

## Articles- **NATURAL & SYNTHETIC**

**Directions:** Each student at your table will be given a different article to read. You will read your article and answer the questions on your worksheet. Then you will group up with someone else who has your same article. You will answer the questions from your group discussion. Then you will go back to your table and share your article with your table. Each student at the table will have a different article and a different worksheet.

### THE BIZARRE QUEST FOR ARTIFICIAL BLOOD

1. In 1878 what type of milk did a doctor inject into a patient's veins?
2. Today, doctors transfer human blood provided by human donors into a patient's body. What is this process called?
3. Give two reasons why scientists are searching for an alternative to human blood.
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4. Give 3 functions of blood.
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5. Give 2 reasons why blood transfusions aren't ideal.
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6. Does artificial blood need to form all of the functions of real blood to save lives? Why?
7. Scientists are successfully creating hemoglobin-based oxygen carriers. This works for some patients. What are the problems associated with it?
8. Bioengineer Cabrales is making synthetic oxygen-carrying molecules inspired by \_\_\_\_\_ blood.
9. Other researchers are trying to make synthetic blood out of \_\_\_\_\_ (PFCs).
10. When blood transfusions aren't possible, what are some other options besides artificial blood?
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### EXPERT GROUPE

**Directions:** You will find 2-3 other people that have your same article (blue paper). As a group, you will discuss what you read and answer the following questions.

1. Why are scientists eager to find an artificial replacement for blood? Provide evidence to support your answer.
2. What is blood made of? (Be specific).

## TABLE GROUPS

**Directions:** Each person at your table read a different article. They will be asking you these questions. Be prepared to answer.

1. Why is there a need for artificial blood?
2. Does artificial blood need to be exactly the same as real human blood? Why/Why not?
3. Are there places in the world that use artificial blood? Where? Why?

The table below has questions for you to ask the people at your table about the articles that they read. Ask them the questions and write down their answers.

### **Chewing on Plastic:**

1. What pollution problem can be caused by using artificial gum?
2. Seattle has a famous gum wall. Discuss what that gum wall would be like (or if it would exist) if it was only filled with "simply gum."
3. Did the woman who invented the gum use the scientific method or the engineering design process to perfect her gum? Why?

### **Cell Phone Chemistry:**

1. Choose 3 of the **elements** used in a cell phone and explain their function.
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2. Explain how a cell phone is a synthetic item but comes from natural resources.

### **Golf Ball Cleanup:**

1. What happens to a golf ball after it enters the ocean?
2. Why is it a problem that golf balls land in the ocean?
3. Are golf balls made from natural or synthetic substances? Explain your answer.

## CLASS DISCUSSION

Directions: As a class, give examples of advantages and disadvantages to synthetic products.

<u>Advantages</u>	<u>Disadvantages</u>