

# Cold, Flu, or Allergy?

---

## Core Concepts:

- Colds, the flu, and respiratory allergies have similar symptoms but they are treated with different drugs.
- The Drug Facts label on over-the-counter drugs provides information essential for selecting and using drugs safely.
- A doctor or pharmacist can provide advice to help people select over-the-counter drugs.

## Class time required:

2-3 forty-minute class periods

## Teacher Provides:

### For each student

- Copy of student handout entitled **Cold, Flu, or Allergy?**

### For Part 1 - Each team of students will need:

- Small plastic bag labeled “Eva Miller” containing a single-ended cotton swab that has been dipped into a 2% phenolphthalein solution and allowed to air dry. Purchase regular cotton swabs and then use scissors to cut one cotton end off. Phenolphthalein solution can be purchased from a science supply company such as Ward’s Science or Carolina Biological Supply.
- Small plastic bag labeled “Kyla Miller” containing a single-ended cotton swab. Do NOT treat this cotton swab with phenolphthalein.
- Small plastic bag labeled “Danielle Miller” containing a single-ended cotton swab. Do NOT treat this cotton swab with phenolphthalein.
- **Rapid Flu Test Strip** printed on plastic transparency (see page vii). Alternatively, you can print it on paper and place the paper strip into a plastic sheet protector.
- Small tube labeled “Rapid Flu Test Solution” containing at least 1 mL of pH 10 buffer solution (or 1 mL of household ammonia diluted 1:10 with tap water). Purchase pH 10 buffer solution from a science supply company such as Ward’s Science or Carolina Biological Supply.
- Dropper (plastic transfer pipet) labeled “Rapid Flu Test Solution”

### For Part 2 – Each team of students will need:

- Color copies of the 4 over-the-counter drug labels (see pages viii-xi). *Optional: To make look more realistic, cut along the dotted lines to remove the white space from around the labels.*
- Optional: Copy of **General Safety Precautions** for each pair of students (see page vi).
- Optional: Copy of **How to Read a Drug Facts Label** for each pair of students (see page xii).

## Teacher Resources:

- **CDC - Influenza (Flu)** provides a wide variety of resources related to influenza. <http://www.cdc.gov/flu/>
- **CDC - Common Cold and Runny Nose** provides information on the common cold. <http://www.cdc.gov/getsmart/community/for-patients/common-illnesses/colds.html>
- **WebMD - Allergies Health Center** provides information on allergies. <http://www.webmd.com/allergies/>
- **WebMD - Cold, Flu, & Cough Health Center** provides information on colds and influenza. <http://www.webmd.com/cold-and-flu/default.htm>
- **WebMD - Allergy Medications** lists and describes OTC and prescription drugs to relieve allergy symptoms. <http://www.webmd.com/allergies/guide/allergy-medications>

## Suggested Class Procedure:

1. Pose the questions below to the class and allow time for students to share their answers with the class:
  - How could you tell whether your symptoms are caused by allergies, a cold, or the flu?
  - There are many different kinds and brands of allergy, cold, and flu products that you can buy without a prescription. How do you or your parents choose the appropriate products to relieve symptoms caused by allergies, a cold, or the flu?
2. Distribute **Cold, Flu, or Allergy?** student instructions to each student. *Note: Teachers may want to distribute the student instructions in parts so that students do not read ahead. Distribute pages 1 and 2 first, then distribute pages 3 through 8 distributed after students have completed and analyzed the flu tests.*
3. Read the introduction to students. Have students predict which daughter, or daughters, have the flu. Select students to share and explain one of their predictions.
4. Explain that they will be conducting lab tests to determine if Eva, Danielle, and Kyla Miller have the flu.
5. Optional: Distribute and review **General Safety Precautions**.
6. Distribute supplies for the Rapid Flu Test to each pair of students:
  - Bag labeled “Eva Miller” containing a cotton swab treated with 2% phenolphthalein
  - Bag labeled “Kyla Miller” containing a cotton swab
  - Bag labeled “Danielle Miller” containing a cotton swab
  - **Rapid Flu Test Strip**
  - Tube of “Rapid Flu Test Solution”
  - Dropper labeled “Rapid Flu Test Solution”

**Warning:** It is essential that you maintain families’ legal rights to privacy related to health and medicine use. Do not allow students to provide or discuss examples of medicines or dietary supplement used by their family.

