

## Flipped IN-CLASS Lesson Plan Template

Topic or concept: Cardiovascular System

### Basic objectives for preparatory work:

1. Identify the parts of the human heart and arteries and veins that attach to the heart
2. Explain the structural differences between arteries, veins, and capillaries
3. Identify the parts that make up blood
4. Describe what the terms oxygenated and deoxygenated mean
5. Explain systolic and diastolic pressure

### Advanced objectives for classwork & after class work:

1. Explain how components of blood help maintain homeostasis
2. Describe how blood flows through the circulatory system
3. Determine the direction of movement of oxygen and carbon dioxide, nutrients, hormones, and wastes between the bloodstream and the lungs and the bloodstream and body tissues
4. Using the diagram of the cardiovascular system provided:
  - a. Label the parts of the human heart and the arteries and veins attached to it
  - b. Indicate the direction of blood flow and identify if the blood is oxygenated or deoxygenated
  - c. On the circuit diagram, label which is the systemic and which is the pulmonary circuit and indicate which blood vessels are arteries, veins, and capillaries
  - d. Identify the direction of movement of oxygen and carbon dioxide through the two circuits

	Time planned	Activity and rationale	Resources needed
Beginning of class period	5 mins	“Brain dump” to activate knowledge from preparatory activities and provide accountability	Paper and writing implement
Middle of period	15-20 mins	Mini-lecture based on main points of system engaging students in Q&A. Clarify misconceptions and offer new info.	Lecture prep/slides, access to videos if needed
Middle of period (use if needed)	20 mins	Group discussion of topic including muddy points. Gamify information, lecture prepared questions (i.e. iClicker, Kahoot, etc.)	Prepared iClicker or Kahoot questions.
End of period	5 mins	Reflection on material. RSQC (Recall, Summarize, Question, Review, Connect, Comment). Students solidify understanding in preparation for doing advanced work at home. Wrap-up questions. Explanation of advanced work.	RSQC template handouts. Instructor lead Q&A and discussion of next steps.

## Flipped AFTER CLASS Work Plan Template

Advanced learning objective	Activity and rationale	Instructions to students
<ol style="list-style-type: none"> <li>1. Explain how components of blood help maintain homeostasis</li> <li>2. Describe how blood flows through the circulatory system</li> <li>3. Determine the direction of movement of oxygen and carbon dioxide, nutrients, hormones, and wastes between the bloodstream and the lungs and the bloodstream and body tissues</li> <li>4. Using the diagram of the cardiovascular system provided:               <ol style="list-style-type: none"> <li>a. Label the parts of the human heart and the arteries and veins attached to it</li> <li>b. Indicate the direction of blood flow and identify if the blood is oxygenated or deoxygenated</li> <li>c. On the circuit diagram, label which is the systemic and which is the pulmonary circuit and indicate which blood vessels are</li> </ol> </li> </ol>	<p>Complete the worksheet provided on Canvas.</p> <p>Watch the video links provided in Canvas to conceptualize how the cardiovascular system works and keeps us alive.</p>	<ul style="list-style-type: none"> <li>• Go to Canvas Course Homepage and click the link for the week. Complete the cardiovascular diagram worksheet under this weeks assignments.</li> <li>• Worksheets must be handwritten and must be legible. Be sure to include your SJSU ID# in the space provided.</li> <li>• Turn the worksheet to the instructor at the beginning of class Wednesday.</li> <li>• All students must post one discussion question on Canvas of a “muddy point”, something that is still unclear.</li> <li>• All students must answer two posted discussion questions.</li> </ul>

## GUIDED PRACTICE

Class: Human Biology

Date assigned: Wednesday of current week

Date due: Sunday before lecture on topic

Time estimate to complete this assignment: 45-60 minutes

### Overview/Introduction

What is this lesson about? Why do we care?

We recently discussed how the body breaks down the food we eat to unit molecules that our body can use to make new cells, repair existing cells, and to create energy. In this chapter we will look at how those nutrients are moved from the small intestine to all of the tissues of the body, how the wastes are moved from cells to organs for release from the body. We will also discuss how the body brings oxygen to the cells and takes carbon dioxide away from the cells.

At the conclusion of this activity students will be able to:

- identify and name the major structures of the human heart
- compare and contrast the major blood vessels of the circulatory system
- determine and discuss the direction of movement of oxygen and carbon dioxide, nutrients and wastes, hormones and immunity cells are moved between the bloodstream and the lungs and the bloodstream and the body tissues of the closed circulatory system
- explain how the circulatory system regulates blood pressure
- discuss various cardiovascular diseases and their causes

### Learning Objectives

Basic objectives

List 3-5 learning objectives that you expect students to be able to master on their own before class.

1. Identify the parts of the human heart and arteries and veins that attach to the heart
2. Explain the structural differences between arteries, veins, and capillaries
3. Identify the parts that make up blood
4. Describe what the terms oxygenated and deoxygenated mean
5. Explain systolic and diastolic pressure

Advanced objectives

List 3-4 learning objectives that you expect students to need help mastering.

