

Name: _____ Class: _____ Date: _____

B3.2 Air pollution



Tracking down technology

Perhaps you have helped vacuum at home. The vacuum removes dirt and dust from the floor and from objects. Here you will learn how a vacuum cleaner works, and discover other ways of removing dirt.

1. The following text describes the principle of a vacuum cleaner.
Read the text and then in your own words explain to your classmate next to you how a vacuum cleaner works.

a.	A vacuum cleaner has a motor that drives a cooling fan. (Think of this fan as similar to a room fan.)
b.	The cooling fan generates a negative pressure.
c.	Air, dust, and dirt are drawn into the vacuum cleaner by the negative pressure.
d.	This airflow passes through several filters in the vacuum cleaner and is cleaned.
e.	The clean air is expelled from the vacuum cleaner. The dust and dirt remain inside the vacuum cleaner.
f.	When the vacuum cleaner is full of dirt, it must be emptied.

2. A vacuum cleaner needs current to work. Look for the place in the text where current is needed and write down the letters: _____
3. Why is electricity needed?

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4. Guess why the air that comes out of the vacuum cleaner is warm.

So a vacuum cleaner has filters. You are already familiar with filters from the experiment on water purification.

5. In your own words, describe the properties of a filter.

6. Vacuum cleaners with a vacuum bag are common.
Have an adult show you the inside of a vacuum cleaner and count the number of filters.

Tip: The vacuum bag is one of the filters.

Number of filters: _____



Vacuum cleaner with bag.

7. Find out what function the filters perform. Write down your results.

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Other vacuum cleaners do not use a vacuum bag to filter the dirt out of the air that is sucked in. That's why these vacuum cleaners are called **bagless vacuum cleaners**.

The photo shows a bagless vacuum cleaner.

8. Where do you think the dirt is collected?
Circle the place on the photo.
9. With your teacher's help, find out how dust particles are separated from the air without filters. If you search on the Web, the following keywords can help you: cyclone filter, cyclone principle.
Take notes.



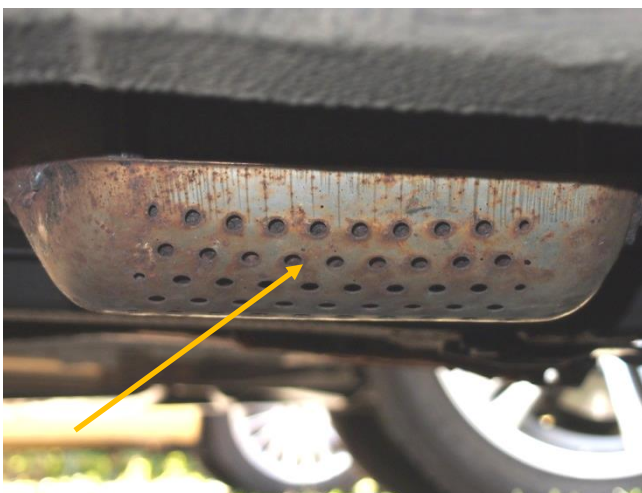
Vacuum cleaner without a bag.

Filters are also used in cars because engine combustion produces exhaust gases and pollutants that should not reach the environment.

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10. Find out from someone who has a car or from a car repair shop where filters are installed in the car. Take notes.

11. What are these filters used for?



Catalytic converter and diesel particulate filter in the exhaust pipe of a diesel vehicle.

The filters are usually built into the car so you can barely see them. If you lie underneath a diesel vehicle, you can see the device shown in the adjacent photo. It contains the diesel particulate filter, which makes sure that black smoke doesn't pour out of the exhaust pipe.