

# Indoor Air Quality Activity Book



Learn how to improve the air in your home and keep your family safe and healthy!



# Healthy Home Principles



Everyone should have access to safe, decent, and sanitary housing. Creating healthier housing promotes the healthy growth and development of children and has the potential to save billions in health care costs. Fortunately there are some really simple ways to help make your home a healthier place for you and your family to live:

1. **Keep it dry.** Prevent water from entering your home through leaks in the roof, rain water from entering the home due to poor drainage, and check your interior plumbing for any leaks.
2. **Keep it clean.** Control the source of dust and contaminants, creating smooth and cleanable surfaces, reducing clutter, and using effective cleaning methods.
3. **Keep it safe.** Store poisons out of the reach of children and properly label them. Secure loose rugs and keep children's play areas free from hard or sharp surfaces. Install smoke and carbon monoxide detectors and keep fire extinguishers on hand.
4. **Keep it well ventilated.** Ventilate bathrooms and kitchens and use the whole house ventilation for supplying fresh air to reduce the concentration of contaminants in the home. This will also reduce mold growth.
5. **Keep it pest-free.** All pests look for food, water, and shelter. Seal cracks and openings throughout the home and store food in pest-resistant containers. If needed, use sticky-traps and baits in closed containers, along with least toxic pesticides such as boric acid powder.
6. **Keep it contaminant-free.** Reduce lead-related hazards in pre-1978 homes by fixing deteriorated paint, and keeping floors and window areas clean using a wet-cleaning approach. Test your home for radon, a naturally occurring dangerous gas that enters homes through soil, crawlspaces, and foundation cracks. Install a radon removal system if high levels are detected.
7. **Keep your home maintained.** Inspect, clean, and repair your home routinely. Take care of minor repairs and problems before they become large repairs and problems.
8. **Thermally controlled.** Houses that do not maintain adequate temperatures may place the safety of the residents at increased risk from exposure to extreme cold or heat.

# Complete the Sentence

There are many things we can do to have a healthy home.

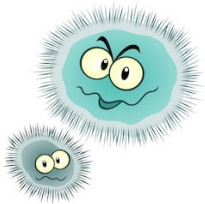
After reading the information on the previous page, complete the sentences below with “should” or “shouldn’t” with how to protect the air in your home.

Should

Shouldn't

You \_\_\_\_\_ keep your home dry and constantly check for leaks in your roof and plumbing.

You \_\_\_\_\_ leave pesticides and cleaning products in reach of children.



You \_\_\_\_\_ ventilate your bathroom and kitchen to prevent mold growth.

You \_\_\_\_\_ leave food out to attract pests.

You \_\_\_\_\_ leave clutter lying around and not dust or clean often.



You \_\_\_\_\_ test your home for radon.

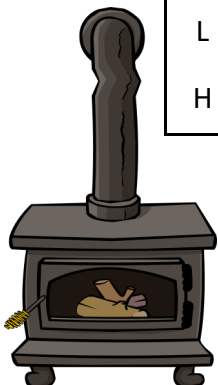
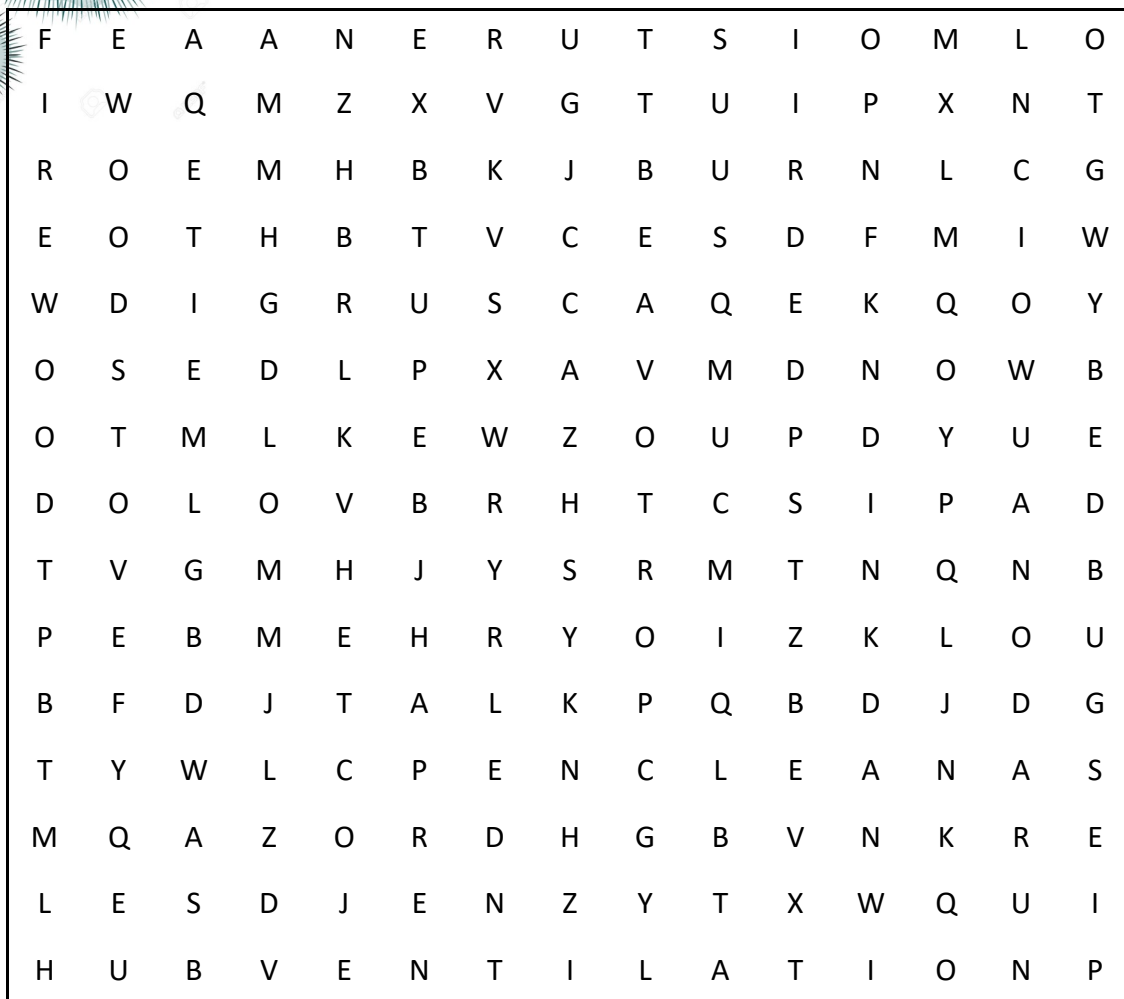
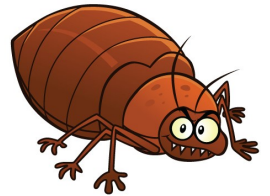
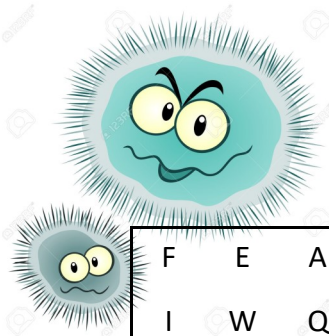


You \_\_\_\_\_ keep your home maintained and fix problems right away.

