

## Identifying Air Pollution Sources Activity

### Time Required (~10 minutes total):

- 7 minutes for students to work in group
- 3 minutes for students to report out to the class about what they found

### Materials:

- Air Quality Sources Worksheets
- pen/pencils

### What to do:

1. Break up students into groups of two or three (at table groups if applicable).
2. Hand out worksheets to students, 1 worksheet for each group, so students will not all have the same place to think about.
3. Ask students to circle sources of air pollution in the pictures and then think about other sources of air pollution in these environments that are not included.
4. Go around the room to the students and ask them what they have found and give them pointers/more suggestions.
5. Ask students to report out to the class about what they found and discussed within their groups.

### Example Sources of Air Pollution:

Students may think of a wide variety of sources of air pollution based on their own personal experiences. This activity idea should help them think about what they can do testing on with the Pods later in the project. Below are just some potential sources of air pollution found in each of the environments that you can talk about with students to spur more thoughts and creativity.

### On the Farm:

- Cows burp and fart producing methane (VOCs) and CO<sub>2</sub>
- Pigs also burp and fart producing methane and CO<sub>2</sub> but not as much as cows
- Tractors produce a lot of CO<sub>2</sub> and NO<sub>x</sub> and particulate matter from combustion
  - Other vehicles and machinery on farms can also produce the same types of pollutants
- Trees produce VOCs (not considered pollutants, but still a source of VOCs)
  - Grass and other plants also emit VOCs
  - Grasses, plants, and trees are also a sink for trapping CO<sub>2</sub> that is produced by sources of combustion on the farm
- VOCs from trees and NO<sub>x</sub> from vehicles (such as the tractor) can combine and form ozone, more harmful VOCs, and particulate matter (small particulates, <2.5um)
- The house is being heated by a fireplace, so CO<sub>2</sub> and NO<sub>x</sub> and particulate matter along with water vapor is coming out the chimney of the house
- The grain house is full of larger particulate matter (>2.5um) created by mechanical processes of processing the grain

