Make a Map

Math Domain

- Number/Quantity
- Shape/Space [✓] Function/Pattern
- Chance/Data
- Arrangement

Math Actions (possible weights: 0 through 4)

- Modeling/Formulating [2]
- Manipulating/Transforming [1]
- Inferring/Drawing Conclusions [3]
- Communicating [2]

Math Big Ideas

- Scale
- Continuity
- Equivalence [✓]
- Use of Limits
- Reference Frame [✓]
- Boundedness
- General/Particular
- Invariance/Symmetry
- Contradiction
- Approximation
- Other

The intent of this task is to have students demonstrate their understanding of diagrams of binary relationships by reading, interpreting, and constructing such diagrams.

1.

2. Kevin - black triangle
   Andrew - gray triangle
   Michael - white triangle

3. solid line with arrow we live in the same house
   dashed line with arrow we go to the same school
   dotted line with arrow we go to the same camp
4. The only circle that can be definitely identified is the black, representing the sewing machine; for the other circles there are several possibilities.

Here is one:

The black circle represents the sewing machine.

The first shaded circle represents the radio.

The second shaded circle represents the vacuum cleaner.

The white circle represents either the iron or the hair dryer.

And here is another:

The black circle represents the sewing machine.

The first shaded circle represents the radio or the vacuum cleaner.

The second shaded circle represents the iron.

The white circle represents the hair dryer.

Dealing with uncertainty is a hard task for this age group, and they may have difficulty in verbalizing the possible duality of representation.

5. It is imperative that the symbolism, the narrative of the relationships, and the direction of the arrows be consistent. It is hoped that students will choose interesting, fanciful stories to map. Here is one possibility:

There are 3 surviving kittens in a litter. There is a female named Anne, who weighs the least and is the palest. There is a male named Charlie who weighs the most, and there is a female named Beth who has the darkest fur.

Anne

Beth

Charlie

Weighs more than

Has darker fur than

Is the same gender as

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<table>
<thead>
<tr>
<th>Model/ Formulating (weight: 2)</th>
<th>partial level</th>
<th>full level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correctly identify some of the symbols and arrows in 1–4.</td>
<td>Correctly identify all of the symbols and arrows in 1–4.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Transforming/ Manipulating (weight: 1)</th>
<th>partial level</th>
<th>full level</th>
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<tbody>
<tr>
<td>Give a partial ordering of the objects in 4.</td>
<td>Make a fully correct ordering of the objects in 4.</td>
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<thead>
<tr>
<th>Inferring/ Drawing Conclusions (weight: 3)</th>
<th>partial level</th>
<th>full level</th>
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<tr>
<td>Correctly identify elements and arrows in 1-3.</td>
<td>Additionally, provide a reasonable interpretation of 4.</td>
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<tr>
<th>Communicating (weight: 2)</th>
<th>partial level</th>
<th>full level</th>
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<tbody>
<tr>
<td>Give a minimal narrative in 5 that mimics one of the earlier questions.</td>
<td>Devise and describe clearly a fresh set of elements and relationships in 5.</td>
<td></td>
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