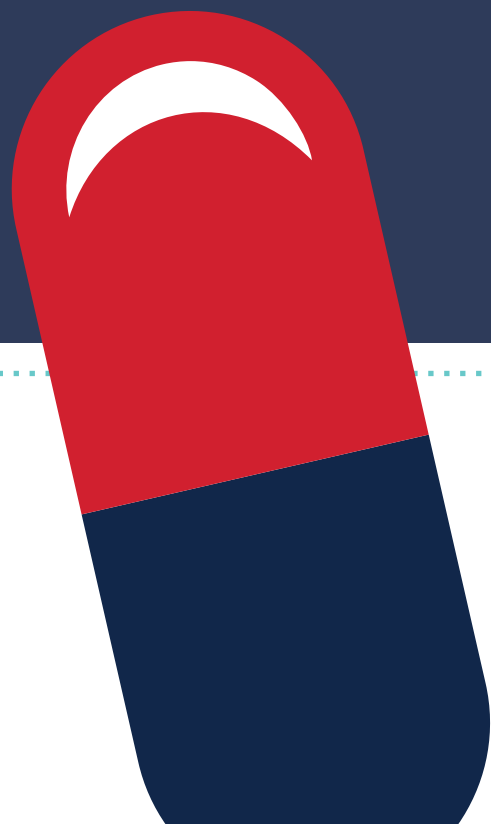


ELEMENTARY
SCHOOL

DIGITAL LESSON EDUCATOR GUIDE



LESSON OVERVIEW



In this lesson, students will investigate what medicine is and when, how, and why we take it. Through a series of activities, students will discover how medication enters our bodies to control illnesses that won't go away, helps prevent us from getting sick, and makes us feel better when we are sick. They will use this information to help explain the importance of responsibly consuming medications that are sold over-the-counter (OTC) and those prescribed by a doctor.

The accompanying presentation was created with PowerPoint so that it can be used in a variety of classrooms. If you are using a laptop with an LCD projector, simply progress through the PowerPoint by clicking to advance. All of the interactive aspects of the presentation are set to occur on click. The corresponding videos link to the slides. Click on the images to play the videos. If you are using an interactive whiteboard, tap on each slide with your finger or stylus to activate the interactive aspects of the presentation. It does not matter where you tap, but you can make it appear as if you are making certain things happen by tapping them. Teacher notes are included for each slide that include information on how to proceed.

Content Areas

Life Sciences and Health Education

Activity Duration

3 class sessions (45 minutes each)

Grade Level

Grades 3-5

Essential Questions

- What is Medicine?
- Why do we take medications?
- How do medications work?
- Why are some medications sold over-the-counter while others are prescribed by a doctor?
- Why is it important to use medications responsibly?

Materials

- White index cards (one per partner group)
- Access to the Internet
- Journals or blank paper
- Markers
- Chart paper and markers
- Diagram of the digestive system (one per student)
- Avoiding Medication Mistakes capture sheet (one per student)

Objectives

- Describe the appropriate uses of medication.
- Explain how medication affects the body.
- Summarize why it is important to use over-the-counter and prescription medications responsibly.

BACKGROUND INFO

Medications are chemicals or compounds used to cure diseases and save lives. Today's medications are produced using a variety of sources. Some medications are produced in labs by mixing chemicals or through biological engineering. Others are manufactured by utilizing byproducts. For example, Penicillin is extracted from Penicillium mold. Many medications are developed using substances from nature. In 1962, Arthur Barclay, a United States Department of Agriculture (USDA) botanist, collected a sample of bark from the Pacific yew tree. Today, the anti-cancer agents from the Pacific yew are used in some of the most effective cancer medications ever developed. When used responsibly, medications can help manage and prevent disease, ease symptoms, and in some cases, diagnose illnesses.

The overuse and misuse of prescription and over-the-counter medications is a serious public health threat. After marijuana (and alcohol), the most commonly abused substances by Americans 14 and older are prescription and over-the-counter medications.

Opioids, a type of prescription medications, are prescribed to treat pain. Despite the fact that there has not been an increase in pain reported, prescription opioid sales in the U.S. nearly quadrupled from 1999 to 2014. Prescription opioids and heroin, an illegal type of opioid, are the main causes of overdose deaths. Over-the-counter medications can be just as addictive and dangerous as prescription medications. Cough and cold remedies containing dextromethorphan are the most commonly misused over-the-counter medications. When misused, dextromethorphan can cause hallucinations and a potent high. Dextromethorphan can also cause impaired motor function, numbness, nausea, vomiting, increased heart rate or blood pressure, and, on rare occasions, hypoxic brain damage.

