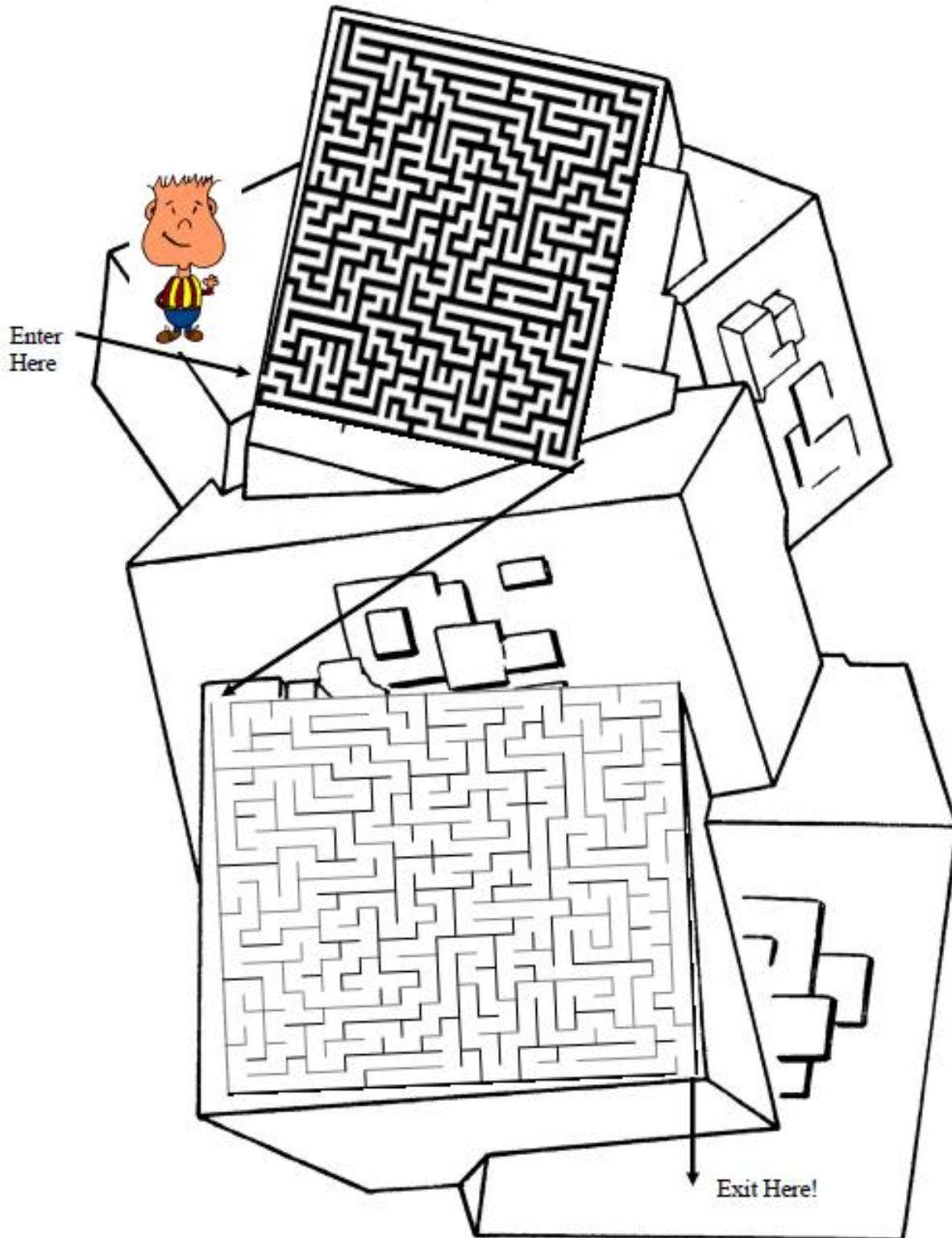


# A- Mineral- Mazing

Can you help Mini Miner Mike find his way through the fluorite mazes?



# The Path to Mineral Treasures

Diamond Dan is searching for mineral treasure. Only one path will lead to the mineral treasure. Figure out which path to follow that actually leads to the treasure and write the name of the mineral on the line below. It's a type of quartz, but which type?

**1**

**2**

**3**

**4**

1 \_\_\_\_\_

2 \_\_\_\_\_

3 \_\_\_\_\_

4 \_\_\_\_\_

# ICE SPIKES

A Great Ice Experiment from scientist Dr. Kenneth Libbrecht at the California Institute of Technology.

When water freezes, it gets bigger! Fill a plastic bottle with water and put it in your freezer. When the water is frozen solid, you will see that the bottle has split open. When the water froze, it expanded, that is, it got larger. This physical feature of ice helps create ice spikes in an ice tray.

## What You Need:

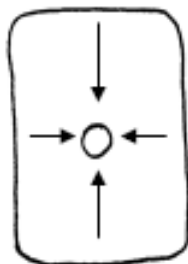
- Plastic Ice Tray
- Distilled Water (water from the faucet does not always work very well for this experiment)
- Freezer

**What To Do:** Preparation for this experiment is very easy. Fill each section in the plastic ice tray with distilled water. Only fill each section about 2/3 full. Don't fill them to the point that they flow into each other.

Now, put the tray in your kitchen freezer. Place the tray so that there is at least two inches of space above the ice tray. When the water is frozen, you should have some ice spikes.



**How Do Ice Spikes Form?** Ice spikes are the result of the special feature of ice mentioned above: water expands (gets larger) when it freezes. This is what happens.



At first, the ice in the ice cube tray freezes at the edges of each section. Then, it freezes toward the center of the section. This will continue until there is a small hole in the middle of the top of the ice cube. While this is happening, the water is also freezing *below* the surface of the ice cube. Remember that water expands or gets larger as it freezes. So, as the water freezes at all the sides of the ice cube section in the tray, it pushes the unfrozen water up and out of the little hole on the top.

The water that is pushed through the hole freezes in the shape of a small straw. More water is pushed through the straw and it freezes. This continues until all the water has frozen or the straw itself freezes solid. This "straw" is the ice spike!

