Fundamentals of Chemical Fume Hood Safety:
How Airflow is Affected

There are several types of chemical fume hoods that provide protection and help capture and exhaust chemical vapors and airborne particulates, however, all types work on similar principles.

Airflow in a chemical fume hood can be interrupted, altered, and changed by different factors.

Airflows into the hood capturing and containing contaminants, preventing them from escaping into the laboratory room.

Smoke provides visual demonstration of how airflows in a fume hood.

Many conditions can affect the efficiency and safe operation of a fume hood.

Chemicals closer to the front of the hood are more likely to leak from the hood.

Operate at least 6 inches from the front. The placement of objects close to the front opening may result in leakage and loss of containment.
Sash height is important for maintaining proper airflow, and to keep those working in it and around it safe. When working in the hood, the sash should be at the certification mark.

Raising and lowering the sash should be done slowly. Moving the sash quickly can disturb the airflow and result in leakage.
Large equipment inside the hood obstructs the airflow and may allow the vapors to escape into the lab.

Equipment should be elevated to allow air to flow under it so the proper fume hood airflow patterns will be maintained.

Abrupt movements can cause turbulence allowing vapors to escape. For example, most people walk at a velocity of approximately 250 feet per minute (about 3 miles per hour). Wakes or vortices form behind a person who is walking, and velocities in those vortices exceed 250 feet per minute. When a person walks in front of an open fume hood, the vortices can overcome the fume hood face velocity and pull contaminants out of the fume hood, into the vortex, and into the laboratory.

Place equipment and materials inside the hood before work begins. If you do need to move arms out of the hood, move them slowly, perpendicular to the hood face.

Location of the hood is important too.

It should be away from doors, fans, or ceiling air supply diffuser.

The fume hood should be installed in a low traffic area.

Link to video job aid: https://reach.cdc.gov/jobaid/fundamentals-chemical-fume-hood-safety-how-airflow-affected