A Dangerous Mix

Learn why it’s not safe to take medications with other substances.

AnyTHING YOU INGEST CAN HAVE AN EFFECT on your body. For instance, the caffeine in coffee can help you stay awake. And an allergy pill can relieve your stuffy sinuses.

The active ingredients in prescription and over-the-counter (OTC) drugs are tested for safety. But mixing medications may have dangerous side effects.

Interaction Alert

An active ingredient is the part of a drug that acts on your body. Combining substances can change the way an active ingredient works. This can increase its effect on your body, make it less effective, or have other unexpected results.

For example, Ritalin is a stimulant that is prescribed to treat attention deficit hyperactivity disorder (ADHD). It increases alertness and attention. It can also increase heart rate and blood pressure. The decongestants in many OTC allergy medications are also stimulants. Taking Ritalin with a decongestant can further increase heart rate and blood pressure. Over time, this can damage the heart.

Even with OTC drugs, you can exceed the dosage of an active ingredient. Imagine that you have a cold. You may take Tylenol for a headache and cold medicine for a cough. But many OTC cold treatments contain acetaminophen, Tylenol’s active ingredient. Mixing these medications can mean too much acetaminophen. This increases your risk for liver damage.

Even vitamins, herbal supplements, and foods can interact with medications. For example, the allergy medicine Allegra is less effective if taken with citrus fruits. The herbal supplement St. John’s wort may...
interact with drugs that treat depression. These interactions can cause high fevers, seizures, or other dangerous side effects.

**Protecting Yourself**

All medications include labels with instructions and interaction warnings. Always carefully read labels with an adult. Talk to your doctor before starting a new medication.

Vitamins and herbal supplements might not be labeled with warnings. Ask your pharmacist or doctor about possible interactions before starting a medication.

Staying smart and reading labels carefully will make sure your medicine is helping. After all, medicine should make you feel better, not worse!
A Dangerous Mix

Many teens regularly take medications and over-the-counter drugs. But they may not know that mixing substances can cause unexpected and potentially dangerous effects. Those risks are even greater when alcohol and illicit drugs are involved. By sharing the student article “A Dangerous Mix,” teaching the lesson, and handing out the activity sheet, you will help students be smart about medicine safety.

Critical-Thinking Questions

1. What is an active ingredient? Where can it be found? Give an example of an active ingredient. (An active ingredient is the part of a drug that has an effect on the brain or body such as causing alertness or slowing breathing. Active ingredients can be found in drugs and alcohol, over-the-counter and prescriptions medications, and even natural substances like food, vitamins, and herbal supplements. Examples may include caffeine, decongestants, stimulants in ADHD medications, etc.)

2. Explain why it is important to check the ingredients in any over-the-counter medications before taking them. (Answers may include that many over-the-counter medications contain the same active ingredients. Mixing these medications may cause you to take too much of a chemical, which may be harmful to your body.)

3. Why might someone who mixes alcohol and drugs end up in the emergency room? Use evidence to support your answer. (Alcohol increases the effects of many drugs. This can cause dangerous complications that may impair a person’s breathing, such as with sedatives or opioids, or dangerously increase a person’s heart rate, such as with stimulants like cocaine and methamphetamine.)

Writing Prompts

Grades 6–8 Why is it important to tell your doctor about any vitamins or herbal supplements you are taking?

Grades 9–10 Describe how the effect of a medication may change if it is mixed with another substance. Give an example.

Grades 11–12 Explain why mixing drugs and alcohol can increase your risk of death.

Paired Reading

“Non-Addictive Drugs: Are They Always Safe?” (teens.drugabuse.gov/blog/post/non-addictive-drugs-are-they-always-safe) This paired text describes why even over-the-counter medications should be used with caution.

Writing Prompt Explain why it is important to follow directions on an OTC medication. Describe two possible risks if you misuse the drug. Have students use text evidence from “Non-Addictive Drugs: Are They Always Safe?” and “A Dangerous Mix” to support their answers.

Activity Sheet Answers

1. The active ingredient in the medication is chlorpheniramine maleate.

2. Assuming an age of 12 and up: You can take a maximum of 12 pills per 24 hours.

3. Answers may include that a person should not drive a vehicle when taking this medication because the medication can cause the person to be drowsy.

4. Alcohol, sedatives, and tranquilizers.

5. A sedative is a substance that slows breathing and heart rate and causes drowsiness. This is similar to the medication’s side effects. When the substances are combined, the effects could be amplified, causing the person’s breathing to slow too much. It could also result in other side effects. This is also true for alcohol, which can amplify the effects of medications.