You \_\_\_\_\_ make sure your house is warm in the winter and cool in the summer to keep your family healthy and safe.

# Healthy Homes Word Search

Having good indoor air quality is essential to having a safe and healthy home, and keeping your family healthy. Find the words that can help keep your home clean and healthy and improve your indoor air quality!



Mold

Woodstove

Woodsmoke

Moisture

Asthma

Bed bugs

Radon

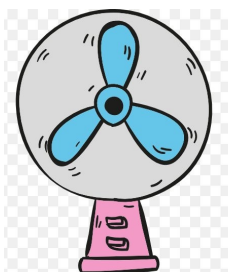
Clean

Healthy Home

Burn

Firewood

Ventilation



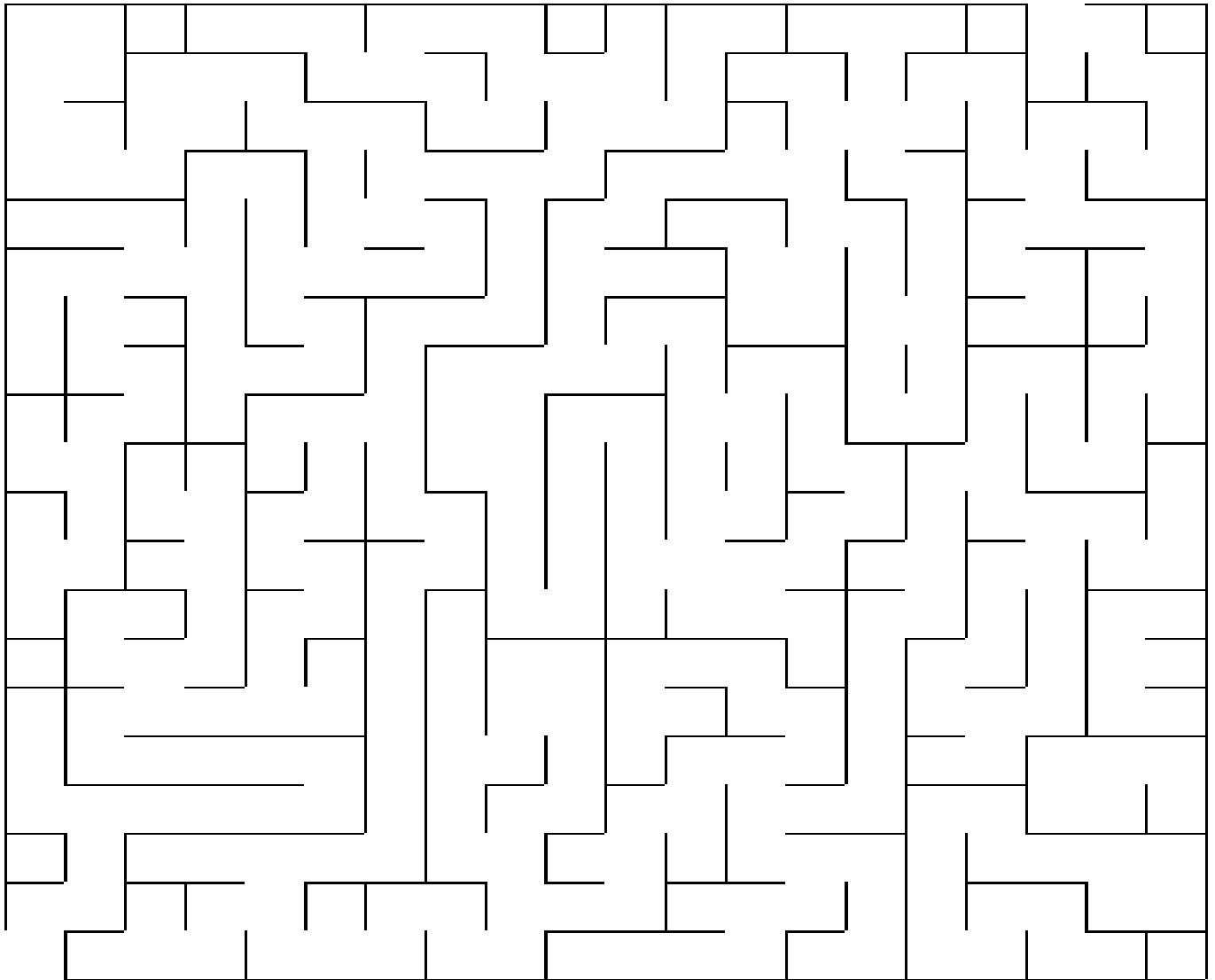
# Mold Maze

Oh no! Suzy found mold on her kitchen counter! Mold grows wherever there is water or moisture. It can usually be found in the kitchen or bathroom. Mold can cause health problems like asthma, nose and eye irritation, and more. Mold can easily be removed just by cleaning the area with soap and water, and then making sure the area is dry. Also be sure to fix the water problem as well.

Help Suzy reach her gloves and sponge so she can clean up the mold before it grows!



**Start**



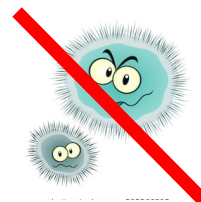
**Finish**



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# Smoky fires are a waste!



Reduce smoke and generate more heat.

**Use dry firewood.** Fires built with dry firewood use less fuel, generate more heat, and release a minimal amount of smoke. Burning wood that contains more than 20% moisture creates more smoke and creosote buildup in woodstoves.

