Where is Number in Algebraic Reasoning?

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Using Playing Cards

Let's play the game 'Salute''

- Need three players on the team
- Deck of cards
- Paper to write problem
Two of Everything

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
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</thead>
<tbody>
<tr>
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Rule____________
Activity Sheet 1. What Would You Choose?

Circle your choice.
- Choice A: 100 coins each day for 10 days
- Choice B: 5 coins and a magic pot that doubled the coins each day for 10 days

Work it out: How many coins would you have in 10 days with choice A? With choice B? Show your work on the back of this page.

Final thought: After working through the problem, would you still make the same choice? Why or why not? _______________

Activity Sheet 2. Pattern Seekers

1. On the graph paper below, draw the pattern you see.

2. Create a table of the pattern you see.

<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Cubes</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

3. On the back of this page, describe the pattern in your own words. Then write a rule for the pattern.
The students were introduced to a system of equations.

**HOW MUCH IS EACH SYMBOL WORTH?**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><img src="cloud" alt="" /></td>
<td><img src="sun" alt="" /></td>
<td><img src="rain" alt="" /></td>
</tr>
<tr>
<td><img src="flower" alt="" /></td>
<td><img src="cloud" alt="" /></td>
<td><img src="sun" alt="" /></td>
</tr>
<tr>
<td><img src="rain" alt="" /></td>
<td><img src="flower" alt="" /></td>
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<td></td>
<td><img src="rain" alt="" /></td>
<td><img src="sun" alt="" /></td>
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<tr>
<td></td>
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<td><img src="flower" alt="" /></td>
</tr>
</tbody>
</table>

How much is each symbol worth?

Sun? _______   Cloud? _______   Flower? _______

Explain your reasoning.

**HOW MUCH DOES EACH FISH COST?**

<table>
<thead>
<tr>
<th>SUM</th>
<th>$6</th>
<th>$12</th>
<th>$19</th>
<th>$16</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUM</td>
<td>$13</td>
<td>$19</td>
<td>$21</td>
<td></td>
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</tbody>
</table>

Goldfish  Beta  Clown Fish

What is the cost of each fish?

Goldfish? ________  Beta? ________  Clown Fish? ________

Explain your reasoning.

What is the weight of each whale?

Right Whale? _______  Gray Whale? _______  Blue Whale? _______

Explain your reasoning.

Which is worth more, a SMILE or a FROWN?

Sum

\[
\begin{array}{ccc}
+ & + & + \\
\text{Frown} & \text{Smile} & \text{Neutral face} \\
40 & 32 & 35 \\
\end{array}
\]

Sum $52 \quad 50 \quad 42$

What is the value of each face?

Frown? ________  Smile? ________  Neutral face? ________

Explain your reasoning.

## Dinner Tables

<table>
<thead>
<tr>
<th>Dinner Tables</th>
<th>Show How</th>
<th>Number of People</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><img src="image" alt="Diagram" /></td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td><img src="image" alt="Diagram" /></td>
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<td>3</td>
<td><img src="image" alt="Diagram" /></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td><img src="image" alt="Diagram" /></td>
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<td>5</td>
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<td>6</td>
<td><img src="image" alt="Diagram" /></td>
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<tr>
<td>7</td>
<td><img src="image" alt="Diagram" /></td>
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</table>
Tiling a Patio

<table>
<thead>
<tr>
<th>Patio Number</th>
<th>Number of Brown Tiles</th>
<th>Number of White Tiles</th>
<th>Total Number of Brown and White tiles</th>
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</table>

Graph  

Table  

Equation  

Solution
Crossing the River Problem

Scenario

Eight adults and two children need to cross a river. A small boat is available that can hold one adult, or one or two children. Everyone can row the boat. How many one-way trips does it take for them all to cross the river?
INTERNET RESOURCES

❖ Scales and Balance

http://nvm.usu.edu/en/nav/frames_asid_324_g_3_t_2.html

❖ Pan Balance Shapes

http://illuminations.nctm.org/Activity.aspx?id=3531

❖ Function Machine:

http://www.shodor.org/interactivate/activities/FunctionMachine/

❖ Function Machine Math Playground

http://www.mathplayground.com/functionmachine.html

❖ Stop that Creature!

http://pbskids.org/cyberchase/media/games/functions/
Free Apps for the iPad

• **Visual Algebra Puzzles**
  Create your own algebra puzzles then try to solve them! This easy to use, educational tool was designed to work together with Shuttle Mission Math, an algebraic reasoning game in the app store. Puzzles can be solved with at least one of the following visual strategies: Scale Up, Scale Down (multiply or divide).


• **Shuttle Mission Math**
  Shuttle Mission Math is a mathematical puzzle game that makes algebraic thinking both visual and interactive. The goal is to find the weight of each space creature and assemble a team for the next shuttle mission.


• **Algebra Champ**
  Game like environment for solving linear equations

Bibliography