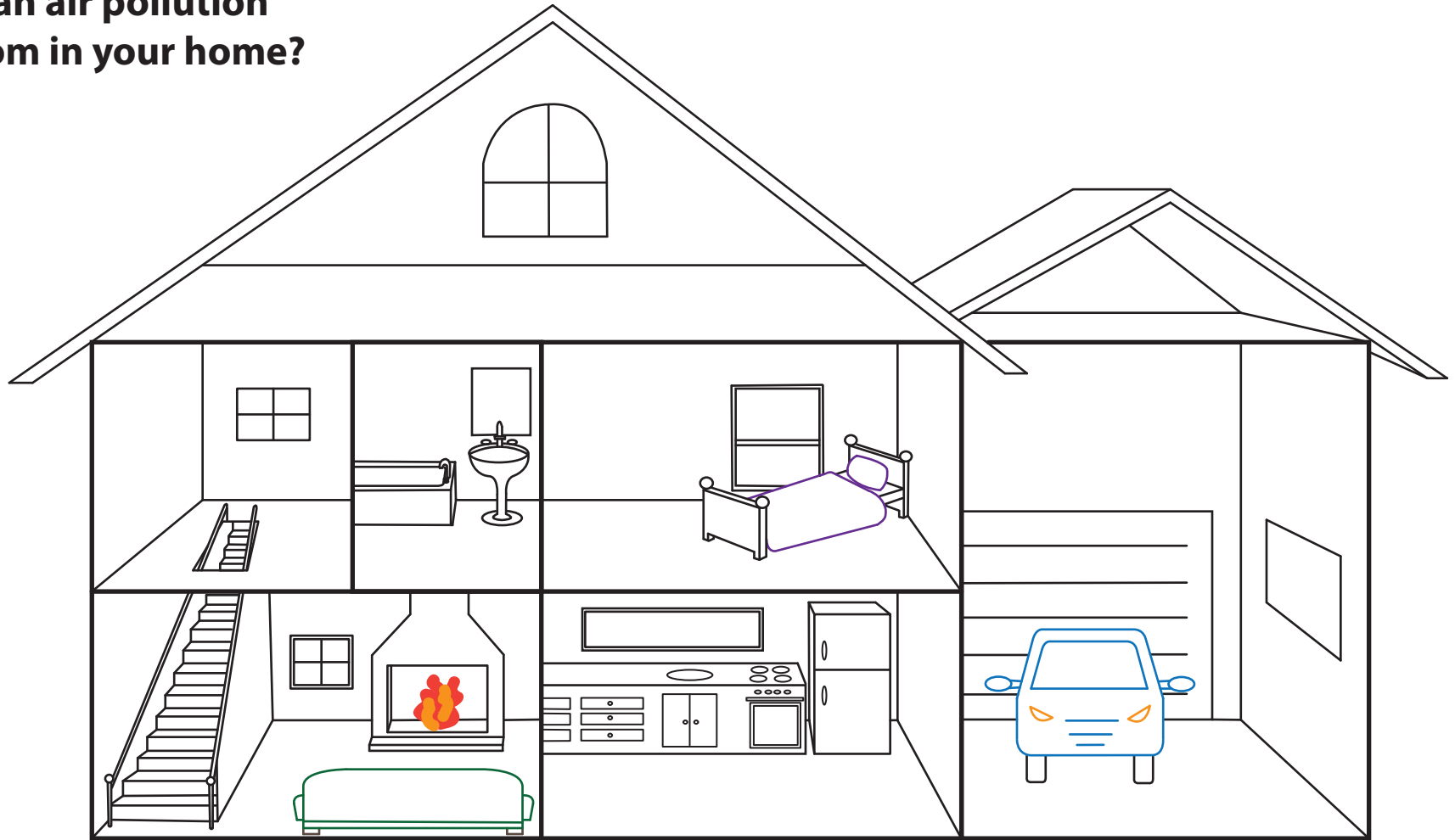
**In the Classroom:**

- People (though not drawn) are some of the biggest sources of air pollution in a classroom emitting CO<sub>2</sub>, VOCs, and particulate matter
  - Dust from skin cells and dirt on shoes can be resuspended in the air from people walking around
  - Perfume and cologne emit VOCs from people
- Blackboards can produce a lot of particulate matter because of the chalk.
- White board markers can emit VOCs.
- If the window is open, VOCs from cars in the parking lot can get into the classroom.
- The vent will circulate air out of the classroom (and the vent normally has filters), so this will help decrease overall pollutants in the classroom
- Opening the door can also decrease pollutants in the classroom, but if there are a lot of pollutants in the hallway, then air pollution in the classroom would increase
- Some classrooms have printers, which leads to production of ozone

**In your Home:**

- People (though not drawn) are some of the biggest sources of air pollution in your home emitting CO<sub>2</sub>, VOCs, and particulate matter
  - Pets also emit similar pollutants to people
- Cooking is one of the largest sources of air pollution in the home, producing CO<sub>2</sub>, NO<sub>x</sub>, VOCs, and particulate matter
  - Oven, stove, etc.
- Furnaces are giant combustion chambers in a house. Anytime there is combustion, CO<sub>2</sub>, NO<sub>x</sub>, VOCs, and particulate matter are produced. Furnaces have filters, however, these filters do not work on all types of air pollutants.
- The fireplace produces
- Cleaning products release CO<sub>2</sub>, NO<sub>x</sub>, VOCs, and particulate matter
- Furniture is coated in flame retardants (VOCs), that can release into the air
- Pollution from outside the home can also go into the home
  - For example, if you live near a busy road, pollution from cars will enter your home

