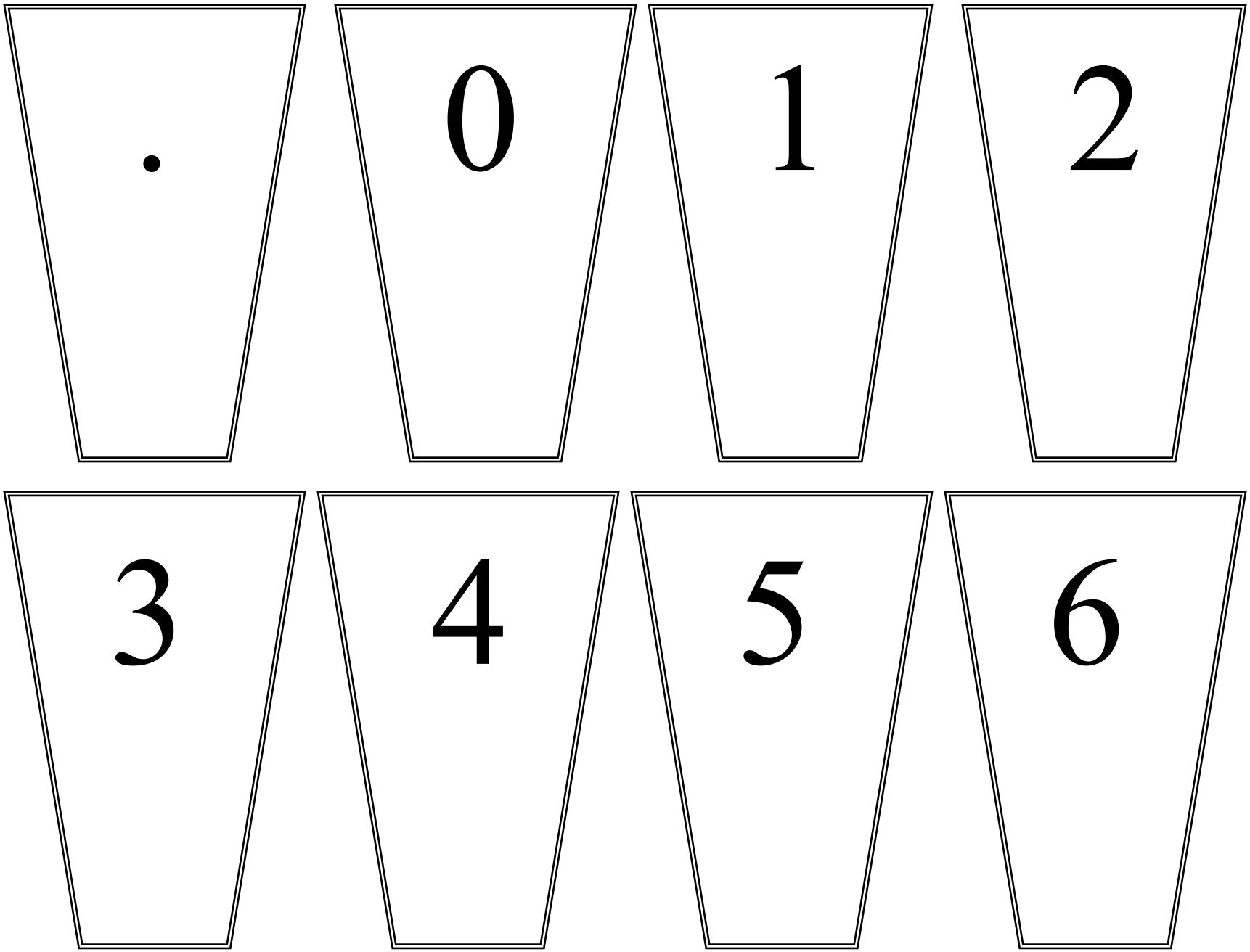
BLM 5–8.15: Thousand Grid