**Note:** The everyday use of the words “drugs”, “medicines”, and “dietary supplements” is different from the definitions used by the FDA (Food and Drug Administration). The *Fact Sheet* uses the FDA language. However, to help students relate the activity to their lives, we have used the words “drug” and “medicine” interchangeably.

7. Students complete **Part 1: Rapid Influenza Tests**
8. Collect bags and tubes of Rapid Flu Test Solution for reuse in additional classes. Students should be instructed to discard the used cotton swabs and used Rapid Flu Test Strips.
9. Distribute color copies of the 4 drug labels.
10. Optional: Distribute a copy of **How to Read an Over-The-Counter Drug Facts Label** to each pair of students.
11. Ask students to work with their partner to complete **Part 2: Danielle’s Case**.
12. Students work with their partner to complete **Part 3: Kyla’s Case** and **Part 4: Eva’s Case**. *Note: Students can complete Parts 2, 3, and 4 for homework.*
13. Optional extensions:
  - Create a comparison chart that summarizes the similarities and differences between cold, flu, and allergy causes and symptoms.
  - Make a list of the four most important things you learned about selecting and using over-the-counter drugs for cold, flu, or allergy symptoms. Have students share their lists to create a class list.
  - Create a comparison chart to show the similarities and differences between cold, flu, and allergy. Include both symptoms and causes.
  - Some people have proposed that antibiotics should be made available as over-the-counter medicines. Explain why most scientists are opposed to this proposal.
  - What are the advantages and disadvantages for using combination versus single symptom medications?
14. Optional: The multiple choice questions on pages iv- v may be used for homework or a quiz.

## Multiple Choice Questions - *Cold, Flu, or Allergy?*

1. It can be difficult to tell whether a person has a cold, the flu, or allergies because these all
  - A. Are caused by viruses that damage the respiratory system.
  - B. Cause respiratory system symptoms.
  - C. Are treated using the same medicines.
2. Which are symptoms of the flu, but not of allergies or the common cold?
  - A. A high fever and body aches.
  - B. A cough and runny nose.
  - C. Itchy eyes and nose.
3. Which type of over-the-counter medicine would be most effective for treating allergy symptoms?
  - A. Analgesics
  - B. Antihistamines
  - C. Decongestant
4. A long-lasting illness that can be treated but not cured is called
  - A. An acute disease.
  - B. A chronic disease.
  - C. A respiratory disease.
5. A 13 year old boy has a really bad cold and a bad headache. He wants to take both Multi-Symptom Cold Medicine for his cold symptoms and Tylenol for his headache. This may be dangerous if both medicines
  - A. Contain the same pain reliever.
  - B. Are used to treat allergies.
  - C. Treat different symptoms.
6. Prescription antiviral medicines such as oseltamvir and zanamivir
  - A. Should only be used if flu symptoms last for more than three days.
  - B. Provide immunity to influenza viruses.
  - C. Reduce and shorten the duration of flu symptoms.
7. Medicines used to suppress coughs are called
  - A. Antitussives
  - B. Decongestants
  - C. Expectorants
8. Medicines used to thin mucus and promote the clearing of mucus from the respiratory system are called
  - A. Antitussives
  - B. Decongestants
  - C. Expectorants

9. An analgesic/antipyretic is used to reduce
  - A. Fever and pain.
  - B. Itchy nose and eyes.
  - C. Cough and nasal congestion.
  
10. Young children, people over 65 years old, and people with chronic diseases are
  - A. Not susceptible to antiviral medicines.
  - B. Usually advised to avoid getting the influenza (flu) vaccination.
  - C. Most at risk for serious complications from influenza (“the flu”).
  
11. Any effect of a medicine that is in addition to its intended effect, especially an effect that is harmful or unpleasant, is called
  - A. A side effect
  - B. A drug interaction
  - C. An overdose
  
12. A decongestant makes it easier to breathe because it
  - A. Reduces swelling of tissues in the nose.
  - B. Prevents allergies by blocking antihistamines.
  - C. Suppresses coughs and increases mucus production.
  
13. Doctors usually do not prescribe antibiotics for the common cold because antibiotic use may promote
  - A. A decrease in viruses, but not bacteria.
  - B. Side effects and drug interactions.
  - C. The evolution of antibiotic resistant bacteria.
  