# Where can air pollution come from in your home?



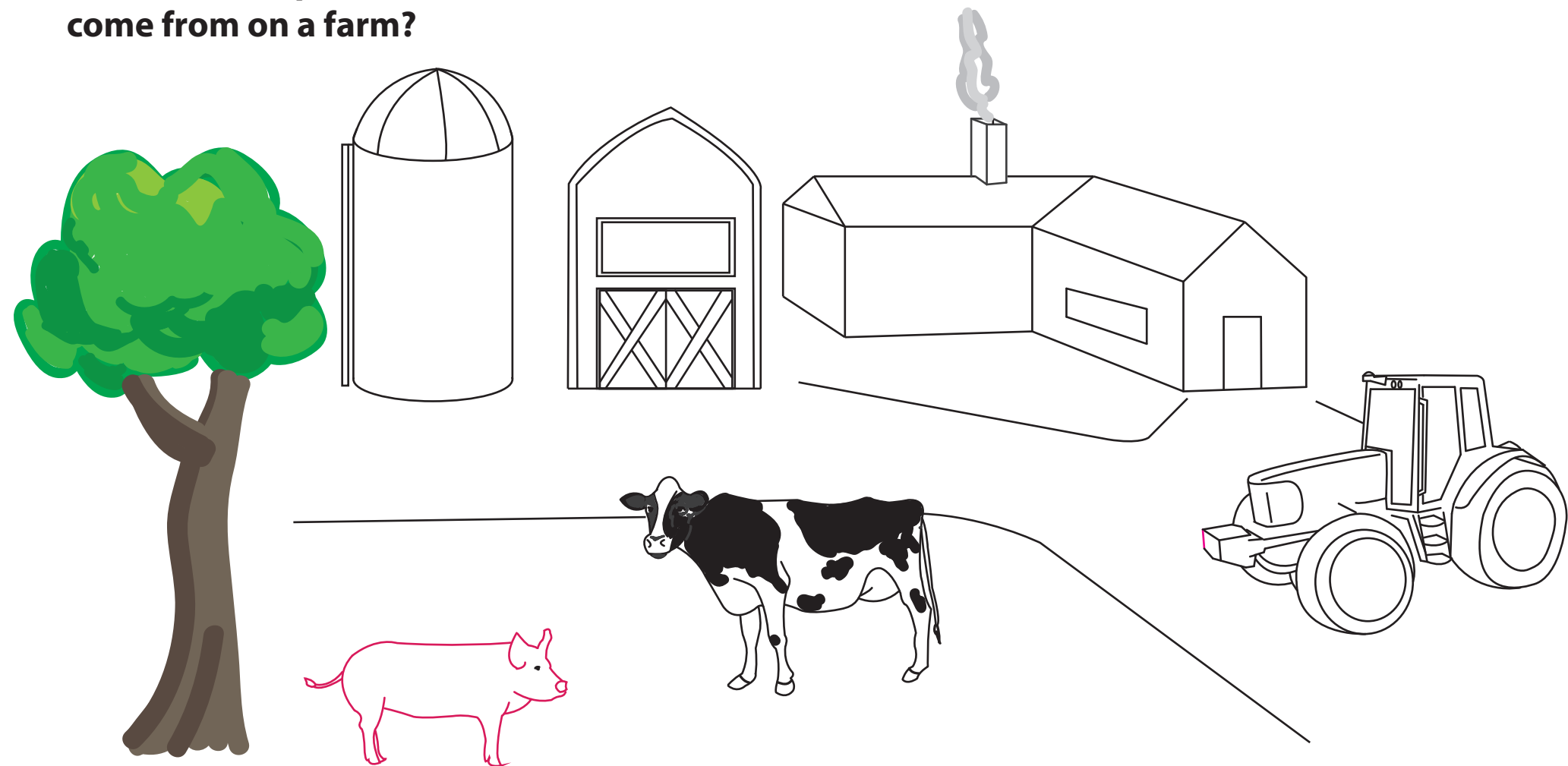
Circle sources of air pollution inside the house.

Draw other sources of air pollution in your house.

List the air pollution sources here:

How can you decrease air pollution in your house?