**Burn efficiently.** An efficient fire is built with dry firewood and ample airflow. These factors allow the fire to get hot enough to completely burn the wood and produce heat to warm your home. Only burn firewood that has been stored out of the weather for 6-12 months.

Small particles and pollutants in wood smoke can trigger asthma attacks. Even occasional exposure to wood smoke can cause watery eyes, stuffy noses, and chest tightness. Studies show an estimated 70% of smoke from chimneys can re-enter homes. By using dry firewood and operating a woodstove efficiently, you are helping protect the health of your family.

Make sure your woodstove is well maintained. Inspect your chimney annually for creosote and other issues. Regularly remove ashes in a metal container with a cover. Never burn garbage, treated lumber, or painted wood in your stove. This can damage a stove and create health issues.

## 4 steps to having dry firewood:

1. **Split.** Split wood dries much faster. Split small pieces for kindling.
2. **Stack.** Properly stacked wood allows air to circulate around the wood. Build the firewood stack away from buildings. Keep wood off the ground.
3. **Cover.** Keep rain and snow off by covering the stack correctly. Stack wood in a covered structure or use a tarp to cover the top of the woodpile. Keep the sides open so air can circulate.
4. **Store.** Wood should dry for 6 to 12 months. Be sure to plan ahead. It takes time for wood to dry. The logs should sound hollow when knocked together.

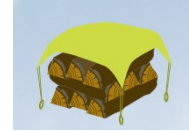
## 3 steps to efficient wood burning:

1. **Start it hot.** Start with a small fire. Use dry kindling and a few pieces of wood. Make sure the fire is getting plenty of air. Gradually add larger pieces of dry firewood.
2. **Adjust airflow slowly.** Once the stove is fully heated, add dry firewood. Keep space between firewood when adding more fuel. A smoldering fire or smoke from the chimney are all signs that the fire needs more air or the firewood is too moist.
3. **Create draft to refuel.** When more firewood is needed, fully open the air control to create a draft in the chimney first. Add wood and adjust burn rates by adding or reducing airflow.

# Matching!

You just learned how to properly dry firewood. Match the pictures to the words to put the wood in the right order to have dry wood to heat you home!

1. Split



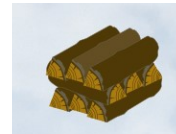
2. Stack



3. Cover



4. Store



## Stack the wood!

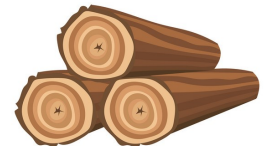
Oh no, your fire went out! You just learned how to make an efficient fire. Number the firewood pictures from 1-3 in the order you would put them in the woodstove to make a good fire to heat your home.



\_\_\_\_\_



\_\_\_\_\_



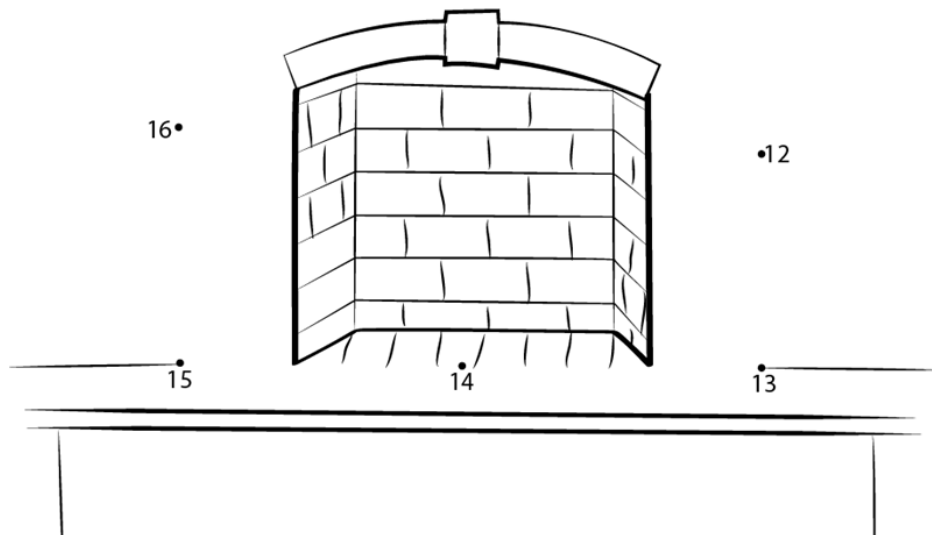
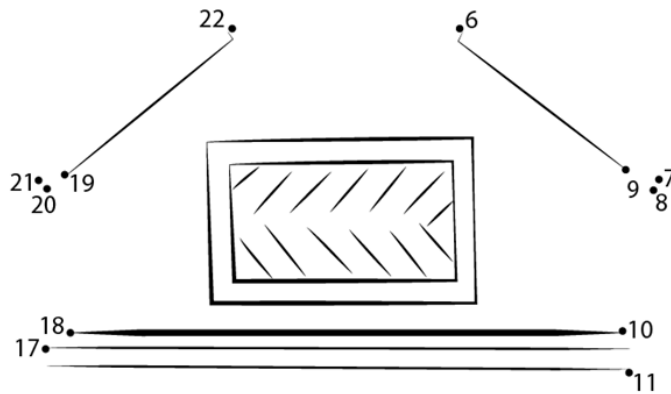
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# Connect the Dots to heat your home!