Subject Areas
- Science Literacy
- English Language Arts
- Health/Life Skills

Standards

CCSS
- RST.6-8.1 / RST.9-10.1 • Cite specific textual evidence to support analysis of science and technical texts
- W.6–8.1 / W.9–10.1 • Write arguments to support claims, using valid reasoning and relevant and sufficient evidence

NGSS Practices
- Obtaining, evaluating, and communicating information/engaging in argument from evidence

NSES • Personal health

NCSS • 8. Science, technology, and society

Additional Lesson Resources
- Tiered Vocabulary Tools: Visit scholastic.com/headsup/adangerousmix for a vocabulary list to support this article.
- headsup.scholastic.com /teachers and teens.drugabuse.gov

NIH National Institute on Drug Abuse
# Drug Facts

<table>
<thead>
<tr>
<th>Active Ingredient (in each tablet)</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorpheniramine maleate 2 mg</td>
<td>Antihistamine</td>
</tr>
</tbody>
</table>

**Uses**
- temporarily relieves symptoms due to hay fever or 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
  - trouble urinating due to an enlarged prostate gland
- Ask a doctor or pharmacist before use if you are taking tranquilizers or sedatives.
- 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 over: take 2 tablets every 4 to 6 hours; not more than 12 tablets in 24 hours
- children 6 years 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 20-25°C (68-77°F)
- protect from excessive moisture

**Inactive ingredients**
- D&C yellow no. 10, lactose, magnesium stearate, microcrystalline cellulose, pregelatinized starch

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**Read the Label!**

Read the label from an allergy and cold medication below. Answer the questions that follow.

**Answer these questions on a separate sheet of paper as necessary.**

1. What is the active ingredient in the medication?

2. What is the maximum number of pills someone your age can take in 24 hours?

3. Name an activity that should be avoided while taking this medicine. Explain why.

4. Which substances should not be taken with the medication?

5. Reread the sidebar “Drugs and Alcohol: A Toxic Mix” to understand the effect of a sedative on the body. Explain why a sedative should not be taken with this medication. Include evidence from the label and the article to support your answer.

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*For more information, visit [scholastic.com/headsup](http://scholastic.com/headsup).*

From Scholastic and the scientists of the National Institute on Drug Abuse, National Institutes of Health, U.S. Department of Health and Human Services
Dear Teacher,

The vocabulary list on the following pages is drawn from the “A Dangerous Mix” student article and the “Read the Label!” activity sheet. It can be previewed with students prior to reading or reinforced with students afterward. Encourage students to incorporate these words into their discussions and writing about the student article and activity sheet.

The list integrates vocabulary words that would be used across several content areas, such as adolescent, ingest, and usage, as well as domain-specific words, such as decongestant, dose, and vitamin.

Some suggestions for students to help their understanding include:

organizing concept maps that include word parts, synonyms, antonyms, and examples;
composing memory aids that explain the words or use them in a meaningful context;
employing the words to create newspaper articles, stories, or poems.

Sources: Unless otherwise noted, definitions are sourced or adapted from Merriam-Webster’s Collegiate Dictionary and Scholastic Children’s Dictionary.
**Acetaminophen (noun)**: a substance used in medications to relieve pain and reduce fever

**Active (adjective)**: producing or involving action or movement

**Addiction (noun)**: a brain disorder or illness associated with compulsive (uncontrollable) behavior, such as drug use, despite negative consequences

**Adolescent (adjective)**: related to the time when a young person is becoming an adult

**Alertness (noun)**: the state of being aware and ready to act

**Allergy (noun)**: a condition in which a person’s body is very sensitive to certain substances, resulting in rashes, breathing difficulties, and other problems

**Alprazolam (noun)**: a type of sedative drug used to increase calmness

**Amplify (verb)**: to increase the strength or amount of

**Antihistamine (noun)**: a substance used to reduce allergy reactions in the body as well as some cold symptoms

**Attention-deficit/hyperactivity disorder (ADHD) (noun)**: also called attention deficit disorder: a disorder that makes it difficult to pay attention and control impulsive behaviors. It may also involve restlessness and near-constant activity.

**Blood pressure (noun)**: the force caused by the blood pressing against the blood vessels that carry blood through the body (such as especially arteries); high blood pressure is connected to a higher risk for heart disease

**Bronchitis (noun)**: a condition that occurs when the tubes that carry air to the lungs become inflamed (red and swollen), causing coughing

**Caffeine (noun)**: a substance found in coffee, tea, and chocolate that tastes bitter and is a stimulant

**Chemical (noun)**: a substance, such as an element or a mix of elements (compound), that is made by a chemical process

**Chlorpheniramine maleate (noun)**: an antihistamine

**Citrus (noun)**: a type of tree or shrub that has pulpy fruit covered in a thick rind

**Cocaine (noun)**: an addictive illegal drug that produces a temporary increase in alertness and feelings of pleasure

**Coordination (noun)**: the functioning of different muscles together to perform complex movements

**D&C yellow no. 10 (noun)**: a substance used to color foods and drugs

**Decongestant (noun)**: a substance found in medications that relieves congestion (clogged sinuses)

**Depression (noun)**: a medical condition in which a person experiences symptoms such as extreme sadness, difficulty concentrating, and a lack of energy

