



2



Grade level
Grade 2



GRADE 2



DIAGNOSTIC ASSESSMENT






TEACHER RESOURCE

EXCERPT

Assessment questions
or tasks are provided
for all 5 strands



Kelly Dixon

-  **Number Sense and Numeration**
-  **Measurement**
-  **Geometry and Spatial Sense**
-  **Patterning and Algebra**
-  **Data Management and Probability**






**DIAGNOSTIC ASSESSMENT
TEACHER RESOURCE**

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2



Grade level
Grade 2



GRADE 2



DIAGNOSTIC ASSESSMENT TEACHER RESOURCE

Assessment questions
or tasks are provided
for all 5 strands



Kelly Dixon

- Number Sense and Numeration
- Measurement
- Geometry and Spatial Sense
- Patterning and Algebra
- Data Management and Probability



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As teachers, we want each of our students to **get** what we are teaching. Often, our hope is to have students **get there** as quickly and as best as they can. Although the goal of achieving curriculum expectations is common for all students, the starting points and routes in reaching this goal differ widely. In our work to enable students to achieve the common goal, it is important to be explicit in our assessment and instruction.

How do we do this? We need to assess our students at the beginning and throughout the learning cycle so we can provide them with ongoing, specific feedback and guidance for growth. Some of the most effective ways to do this with young children are in individual or small group assessment contexts, and through observations and teacher-student conferences.

This *QUICKCHECK Math Diagnostic Assessment Teacher Resource* provides *diagnostic* assessment activities for all five strands of the mathematics curriculum. It offers guidance and structure in an easy-to-use format for student-teacher assessment conferences, either with individuals or small groups of students. This Assessment Resource provides a variety of opportunities for students to demonstrate their learning. Every assessment activity uses open questions and tasks that allow for a range of student responses and that reveal student strategies and thinking. *What to Look For* sections help make connections between assessment observations and curriculum expectations. These connections are particularly useful when providing students and parents with specific feedback on growth and on next steps.

The format of the *QUICKCHECK Math Diagnostic Assessment Teacher Resource* is open and flexible. There is no need to do all the assessment activities in each strand section. We have provided a number of choices for activities that assess similar concepts and skills; it is entirely your decision as to which activities you choose to use to assess your students. You decide how often you need to assess your students and whether or not you will assess them individually or in small groups. *Student Observation Sheets* for each activity are offered as an option for recording your assessment observations. These reproducible sheets are found at the end of each section when required.

We are indebted to the teachers of the Toronto District School Board who piloted these Assessment Resources and whose feedback was essential to the development of their final forms.


Kelly Dixon

Author's word



QUICKCHECK MATH DIAGNOSTIC ASSESSMENT TEACHER RESOURCE

Table of contents for
the Diagnostic Assessment
Teacher Resource



- A Word To Teachers V
- Before You Begin VIII
- How To Use X

Number Sense and Numeration

- Diagnostic Assessment Check Point Activities 1
- Student Observation Sheets Overview 14
- Student Observation Sheets 15
- Template: Domino Template 22
- Teacher Notes 23

Measurement

- Diagnostic Assessment Check Point Activities 25
- Student Observation Sheets Overview 46
- Student Observation Sheets 47
- Teacher Notes 58

Geometry and Spatial Sense

- Diagnostic Assessment Check Point Activities 59
- Student Observation Sheets Overview 66
- Student Observation Sheets 67
- Teacher Notes 71



Patterning and Algebra


■ Diagnostic Assessment Check Point Activities	73	VII
■ Student Observation Sheets Overview	82	
■ Student Observation Sheets	83	
■ Teacher Notes	88	

Data Management and Probability

■ Diagnostic Assessment Check Point Activities	89
■ Student Observation Sheets Overview	96
■ Student Observation Sheets	97
■ Teacher Notes	101
■ Glossary of Mathematical Terms	102

PART OF THE CONTENTS INCLUDED IN THIS EXCERPT

Table of contents
for the Excerpt



Number Sense and Numeration

■ Activities 6: Relate each numeral to the anchor of 5 on a number line	4
■ Activities 15: Relate each part-part-whole problem to its representation on an open number line	10
■ Student Observation Sheets	15
■ Teacher notes	23