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# Air flow is important

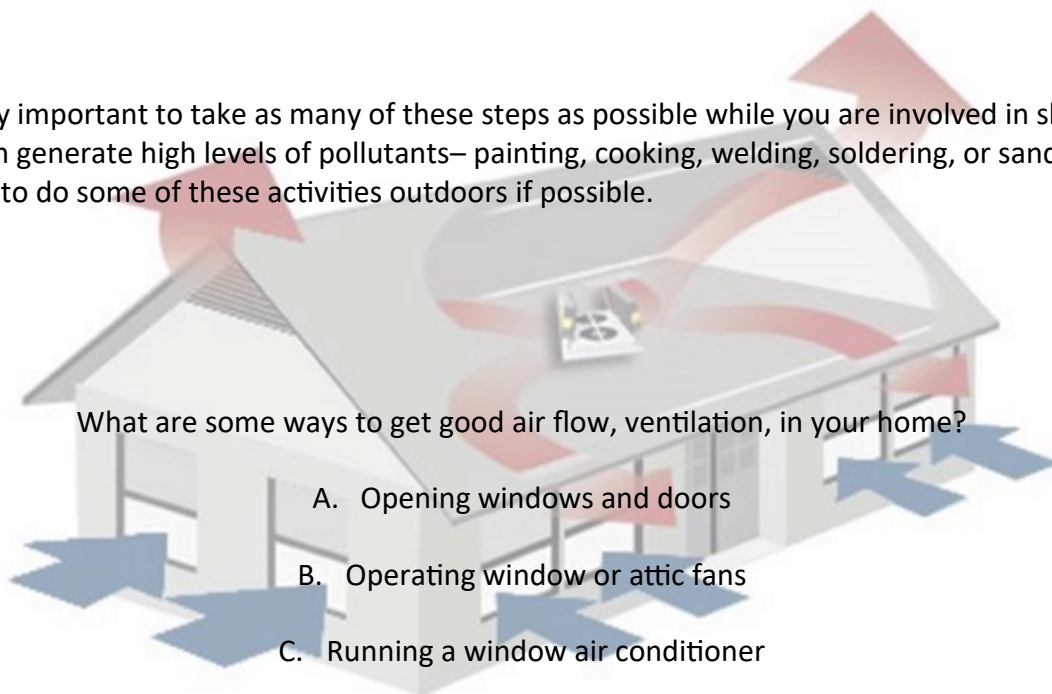
For most indoor air quality problems in the home, source control is the most effective solution.

One approach to lowering the concentrations of indoor air pollutants in your home is to increase the amount of outdoor air coming indoors.

Ventilation removes air pollutants from the home and brings clean fresh air into the home. This reduces the level of contaminants and improves indoor air quality. Ventilation also keeps moisture levels in check, making it harder for mold to grow.

Most home heating and cooling systems do not mechanically bring fresh air into the house. Opening windows and doors, operating window or attic fans, or running a window air conditioner with the vent control open increases the outdoor ventilation rate. Bathroom or kitchen fans that exhaust outdoors remove contaminants directly from the room where the fan is located and also increases the outdoor air ventilation rate.

It is particularly important to take as many of these steps as possible while you are involved in short-term activities that can generate high levels of pollutants— painting, cooking, welding, soldering, or sanding. It would be good to try to do some of these activities outdoors if possible.



What are some ways to get good air flow, ventilation, in your home?

- A. Opening windows and doors
- B. Operating window or attic fans
- C. Running a window air conditioner
- D. All of the above

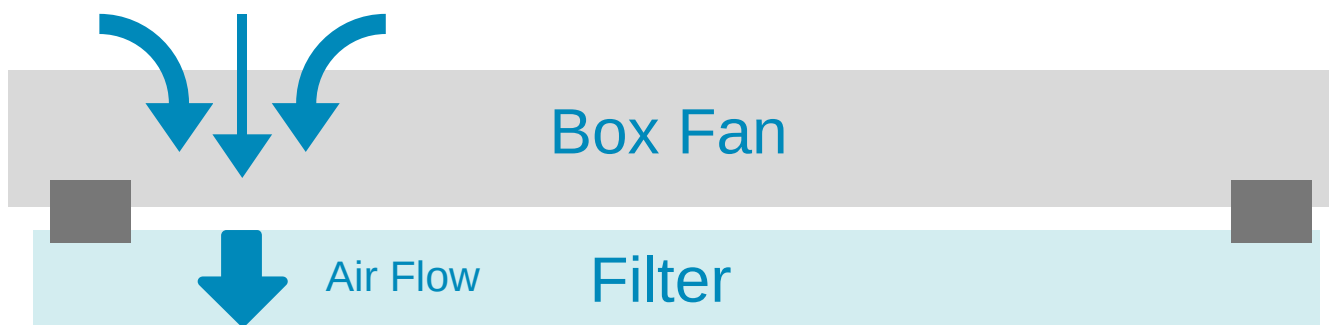
Answer: D. All of the above

# Make your own air cleaner

Why have an air purifier? **The air inside our homes is two to five times more polluted than outdoor air.** Air quality can be improved using an air purifier in homes using woodstoves or homes that are located in wildfire-prone areas. The better the air, the better it is for our lungs. Making your own air purifier like the one below is cheap and effective. [https://www.youtube.com/watch?v=kH5APw\\_SLUU](https://www.youtube.com/watch?v=kH5APw_SLUU)



1. Purchase a 20 inch box fan, and 20 inch high-efficiency particulate air (HEPA) grade furnace filter. Minimum efficiency reporting value (MERV) 11 filters will also work and can be purchased online.
2. Attach filter to fan with tape. Make sure arrow on filter is pointed away from the fan (*Image below is from the top of the fan and filter*).



3. Use the fan only when someone is in the room. Make sure it does not overheat.
4. Replace filter when dirty.



**Warning:** The use of this purifier equipment may create fire risks. You, as the operator, should take precautions to prevent fire or other damages. Do not leave the fan and filter continuously running when away from your house as it possibly could catch fire.

\*Note that this filter will not fix all air quality problems. Often it is up to the home owner to make their air quality better. Contact [healthyhomes@anthc.org](mailto:healthyhomes@anthc.org) or visit [anthc.org](http://anthc.org) for more information on creating a healthy home and good indoor air quality.

# Tour the house!

Good indoor air quality is important to keeping your family healthy because we spend most of our time inside. There can be more air pollutants inside your home than outside! We need to take care of our home to take care of our health.

