

1 Cubes

1. How many faces does a cube have?
2. How many edges does a cube have?
3. How many vertices does a cube have?
4. How many edges are connected at a vertex? Is the answer the same for all vertices?
5. How many faces have a common edge? Is the answer the same for all edges?
6. To make a 3-inch by 3-inch cube, how many smaller cubes that are 1-inch by 1-inch do we need? Draw this below.

7. Suppose you take a 2-inch by 2-inch cube, and paint it green. After that, you cut the cube into multiple cubes with side length 1 inch. How many small cubes will have exactly one face painted green?

Two faces?

Three faces?

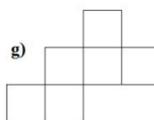
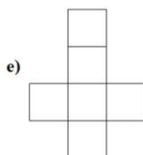
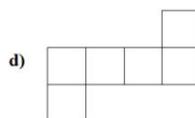
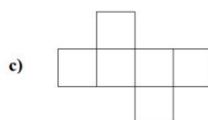
No faces?

8. What about with a 3-inch by 3-inch cube?

2 Nets

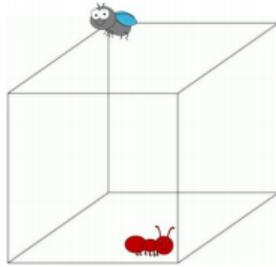
In math, a net is a pattern that you can cut and fold to make a model of a solid shape.

1. Let's use a net to make a cube!
2. From which nets can you make a cube?

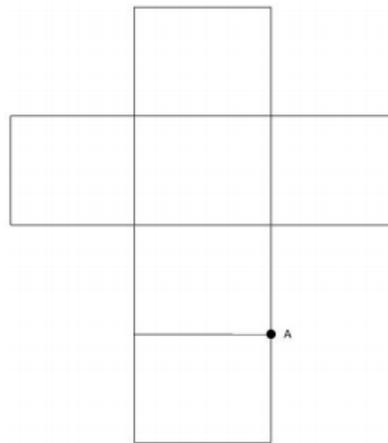


3 Challenge

- Allison Ant (Point A) and Bobby Bug (Point B) are sitting at opposite corners of a cube, as shown below:



Allison Ant's location (Point A) is marked on the net below. Find the position of Bobby Bug and mark it with the letter B.



- Allison Ant wants to visit Bobby Bug. Draw what you think the shortest route from A to B is on the cube above. Then, draw this route on the net above.
- Now, using a different color, try to find the shortest route from A to B using the net. Now draw this route on the cube. Is this shorter than the route you found using the cube first?
- Extra Challenge: Can you create a net for a pyramid? A cone? A cylinder? Draw these below.

This handout was adapted from UCLA Math Circle's handout, "Early Elementary Week 4: Nets."