This lesson sequence is designed to help elementary students understand the importance of appropriate prescription and over-the-counter

medication use. It provides the foundation for the secondary Operation Prevention lessons related to the misuse of opioids. Specifically, the use and misuse of opioids such as heroin, morphine, and prescription painkillers.

This guide was created to give educators ideas and strategies for presenting the content in the digital lesson. It provides slide-by-slide details for educators to be prepared to engage with students as they explain, discuss, and effectively facilitate the content in the presentation. The presentation is designed to cover three 45-minute class sessions, but it is flexible, depending on the students' needs and time available.

During the lesson sequence, students will explore the reasons why we take medication, how medications work, and summarize the importance of responsibly utilizing over-the-counter and prescription medications. As an introduction to these topics, students will conduct activities that require them to explain what medication is and how it should be utilized (manage and prevent disease, ease symptoms, sometimes aides in diagnosis).

At different points in the lesson, students may be tempted to share personal information regarding misuse by themselves or others. As always, be sure to follow school or district policies about the sharing of personal information about minors.

SLIDES 2-9

ENGAGE, EXPLORE, AND EXPLAIN

Overview: : Students will be guided through a series of brief activities to explore the role of the immune system, generate a working definition for medication, and explain how medication is used.

Slides 2-9 contain activities to engage students in understanding what the immune system is and how medication is use to assist the immune system in managing/preventing disease (e.g. cancer, heart disease), and easing symptoms (e.g. seasonal allergies, cold).

WHAT IS IMPORTANT?



- Patient Name
- Name of medication and strength
- Instructions on how and when to take this medication
- Physical description of the medication
- Expiration date
- Number of pills in bottle

2
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OPERATION PREVENTION

SLIDE 2

- Invite students to review the information on the prescription medication label using the slide.
- Ask students to consider why each piece of information is important to know.

MEDICATION: WHAT IS IT?

Work with your partner to define the term medication using the clue questions.

- Where is it?
- What does it do?
- What's another word for it?
- What does it look like?



3
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OPERATION PREVENTION

SLIDE 3

- Organize students into partners and distribute one index card to each partner group.
- Direct students to work with a partner to generate a definition using the guiding questions. This will help assess what students already know about medication.
- Allow partner groups to share their definitions.

DAY 1

MEDICATION: WHAT IS IT?



Medications are made in laboratories, some of which are even created from substances found in nature. They keep people healthy when used as directed or prescribed.

Some can be purchased at the store by an adult and some require a prescription from the doctor.

SLIDE 4

- Present the definition on this slide and allow students to revise their original definitions as needed.
- Work as a class to finalize and record a working definition.

MEDICATION: HOW IS IT USED?

Most of the time your immune system keeps you healthy. When it does not, medications can be used to help your immune system. A responsible adult, or a doctor, should be asked to determine if medication is needed to help you feel better.



SLIDE 5

- Describe the role of the immune system in the body. It is a system made up of special cells, proteins, tissues, and organs that work to protect the human body.
- Explain that medication may be considered when the immune system is unable to protect the body on its own.

MEDICATION: HOW IS IT USED?

THE IMMUNE SYSTEM



Check your thinking by watching the video



SLIDE 6

- Ask students to write down three things they might already do, or can do, to prevent illness.
- Use the video "The Immune System" to reinforce that preventive measures (e.g. immunizations, proper rest, good nutrition, regular exercise, routine check-ups) are the best ways to fight illness and that when preventive measures are not enough, medication can be used to assist the immune system.

Video is at the bottom of this page:

<https://kids.usa.gov/teens/watch-videos/health-and-safety/index.shtml>

- Guide students to add to their list, and provide an opportunity to clarify any questions, after they viewed the video.
- Explain that children and pre-teens should always consult a doctor or responsible adult regarding the possible need for medication.



SLIDE 7

- Use the collection of pictures and objects shown. (e.g. tissues, thermometer, plastic bag filled with grass, breast cancer ribbon, picture of American Heart Association logo, toy ambulance) that are related to how medications are used to assist the immune system (manage and prevent disease, ease symptoms).
- Present the images one at a time and ask students what they think the collection represents. Accept and record all ideas allowing students to modify their theme ideas after each item is presented.
- After the entire collection is revealed, explain that medications are used to manage and prevent disease (e.g. cancer, heart disease), ease symptoms (e.g. seasonal allergies, cold), and can be used to help in the diagnosis of some illnesses.
- Work as a group to classify the collection of objects into two categories (manage and prevent disease, ease symptoms). Some objects (e.g. ambulance) might be a good fit for both groups depending on the class discussion.