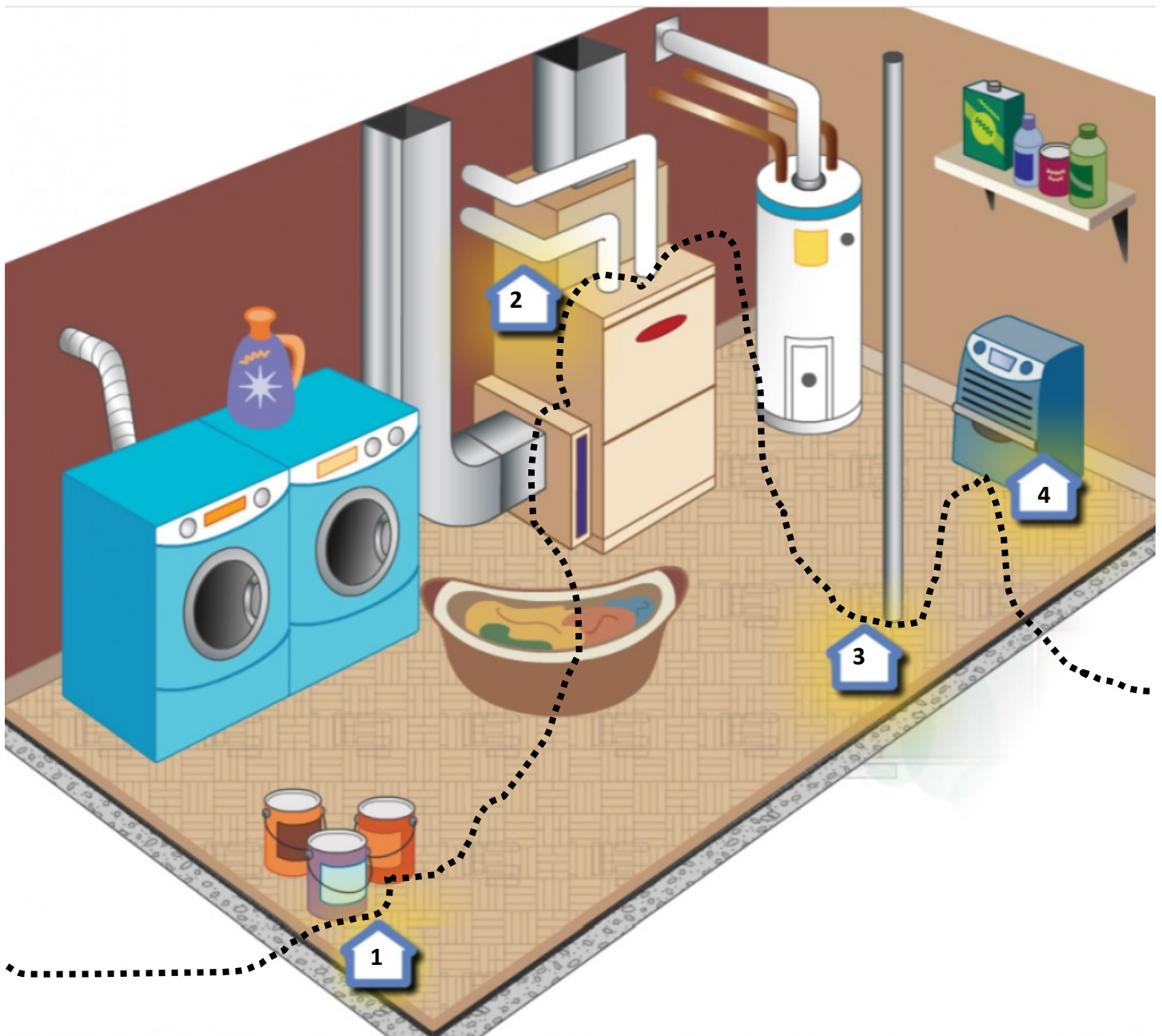
Follow Billy around his house room-by-room to learn some of the most important ways to protect the air in your home!



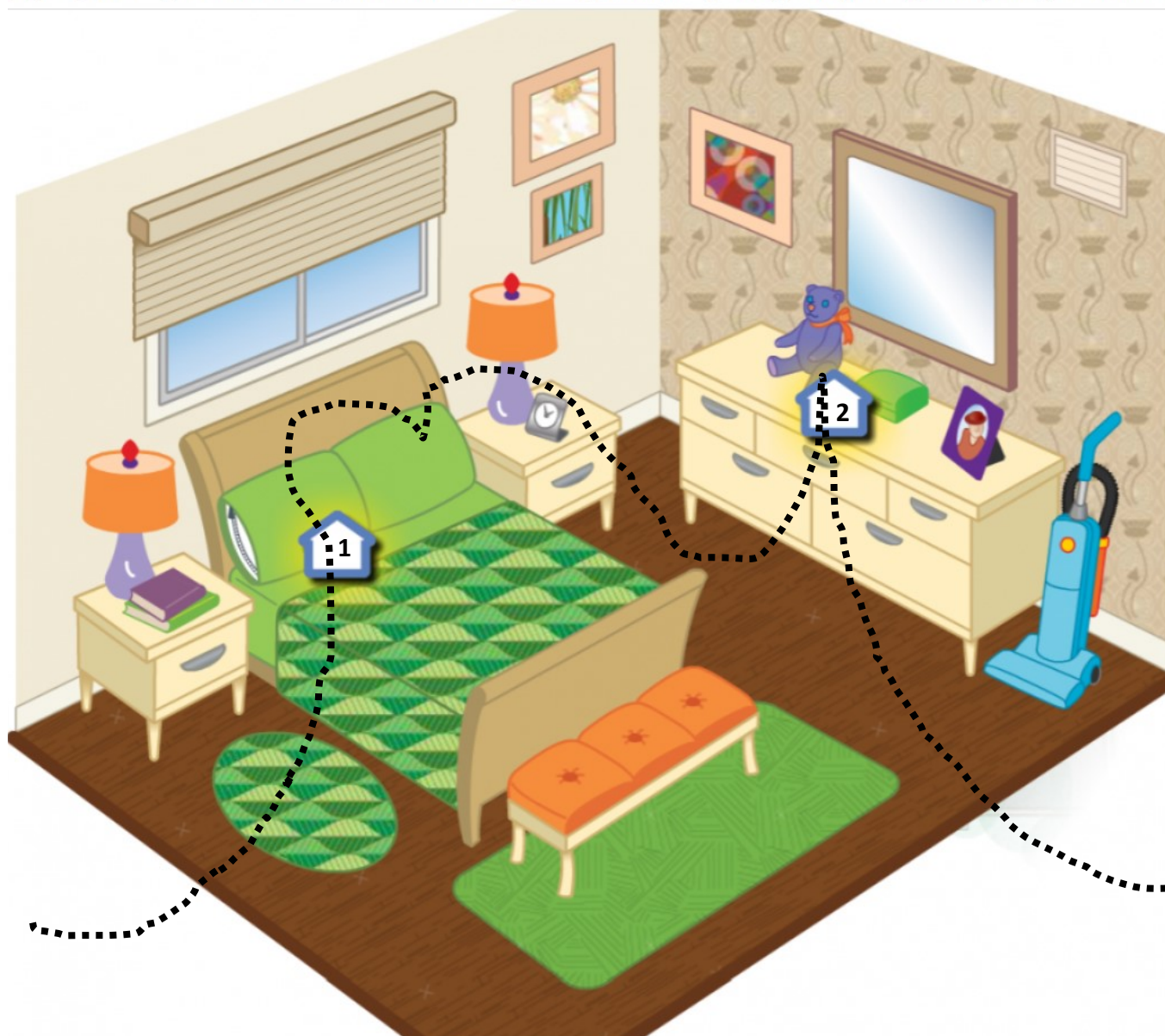


1. Pet hair and dander can cause allergies. Keep pets away from sleep areas and off of furniture. Vacuum often.
2. Fireplaces and woodstoves are sources of carbon monoxide. Make sure you ventilate rooms with woodstoves or fireplaces.
3. Secondhand smoke from cigarettes can trigger asthma and other respiratory illnesses. To protect children especially, do not smoke inside your house.

