

# Rubric: Ice Cream

## Key APS Mathematics Standards:

### Target Performance Standards – Grade 2:

1. **Develops and applies** more complex patterns and relationships in real-life and mathematical problem situations.
2. **Describes, creates, and extends** a wide variety of patterns.
3. **Uses and explains** multiple strategies to solve addition and subtraction problems, with and without re-grouping, using two-digit numbers.
4. **Communicates** mathematical thinking coherently and clearly to others.

- If the student does not attempt to solve the task or the work on the problem is completely unrelated to the task, the student's work for the task is considered "**Unscorable**" and should not be assigned a performance level of Novice, Apprentice, Practitioner, or Expert.

Level	Understanding	Strategies, Reasoning, & Procedures	Communication
Novice	❖ The student understands that s/he must choose ice cream cones, but does not understand that there is a pattern, and that there are multiple combinations of ice cream cones.	<p>❖ The student has started the task using manipulatives or representations, but does not use an effective strategy to find the different cone combinations.</p> <p>❖ The student draws ice cream cones, but does not list them all and does not see that there is a pattern to the different cone combinations.</p> <p><b>Sample Strategy:</b> The student begins by drawing the 3 different ice cream flavors (vanilla, chocolate, &amp; strawberry), only uses one type of cone, and does not state how many different ice cream cones can be made.</p>	<p>❖ There is little or no communication, the student did not label the work, and/or their thinking is difficult to follow.</p> <p>❖ <b>Summary:</b> The student cannot write/verbalize his/her final answer, and/or uses little or no math language and symbols to explain (verbally or in writing) how s/he arranged the different combinations of ice cream cones.</p> <p>❖ <b>Representations:</b> The student has no system (charts/t-tables/graphs) to track the combinations of ice cream cones.</p>

<p><b>Apprentice</b></p>	<p>❖ The student understands that:</p> <ul style="list-style-type: none"> <li>• S/he must find the different combinations of ice cream cones using 2 different cones and 3 different flavors.</li> <li>• There are multiple cone combinations, but does not recognize a pattern for the cone combinations and cannot identify all of the combinations.</li> </ul>	<p>❖ The student has started the task using manipulatives or representations, has chosen a strategy for finding the different cone combinations, but does not achieve a correct solution.</p> <p>❖ The student does not identify a pattern for the ice cream cone combinations and makes no connection to the concept of 'sets' to establish the pattern.</p> <p><b>Sample Strategy:</b> The student uses symbols to represent the different flavors and cones, but does not identify all of the different combinations. S = Sugar, P = Plain, V = Vanilla, C = Chocolate, SB = Strawberry</p> <p>The flavor combinations are: S-V, S-SB, C-S, V-S, P – C, C - P</p>	<p>❖ The student has communicated his/her understanding of the task by labeling their work, but the task is not clearly organized and the student's thinking is hard to follow.</p> <p>❖ <b>Summary:</b> The student states his/her final answer and uses some math language/symbols to explain (verbally or in writing) how s/he arranged the different combinations of ice cream cones.</p> <p>❖ <b>Representations:</b> The student can represent the ice cream cones, but has not establish an accurate system (charts/t-tables/graphs) to track the combinations of ice cream cones.</p>
<p><b>Practitioner</b></p>	<p><b>Proficiency</b></p> <p>❖ The student understands that:</p> <ul style="list-style-type: none"> <li>• S/he must find all of the different cone combinations using 2 different cones and 3 different flavors.</li> <li>• There is a pattern to the cone arrangements and uses the pattern to find all of the cone combinations.</li> <li>• The student connects the pattern to 'sets' and relates the pattern to addition.</li> </ul>	<p><b>Proficiency</b></p> <p>❖ The student must have a correct solution and demonstrate one strategy that will find all of the cone combinations.</p> <p>❖ The student identifies the pattern and uses the pattern to find the different combinations of cones.</p> <p>❖ The student connects the pattern with 'sets' of cones and makes the connection to addition and/or repeated addition.</p> <p><b>Sample Strategy:</b> I can start with sugar cones (s) to make 3 combinations: s – vanilla, s- chocolate, s – strawberry so the plain cones (p) will also have 3 combinations: p – vanilla, p – chocolate, p – strawberry.</p> <ul style="list-style-type: none"> <li>• Each cone type will have a set of 3: 3 flavors and 1 cone. <math>3 + 3 = 6</math></li> <li>• There will be 6 combinations of ice cream cones.</li> </ul>	<p><b>Proficiency</b></p> <p>❖ The student can represent his/her work in a clear, organized manner.</p> <p>❖ <b>Summary:</b> The student states his/her final answer and uses appropriate math language and symbols to explain (verbally or in writing) how s/he arranged the different combinations of ice cream cones.</p> <p>❖ <b>Representations:</b> The student can represent the ice cream cones using manipulatives and/or drawings, has created an efficient system (charts/t-tables/graphs) to track combinations of ice cream cones.</p>

<p><b>Expert</b></p>	<ul style="list-style-type: none"> <li>❖ The student understands that: <ul style="list-style-type: none"> <li>• S/he must find all of the different cone combinations using 2 different cones and 3 different flavors.</li> <li>• There is a pattern to the cone arrangements and uses the pattern to find all of the cone combinations.</li> <li>• The student connects the pattern to 'sets' and relates the pattern to repeated addition and/or multiplication.</li> </ul> </li> <li>❖ <b>Task Extension:</b> The student includes a rule, equation, generalization, and/or observation (verbal or written) about their understanding of patterns.</li> </ul>	<ul style="list-style-type: none"> <li>❖ The student must have a correct solution and demonstrate one or more strategies that will find all of the cone combinations.</li> <li>❖ The student identifies the pattern and uses the pattern to find the different combinations of cones.</li> <li>❖ The student connects the pattern with 'sets' of cones and makes the connection to repeated addition and/or multiplication.</li> </ul> <p><b>Sample Strategy:</b> See the 'Practitioner' strategy.</p> <p><b>Task Extension:</b></p> <ul style="list-style-type: none"> <li>• There are 6 combinations - each cone choice will have 3 combinations. 1 (cone) x 3 flavors = 3, 2 (cones) x 3 = 6, so if I want to add a waffle cone to the selection 3 (cones) x 3 = 9.</li> <li>• If another flavor is added the pattern will be: 1 cone x 4 flavors = 4 cone combinations for each cone type, 2 cones x 4 flavors = 8 cone combinations, 3 cones x 4 flavors = 12 cone combinations.</li> </ul>	<ul style="list-style-type: none"> <li>❖ The student can represent his/her work in a clear, organized manner.</li> <li>❖ <b>Summary:</b> The student states his/her final answer and uses appropriate math language and symbols to explain (verbally or in writing) how s/he arranged the different combinations of ice cream cones.</li> <li>❖ <b>Representations:</b> The student can represent the ice cream cones using manipulatives and/or drawings, has created an efficient system (charts/t-tables/graphs) to track combinations of ice cream cones.</li> <li>❖ <b>Task Extension:</b> The student includes a rule, equation, generalization, and/or observation (verbal or written) about combining the ice cream cones.</li> </ul>
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