Answer guide:

- Manage and Prevent Disease: breast cancer ribbon, American Heart Association logo, ambulance
- Ease Symptoms: tissues (cold, seasonal allergies), grass (seasonal allergies), thermometer, ambulance

DAY 1

MEDICATION: HOW IS IT USED?

Medications are used to make a person feel better when they are sick to:

- help fight disease and infection in the body
- replace or block chemicals in the body
- control an illness
- relieve pain
- relieve symptoms



SLIDE 8

- Summarize the role of medications with students using the information on the slide.
- Review that medications are used to make a person feel better when they are sick: to help fight disease and infection, replace or block chemicals in the body, control an illness, relieve pain, and relieve symptoms.

REFLECTION

Describe two ways that humans use medications.

Why did Chloe, from the video, need an antibiotic?

SLIDE 9

Guide students to respond to the two prompts on an exit card.

- Describe two ways that humans use medications.
- Why did Chloe, from the video, need an antibiotic?

SLIDES 10-16

EXPLAIN

Overview: Students will demonstrate their understanding of how medications consumed orally travel through the digestive system and move on to the bloodstream.



SLIDE 10

- Show the video clip and ask students to describe what they see.
- Have students record their ideas in their journals or blank piece of paper.
- After students share, confirm that the video shows what a pill look like as it dissolves to be absorbed into the body.

Note: the video can be viewed using QuickTime




SLIDE 11

Pose the question, "How does medication enter the body?" Have students work individually to brainstorm and record ideas about how medications enter the human body. Allow some students to share their ideas with the class. Discuss the list of ways that medications can enter the body. Allow students to revise their original lists.

DAY 2

MEDICATION:
HOW DOES IT WORK?



Medications that enter by mouth travel through your digestive system.

As medications travel, they are absorbed by organs like the stomach and small intestine.

From the digestive system they enter the bloodstream.

12

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OPERATION PREVENTION

SLIDE 12

- Use the provided diagram to explain how medications that enter the body through the mouth travel through the digestive system.
- Explain that from the digestive system, medications are absorbed into the bloodstream.
- Use video on next slide to help build student understanding of an oral medications journey.

MEDICATION:
HOW DOES IT WORK?

Cancer



Receptor

Receptor

Receptor

Receptor

13

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OPERATION PREVENTION

SLIDE 13

Use the first part of the "How Does Medicine Work?" video (0:00-1:13) to help your students understand what happens to a pill when it is swallowed.

Points to reinforce:

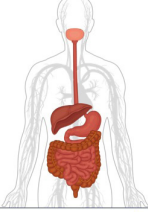
- Medications that enter the body through the mouth travel through the digestive system and are absorbed into the bloodstream.
- Specific medications are used for specific conditions. So, it is really important to seek adult guidance (e.g. parent/guardian/doctor) when you think you might need medication.
- If you are not taking medication correctly it is not going to do its job, and it might even make you sick.

DAY 2

MEDICATION:
HOW DOES IT WORK?

DEMONSTRATE YOUR UNDERSTANDING:
Create a Skit

Create a skit that demonstrates how medication that enters through the mouth travels through the digestive system.



14


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OPERATION PREVENTION

SLIDE 14

- Provide paper and markers and allow students to work in groups to create skits that show how medication travels through the digestive system. Allow students to present their skits to their peers.
- Alternatively, conduct a demonstration. Refer to the diagram and video on slide 13, as needed, to direct students. Have students stand with signs to represent the organs. Have another student stand with a cup of beans, blocks, or pennies to represent the pill. Have the pill travel through the digestive system. Prompt the organs to breakdown/absorb the medication (take beans, blocks or pennies) as it passes. Explain that from the digestive system medication is released into the bloodstream and that often the liver chemically alters the medication before it enters the bloodstream. Conduct the demonstration at least two more times using different students.

MEDICATION:
HOW DOES IT WORK? SUMMARIZER



On Your Own
Add on to the provided diagram to show how the medication or pill traveled through the digestive system.

Extension
Explain where the medication goes when it exits the digestive system.

