Active Learning Log

Name_________________ Answer Key

Build a Tower
Describe or draw how you would build the next step (Step 4) in the pattern:

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Pattern Rule</th>
<th># of blocks for Step 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tower 1</td>
<td>Cover each block with a block of the same color, add 1 gray block to the end of each branch</td>
<td>Add 16 gray, 1 brown</td>
</tr>
<tr>
<td>Tower 2</td>
<td>Cover each with 1 one of the same color, add two blocks of the same to the end of each branch</td>
<td>Add 16 gray, 16 brown</td>
</tr>
</tbody>
</table>

Balancing Art
Alexander Calder was a famous artist who made sculptures by balancing metal, wood, and other objects hanging from wires—he invented the mobile (pronounced moh-beel). Can you balance this mobile? Draw the piece(s) you used on the other side:

Design a Skate Park
What did you change to make it work? Why?
The challenges in Design a Skate Park have the user control the location of ramp ends (which changes the length and slope of the ramps) in order to achieve target slopes and avoid obstacles. The exact changes that need to be made vary from challenge to challenge.
Light Show DJ
Find two sets of mirror speeds that produce this Lissajous (pronounced liss-uh-jew) pattern:

```
  ___________ : ___________  
Mirror 1 Speed  Mirror 2 Speed
  _________ : ___________  
Mirror 1 Speed  Mirror 2 Speed
```

Bonus: How are the two sets of speeds alike?
They are equivalent ratios. Any 1:3 ratio will produce this pattern (i.e., Mirror 2 Speed needs to be 3x Mirror 1 Speed). Values of 10 through 60 are available.

Whack-a-Phone
Some people say that you use the same part of your brain for both music and math. Try playing the Whack-a-Phone. How are musical notes related to math?
Whack-a-Phone demonstrates the relationship between length and pitch: the longer the tube, the lower the note. A tube that is double the length of another produces a note that is an octave lower. Whack-a-Phone also uses graphs of tube length as a unique form of musical notation. Whack-a-Phone is labeled with numeric lengths rather than note names (e.g., A-B-Bflat, Do-Re-Mi).

Additional Questions
What are two jobs featured in Design Zone that use math?
Design Zone features architects, digital designers, videogame designers, musicians, DJs, laser engineers, roller coaster engineers, bike engineers, and skate park engineers.

Which exhibit was your favorite? What did you like about it?
Descriptions of all Design Zone exhibits can be found in the Teachers’ Guide.

Write a trivia question about a Design Zone exhibit that will stump your classmates:
**Question:**
Descriptions of all Design Zone exhibits can be found in the Teachers’ Guide.

**Answer:**