14. During an allergic reaction
  - A. Allergens are produced by antihistamines.
  - B. Histamines cause allergy symptoms.
  - C. Immune systems action is decreased.
  
15. Taking two medicines with the same active ingredient is most likely to lead to
  - A. Harmful drug interactions and side effects.
  - B. Unpleasant digestive system problems.
  - C. An overdose of the ingredient.

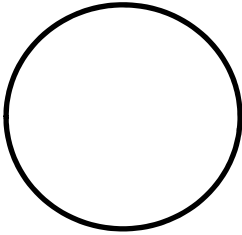
## General Safety Precautions

1. Work in a clean, uncluttered area. Cover the work area to protect the work surface.
  2. Read and follow all instructions carefully.
  3. Pay particular attention to following the specific safety precautions included in the instructions.
  4. Wear safety goggles while performing experiments using chemicals.
  5. Do not use droppers as “squirt guns”.
  6. Never taste or ingest any chemicals used for this activity - they may be toxic.
  7. Do not eat, drink, or apply make-up or contact lenses while performing experiments.
  8. Wash your hands before and after performing experiments.
  9. Chemicals used in experiments may stain or damage skin, clothing or work surfaces. If spills occur, wash the area immediately and thoroughly.
  10. Follow your teacher’s instructions for end-of-experiment clean-up.
- 

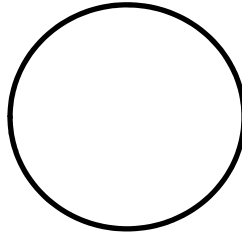
## General Safety Precautions

1. Work in a clean, uncluttered area. Cover the work area to protect the work surface.
2. Read and follow all instructions carefully.
3. Pay particular attention to following the specific safety precautions included in the instructions.
4. Wear safety goggles while performing experiments using chemicals.
5. Do not use droppers as “squirt guns”.
6. Never taste or ingest any chemicals used for this activity - they may be toxic.
7. Do not eat, drink, or apply make-up or contact lenses while performing experiments.
8. Wash your hands before and after performing experiments.
9. Chemicals used in experiments may stain or damage skin, clothing or work surfaces. If spills occur, wash the area immediately and thoroughly.
10. Follow your teacher’s instructions for end-of-experiment clean-up.