**Developing (adjective)**: growing or becoming more advanced

**Diazepam (noun)**: a type of sedative drug used to increase calmness

**Disorder (noun)**: a physical or mental illness

**Dose (noun)**: the quantity of an active ingredient that should be taken at one time

**Emphysema (noun)**: a condition that damages the lungs and causes shortness of breath and may cause heart problems
**evidence** (noun): something that gives proof or a reason to believe something

**exceed** (verb): to go over a set limit

**expected** (adjective): thought to be likely or certain to occur

**glaucoma** (noun): a disease that affects the eye and can cause vision loss over time

**heart rate** (noun): the number of times the heart beats in one minute

**heightened** (adjective): greater in amount or degree

**herbal supplement** (noun): a substance made from herb plants or parts of the plant that is meant to be used as an addition to a person’s diet and often claiming to have possible health benefits

**hydrocodone** (noun): an opioid drug used to treat severe pain

**illicit** (adjective): against the law

**impaired** (adjective): weakened or damaged in function or ability

**ingest** (verb): to take into the body, normally through the mouth

**ingredient** (noun): something that is part of a combination or mixture

**intentionally** (adverb): on purpose or with awareness of what one is doing

**interact** (verb): to act upon one another

**interaction** (noun): the action or effect of two or more things on each other

**lactose** (noun): a type of sugar found in milk products

**liver** (noun): a large organ in the body that cleanses the blood

**magnesium stearate** (noun): a fine white powder added to drug capsules to prevent ingredients from sticking to one another, ensuring better absorption by the body

**magnify** (verb): to increase or intensify

**marijuana** (noun): dried leaves and flowers of the plant, which can be used as a drug

**medication** (noun): a chemical or substance that is used to treat a disease or medical condition

**methamphetamine** (noun): a substance found in some prescription medications that is a stimulant and is sometimes misused illegally

**microcrystalline cellulose** (noun): a substance produced from wood pulp that is added to some drug and vitamin tablets

**mindful** (adjective): aware

**misuse** (verb): to use something in a way that is unintended or harmful, such as misuse of a prescription drug

**opioid** (noun): one of a group of drugs that produce relaxation, pleasure, and pain relief. Opioids can be addictive and potentially deadly due to overdoses.

**overdose** (noun, verb): a lethal or toxic amount of a drug; to take a lethal or toxic amount of a drug

**over-the-counter (OTC) drug** (noun): a medication that can be purchased without a doctor’s prescription

**oxycodone** (noun): an opioid drug used to treat severe pain
OxyContin® (noun): a brand-name version of the drug oxycodone, which is an opioid drug used to treat severe pain

particularly (adverb): to an unusual degree

pharmacist (noun): a trained health-care professional legally allowed to dispense prescription drugs, monitor drug interactions, and advise patients on the proper use of medications

pose (verb): to present

potentially (adverb): possibly, but not yet actual

pregelatinized starch (noun): a substance usually produced from corn or potatoes that is added to many drug or vitamin tablets to help them dissolve easily

prescription drug (noun): a medication that must be ordered by a doctor before it can be dispensed

prostate gland (noun): a small organ located at the base of the bladder in males

recommended (adjective): to be suggested

relieve (verb): to ease or reduce discomfort

Ritalin® (noun): a brand-name version of a stimulant drug used to treat ADHD

risk (noun): the possibility of loss or injury; danger

sedative (noun): a chemical such as a drug that makes a person feel calm or reduces anxiety or nervousness

seizure (noun): a sudden attack caused by abnormal activity in the brain that causes convulsions or loss of consciousness

sinus (noun): an open space in the skull that connects with the nose openings

stimulant (noun): a drug that causes a temporary increase in activity in parts of the brain and/or body and makes a person more active or energetic

substance (noun): a material with a specific chemical makeup

tranquilizer (noun): a powerful drug used to calm nerves and reduce severe anxiety

treat (verb): to care for or deal with medically

Tylenol® (noun): a brand-name version of an over-the-counter pain reliever that contains acetaminophen as its active ingredient

usage (noun): the amount or way of using something

Valium® (noun): a brand-name version of the drug diazepam, which is a type of sedative used to increase calmness

Vicodin® (noun): a brand name for a combination of the drug hydrocodone, which is an opioid drug used to treat severe pain, and non-opioid pain reliever acetaminophen

vitamin (noun): a natural substance that is needed in small amounts in the body but does not provide energy; vitamins are found in some food and are sometimes produced inside the body

Xanax® (noun): a brand-name version of the drug alprazolam, which is a type of sedative used to increase calmness