

Insect Aspirator

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Answer: Make an insect aspirator! An insect aspirator is a simple tool scientists use to collect bugs and insects that are too small to be picked up manually. Basically it's a mini bug vacuum!

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What to Learn In this lab, you will learn to use suction power (your own sucking power!) to suck up (but not inhale!) tiny insects. You will learn the behavior of tiny insects that are difficult to observe because they are so small.

Materials

- A small vial or test tube with a (snug fitting) two-holed rubber stopper. OR a plastic water bottle with a cap.
- Two short pieces of stiff plastic tubing. We'll call them tube A and tube B. OR two bendy straws.
- Fine wire mesh (very small holes because this is what will stop the bugs from going into your mouth!)
- A cotton ball.
- One to two feet of flexible rubber tubing.
- Duct tape or a rubber band or hot glue

Experiment

1. Review the instructions on their worksheets and then break the students into their lab groups.
2. Hand each group their materials and give them time to perform their experiment and write down their observations.
3. Insert the tube A and Tube B into the stopper such that the stopper is in the middle of both pieces.
4. Bend both A and B plastic tubing 90 degrees away from each other. Their ends should be pointing away from each other.
5. Cut a square of mesh large enough to the end of the plastic tubing. Tape (or rubber-band) the mesh over bottom of tube A only. Remember, if you cover both of the tubes the bugs won't be able to enter the aspirator.
6. Insert a small amount of cotton ball into the other side of tube A (not enough to block airflow, just enough to help filter the dust and particles entering the vial).
7. Cut another piece of mesh and cover the other end of Tube A. Secure that mesh with another piece of tape/rubber band.
8. Fit the rubber tubing over the top of tube B (the bent side).
9. Fit the stopper into the vial/test tube.

10. To use the aspirator, hold the end of the rubber tubing near the insects you want to collect, and suck through the top of tube A. The vacuum you create sucks the insects into the vial/test tube (make sure they can fit in the tube!).

Reading

Can you think of a machine that sucks things up? If you're thinking "a vacuum", you're right! The question is, what type of vacuum do we need? A big industrial one, or a little handheld model? The answer is: it depends on what you plan to use it for. It would take a long time to vacuum your entire house with a car vacuum, and it wouldn't be nearly as powerful as it needed to be.

For collecting bugs, if we use too powerful of a vacuum to extract them from their environment, they're going to be crushed so we can't observe their natural behavior (it's like trying to observe bugs that are already squashed on a windshield). Our suction power is done through one straw, while the other straw is the tube where the bugs will be sucked into. In order not to suck up the bugs and be able to catch them, we need this second tube, which leads into the bottle (place where we can catch and observe them). And *you* get to provide the suction power.

Exercises

1. Why don't we use a large vacuum to suck up the bugs?
2. Why do we need a small mesh covering on the end of the straw that we suck on?
3. Why do we need to be careful about catching ants?
4. What insects did you catch that you rarely see?
5. What familiar insects did you catch? (answers may vary).

Answers to Exercises: Insect Aspirator

1. Why don't we use a large vacuum to suck up the bugs? (It is too large. The insects would be nearly impossible to see)
2. Why do we need a small mesh covering on the end of the straw that we suck on? (So as not to suck up the bugs!)
3. Why do we need to be careful about catching ants? (They emit formic acid.)
4. What insects did you catch that you rarely see? (answers may vary.)
5. What familiar insects did you catch? (answers may vary).