Measurement

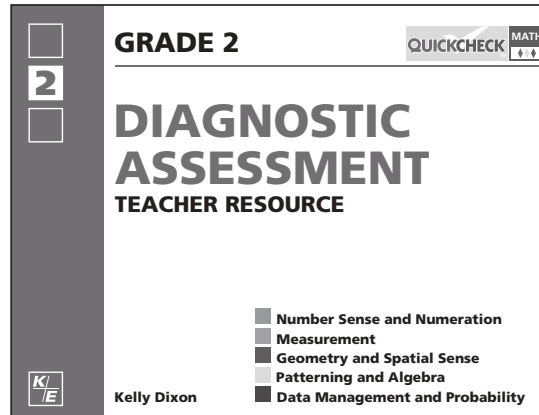
■ Activities 8: Compare each object to the representation of its width	30
■ Activities 17: For each object shown select the best unit to measure it: length, height, width or area	40
■ Student Observation Sheets	47
■ Teacher notes	58
■ Glossary of Mathematical Terms	102



GATHER THE FOLLOWING FOR YOUR ASSESSMENT

Assessment Teacher Resource

- Choose an assessment activity from any of the math strand sections contained



Gather the following before you begin your assessment:

1. Assessment Teacher Resource
2. Select the activity in the Student Resource
3. Manipulatives and *Templates
4. Diagnostic Student Observation Sheets

*Reproducible templates provided

Instructional Student Resources Packages

- Select the activity in the Student Resource that corresponds to the assessment activity you chose from the *Diagnostic Assessment Teacher Resource*.





+ Manipulatives and Templates

- Gather the recommended manipulatives and templates* suggested in the assessment activity.



DOMINO TEMPLATE

QUICKCHECK MATH
GRADE 2

+ Diagnostic Student Observation Sheets

- Use your own method for recording your observations or photocopy the corresponding Student Observation Sheet found at the end of each strand section.

GRADE 2
DIAGNOSTIC STUDENT OBSERVATION SHEET
NUMBER SENSE AND NUMERATION

QUICKCHECK MATH
GRADE 2

Name: _____ Date: _____

3 Compare each decomposition of 5 to its number sentence.

Check Point #1:
Annotated Form
This activity involves the use of the domino template. It can be completed through various strategies. The student understands that there are many ways to decompose or make 5?

Manipulative Model:
Representations of 5, or the number
5, are shown using 5 small manipulatives (e.g., 5 dots on a domino or 5 cubes).
Number Sense and Numeration (page 22)

Student Knows	Next Steps for Learning
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Other Questions I Have About the Student's Learning

Here are some examples of questions you can ask students to probe for their mathematical thinking and understanding:

"How do you know _____? Show me/tell me."
"What is the same and what is different about _____ and _____?"
"Do you think that...?"
"What if...?"



QUICKCHECK MATH DIAGNOSTIC ASSESSMENT TEACHER RESOURCE IN THREE EASY STEPS

How to use the
Diagnostic Assessment
Teacher Resource



1. Assessment activities are organized by strand and are designed to be used with individual or small groups of students. The **Check Point assessment activities** in this book have been designed for diagnostic assessment and are appropriate for use **prior to** a cycle of learning.
2. Use any of the **Check Point assessment activities** depending on your purpose and the needs of your students. The *What to Look For* section helps you discover what your students know and what they need to learn. The *What to Look For* section focuses on student thinking and strategies. If you need a system for recording your assessment observations, copy the Student Observation Sheet that corresponds to the assessment activity you have selected. Student Observation Sheets for each activity can be found at the end of each strand section.
3. Prior to using a **Check Point assessment activity**, gather the suggested manipulatives and have students complete the corresponding activity in their *QUICKCHECK Math Student Resource*.

The responses that you observe from students through these assessment activities will help you:

- Gather useful information for reporting and interviewing purposes
- Pinpoint specific areas for future math instruction.

