### Sample Mathematics Learning Plan – Sorting Shapes

<table>
<thead>
<tr>
<th>Big Idea(s) / Topic(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Classify and sort objects based on measurable attributes and count the number of objects in categories</td>
</tr>
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<table>
<thead>
<tr>
<th>Standard(s) Alignment</th>
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<tbody>
<tr>
<td>MGSEK.MD.3 Classify objects into categories; count the numbers of objects in each category and sort the categories by count</td>
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<table>
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<tr>
<th>Diagnostic Assessment</th>
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<tr>
<td>In the <a href="#">attached diagnostic assessment</a>, students will be shown a group of shapes. They will then be asked to determine which one of the shapes does not belong and provide reasoning as to why that shape does not belong in the group.</td>
</tr>
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</table>
Instructional Design

Desmos Activity link: Shape Sort

In this Desmos activity, students will be classifying objects into categories based on attributes. Students begin by sorting shapes into groups and explaining how they sorted the shapes. The students sort the shapes twice – using a different attribute each time. Finally, students observe shapes that have already been sorted and try to determine how the shapes were sorted. As a reflection of the activity, students are asked to share a sort that was interesting to them and why?

For the best card sort experience, we recommend two students per one device to increase accountable math conversation.

Engage

1 Sorting Shapes

On the next screen you will sort shapes into groups.
-You can put shapes into a group by dragging one shape on top of another shape.
-You can add as many shapes as you want to a group.
-If you change your mind you can drag a shape out of a group.

You must have at least two groups.

We would like you to be able to explain how you sorted the shapes.

Student Supports

We would like you to be able to explain how you sorted the shapes.

3 Explain Your Sort

Explain how you sorted the shapes.

Explain any math terms you use in everyday words, so other people understand what you mean by them.

- **Synchronous**: Using the teacher dashboard, restrict students to the first two screens. Have students complete the first two screens and engage them in a classroom discussion, pausing the activity as needed to highlight student responses. Highlight unique sorts and use a variety of sorts to address misconceptions and help students make connections.
- **Asynchronous**: Introduce the problem to students in a virtual platform; this can be done via e-document or video. Allow students to share responses within the Desmos platform and provide feedback via the teacher dashboard. Additionally, students could use an audio/video to share. Provide feedback to individual student responses and highlight multiple strategies used by students.
● **Unplugged/ Offline** Provide the opening image for students to engage in the task. Have students share ideas through email/text/phone. Provide feedback to students and share other students’ ideas before engaging in the remaining sections.

Explore

4 Sort Them in a New...

**Student Supports**

There are no wrong answers. You just have to be able to explain how you sorted the shapes!

5 Explain Your Second...

Explain how you sorted the shapes the second time.

Explain any math terms you use in everyday words, so other people understand what you mean by them.

● **Synchronous**: Complete Desmos activity during synchronous learning, either face to face, virtual, or blended. Using the teacher dashboard, unrestrict screens 4 and 5. Provide students with time to complete the activities on these screens, then engage students in a discussion of their sorts. Highlight unique sorts and help students make connections between the first sort and the second sort. Allow students to share their thinking about the first two sorts and the connections they have made.

● **Asynchronous**: Using the teacher dashboard, unrestrict screens 4 and 5. Give students time to complete the screens and provide feedback. Ensure that enough time is provided for students to participate and respond to your feedback and edit responses as needed. Be sure to provide students with access to other students’ thinking during this part of the activity.

● **Unplugged/ Offline**: Provide paper/electronic versions of the activity presented on screens 4 and 5. Allow students time to complete the work and submit through email/text or other means. Provide feedback and share with other students and provide access to other students’ thinking.

Apply

6 Guess My Rule 1

Someone sorted the shapes like this.

What do you think they were thinking?

● **Synchronous** Complete Desmos activity during synchronous learning, either face to face, virtual, or blended. Highlight student responses that are unique and/or sorting “rules” that may be interesting, but need clarity. Allow students to clarify these sorts as necessary. Depending on student responses, these discussions could be used for a couple of days.

● **Asynchronous** Using the teacher dashboard, unrestrict screens 6. Give students time to complete the screens and provide feedback. Ensure that enough time is provided for students to participate.
and respond to your feedback and edit responses as needed. Be sure to provide students with access to other students’ thinking during this part of the activity. Also, provide access to other students’ thinking and clarify sorts as done with synchronous learners, above.