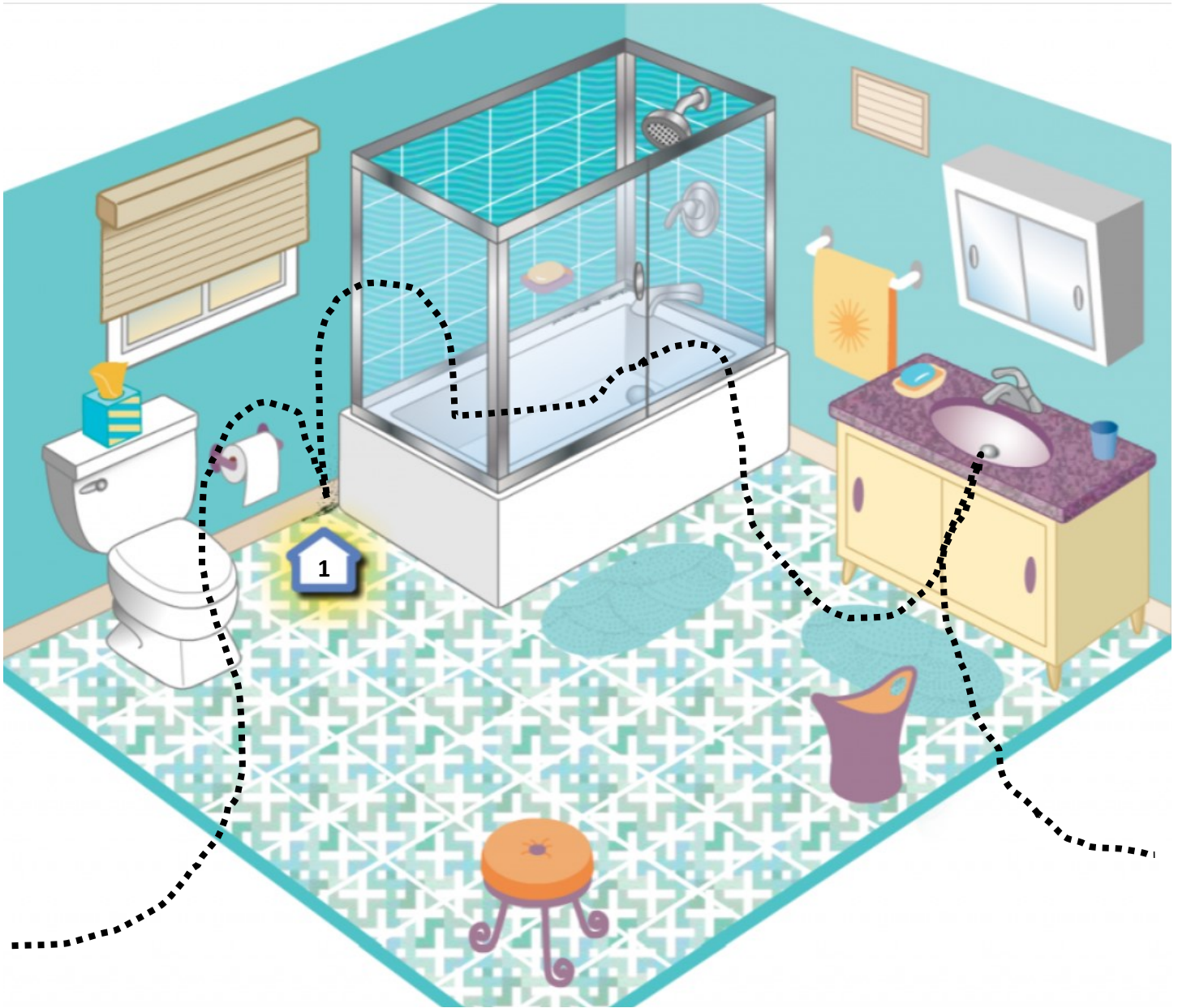




1. Paints, chemicals, and other products release Volatile Organic Compounds (VOCs). Make sure there is plenty of ventilation when using these products. Consider buying products with little or no VOCs.
2. Heating, ventilation, and other appliances are sources of carbon monoxide. Properly install, use, and maintain appliances. Install carbon monoxide detectors in living spaces.
3. Radon is a naturally occurring radioactive gas that can enter a home through cracks and openings in floors that are in contact with the ground. Leave a space between the ground and your floor to let radon escape and not enter your house. Testing for radon is the only way to know it's in your home. Do-it-yourself radon test kits are simple and inexpensive.
4. Basements can be damp. Install a dehumidifier to keep the basement at a good humidity level (30-50% humidity) to reduce potential for mold. It is important to dry water-damaged areas to prevent mold.