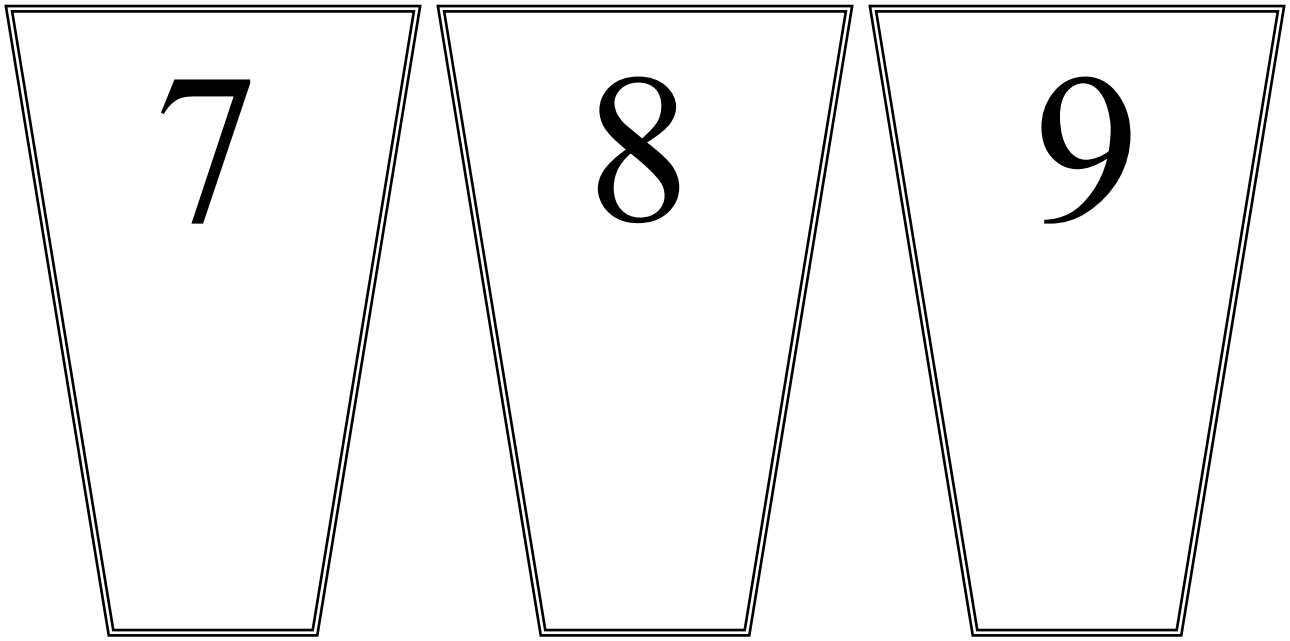
BLM 5–8.16: Place-Value Mat—Decimal Numbers