DIAGNOSTIC ASSESSMENT

NUMBER SENSE AND NUMERATION

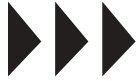


Activity book chosen
for this Excerpt:
**Number Sense
and Numeration**



6

Relate each numeral to the anchor of 5 on a number line.



Check Point #2

The **Check Point assessment activities** in this book have been designed for diagnostic assessment and are appropriate for use **prior to** a cycle of learning.



...ts relate number
Do students ide
there are?

This **number** and **heading** relate to the same number in the Student Resource.



Outlines the content to be assessed and often strategies to look for.



Materials Needed

Have a number line or a ruler available for the following assessment tasks.

Lists the manipulatives and templates needed for the particular assessment activity.



Number Sense and Numeration

6

Relate each numeral to the anchor of 5 on a number line.

■ "6 is how many more than 5? Or 3 is how many less than 5?" Continue with more examples of number statements as they relate to 5. Have children quiz each other.

Student Resource:
A reproduction of the activity in the Student Resource needed for the assessment tasks.





Question/Task

What To Look For

Question/Task:

Open questions and tasks allow for a range of appropriate student responses and help reveal student strategies and thinking.

*Choose which tasks and questions suit your purposes the best. There is no need to do them all.



What to Look For:

Defines a range of appropriate responses and strategies to help you make connections between your observations and curriculum expectations.



Students look at the bottom grid in their Student Resource and point to the square that shows Monkey pointing to the number line.

Ask: "What number is Monkey pointing at? How do you know? What did you do?"

Repeat the above task using the other square that shows Monkey pointing to the top left square.

Ask: "What number is Monkey pointing at? How do you know?" You may want to model for students: "8 is 1, 2, 3 more than 5."

- Students may say that they counted on from 5 or they know that 6 comes right after 5.
- Students may say: "The number is 6. Monkey moved over 1 more space," "1 more than 5 is 6," or, "6 is 1 more than 5."
- Students count on from 5. Students may say: "The number is 8. Monkey moved over (forward) 3 more spaces (to the right). 8 is 3 more than 5."

2. Using the bottom grid in the Student Resource, point to the top middle square.

Ask: "What number is Monkey pointing at? How do you know?"

Repeat the above task using the other square that shows fewer than five.

- Students may say: "The number is 4. Monkey moved back 1 space. 1 less than 5 is 4."
- Students count back from 5. Students may say: "The number is 3," or, "I counted backwards from 5 and got 3," or, "Monkey moved back 2 spaces from 5, which is 3."

3. Show students a ruler or number line.

Say: "Show me a number more/fewer than 5. How do you know?"

Next, say: "Show me a number 1, 2, 3, etc. more/less than 5. How do you know?"

- Using 5 as an anchor, students are able to identify numbers in relationship to how many more or fewer than 5 they are.

15 Relate each part-part-whole problem to its representation on an open number line.



Check Point #5

The **Check Point** assessment activities in this book have been designed for diagnostic assessment and are appropriate for use **prior to** a cycle of learning.



part-part-whole
to represent the
open number line

This **number** and **heading** relate to the same number in the Student Resource.



Outlines the content to be assessed and often strategies to look for.



Materials Needed

Have a ten frame and counters available for the following assessment tasks.

Lists the manipulatives and templates needed for the particular assessment activity.



Number Sense and Numeration

15 Relate each part-part-whole problem to its representation on an open number line.

■ An open number line is introduced here. Each problem relates to the anchor number of 5 or 10.


Student Resource:
A reproduction of the activity in the Student Resource needed for the assessment tasks.






