

Mathematical Thinking and Expression – Exploring, Processing, and Problem-Solving

Numbers and Operations 2.1

A COUNTING AND CARDINALITY

1 CARDINALITY

A.1 Know number names and the count sequence. 2.1 PK.A.1

1 Name numerals up to 10. 2.1 PK.A.1.1

2 Rote count up to 20. 2.1 PK.A.1.2

3 Match a numeral to a set of 0–10 objects. 2.1 PK.A.1.3

4 Represent a number of objects with a written numeral 0–10. 2.1 PK.A.1.4

5 Differentiate numerals from letters. 2.1 PK.A.1.5

6 Counts on when a specific number is provided. 2.1 PK.A.1.6

2 COUNTING

A.2 Count to tell the number of objects. 2.1 PK.A.2

1 Subitize (visually quantify) to determine how many: attach a numerical value to a set of objects without counting up to six. 2.1 PK.A.2.1

2 Use one-to-one correspondence when counting to 10. 2.1 PK.A.2.2

3 State the total number of objects counted, demonstrating understanding that the last number named tells the number of objects counted. 2.1 PK.A.2.3

4 Use counting and numbers as part of play and as a means for determining quantity. 2.1 PK.A.2.4

3 COMPARING

A.3 Compare numbers 2.1 PK.A.3

- 1 Create sets of objects with same and different amounts . 2.1 PK.A.3.1
- 2 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group up to 10 . 2.1 PK.A.3.2
- 3 Compare two numbers between 1 and 5 when presented as written numerals . 2.1 PK.A.3.3
- 4 Practice use of mathematical vocabulary to compare numbers of objects 2.1 PK.A.3.4

MP MATHEMATICAL PROCESSES

MP Use mathematical processes when quantifying, comparing, representing, and modeling numbers. 2.1 PK.MP

- 1 Engage in numerical play . 2.1 PK.MP.1
- 2 Persist in numerical play (Reference AL.2 PK.C). 2.1 PK.MP.2
- 3 When prompted, communicate thinking while engaged in numerical play . 2.1 PK.MP.3
- 4 Talk and listen to peers during numerical play . 2.1 PK.MP.4
- 5 Use common forms of numerical representation (e.g., fingers, tally marks, dots) . 2.1 PK.MP.5

Algebraic Concepts 2.2

A OPERATIONS AND ALGEBRAIC THINKING

1 OPERATIONS AND ALGEBRAIC THINKING

A.1 Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from. 2.2 PK.A.1

- 1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations . 2.2 PK.A.1.1
- 2 Explain adding and subtracting sets of objects up to and including six, using basic math vocabulary (e.g., putting together, adding to, taking away, taking apart, taking from) . 2.2 PK.A.1.2
- 3 Join sets of objects . 2.2 PK.A.1.3
- 4 Separate sets of objects . 2.2 PK.A.1.4
- 5 Add objects to a set and tell a number story about it . 2.2 PK.A.1.5

MP MATHEMATICAL PROCESSES

MP Use mathematical processes when representing relationships. **2.2 PK.MP**

- 1 Engage in mathematical play . **2.2 PK.MP.1**
- 2 Persist in mathematical play (Reference AL.2 PK.C). **2.2 PK.MP.2**
- 3 Problem-solve during mathematical play (Reference AL.4 PK.C). **2.2 PK.MP.3**
- 4 When prompted, communicate thinking while engaged in mathematical play . **2.2 PK.MP.4**
- 5 Talk and listen to peers during mathematical play . **2.2 PK.MP.5**
- 6 Use common forms of numerical representation (e.g., fingers, tally marks, dots) . **2.2 PK.MP.6**

Geometry 2.3

A GEOMETRY

1 IDENTIFICATION

A.1 Identify and describe shapes. **2.3 PK.A.1**

- 1 Describe objects in the environment using names of shapes . **2.3 PK.A.1.1**
- 2 Recognize and describe the attributes of geometric figures . **2.3 PK.A.1.2**
- 3 Describe the relative positions of objects using terms such as above, below, beside, in front of, behind, and next to . **2.3 PK.A.1.3**
- 4 Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (solid) . **2.3 PK.A.1.4**

2 APPLICATION

A.2 Analyze, compare, create, and compose shapes. **2.3 PK.A.2**

- 1 Analyze and compare two- and three- dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts, and other attributes . **2.3 PK.A.2.1**
- 2 Model shapes in the world by building shapes from components and drawing shapes . **2.3 PK.A.2.2**
- 3 Use geoboards to create shapes with rubber bands . **2.3 PK.A.2.3**
- 4 Use simple shapes to compose larger shapes . **2.3 PK.A.2.4**

MP MATHEMATICAL PROCESSES

MP Use mathematical processes when drawing, constructing, modeling, and representing shapes. **2.3 PK.MP**

- 1 Engage in geometric play . **2.3 PK.MP.1**
 - 2 Persist in geometric play (Reference AL.2 PK.C). **2.3 PK.MP.2**
 - 3 Problem-solve during geometric play (Reference AL.4 PK.C). **2.3 PK.MP.3**
 - 4 When prompted, communicate thinking while engaged in geometric play . **2.3 PK.MP.4**
 - 5 Talk and listen to peers during geometric play **2.3 PK.MP.5**
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Measurement, Data, and Probability 2.4

A MEASUREMENT AND DATA

1 MEASUREMENT

A.1 Describe and compare measurable attributes of length and weights of everyday objects. **2.4 PK.A.1**

- 1 Recognize attributes of objects that can be measured . **2.4 PK.A.1.1**
 - 2 Measure objects using non-standard items (e .g ., hands, shoes, yarn, blocks) . **2.4 PK.A.1.2**
 - 3 Practice use of standard measurement tools . **2.4 PK.A.1.3**
 - 4 Practice using measurement vocabulary . **2.4 PK.A.1.4**
 - 5 Sort and order by one attribute . **2.4 PK.A.1.5**
 - 6 Use ordinal number words to describe the position of objects (first, second, last) . **2.4 PK.A.1.6**
 - 7 Compare two objects with a measurable attribute in common to see which object has “more of”/“less of” the attribute and describe the difference . **2.4 PK.A.1.7**
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4 DATA

A.4 Classify objects and count the number of objects in each category. **2.4 PK.A.4**

- 1 Classify up to 10 objects using one attribute into categories . **2.4 PK.A.4.1**
- 2 Display the number of objects in each category . **2.4 PK.A.4.2**
- 3 Count and compare the quantities of each category to describe which category has “more of”/“less of” the attribute . **2.4 PK.A.4.3**

MP MATHEMATICAL PROCESSES

- MP** Use mathematical processes when measuring; representing, organizing, and understanding data. **2.4 PK.MP**
- 1** Engage in activities that include measuring, representing, organizing, and understanding data . **2.4 PK.MP.1**
 - 2** Persist in activities that include measuring, representing, organizing, and understanding data (Reference AL.2 PK.C). **2.4 PK.MP.2**
 - 3** Problem-solve in activities that include measuring, representing, organizing, and understanding data (Reference AL.4 PK.C). **2.4 PK.MP.3**
 - 4** When prompted, communicate thinking while engaged in activities that include measuring, representing, organizing, and understanding data . **2.4 PK.MP.4**
 - 5** Talk and listen to peers during activities that include measuring, representing, organizing, and understanding data . **2.4 PK.MP.5**