A filter removes something unwanted from a substance when it passes through. A biofilter is the same, but uses tiny invisible organisms to remove pollution or unwanted substances by breaking them down into something else. Wetlands are natural and effective biofilters, and are extremely important for healthy water. People now create wetlands on purpose to deal with storm water and sewage.

View the ABC’s ‘Wetlands clean up stormwater video’: bit.ly/ed-0001


The basic design of a ‘rain garden’ (a place where stormwater is collected and filtered) is shown on the last page. Students can better understand how filtration can occur in a wetland by making and observing their own natural filter system.

Materials (one set of the below per table group)

- 1 x student worksheet per pair (see next page)
- 1 x clear plastic container and funnel (you can use soft drink bottles, carefully cut)
- Cups for mixing
- Paper napkins, cotton balls
- A cup full each of sand and gravel
- A ball of clay (about golf ball size will do).
- Materials to be used as ‘pollutants’: e.g. leaves, fruit peel, egg shells, glitter, strongly coloured and smelling spice [like turmeric], grass clippings, dirt, cooking oil.

For the class

- buckets for disposal of materials
- paper towels for cleaning out the containers and funnels.

Method

These instructions are also provided on the student sheet (see next page).

Step 1: Place the funnels into the containers:

Step 2: Layer four of the filter materials inside your funnel: choose from napkin, cotton balls, sand, gravel, clay (use only a thin layer of the clay if using).
Filtration activity (student sheet)

Step 3: Mix up ‘pollution’ in a cup using the materials provided.

Step 4: Predict what type of pollution might be removed by each layer of your filter.

Step 5: Pour the polluted water through the filter.

Step 6: Observe and write down what you notice.

Procedure

Step 1: Place your funnel into your container.

Step 2: Layer four of the filter materials inside your funnel (choose from napkin, cotton balls, sand, gravel, clay)

- put only a thin layer of the clay if using.

Step 3: Mix up ‘pollution’ in a cup using the materials provided.

Step 4: Predict what type of pollution might be removed by each layer of your filter.

Step 5: Pour the polluted water through the filter.

Step 6: Observe and write down what you notice:

Step 7: Take apart your filter and look at the different layers – can you tell what was removed by each? Write your responses below.

Filter layer 1

Filter material: 

Pollution filtered out: 

Filter layer 2

Filter material: 

Pollution filtered out: 
**Filter layer 3**
Filter material:
Pollution filtered out:

**Filter layer 4**
Filter material:
Pollution filtered out:

Step 8: Observe the filtered water. Write your observations of what it looks like (colour, transparency, smell):

Step 9: Compare what you saw to your prediction. Were you correct?
If not, what did you learn?

Step 10: Empty the two parts of your filter and wipe it out.

Step 11: Repeat - using what you learned. (Try to get your water even cleaner by putting the layers in another order, or using different amounts of each material.)

**Filter layer 1**
Filter material:
Pollution filtered out:

**Filter layer 2**
Filter material:
Pollution filtered out:

Did you improve? Write what you observed/learned:

Draw your idea of a wetland cross-section. Add in how you think decomposers would make the filtration even better.
Dirty water in the drainage layer can be cleaned by sandy soil roots removing excess nutrients and encouraging microbes. Clean water out.