- **Unplugged/ Offline** Provide students with access to the paper version of the sort shown above and allow students to engage in the questions presented on screen 6. Ask students to complete the questions and have them submit responses via email/text/phone. Provide feedback, share these responses with other students, and share other students’ responses with them.

## Reflect

7 Reflection: What Did …

Students will reflect on sorting and what did they consider when sorting the shapes.

- **Synchronous** Complete Desmos activity during synchronous learning, either face to face, virtual, or blended. Highlight student responses that are unique and/or sorting “rules” that may be interesting, but need clarity. Allow students to clarify these sorts as necessary. Depending on student responses, these discussions could be used for a couple of days.

- **Asynchronous** Using the teacher dashboard, unrestrict screen seven. Give students time to complete this part of the activity and provide feedback. Ensure that enough time is provided for students to participate and respond to your feedback and edit responses as needed. Be sure to provide students with access to other students’ thinking during this part of the activity. Also, provide access to other students’ thinking and clarify sorts as done with synchronous learners, above.

- **Unplugged/ Offline** Provide students with access to the paper version of the reflection and allow students to engage in the task. Ask students to complete the questions and allow students to engage in the task. Ask students to complete the questions and have them submit responses via email/text/phone. Provide feedback, share these responses with other students, and share other students’ responses with them.

## Evidence of Student Success

### Formative Assessment Questions:

This standard allows teachers to assess many areas by questioning students about the sort.

- What attributes did you use to determine your groups?
- Are there more ways to compare these objects or to sort them?
- Why did you decide to classify the objects this way?

## Student Learning Supports

Establish mathematics goals to focus learning.
• Make instructions and expectations clear for the activities.
• Make explicit connections between current and prior lessons or units.

Facilitate meaningful mathematical discourse.
• Explicitly model and teach good “discussion board” etiquette.

Pose purposeful questions.
• Predetermine when you will call on the student or use the pause feature within the activities.
• Break class into small discussion groups to work collaboratively and then have groups report back to the whole group.

Support productive struggle in learning mathematics.
• Offer outlines and other scaffolding tools and share tips that might help students learn.
• Provide feedback using the feedback feature within activities and offer corrective opportunities.
• Consider the pacing of the lesson.

Elicit and use evidence of student thinking.
• Anticipate any misconceptions or questions students might have about the task, materials or technology. Proactively address them with readily available and accessible resources.

Additional Student Supports:
[add specific supports for this learning plan]
• 

<table>
<thead>
<tr>
<th>Engaging Families</th>
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<tbody>
<tr>
<td>• To extend student thinking teachers could ask students to think about how to make categories equal. This prepares students for the Grade 1 standard.</td>
</tr>
<tr>
<td>• Ask students to collect items in the home and sort them in a way that makes sense to them.</td>
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<tr>
<td>• Adults could give students buttons, or other collections of items, and ask them to separate the buttons into different piles however they wish and explain how they sorted them (they may use color, shape, size, number of holes, texture, etc.) and then have students count the number of buttons in each pile. Finally students can organize the groups by quantity in each group.</td>
</tr>
</tbody>
</table>
## Diagnostic Assessment – Which One Doesn’t Belong?

For each set of shapes, circle the one that you think does not belong, then describe why you think it does not belong with the other shapes.

<table>
<thead>
<tr>
<th>Which one doesn’t belong?</th>
<th>Why do you think it doesn’t belong?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Shape 1" /></td>
<td><img src="image2" alt="Shape 2" /></td>
</tr>
<tr>
<td><img src="image3" alt="Shape 3" /></td>
<td><img src="image4" alt="Shape 4" /></td>
</tr>
<tr>
<td><img src="image5" alt="Shape 5" /></td>
<td><img src="image6" alt="Shape 6" /></td>
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<tr>
<td><img src="image7" alt="Shape 7" /></td>
<td><img src="image8" alt="Shape 8" /></td>
</tr>
<tr>
<td><img src="image9" alt="Shape 9" /></td>
<td><img src="image10" alt="Shape 10" /></td>
</tr>
<tr>
<td><img src="image11" alt="Shape 11" /></td>
<td><img src="image12" alt="Shape 12" /></td>
</tr>
</tbody>
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*Note: Images are placeholders.*
Shape Sorts 1 and 2