



Desalination

STEM Sims

Lesson 2: Building a Desalination Plant

Can you build a desalination plant that changes ocean water into fresh water? You'll need to know where to use vacuum pumps, water pumps, liquid pipes, and gas pipes so your plant makes fresh water. Get ready to be pumped up.

Doing the Science

1. Start the Desalination Simulation.



Q.A. What is the purpose of a desalination plant?

Q.B. Describe a region or area that might need a desalination plant. State why this area requires this type of plant.

2. Select "Surface" for Warm Water Intake Depth and "200m" for Cold Water Intake Depth, and then select Continue.
3. Your tasks are listed on-screen between the Fresh Water and Cold Water Reservoirs as well as in Table 1. Work on each task in order.
4. To connect the Warm Water to the Aerosolizer, select and drag the icon of the correct pipe or pump to two dots. If you need the element to be vertical instead of horizontal, click on the R for rotate.

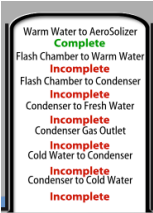
- No pipe or pump paths should overlap.
- Experiment connecting pumps and pipes on a path from the bottom left-hand dot in Warm Water to the middle dot on the Aerosolizer.
- When you have the correct combination, the task on the bottom right side of the screen will convert from the Red Incomplete to the Green Complete as shown in this figure.
 
- When you have all tasks successfully completed, record in Table 1 below how many pipes and pumps you used for each task.

Table 1. Number of Pipes or Pumps Needed for a Connection

Task	Liquid Pipe	Gas Pipe	Water Pump	Vacuum Pump
Warm Water to Aerosolizer				
Flash Chamber Drain to Warm Water Return				
Flash Chamber to Condenser				
Condenser Drain to Fresh Water				
Condenser Gas Outlet (Off Screen)				
Cold Water Intake to Condenser				
Condenser to Cold Water Return				

What Do You Understand?

- What is the purpose of an aerosolizer in the plant?

2. What is the purpose of the condenser in the plant?

3. Does aerosolizing particles increase or decrease the energy of the particles?
Provide a reason to support your answer.

4. Does condensing particles increase or decrease the energy of the particles?
Provide a reason to support your answer.

5. In which location would the particles have the *greatest* amount of energy?
Provide a reason to support your answer.

6. In which location would the particles have the *slowest* motion? Provide a reason to support your answer.

7. At which location(s) in the plant does energy have to be added to complete a given process?

8. How does a pipeline that carries a gas differ from a pipeline that carries a liquid?

9. What is the purpose of a vacuum pump?
