



ELEMENTARY MATH PROJECT

GRADE 1

Measurement and Geometry

Key Number Concept 2: Comparison of 2D Shapes and 3D Objects

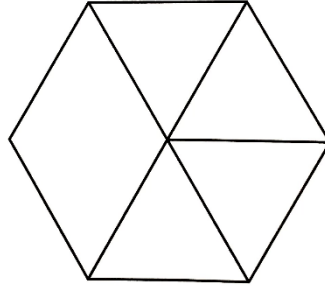
Sample Week at a Glance

This week's lessons are the starting point for comparing 2D shapes and 3D objects. Prior to this week, students were given experience with sorting various objects (buttons, attribute blocks, etc.) before sorting shapes in this week's lessons. It is useful to have introduced instructional routines, such as [Which One Doesn't Belong?](#) and [Same But Different](#), as well as the structure of Math Workshop, prior to this week's lessons, as well.

Monday	<p>Topic: Free sort</p> <p>Before: Students are put into groups of 3 or 4 students and given a large variety of shapes to sort. One way to do this is to provide each group with these shapes which they will have to first cut out (you do not have to use all of the shapes). Tell students that they will be sorting these shapes any way they would like and to be prepared to share their sorting rule.</p> <p>During: Students are sorting their shapes in a collaborative manner. Visit each group and ask them about their sorting rule, why particular shapes are placed in certain groups, and how they resolved any disagreements. Provide them with a shape that hasn't yet been sorted to witness their thought process as they tell you how they would sort it. You may want to take pictures of the sorting for each group for future class discussions. Early finishers can be asked about different ways they could have sorted their shapes.</p> <p>After: Have students do a gallery walk to see how other groups sorted their shapes. Then discuss the sorts as a class. Some questions to consider are:</p> <ul style="list-style-type: none">• How did you sort your shapes?• Which shapes were most challenging to sort and why?• Were there any disagreements over how to sort a shape?• Were there misfits that did not belong to any group? Why?• How would you sort your shapes next time?
Tuesday	<p>Topic: Directed sort</p> <p>Before: Which One Doesn't Belong? Use this image. Encourage students to notice the different attributes that the shapes have. Which shapes are the same? Which one is different? Can they make a case for each shape?</p> <p>During: Students work in pairs. Provide them with a subset of the shapes they were working with yesterday. Alternatively, use physical shapes such as 3D solids.</p>

	<p>Ask them to sort the shapes in the following ways (one at a time). You may need to explain the terminology used, though students do not need to memorize terms at this grade level.</p> <ul style="list-style-type: none"> • Number of edges/sides • Number of faces (for 3D objects) • Number of corners/vertices • Curved vs not curved <p>Circulate while students work, observing how they sort and offering support where needed. Ask students how a particular shape is sorted and why? Are there any misfits or challenging shapes? Why?</p> <p>After: Gather students as a class and ask them to share about the sorting activity.</p> <ul style="list-style-type: none"> • What was your strategy for sorting shapes? • Which directed sort was easiest? Which was most challenging? Why? • Which shapes were most challenging to sort and why? • Were there any disagreements over how to sort a shape? • Were there misfits that did not belong to any group? Why? • Were you able to sort a shape in more than one way? Why?
Wednesday	<p>Topic: Comparing and contrasting shapes</p> <p>Before: Same But Different. Use this image. How are these images the same? How are they different? Help students to see that a cube is the 3D version of the 2D square and that its faces are squares.</p> <p>During: Math Workshop. Some ideas you could include...</p> <ul style="list-style-type: none"> • Meet with the teacher who can show students the pictures of Monday's student free sorts to ask students if there are any shapes that were not sorted in the correct group and why. Alternatively, the teacher can show students a sort that the teacher created for the purpose of critiquing (which would include errors or evoke some debate). • Free sort with some new and old materials (e.g., buttons, attribute blocks, paper clips, beads, mixed beans, etc.) • Sorting 3D geometric solids where students pick one of the sorting rules: <ul style="list-style-type: none"> ○ Number of faces ○ Number of corners ○ Number of edges • Online same and different game such as this. • Use a small subset of the shapes from Monday. Have students sort them and glue them onto a page in their math journal with their sorting rule. You may need to provide printed sorting rules to glue into their journals as well. This works well as an "After" activity as well. <p>After: Students and teachers meet to debrief the activities. For example, you might ask which materials were easier, more challenging, or more fun to sort? Which 3D sort was the most popular: by faces, corners, or edges? Why? What did you learn from these activities? What do you still want to learn?</p> <p>Alternatively, refer to the last bullet in the list above.</p>
Thursday	<p>Topic: Composing and decomposing shapes</p> <p>Before: Quick Images routine. Show students the image below for 1 to 2 seconds and then hide it! You may need to do this again once or twice more. The idea</p>