Question/Task	What To Look For
<p>Students look at only the top grid in their Student Resource. Now pose the following problem. How many brown cookies are there altogether? How many yellow ones? How many red ones? How many altogether?"</p>	<ul style="list-style-type: none"> ■ E.g.: Students count on from 5 to 10 to find the total. They use ten frames to model. "5 brown and 5 yellow altogether," or, "My ten frame is full. 10 take away 10 is 0. 10 take away 10 is 0."
<p>Students choose a bag of cookies from the Student Resource. Ask: "How do you know which number line goes with this bag of cookies?"</p> <p>Repeat with more examples.</p>	<ul style="list-style-type: none"> ■ Students relate the chosen number line to the anchor number of 5 or 10 as shown in the rows of brown cookies.
<p>3. Have students look at only the bottom row of the bottom grid in their Student Resource. Now pose the following problem.</p> <p>Say: "Taylor has 10 cars and 1 truck. How many vehicles are there altogether? Can you find a number line that shows the number story? Why did you choose the number line you did?"</p> <p>Repeat the above activity using another open number line to create the word problem.</p>	<ul style="list-style-type: none"> ■ E.g.: Students point to the bottom left square. "The number line shows Taylor's 10 cars. The blue arrow shows that Taylor also has 1 truck. The number 11 shows how many vehicles there are altogether. 10 and 1 more make 11."

Question/Task:
Open questions and tasks allow for a range of appropriate student responses and help reveal student strategies and thinking.
*Choose which tasks and questions suit your purposes the best. There is no need to do them all.



What to Look For:
Defines a range of appropriate responses and strategies to help you make connections between your observations and curriculum expectations.





**STUDENT
OBSERVATION SHEETS**
NUMBER SENSE AND NUMERATION

GRADE 2
DIAGNOSTIC STUDENT OBSERVATION SHEET
NUMBER SENSE AND NUMERATION

Name: _____

Date: _____

Assessment Activity
 Correlation

6 Relate each numeral to



▶▶▶ **Check Point #2**

The **Check Point assessment activities** in this book have been designed for diagnostic assessment and are appropriate for use **prior to** a cycle of learning.



6 Relate each numeral to the anchor of 5 on a number line.

* To know the answer to #2 or 3, a student needs to know 10. Consider other more examples of number statements as they relate to 5. Have children ask each other.

Student Knows

Prior to the assessment list the appropriate knowledge, skills and strategies to look for during the assessment. For guidance with identifying these, use the **Assessment Focus** and **What to Look For** sections from the specific assessment activity you choose. Your curriculum documents are excellent sources as well.

Check the appropriate boxes as you observe and listen to student responses during the assessment.



Next Steps for Learning

Prior to the assessment list the same knowledge, skills and strategies here as you listed in the Student Knows column. Check the appropriate boxes as you observe and listen to student responses during the assessment.



Other Questions I Have About the Student's Learning

Here are some examples of questions you can ask students to probe for their mathematical thinking and understanding:

"How do you know _____? Show me/tell me."

"What is the same and what is different about _____ and _____?"

"Do you think that...?"

"What if...?"

Your assessment observations may bring up further questions about your student's learning. If so, record them here. You may find some of the open questions provided here helpful as you probe further for mathematical thinking and understanding.



GRADE 2
DIAGNOSTIC STUDENT OBSERVATION SHEET
NUMBER SENSE AND NUMERATION

Name: _____

Date: _____

Assessment Activity
 Correlation

15 Relate each part-part-whole problem to its representation on an open number line.



in an open number line.

Student Knows

Next Steps for Learning

▶▶▶ **Check Point #5**

The **Check Point** assessment activities in this book have been designed for diagnostic assessment and are appropriate for use **prior to** a cycle of learning.



15 Relate each part-part-whole problem to its representation on an open number line.
■ An open number line is introduced here. Each problem relates to the anchor number of 5 or 10.

Prior to the assessment list the appropriate knowledge, skills and strategies to look for during the assessment.
 For guidance with identifying these, use the **Assessment Focus** and **What to Look For** sections from the specific assessment activity you choose. Your curriculum documents are excellent sources as well.

Check the appropriate boxes as you observe and listen to student responses during the assessment.



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"What is the same and what is different about _____ and _____?"

"Do you think that...?"

"What if...?"

Your assessment observations may bring up further questions about your student's learning. If so, record them here. You may find some of the open questions provided here helpful as you probe further for mathematical thinking and understanding.