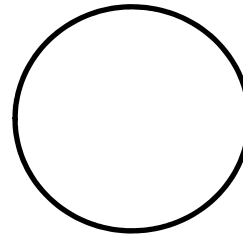
**Rapid Flu Test Strip**



**Danielle Miller**

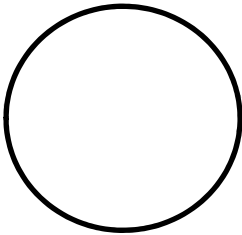


**Kyla Miller**

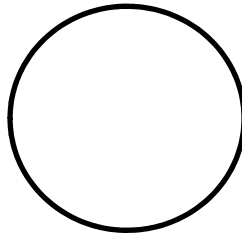


**Eva Miller**

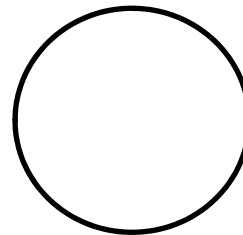
**Rapid Flu Test Strip**



**Danielle Miller**

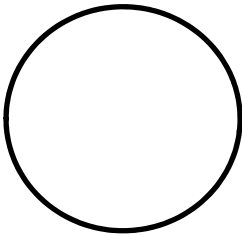


**Kyla Miller**

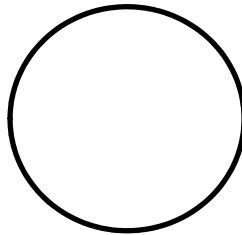


**Eva Miller**

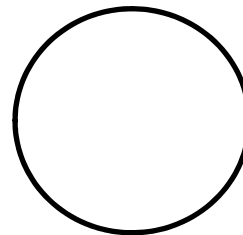
**Rapid Flu Test Strip**



**Danielle Miller**

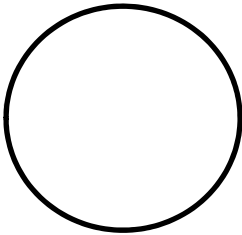


**Kyla Miller**

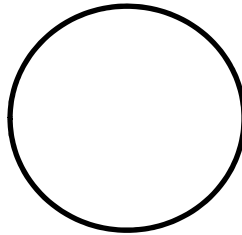


**Eva Miller**

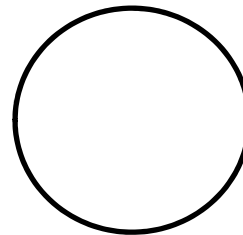
**Rapid Flu Test Strip**



**Danielle Miller**



**Kyla Miller**



**Eva Miller**

**Drug Facts**

**Active Ingredients (in each 20 ml) Purposes**

Acetaminophen 650 mg.....Pain reliever/fever reducer  
 Dextromethorphan HBr 20 m.....Cough suppressant  
 Gualfensin 400 mg.....Expectorant  
 Phenylephrine HCL 10 mg.....Nasal decongestant

**Uses:** temporarily relieves these common cold and flu symptoms: • nasal congestion • sinus congestion and pressure •cough due to minor throat and bronchial irritation •minor aches and pains •sore throat •headache •reduces fever •promotes nasal and or sinus drainage •helps loosen phlegm (mucus) and thin bronchial secretions to drain bronchial tubes and make coughs more productive.

**Warnings**

**Liver warning:** This product contains acetaminophen. Severe liver damage may occur if you take:  
 •more than 6 doses in 24 hours, which is the maximum amount •with other drugs containing acetaminophen •3 or more alcoholic drinks daily while using this product

**Sore throat warning:** If sore throat is severe, persists for more than 2 days, is accompanied by or followed by fever, headache, rash, nausea, or vomiting, consult a doctor promptly.

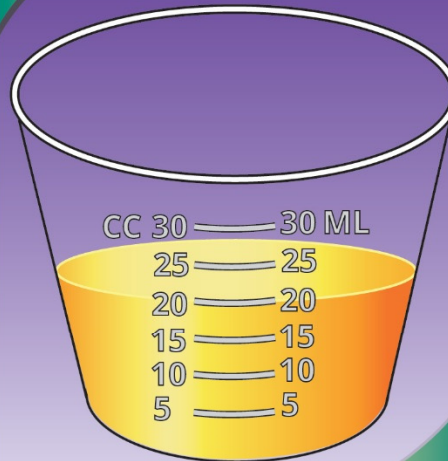
**Do not use**

•with any other drug containing acetaminophen (prescription or nonprescription). If you are not sure whether a drug contains acetaminophen, ask a doctor or a pharmacist.  
 •for children under 12 years of age  
 •if you are now taking a prescription monoamine oxidase inhibitor (MAOI) (certain drugs for depression, psychiatric, or emotional conditions, or Parkinson's disease), or for 2 weeks after stopping the MAOI, ask a doctor or pharmacist before taking this product.

**Ask a doctor or pharmacist before use** if you are taking the blood thinning drug warfarin

**Keep out of reach of children**

# Multi Symptom Cold and Flu Syrup



**liquid 240 ml dosing cup provided**

**Warnings (continued)**

**Overdose warning:** Taking more than the recommended dose may cause liver damage. In case of overdose, get medical help or contact a Poison Control Center right away. Quick medical attention is critical for both adults and children even if you do not notice any signs or symptoms.

**Ask a doctor before use if you have**

•liver disease •heart disease •high blood pressure  
 •thyroid disease •diabetes •trouble urinating due to an enlarged prostate gland •persistent and chronic cough such as occurs with smoking, asthma, chronic bronchitis, or emphysema •cough that occurs with too much phlegm (mucus)

**Stop use and ask a doctor if** •nervousness, dizziness, or sleeplessness occurs •pain nasal congestion, or cough gets worse or lasts for more than 7 days •fever gets worse or lasts more than 3 days •redness or swelling is present •new symptoms occur •cough comes back or occurs with a rash or persistent headache. These could be signs of a serious condition.