15

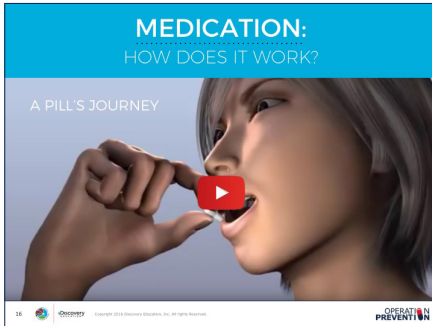
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OPERATION PREVENTION

SLIDE 15

- Distribute a [digestive system diagram](#) to each student. Have students work individually to use numbers, symbols, and words to label the diagram to show how medication travels through the bloodstream.
- Optional: Use the provided link to help deepen your students understanding of the functions of the digestive system. Type "Digestion System Movie" in the search box: <https://kids.usa.gov/teens/health-and-safety/general-health/index.shtml>

DAY 2



SLIDE 16

Use this video for students to check their work and summarize what happens to a pill when it is swallowed. Ask students to share how the digestive system plays a role with food and medications.

Anticipated responses:

- The digestive system breaks down food into energy (As discussed in the video on slide 13).
- The digestive system dissolves a pill into the bloodstream to help the healing process.

SLIDES 17-21

ENGAGE, EXPLORE, AND EVALUATE


Overview: : In this section, students will learn about two classifications of medication (over-the-counter and prescription). They will also explore how to use medications responsibly.



Slides 17-21 contain activities to engage students in understanding responsible uses of prescription and over-the-counter medications.

PRESCRIPTION VS. OVER-THE-COUNTER

Prescription Medications
Medications prescribed by a doctor for a specific person. They determine your dosage based on your height, weight, age, and muscle mass.

Over-the-Counter Medications (OTC)
Medications that do not need a doctor's prescription and can be sold directly to an adult customer.

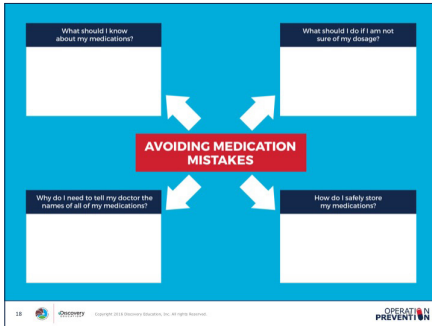


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SLIDE 17

- Introduce the two categories of medications by displaying the terms Over-The-Counter (OTC) and Prescription.
- Ask students what they think prescription medications means. Click to reveal and review the description for prescription medications. Emphasize that prescriptions are specific to the individual based on their condition, height, weight, age, and muscle mass. So, they cannot be safely shared or stored in a shared space.
- Ask students how they think OTC medications differ from prescription medications. Click to reveal and review the description of OTC medications. Allow time for students to ask clarifying questions.

DAY 3



SLIDE 18

Distribute a capture sheet to each student and read the questions aloud. Ask students to answer the questions using the information presented in the next three slides including the video.

Answer guide:

What should I know about my medications?

- You should know the name, purpose, and dosage of your medications.

What should I do if I am not sure of my dosage?

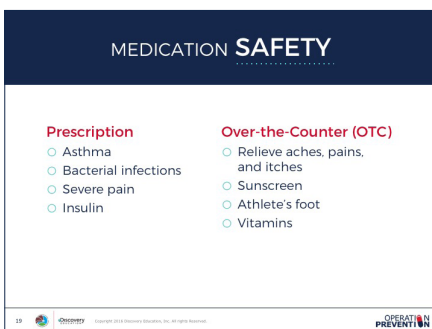
- You should ask your doctor for prescription medications and pharmacist/responsible adult for OTC medications. Be sure to use the correct measuring tool when taking your medication.

Why do I need to tell my doctor the names of all of my medications?

- My doctor needs to know the names of all of my medications to avoid negative medication interactions and side effects.

How do I safely store my medications?

- To safely store my medications, I should put them in a cool and dry place out of the reach of children and pets.



SLIDE 19

- Review some of the symptoms/conditions that may be treated by each category of medications.
- Ask students if they notice a difference.
- Make sure they understand that prescription medications are typically used to treat more severe health issues (e.g. prescriptions treat conditions that may not have OTC treatment available, symptoms/conditions that require doctor supervision).
- You may have students on prescription medications for asthma, explain that sometimes it is necessary to see the doctor when OTC medications are not working.

DAY 3



SLIDE 20

Show video, pausing to allow students to answer the questions/complete the questions on capture sheet.



SLIDE 21

Invite students to review the information on the prescription medication label again. Ask students to apply what they have learned to explain why each piece of information is important to understand to ensure safety.