TEACHER NOTES

Additional page
to enter your notes



DIAGNOSTIC ASSESSMENT MEASUREMENT



Activity book chosen
for this Excerpt:
Measurement



8

Compare each object to the representation of its width.



Check Point #3

The **Check Point assessment activities** in this book have been designed for diagnostic assessment and are appropriate for use **prior to** a cycle of learning.



...the opportunity to identify, ... the width of objects. Students use ... language that describes

...taller, wider, shorter, wider, tallest, widest, ... Students understand that it is important ... unit when measuring something or when ... measurements.

This **number** and **heading** relate to the same number in the Student Resource.



Outlines the content to be assessed and often strategies to look for.



Materials Needed

Have paper clips, connecting cubes or dimes, and three different packs of sticky notes (same colour and height but different widths) available for the following assessment tasks.

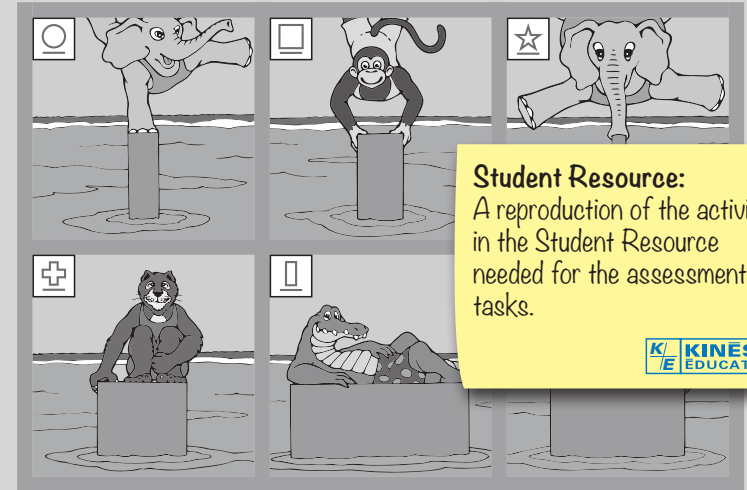
Lists the manipulatives and templates needed for the particular assessment activity.



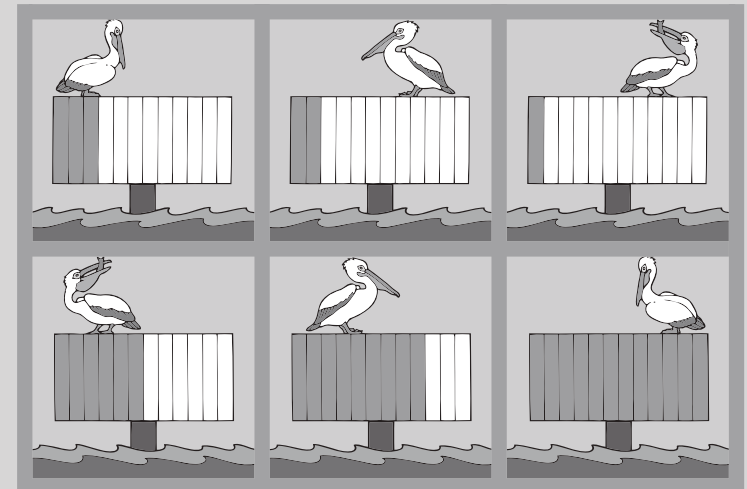
Measurement

8

Compare each object to the representation of its width.



Student Resource:
A reproduction of the activity in the Student Resource needed for the assessment tasks.



Question/Task**What To Look For****Question/Task:**

Open questions and tasks allow for a range of appropriate student responses and help reveal student strategies and thinking.

*Choose which tasks and questions suit your purposes the best. There is no need to do them all.



Look at the top grid of the Student Resource.
 What is the same about each of the wooden
 What is different?"

- Same: "They are all brown; they are all made of wood; they are the same height."
- Different: "They are all different and some are narrow." If students are taller than others, probe further by asking "Are they bigger?" Do they tell you how or do they show you how by using hand or finger spans?