Ones		Tenths	Hundredths	Thousandths

BLM 5–8.17: Number Fan



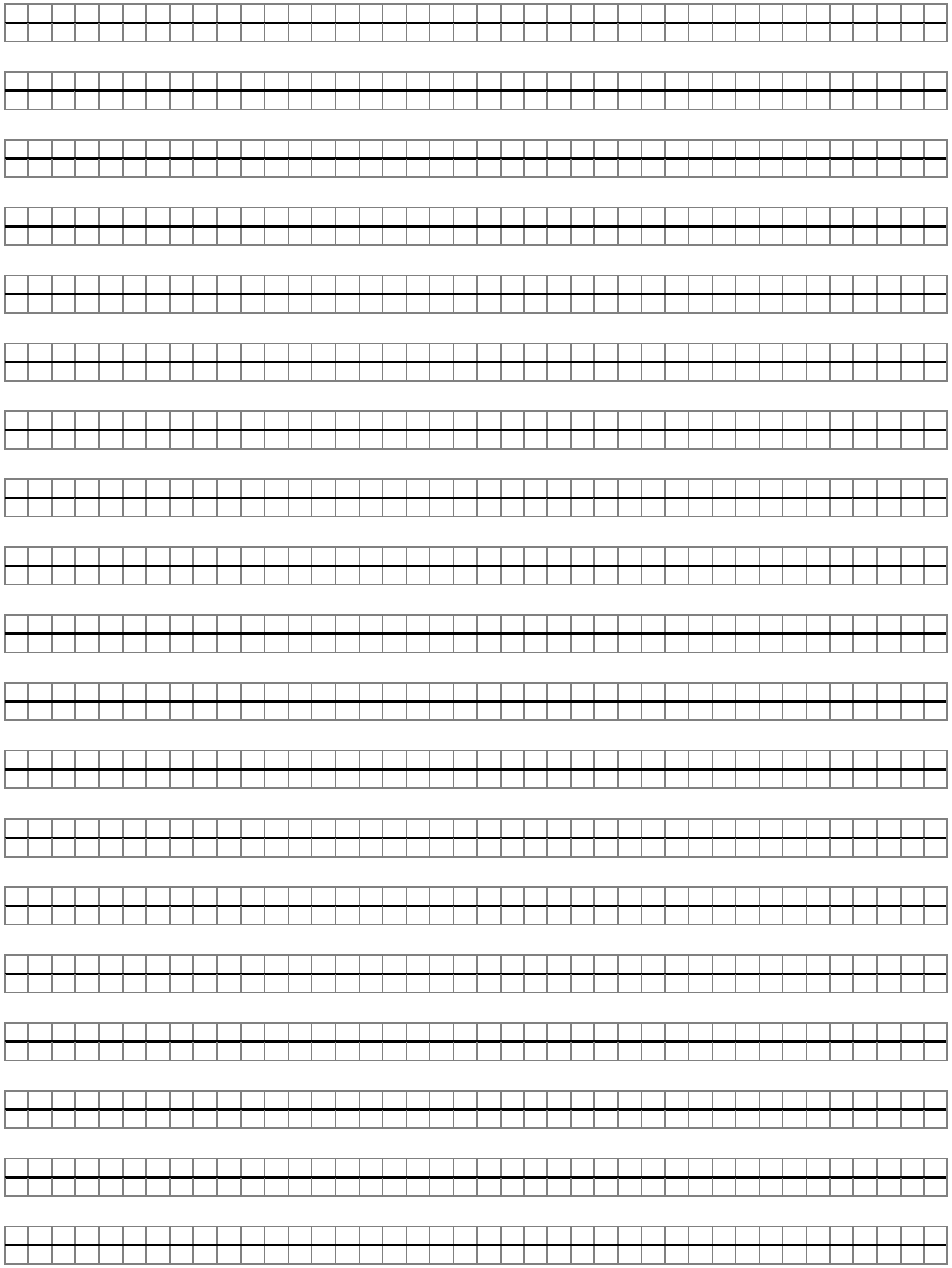
BLM 5–8.17: Number Fan (Continued)