Anticipated responses:

- Patient Name: Know exactly who the medication is for.
- Name of Medication and Strength: Know what the medication is called and that the amount is customized for a specific person.
- Instructions: Explains how to take the medication. Take only as directed on the label. If it is daily, it should be taken once each day. If it says "three times a day" it should be taken throughout the day, instead of all at once. Note if it asks to take with food or water and follow those directions.
- Physical description of the medication: Helps identify the medication by describing physical appearances.
- Expiration date: Throw away medications that are past the expiration date. Old medications may not work or could make you sick.
- Number of pills in bottle: The number of pills prescribed is unique to each person and situation.

REFERENCES

<https://www.cdc.gov/getsmart/community/materials-references/graphics.html>

<https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm092810.htm>

<https://www.drugabuse.gov/publications/drugfacts/prescription-over-counter-medications>

<https://www.addictioncenter.com/painkillers/over-the-counter-drugs/>

<https://www.cdc.gov/drugoverdose/data/statedeaths.html>

<http://kidshealth.org/en/teens/meds.html>

<https://nihseniorhealth.gov/takingmedicines/drugsinthebody/01.html>

<https://healthfinder.gov/HealthTopics/Category/everyday-healthy-living/safety/use-medicines-safely>

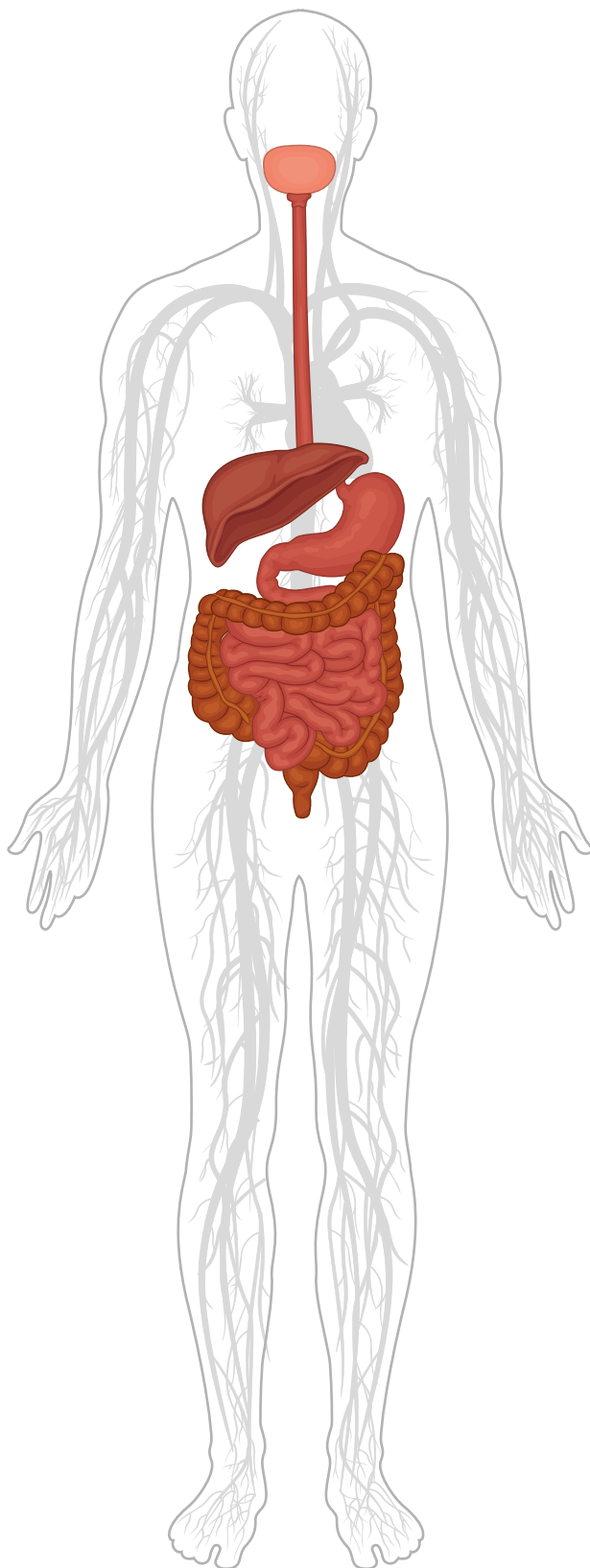
<http://www.foxnews.com/health/2013/08/21/pacific-yew-potent-cancer-fighting-agent.html>