What to Look For:

Defines a range of appropriate responses and strategies to help you make connections between your observations and curriculum expectations.



2. Have students look at the bottom grid of their Student Resource.

Say: "Show me the width of brown that is the widest. How wide is it?"

Because the bar sections are narrow, some students may have a difficult time counting them. If that is the case, ask: "Show me the narrowest width of brown. How wide is it?"

- Students select the bottom right square as the widest. Students may count the bars or sections, e.g., "It is 12 bars wide," or say that "it has the most brown."
- Students select the top right square as the narrowest: "It has the smallest/narrowest brown." Students count the bars or sections: "It is one bar wide."

3. Show students three different packs of sticky notes that are the same colour and height but are different widths. Put dimes, cubes, and paper clips in front of the students.

Say: "Measure the widths of these sticky notes. Order the sticky notes from narrowest to widest. How do you know?"

- Do students use the same unit to measure and compare widths? Do they line up their units without gaps or overlaps? Do they measure straight across the width?
- Did quantifying the measurements help students order the widths accurately or did they use another strategy, like lining them up and comparing them visually?

17 For each object shown select the best unit to measure it: length, height, width or area.



Check Point #8

The **Check Point assessment activities** in this book have been designed for diagnostic assessment and are appropriate for use **prior to** a cycle of learning.



measuring area.

Materials Needed

Have groups of non-standard units available for the following assessment tasks such as skipping ropes, dimes, erasers, square pattern blocks, straws, or index cards.

Lists the manipulatives and templates needed for the particular assessment activity.



This number and heading relate to the same number in the Student Resource.



Provides the opportunity to identify

of an object and to differentiate units of measurement from those

Outlines the content to be assessed and often strategies to look for.



Measurement

17 For each object shown, select the best unit to measure it: length, height, width, or area.

■ "Which object at the bottom would be the best to use to measure each object at the top?" Have students try using the units below to measure the real objects in your classroom depicted in the top grid.

 ?	 ?	 ?
 ?	 ?	 ?

Student Resource:
A reproduction of the activity in the Student Resource needed for the assessment tasks.





Question/Task	What To Look For
<p>Students look only at the top grid of their Student</p> <p>at each square. Tell me, what are we</p> <p>to be measuring: length, width, height,</p>	<ul style="list-style-type: none"> Students interpret or “read” each square. E.g.: “Width/how fat the finger is; height of the door/how high the book; width of the laptop; area of the square.”
<p>Students the non-standard units you have</p> <p>Say: “I want to measure the length of the room. Would dimes be a good unit to use? Would I want to know how many dimes long the room is? Why/why not? What group of things would be better?”</p>	<ul style="list-style-type: none"> Students identify that using dimes to measure the length of the classroom would take too long. Students might indicate that there would be too many dimes to count. Students suggest that the skipping ropes or straws would be better because they are longer. It would be faster or easier to measure the length with longer objects and easier to count the number of skipping rope lengths (unit iteration).
<p>3. Show students the non-standard units you have gathered.</p> <p>Say: “I want to measure the area of this table. Which of these objects would be best to use? Why? Show me.”</p>	<ul style="list-style-type: none"> Do they say the index cards or square pattern blocks are best? Do they notice that these units cover the area without any gaps? Do they indicate that, since the index cards are larger than square pattern blocks, it would be faster to cover the table? How do they decide? Do they use trial and error? Do they test covering a small area with a few different units, or do they know that the square-shaped units would be the best?

Question/Task:
Open questions and tasks allow for a range of appropriate student responses and help reveal student strategies and thinking.
*Choose which tasks and questions suit your purposes the best. There is no need to do them all.

What to Look For:
Defines a range of appropriate responses and strategies to help you make connections between your observations and curriculum expectations.





**STUDENT
OBSERVATION SHEETS
MEASUREMENT**

GRADE 2
DIAGNOSTIC STUDENT OBSERVATION SHEET
MEASUREMENT

Name: _____

Date: _____

Assessment Activity
Correlation



8

Compare each object to



Check Point #3

The **Check Point assessment activities** in this book have been designed for diagnostic assessment and are appropriate for use **prior to** a cycle of learning.