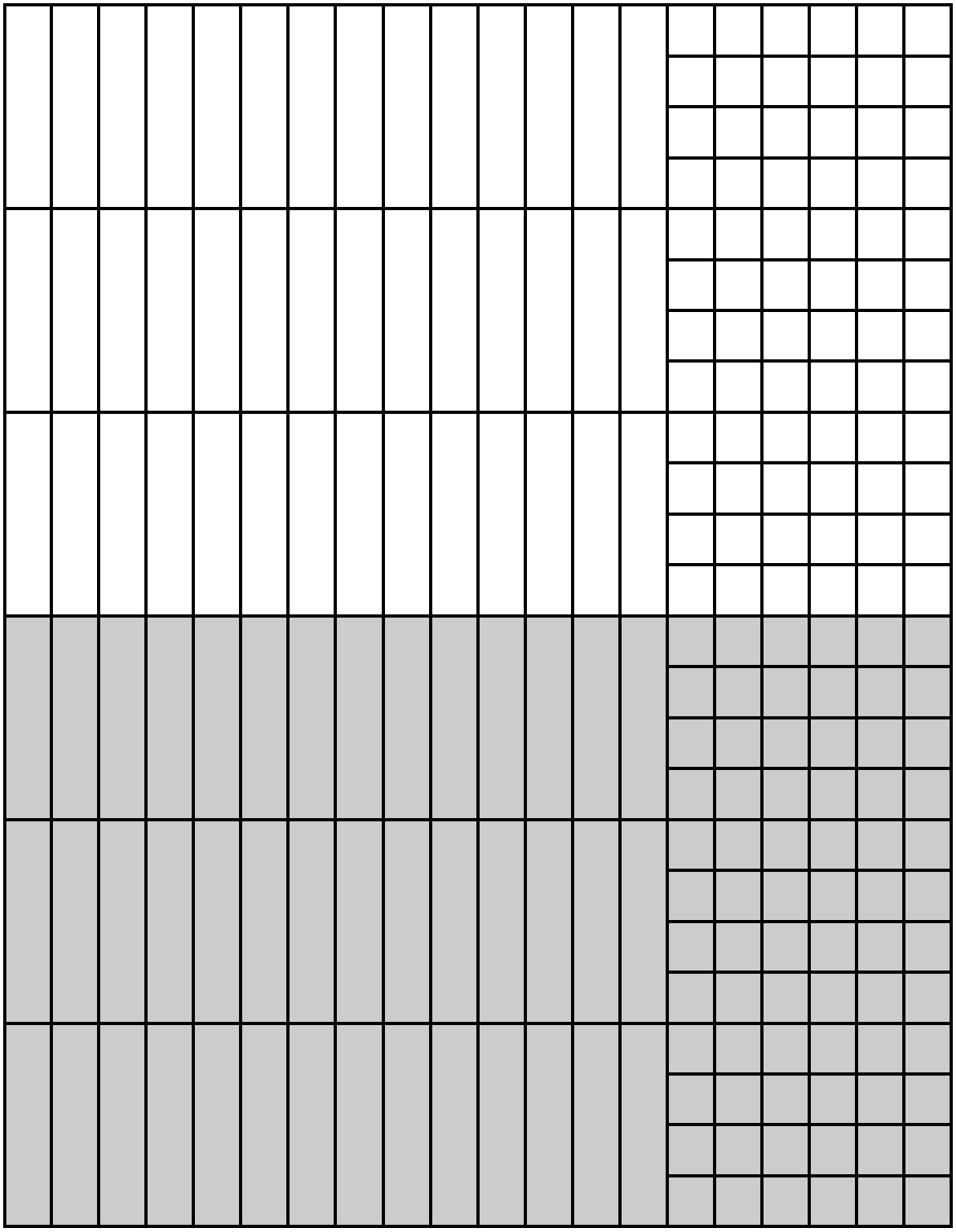
BLM 5–8.18: KWL Chart

K	W	L
What do you think you <u>KNOW</u> about _____?	What do you <u>WANT</u> to know about _____?	What did you <u>LEARN</u> about _____?