<https://www.nlm.nih.gov/exhibition/fromdnatobeer/exhibition-interactive/illustrations/penicillin-alternative.html>

DIAGRAM OF DIGESTIVE SYSTEM

NAME:

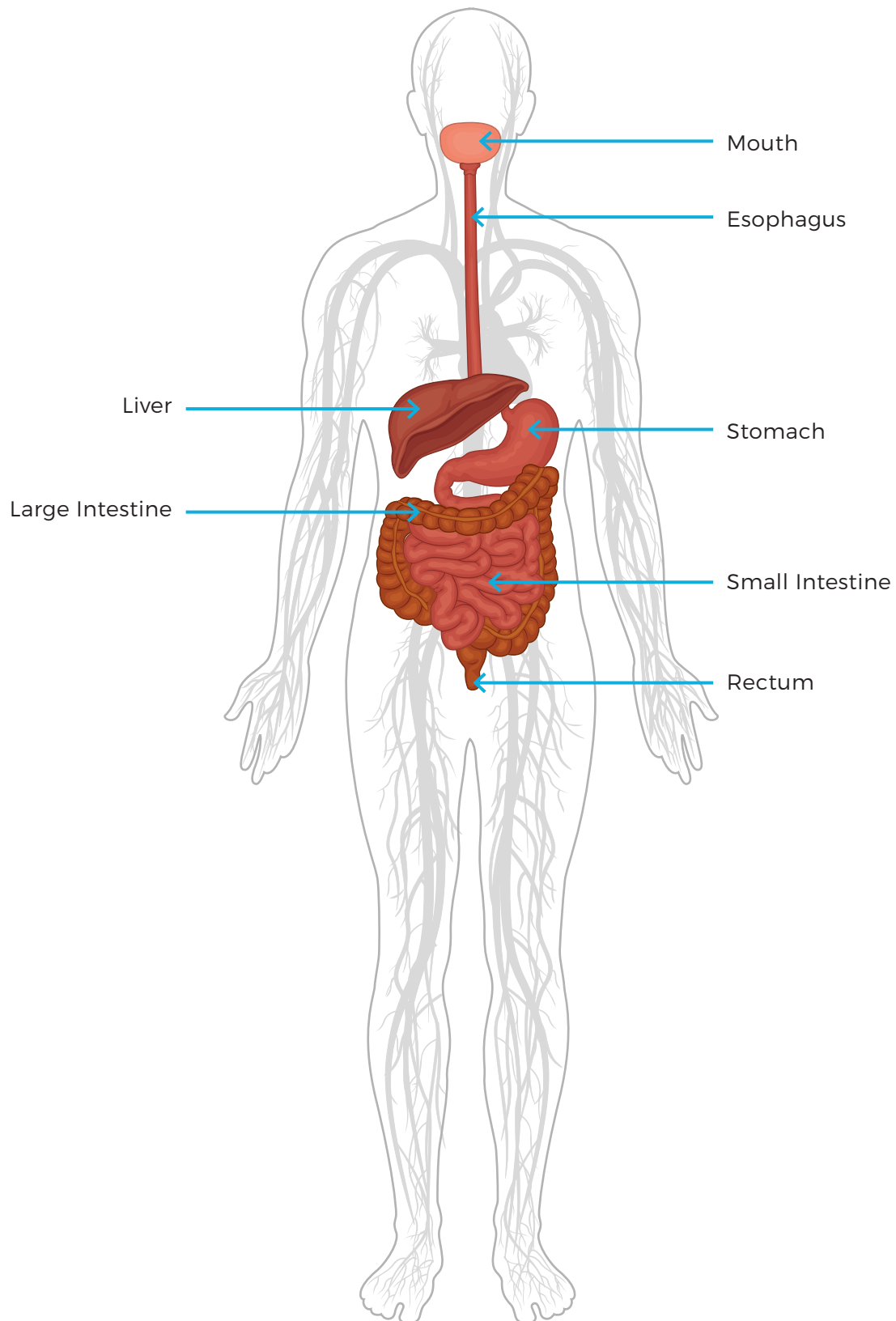
DATE:



ANSWER KEY DIGESTIVE SYSTEM

NAME:

DATE:



AVOIDING MEDICATION MISTAKES **CAPTURE SHEET**

Who should I talk to when I think I might need medication?

What should I do if I am not sure of my dosage?



AVOIDING MEDICATION MISTAKES

Why do I need to tell my doctor the names of all of my medications?

How do I safely store my medications?