behind hiding it is to force students to use a strategy for remembering the image, such as one involving composing and decomposing shapes.



Discuss strategies for recalling the image. How did students “see” the image? What shapes did they see? Can they see it more than one way?

During: Tangram puzzles. Use physical tangram pieces or an online program such as [Mathigon tangrams](#) if physical materials are not available. Students rearrange and compose shapes to make a variety of images thereby solving the puzzles. There are many printable templates online (free and paid versions). [Here](#) and [here](#) are two examples.

Alternatively, students can solve puzzles made for pattern blocks rather than tangrams, since pattern blocks may be easier to come by. You can also use these on another day for further practice with composing shapes.

For students needing more support, provide puzzles that show the individual shapes rather than the silhouette of the shapes. You can further challenge students by asking them to create a particular image (e.g., dog) without a template.

After: Have students share their strategies for solving the puzzles. Which puzzles were easier versus harder and why? Were they able to solve the puzzles in more than one way? Why or why not? What did they learn about shapes through this activity? The big idea here is that we can compose shapes from other shapes as well as decompose shapes into other shapes.

Friday

Topic: Shapes scavenger hunt

Before: Classroom shape hunt. Ask students what 2D shapes and 3D objects they see in and around the classroom. Do they see shapes composed from other shapes? How would they describe these shapes? Although students are not expected to know the names of all the different shapes and solids, introducing this language is a good idea.

One way to do the shape hunt is to play “I spy”. For example, say “I spy with my little eye a shape that is made of two triangles” and students can either point to it or go stand next to it. Repeat this with a variety of single shapes and composed shapes (2D and 3D). You can show images instead of using terms to make this activity more accessible to students.

During: Outdoor shape hunt. This can be done two ways...

1. Students can use a math journal to draw a variety of different shapes that they see outside on the school grounds, including shapes composed of shapes.

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| | <p>2. Students can be given a worksheet with particular shapes to find, such as: triangle, square, circle, rectangle, cube, prism, cone, pyramid. Using sample images makes this activity more accessible. Using words is also a good idea to help expose students to math terminology.</p> <p>Ask students to take a mental note of where they found these shapes or to record this in their journal or on their worksheet if they are able to. This is an opportunity for students to use positional language.</p> <p>After: Meet with students as a whole class. Ask them what examples of shapes they found outside. Can they use positional language to describe where they found the shapes? (e.g., above, below, up, down, etc.) Which shapes could be composed of other shapes? How do they know? Can any of these shapes be decomposed into more than one shape? How do they know?</p> |
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Students need ongoing practice with all math concepts. One week is not enough even if the major ideas of the concept have been discussed in full. Thus, in the weeks and months to follow, make sure to revisit previously taught concepts. Routines such as the ones listed in the Suggested Links below are a great way to do this. Ongoing assessment is also important (see below).

Suggestions for Assessment

What to look for:

- Consistently sorts shapes according to a single attribute and can explain the sorting rule
- Compares and contrasts shapes; that is, student is able to confidently describe which attributes are the same and which are different
- Composes shapes from other shapes and decompose a shape into two or more shapes
- Identifies shapes in the environment and can describe their location using positional language
- Is able to name common shapes (e.g., square, circle, triangle, rectangle)