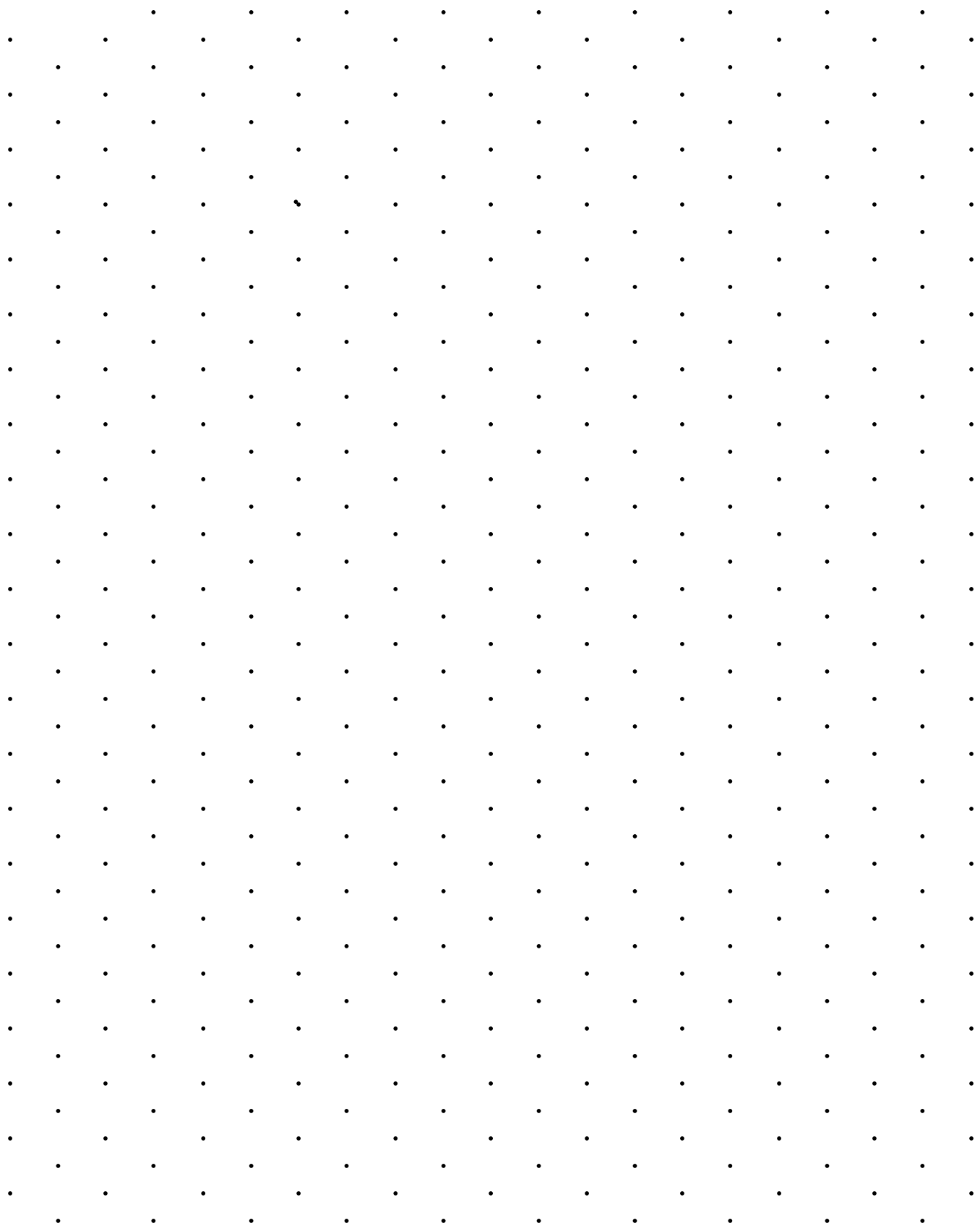
BLM 5–8.19: Double Number Line



BLM 5–8.20: Algebra Tiles



BLM 5–8.21: Isometric Dot Paper



BLM 5–8.22: Dot Paper

BLM 5–8.23: Understanding Words Chart

What does it mean?	Word	Picture
Example		

What does it mean?	Word	Picture
Example		

BLM 5–8.24: Number Line

BLM 5–8.25: My Success with Mathematical Processes

Name _____ Date _____

Task _____

What are the mathematical processes?	How do I know that I have been successful?	How have I shown my successes?
Communication	▪ I use mathematical language and symbols that I already know and that I am learning. ▪ I use real things, pictures, symbols, talking, writing, and thinking to communicate.	
Connections	▪ I connect the math I am learning to math I already know. ▪ I connect the math I am learning to my life.	
Mental Mathematics and Estimation	▪ I can quickly figure out the answers to questions with numbers by thinking about how numbers work (and I don't need to write down my steps). ▪ I estimate to make sure my answer makes sense or when I don't need an exact answer or measurement.	
Problem Solving	▪ I listen to others, talk with others, and try many things when I am trying to answer a kind of question that I have never seen before.	

(continued)

BLM 5–8.25: My Success with Mathematical Processes (continued)

What are the mathematical processes?	How do I know that I have been successful?	How have I shown my successes?
Reasoning	▪ When doing math, I see patterns, I use what I know to help me figure out something that I don't know, and I think about my answers.	

Technology	▪ I use calculators, computers, and other technology to
	  ▫ organize and show my work
	  ▫ figure out patterns
	  ▫ check something of which I am unsure
	  ▫ help me learn in new ways	

Visualization	▪ I can make up, figure out, explain, and link together different pictures and 3-dimensional objects. ▪ When thinking about numbers, I imagine them in my head. ▪ When measuring, I know that sometimes I need an exact number and sometimes I need one that is close.	

BLM 5–8.26: Percent Circle