**Directions.**

•do not take more than directed (see Overdose warning)  
 •do not take more than 6 doses in any 24 hour period  
 •measure only with dosing cup provided  
 •do not use dosing cup with other products  
 •dose as follows or as directed by a doctor

• Adults and children 12 years of age and older:	20 ml in dosing cup provided every 4 hours.
• Children under 12 years of age:	Do not use

**Other Information**

Other information  
 • each ml contains sodium 20 mg  
 • store at room temperature  
 • do not refrigerate

**Inactive ingredients** acesulfame potassium, alcohol, citric acid, D&C yellow no. 10, FD&C green no. 3, flavor, high fructose corn syrup, polyethylene glycol, propylene glycol, purified water, saccharin sodium, and sodium citrate

**Questions or comments?** Call toll free 1-800-XXX-XXXX



## Drug Facts

Active Ingredients (in each liquid-filled capsule)	Purposes
Acetaminophen, 325 mg.....	fever reducer/pain reliever
Dextromethorphan HBr, 15 mg.....	cough suppressant
Doxylamine Succinate, 625 mg.....	antihistamine

**Uses:** temporarily relieves these symptoms occurring with a cold, flu, hay fever, or other upper respiratory allergies:

- headaches
- sore throat
- itchy, watery eyes
- itchy nose or throat
- minor aches and pains
- cough
- runny nose

**Warnings**  
**Liver warning:** This product contains acetaminophen. Severe liver damage may occur if you take:

- more than 8 capsules in any 24-hour period, which is the maximum daily amount
- with other drugs containing acetaminophen
- 3 or more alcoholic drinks every day while using this product.

**Do not use**

- if you are taking a prescription monoamine oxidase inhibitor (MAOI)(certain drugs for depression, psychiatric or emotional conditions, or Parkinson's disease), or for two weeks after stopping these drugs. If you do not know if your prescription drug contains an MAOI, ask a doctor or a pharmacist before taking this drug.
- with any prescription or nonprescription drug containing acetaminophen

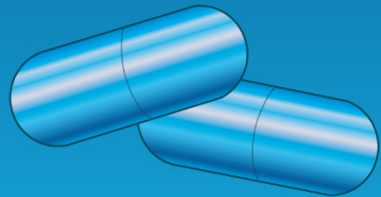
**Ask a doctor before use if you have:**

- liver disease
- glaucoma
- trouble urinating due to enlarged prostate gland
- coughing that occurs with too much phlegm (mucus)
- a breathing problem or chronic cough that lasts or occurs with smoking, asthma, chronic bronchitis, or emphysema

**Ask a doctor or pharmacist before use if you are taking**

- the blood thinning drug warfarin
- any other pain reliever/fever reducer
- sedatives or tranquilizers

# Adult Cold and Flu Formula



20 Liquid-Filled Capsules

## Relieves:

- Cough
- Sneezing
- Sore Throat
- Body Aches
- Fever
- Runny Nose

**When using this product:**

- marked drowsiness may occur
- avoid alcoholic drinks
- alcohol and sedatives may increase drowsiness
- be careful when driving a motor vehicle or operating machinery
- excitability may occur, especially in children

**Stop use and ask a doctor if**

- pain or cough gets worse or lasts for more than 7 days
- fever gets worse or lasts more than 3 days
- redness or swelling is present
- cough comes back or occurs with a rash or headache that lasts. These could be signs of a serious condition.
- new symptoms occur

**If pregnant or breast-feeding,** ask a health professional before use.  
**Keep out of reach of children**  
 In case of overdose, get medical help or contact a Poison Control Center right away. Quick medical attention is critical for adults as well as for children even if you do not notice any signs or symptoms.

**Directions.**

- Do not take more than 8 capsules in any 24 hour period
- Do not exceed recommended dosage (Taking more than the recommended dose can cause serious liver damage.

age	dose
adults and children 12 years and over	2 capsules every 6 hours
children under 12 years	do not use

**Other Information**

- do not use if neck wrap or foil inner seal is broken or missing
- store at room temperature

**Inactive ingredients** FD&C blue no. 1, gelatin, glycerin, pharmaceutical ink, polyethylene glycol, povidone, propylene glycol, purified water, sorbitol sorbitan solution

**Questions or comments?**  
 Call toll free 1-800-XXX-XXXX



## Drug Facts

Active Ingredients (in each tablet)	Purpose
Phenylephrine HCL 10 mg	nasal decongestant

**Uses:** •temporarily relieves nasal congestion due to common cold, hay fever, or other upper respiratory allergies •temporarily relieves sinus congestion and pressure

### Warnings

**Do not use** if you are taking a prescription monoamine oxidase inhibitor (MAOI) (certain drugs for depression, psychiatric, or emotional conditions, or Parkinson's disease) or for two weeks after stopping the MAOI drug. If you do not know if your prescription drug contains an MAOI, ask a doctor or pharmacist before taking this product.