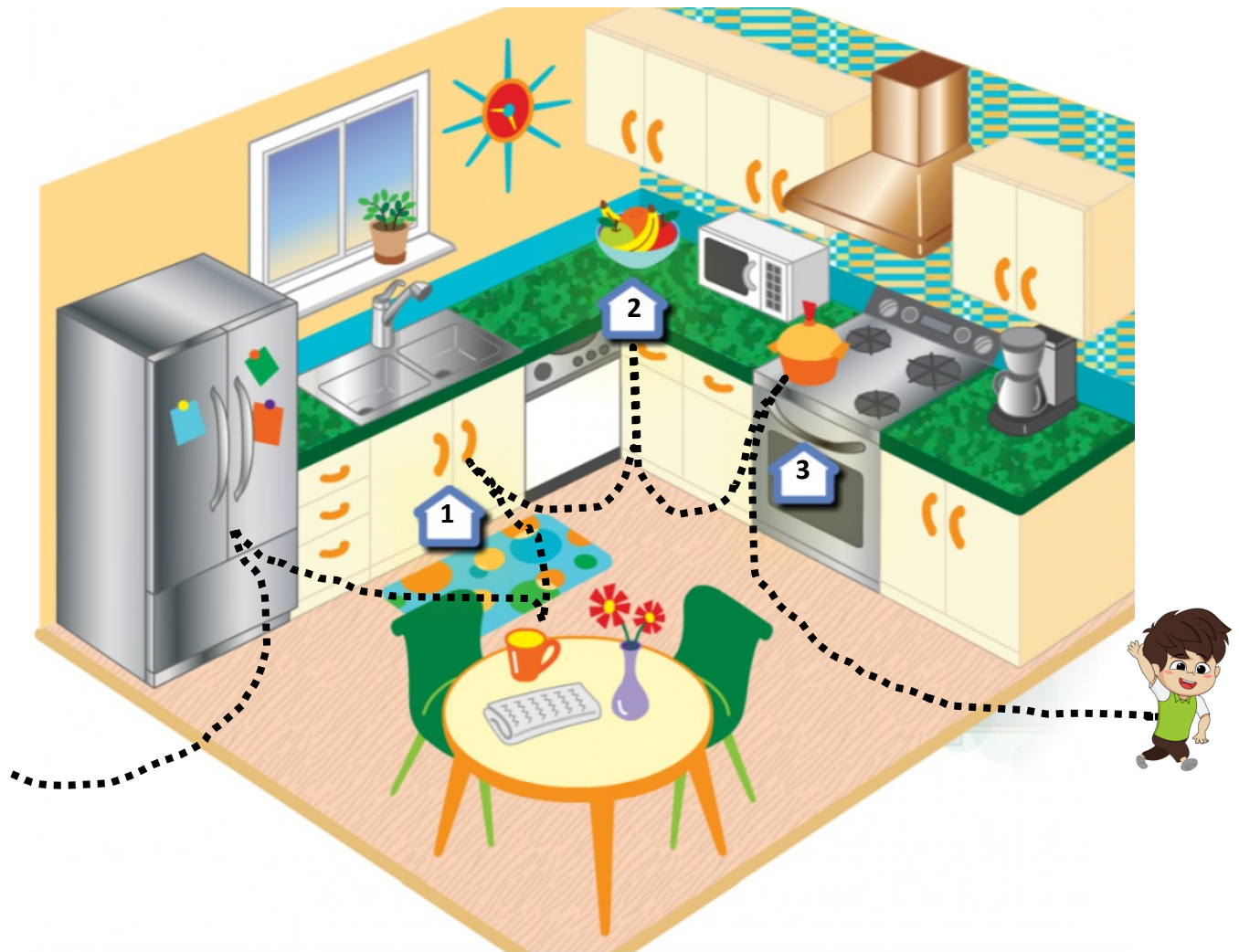


1. Dust mites can trigger asthma attacks. Dust mites are on pillows, blankets, carpets, furniture, and stuffed toys. Dust and vacuum your homes and wash your bedding regularly.
2. Be careful of dust mites. Wash your stuffed toys regularly as well.



1. Bathrooms are a common source of mold. Humidity from showers can lead to moisture which causes mold growth. Mold can cause asthma and other respiratory illnesses. Be sure to use the ventilation fan whenever you're in the bathroom to prevent mold growth.





1. Common household cleaners, usually stored under the sink, release Volatile Organic Compounds (VOCs) when used. Keep all products away from children. Consider purchasing cleaners without VOCs.
2. Pesticides used to get rid of pests can irritate the nose and throat; damage the nervous system; and increase the risk of cancer. If you use pesticides, ventilate the area during and after use. Use non-chemical methods of pest control when possible.
3. Gas stove release carbon monoxide. Make sure to vent stoves outside to decrease exposure.



Yay! You made it through the house! Hopefully Billy taught you some useful tips on how to improve your indoor air quality! Put these tips to work inside your own home and see how much healthier you and your family are!



