Planning and Building a Modular House

Applying Skills

How many faces does each structure have?

1.

2.

3.

4.

How many cubes are in each model? Remember that each cube on an upper level must have a cube below to support it.

5.

6.

7.

8.

9. Of models 5–8, which ones have the same bottom layer?

Extending Concepts

Look at this model house. Suppose you painted all the outside surfaces of the model, including the underside.

10. How many squares would you paint?

11. How many faces would be painted on the cube marked x? on the cube marked y?

12. Would any cube have 4 faces painted? 5 faces painted? Why or why not?

13. Draw a 6-face figure that is not a cube.

Writing

14. Look in the real estate section of a newspaper or in magazines about housing to find pictures that show houses or buildings in different ways. Find two or three examples of different ways to show structures. Tell why you think the artist chose each one.
Changing the Chances

Applying Skills

<table>
<thead>
<tr>
<th>Bag</th>
<th>Blue</th>
<th>Red</th>
<th>Total Number of Cubes</th>
<th>Theoretical Probability of Picking Blue</th>
<th>Theoretical Probability of Picking Red</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>9</td>
<td>1</td>
<td>10</td>
<td>9/10</td>
<td>1/10</td>
</tr>
<tr>
<td>B</td>
<td>7</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>16</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>15</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>22</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>30</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Copy the table and fill in the missing information. Use the first row as an example.

2. Which bag gives you the highest probability of getting a blue cube?

3. Which bag gives you the highest probability of getting a red cube?

4. Which bag gives you the same chance of picking a blue or a red cube?

5. Yasmine has a bag with 60 cubes that gives the same probability of picking a blue cube as Bag C. How many blue cubes are in her bag?

6. How many red cubes are in Yasmine's bag?

7. Rank the bags from the best chance of getting a blue cube to the worst chance of getting a blue cube.

Extending Concepts

Students did experiments with some of the bags shown in the table. The results of these experiments are given below. For each of the results, find the indicated experimental probability. Which bag or bags do you think it is most likely that the students used? Why?

8. In 100 turns, we got 20 reds.

9. We got 44 blues and 46 reds.

10. In 100 turns, we got 75 blues.

11. In 5 turns, we got 0 reds.

Writing

12. Suppose Sandy's bag has 2 purple cubes out of a total of 3 cubes and Tom's bag has 8 purple cubes out of 20 cubes. Explain how to figure out which bag gives you the best chance of picking a purple cube if you pick without looking.
How Close Can You Get?

Applying Skills

The table below shows the results for a student who played the Open Book Game five times.

<table>
<thead>
<tr>
<th>Trial</th>
<th>Target</th>
<th>Estimate</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>432</td>
<td>334</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>112</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>247</td>
<td>214</td>
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<tr>
<td>5</td>
<td>354</td>
<td>407</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>458</td>
<td>439</td>
<td></td>
</tr>
</tbody>
</table>

1. Complete the table by finding the Error for each trial.


3. Find the mean, median, mode (if any), and the range of Dolita's errors.

Every day for 12 days, Tomas runs down the block and times how long it takes.

4. Use the graph to figure out the mode, median, and range for Tomas's running times.

5. Use a calculator to figure out Tomas's mean time for running down the block.

6. Make a prediction for how fast you think Tomas would run on Day 15. Explain how you made your prediction.

7. Look at the data for the first 5 days only. On which days did Tomas get faster?

8. On which day(s) did Tomas run the fastest?

Extending Concepts

9. The graphs shown represent four students' progress in the Open Book Game. For each graph, write a description of the student's progress.

10. Which graph shows the least improvement? Explain.

11. Which graph shows the most improvement? Explain.

Writing

12. Dottie noticed that when her scores in the Memory Game improved, her graph kept going up. But when she played the Open Book Game, her graph went down, although she was sure she was improving. Explain to Dottie how to read a broken-line graph.