Student Knows

Prior to the assessment list the appropriate knowledge, skills and strategies to look for during the assessment. For guidance with identifying these, use the **Assessment Focus** and **What to Look For** sections from the specific assessment activity you choose. Your curriculum documents are excellent sources as well.

Check the appropriate boxes as you observe and listen to student responses during the assessment.



Next Steps for Learning

Prior to the assessment list the same knowledge, skills and strategies here as you listed in the Student Knows column. Check the appropriate boxes as you observe and listen to student responses during the assessment.



Other Questions I Have About the Student's Learning

Here are some examples of questions you can ask students to probe for their mathematical thinking and understanding:

"How do you know _____? Show me/tell me."

"What is the same and what is different about _____ and _____?"

"Do you think that...?"

"What if...?"

Your assessment observations may bring up further questions about your student's learning. If so, record them here. You may find some of the open questions provided here helpful as you probe further for mathematical thinking and understanding.



GRADE 2
DIAGNOSTIC STUDENT OBSERVATION SHEET
MEASUREMENT

Name: _____

Date: _____

Assessment Activity
Correlation

17 For each object shown select the best unit to measure its length, height, width or area.



▶▶▶ Check Point #8

The **Check Point** assessment activities in this book have been designed for diagnostic assessment and are appropriate for use **prior to** a cycle of learning.



17 For each object shown, select the best unit to measure its length, height, width, or area.

* Pick objects in the column except for the door to use to measure each object at the top. Some students try using the units below to measure the real objects in your classroom depicted in the top grid.

Student Knows

Prior to the assessment list the appropriate knowledge, skills and strategies to look for during the assessment.

For guidance with identifying these, use the **Assessment Focus** and **What to Look For** sections from the specific assessment activity you choose. Your curriculum documents are excellent sources as well.

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Next Steps for Learning

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"Do you think that...?"

"What if...?"

Your assessment observations may bring up further questions about your student's learning. If so, record them here. You may find some of the open questions provided here helpful as you probe further for mathematical thinking and understanding.



TEACHER NOTES

Additional page
to enter your notes



analogue clock. A clock that shows the time with the position of its hands.

attribute. A trait of a shape, an object, or an event.

attribute blocks. Tools that help students learn. A set of attribute blocks usually includes five shapes (rectangle, square, circle, triangle, hexagon); each shape comes in three colours, two sizes, and two thicknesses.

capacity. The maximum quantity a container can hold.

conservation. The property of number or shape by which the basic nature remains the same regardless of change in physical arrangement, orientation, or attributes (e.g., colour, size). E.g.: A rectangle remains a rectangle no matter which way it is oriented.

connecting cubes. Small plastic manipulative blocks that can attach to each other.

counting on. An addition or counting strategy where students start with a known number and then count forward a certain quantity more from that number.

equilateral triangle. A triangle with three equal sides.

geoboard. A square board with a grid of pegs (often a 10 x 10 or 11 x 11 grid). Students use elastics to connect the pegs and make shapes.

graph. A drawing that shows data.

– **bar graph.** A graph that uses bars, either horizontal or vertical, to represent the frequency of an event or occurrence.

– **pictograph.** A graph that uses pictures and symbols to represent each item in a data set.

hundreds chart. A 10 x 10 chart. Each square in the chart contains a whole number in order from 1 to 100.

hexagon. A closed shape with six vertices and six straight sides.

isosceles triangle. A triangle that has two of three sides of equal length.

mass. A physical attribute of objects that can be measured in grams or kilograms. The amount of matter of an object or body.

non-standard units. Objects used as measurement units. Some examples are paper clips, cubes, straws, and yogurt containers.

number composition. The remove space joining of two numbers to make a third greater number. E.g.: 10 can be composed of a group of four and a group of six or a group of nine and a group of one.