# Circle the Causes of Air Pollution



Smoking



Music



Coffee



Bleach cleaner



Groceries



Woodstove



Cell phone



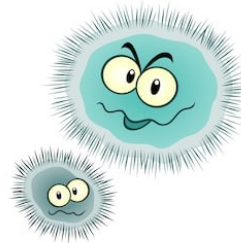
Paint fumes



TV



Pets



Mold



Computer



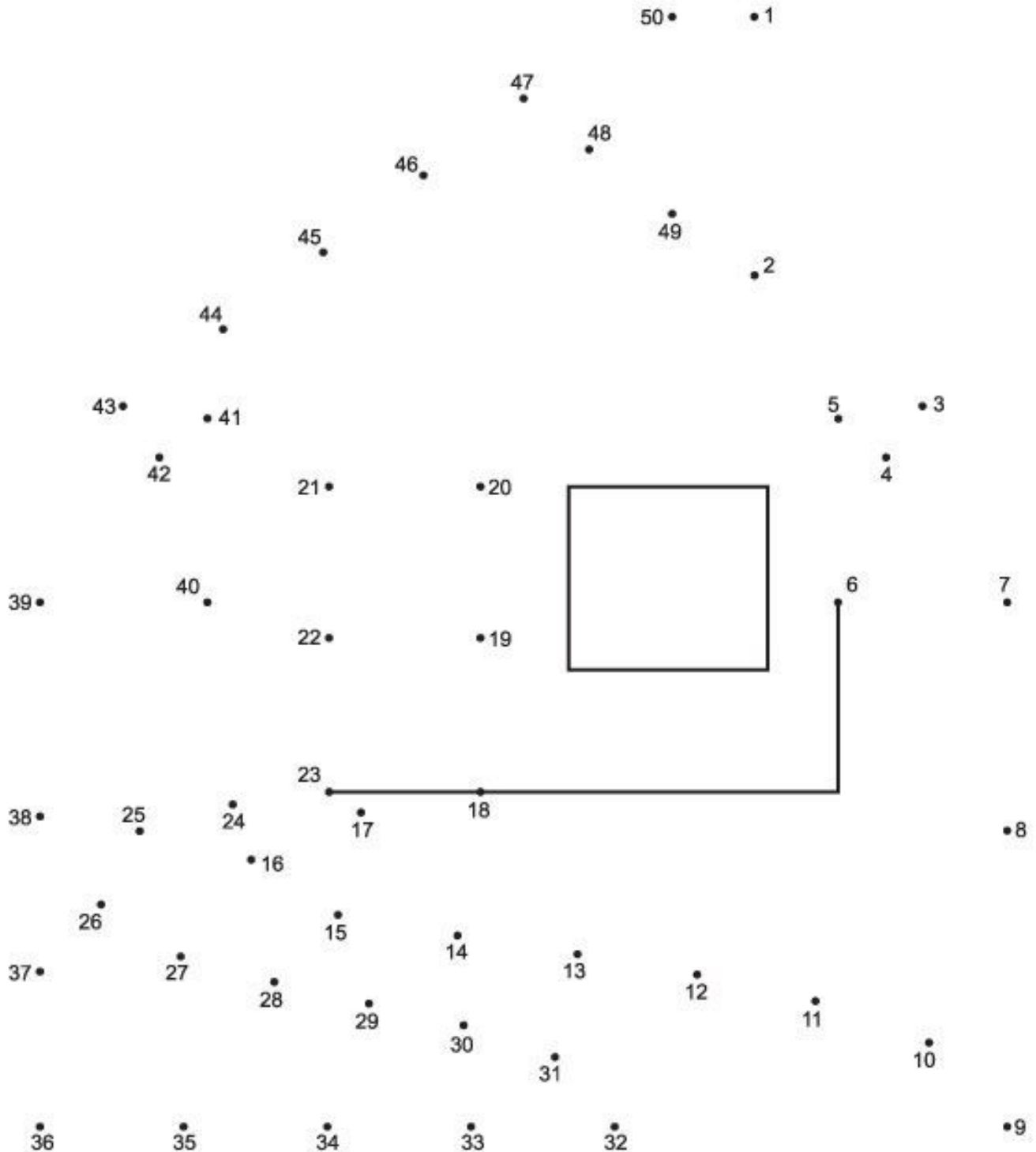
Pesticides



Refrigerator

Answer key: smoking, bleach cleaner, woodstove, paint fumes, pets, mold, pesticides

# Connect the Dots and make a healthy home!



# Bed Bugs



There has been a resurgence of bed bugs throughout the nation. Rural Alaska is more disadvantaged because of the remoteness and the difficulty of getting professional help. Most people generally rely on pesticides to battle bed bugs, which can affect the air quality inside your home and may cause poisoning and other health effects.

Bed bugs are small, wingless insects that feed on blood.

You want to inspect your home to confirm whether or not you have bed bugs. Inspections should be focused within 15-20 feet of where people sleep, because this is where bed bugs are most likely to be found. You want to look for live or dead bed bugs, empty skins they shed, eggs, and fecal stains that look like ink smears.

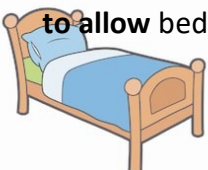
Places you should inspect for bed bugs are: the edge of the mattress and box spring, bed frame, picture frames, electrical outlets, edge of carpets, furniture, window curtains, behind loose wallpaper, screw holes of furniture, behind bed headboards, nightstands, window and door frames, and along the floor against the wall.

Clutter in your home gives bed bugs lots of places to hide. Reducing clutter will give you better control of bed bugs by reducing the number of hiding places. Heavy duty garbage bags or plastic totes can be used to put away things you don't need and eliminate those hiding places.

Vacuuming is one of the best ways to remove the live bed bugs that are hiding in a room. A hose attachment can be used to help focus the vacuum's suction in small spaces, cracks, and crevices. Places you want to vacuum are: the entire mattress, the box spring, the bed frame, inside and under nightstands and other furniture, along the bottom of walls, and around heating vents. When you're done vacuuming, remove the entire vacuum bag, put it into a plastic bag, then seal the plastic bag and throw it in the garbage. Also wash the vacuum hose attachments with soap and hot water.

Heat is one of the best ways to kill bed bugs. Your household dryer is an excellent tool to kill bed bugs using heat.

A pitfall trap is a trapping device used to "catch" bed bugs and prevent them from escaping. Its design relies on the fact that bed bugs are unable to climb on smooth surfaces. The trap is rough on the outside **to allow** bed bugs to climb into the trap and smooth on the inside to prevent the bugs from escaping.



# DO-IT-YOURSELF BED BUG PITFALL TRAP

## You'll need:

- A small, plastic container that will fit under a furniture leg
- A larger, plastic container that the small container will fit inside
- Rough-surfaced tape, such as masking tape
- Glue, preferably a hot glue gun
- Optional: Square piece of tile or plywood



**Step 1** – Cut four pieces of rough-surfaced tape and press them onto the inside of the small container. The tape should reach from the bottom of the container to the top edge of the container.



**Step 2** – Wrap the rough-surfaced tape around the outside of the larger container so that the entire surface is covered from the bottom to the top edge of the container.



**Step 3** – Glue the smaller container inside the larger container. Make sure that the edges of the containers do not touch.



**Step 4** – Move the furniture to be protected away from the wall and place a trap underneath each leg. Items on the furniture, such as blankets or electrical cords, should not be touching the floors, walls, or other furniture.

**Optional** – To make the bed bug trap more sturdy, glue the trap to a square piece of tile or plywood. This is especially useful if the trap will be used in a carpeted area. The tile or plywood will prevent the trap from breaking under the weight of the furniture.

# TIPS

Traps can be used during an active bed bug infestation to trap any bugs coming from or going to the furniture.

Traps can also be used as a monitoring tool if you do not have an active infestation. The traps will provide early warning of bed bugs in your home.

Furniture may be used regularly when the pitfall traps are in place.

Traps can be used indefinitely as long as they are in good shape and are not broken.

## For More Information

- Do-it-Yourself Bed Bug Control Guide  
<https://anthc.org/what-we-do/community-environment-and-health/healthy-homes>
- Virginia Dept. of Agriculture and Consumer Services  
<vdacs.virginia.gov/pesticide-bedbug-fact-sheets.shtml>
- Centers for Disease Control and Prevention  
<cdc.gov/parasites/bedbugs/index.html>
- U.S. Environmental Protection Agency  
<epa.gov/bedbugs>
- University of Minnesota  
<bedbugs.umn.edu>
- University of Florida, IFAS Extension  
<solutionsforyourlife.ufl.edu/bed-bugs>



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