# Where can air pollution come from on a farm?



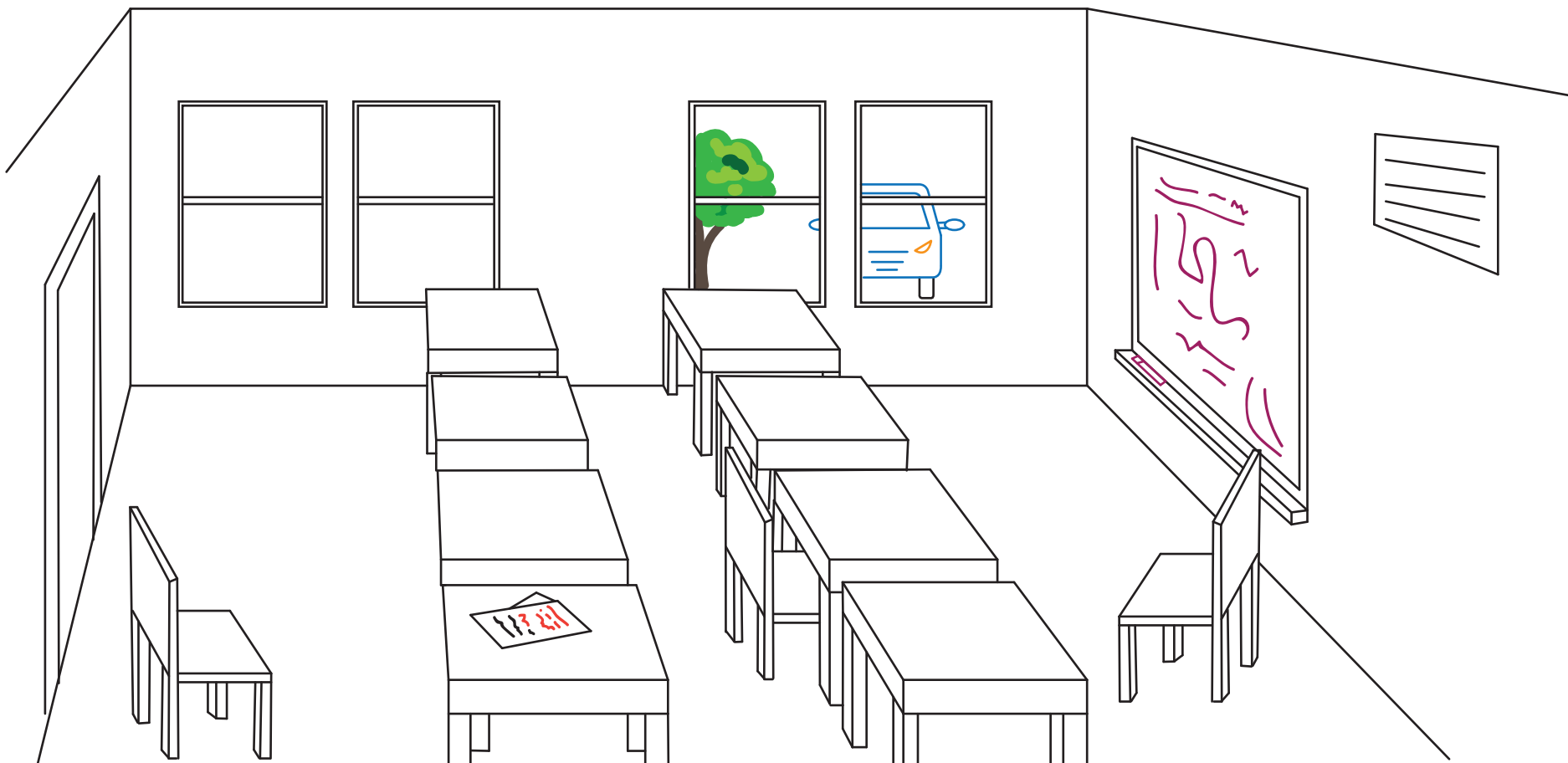
Circle sources of air pollution on the farm.

Draw other sources of air pollution on a farm.

List the air pollution sources here:

How can you decrease air pollution on a farm?

# Where can air pollution come from in a classroom?



Circle sources of air pollution in the classroom.

Draw other sources of air pollution in a classroom.

What other sources of air pollution are there in your school?

List the air pollution sources here:

How can you decrease air pollution in a school?