Glossary of all words
found in italics in this
Diagnostic Assessment
Teacher Resource



number cube. A small plastic or wooden cube. Typically, each cube face shows a different numeral or number of dots from 1 to 6.

number decomposition. The separation of a number into smaller parts. E.g.: 10 can be decomposed into a group of four and a group of six or a group of nine and a group of one.

number line. A line that represents a set of numbers.

one-to-one correspondence. The association of one object to only one number, symbol, or picture.

pattern blocks. Plastic or wooden manipulative sets which include green equilateral triangles, orange squares, tan rhombuses and larger blue rhombuses, red trapezoids, yellow hexagons.

pentagon. A five-sided polygon.

polygon. A closed shape with three or more straight sides.

prism. A three-dimensional figure with two parallel and congruent bases. Particular prisms are identified by the shape of their bases.

property (geometric). A characteristic of a shape or an object that is constant. For example, two geometric properties of triangles are that they all have three straight sides and three vertices.

quadrilateral. A four-sided polygon.

rectangle. A quadrilateral with four right angles. Opposite sides are equal.

rhombus. A parallelogram with equal sides. Squares and diamonds are rhombuses.

shape composition. The combination of smaller shapes to create a larger one. E.g.: Putting together three rhombuses to form a hexagon.

shape decomposition. The separation or division of a large shape into its smaller composite shapes. E.g.: Dividing a rhombus into two equilateral triangles.

square. A rectangle with four equal sides and four right angles. Shape composition.

ten frame. A 2 x 5 array. Students place counters, stickers, or dots to show quantities to 10.

trapezoid. A quadrilateral with only one pair of parallel sides.

vertex. The corner or endpoint where two lines meet.

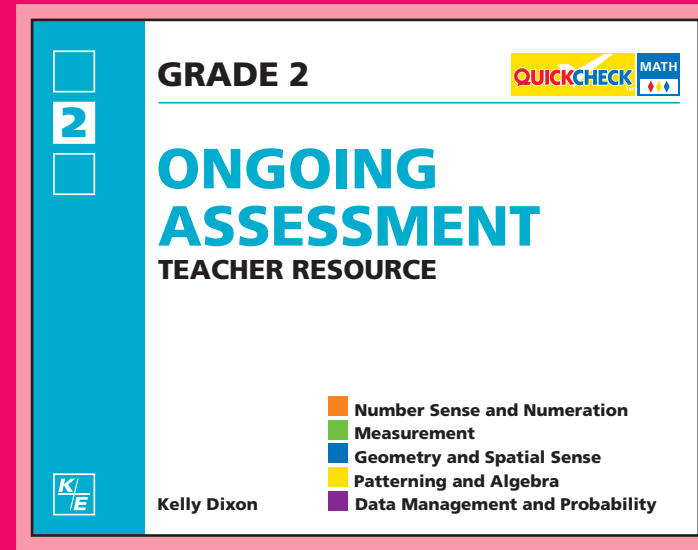
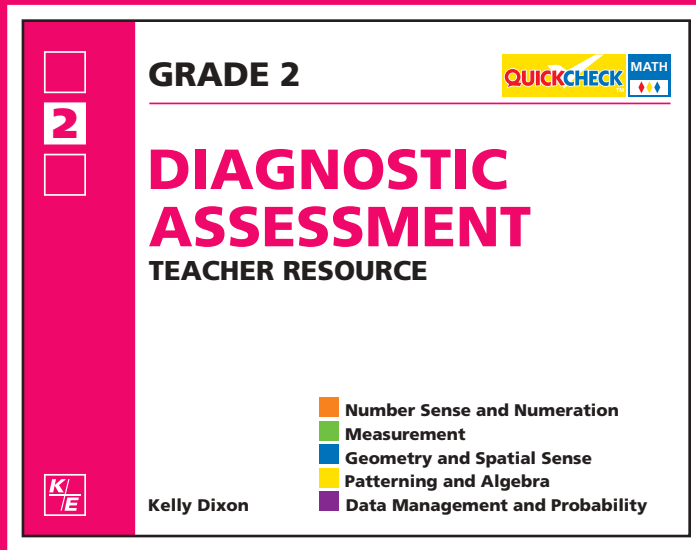
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