

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.

Cell Phone Chemistry

Circuitry:

1. The circuit board has copper, gold and silver—good electrical _____.
2. The connectors are coated in gold because it's highly resistant to _____.

Battery:

3. When you turn on your phone, positively charged lithium _____ move through a lithium-salt solution that conducts _____.

Computer Chip:

4. The chip is embedded with silicon—which has low _____.

Touch Screen:

5. When you touch the screen, there is a change in the _____ field to communicate your finger's location.

Glass:

6. Smartphone screens contain glass made from _____ and _____.

Display:

7. The elements in the display are called _____ because they are hard to mine.
8. Yttrium, Europium and Dysprosium produce the _____ on the liquid crystal display.
9. Gadolinium, lanthanum and terbium give the screen its _____.

Microphone & Speakers:

10. Magnets _____ in the speaker to create audible sound.

EXPERT GROUP

Directions: You will find 2-3 other people that have your same article (green paper). As a group, you will discuss what you read and answer the following questions. Use the KEY on the left to help answer the questions.

1. Which part of the phone has the most **Inner** Transition Metals?
2. Which part of the phone has the most Nonmetals?
3. Which part of the phone has the most Transition Metals?
4. Which part of the phone do you think is the most expensive to make and why? (Hint: It's hard to mine). Discuss with your group why you chose this answer.

TABLE GROUPS

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

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

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?

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.

The Bizarre Quest for Artificial Blood:

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?

CLASS DISCUSSION

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

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