**Ask a doctor before use if you have** •heart disease •high blood pressure •thyroid disease •diabetes •trouble in urination due to enlargement of the prostate gland

**When using this product** •do not use more than directed

**Stop use and ask a doctor if** •you get nervous, dizzy, or sleepy •symptoms do not improve within 7 days or are accompanied by fever.

**If pregnant or breast-feeding**, ask a health professional before use. Keep out of reach of children In case of overdose, get medical help or contact a Poison Control Center right away.

**Directions** Adults and children 12 years and older:

- to relieve symptoms, swallow 1 tablet with a glass of water
- to prevent symptoms, swallow 1 tablet with a glass of water 30 to 60 minutes before eating food or drinking beverages
- can be used up to twice daily (up to 2 tablets in 24 hours)
- do not chew tablet
- children under 12: ask a doctor

### Other Information

•do not use if individual unit is open •store at room temperature  
Inactive Ingredients carrageenan, FD&C blue #1, flavors, cellulose, polyethylene glycol, sucralose, and titanium dioxide

### Questions or comments?

Call toll free 1-800-XXX-XXXX

# Nasofed PE

## NASAL & SINUS DECONGESTANT



**NON-DROWSY  
MAXIMUM STRENGTH**

**20 TABLETS**

# How to Read an Over-the-Counter Drug Facts Label

**Active Ingredient**  
An active ingredient is the chemical compound in the medicine that makes it work in your body to bring relief for your symptoms.

If you are taking more than one OTC medicine, compare the active ingredients. Do not take two medicines with the same active ingredient unless instructed by your doctor, pharmacist, or other healthcare professional.

**Uses**  
This section tells you the ONLY symptoms the medicine is approved to treat.

**Warnings**  
This section tells you what other medications, foods, or situations (such as driving) to avoid when taking this medicine.

**Directions**  
The only recommended dosage and frequency of dosage will be listed here. You should follow this strictly. It's not just how much you take but how often.

**Inactive Ingredients**  
An inactive ingredient is a chemical compound in the medicine that does not treat symptoms. Preservatives, food colors, and flavorings, and binding agents will be listed here.

**Other Information**  
This section tells you other important information about the product, such as how to store the medicine.

**Drug Facts**

Active Ingredients (in each tablet)	Purpose
Chlorpheniramine Maleate 2 mg.....	Antihistamine

**Uses:** temporarily relieves these symptoms due to hay fever and other upper respiratory allergies:  
 sneezing     runny nose     itchy, watery eyes     itchy throat

**Warnings**  
**Ask a doctor before use if you have**  
 glaucoma     a breathing problem such as emphysema or chronic bronchitis  
 difficulty in urination due to enlargement of the prostate gland

**Ask a doctor or pharmacist before use if you are taking sedatives or tranquilizers**

**When using this product**  
 you may get drowsy  
 avoid alcoholic drinks  
 alcohol, sedatives, and tranquilizers may increase drowsiness  
 be careful when driving a motor vehicle or operating machinery  
 excitability may occur, especially in children

**If pregnant or breast-feeding,** ask a health professional before use.  
**Keep out of reach of children.** In case of overdose, get medical help or contact a Poison Control Center right away.

**Directions**

Adults and children 12 years and older	take 2 tablets every 4 to 6 hours not more than 12 tablets in 24 hours
Children 6 to under 12 years	take 1 tablet every 4 to 6 hours not more than 6 tablets in 24 hours
Children under 6 years	ask a doctor

**Other Information**  
store at controlled room temperature 2°-30°C (30°-86°F)  
 Protect from excessive moisture

**Inactive Ingredients** D&C Yellow 10, Lactose, Magnesium Stearate, Microcrystalline Cellulose, Pregelatinized Starch

**Other Information**  
This section tells you other important information about the product, such as how to store the medicine.