1. Explain how components of blood help maintain homeostasis
2. Describe how blood flows through the circulatory system
3. Determine the direction of movement of oxygen and carbon dioxide, nutrients, hormones, and wastes between the bloodstream and the lungs and the bloodstream and body tissues
4. Using the diagram of the cardiovascular system provided:
  - a. Label the parts of the human heart and the arteries and veins attached to it

- b. Indicate the direction of blood flow and identify if the blood is oxygenated or deoxygenated
- c. On the circuit diagram, label which is the systemic and which is the pulmonary circuit and indicate which blood vessels are arteries, veins, and capillaries
- d. Identify the direction of movement of oxygen and carbon dioxide through the two circuits

## Preparatory Activities and Resources:

1. Give detailed, action-oriented instructions for completing the Guided Practice assignment. Keep in mind that the activities should be minimal, simple, engaging, productive, and failure tolerant (see Talbert, 2017, pg. 135)

All students will read chapter 13. *The Cardiovascular System*, paying close attention to section headings and bolded words. Students should know the definition of or understand the importance of the bolded words. You should read and understand the information of each picture and diagram as this will help you understand the concepts of the organ system discussed.

Students will complete the attached worksheet. Worksheets are to be legibly handwritten. The worksheet will be completed using the textbook as well as watching the video links below.

The completed worksheet is due to the instructor at the beginning of class on Monday of the discussion week.

2. Give a “playlist” of resources such as readings, videos, audio, or other content delivery methods that provide students the content to work with.
  1. Worksheet relating to the chapter: terminology, questions related to learning objectives.
  2. Watch video of heart cycle: [https://www.youtube.com/watch?v=z4Egyylf2\\_4](https://www.youtube.com/watch?v=z4Egyylf2_4)
  3. Watch video of heart cycle: <https://www.youtube.com/watch?v=CWFyxn0qDEU>
  4. Publisher supplied resources that will benefit students (there will be a link in Canvas to get to these resources).

**Exercises:** Please complete by Sunday night prior to Monday lecture/meeting.

- Give a method for students to submit their work online BEFORE the face to face class meeting. Google forms, SurveyMonkey, and tools in your LMS will all work. Alternatively, give them instruction on what completed work to bring to class as an entry ticket.
- The submitted work should demonstrate students’ mastery of the basic learning objectives.

The students will take a short quiz linked through Canvas to the publisher site. The quiz will be due before first weekly meeting.

## Questions?

Give a way for students to get help.

- E-mail: [mary.harness@sjsu.edu](mailto:mary.harness@sjsu.edu) (Response time is within 24 hours)
- Office hours MW 11:30-12:30 in DH438
- Canvas discussion: You may post any questions about course materials on the weekly discussion forum. I will reply to these questions in the forum within 24 hours and go over selected questions in class.

## ADVANCED PRACTICE

This is given for students to complete after the class meeting in which they work together.

Class: Human Biology

Date assigned: Wednesday of the week prior to chapter discussion

Date due: Sunday

Time estimate to complete this assignment: (Note that this is advanced practice, so is expected to take longer than a preparatory assignment – but not TOO long! Keep it reasonable.) 1-2 hours

## Learning Objectives

### Advanced objectives

List 3-4 learning objectives that you expect students to need help mastering in class and after class.

1. Explain how components of blood help maintain homeostasis
2. Describe how blood flows through the circulatory system
3. Determine the direction of movement of oxygen and carbon dioxide, nutrients, hormones, and wastes between the bloodstream and the lungs and the bloodstream and body tissues
4. Using the diagram of the cardiovascular system provided:
  - a. Label the parts of the human heart and the arteries and veins attached to it
  - b. Indicate the direction of blood flow and identify if the blood is oxygenated or deoxygenated
  - c. On the circuit diagram, label which is the systemic and which is the pulmonary circuit and indicate which blood vessels are arteries, veins, and capillaries
  - d. Identify the direction of movement of oxygen and carbon dioxide through the two circuits

## Activities & deliverables

1. Give detailed, action-oriented instructions for completing the assignment. Make sure to also include a reflective component.
2. Describe what students should turn in, by when.

Complete the cardiovascular diagram worksheet in Canvas and submit to the instructor at the beginning of class Wednesday.

All students must post one discussion question on Canvas of a “muddy point” something that is still unclear.

All students must answer two posted discussion questions.

## Resources:

3. Give a “playlist” of resources to help students complete the assignment.
- Reading
    - Review chapter 13 *The Cardiovascular System*
    - Worksheet posted on Canvas
    - Lecture slides posted on Canvas
    - Weekly discussion of Muddy points on Canvas
  - Additional resources
    - Go to WileyPLUS resources page for chapter 13 and do the following:
      - Animation and Audio:
        1. Animation: Cardiac Cycle
        2. Animation: Capillary Exchange
        3. Anatomy Overview: Vessels
        4. Anatomy Overview: Blood
        5. Exercise: Paint the Heart
    - Activities:
      1. Chapter13: Mind Mapping Activity: Visualizing the Cardiovascular System
      2. Interactive Process Diagram: The Cardiac Cycle

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