Fill in the blank with the letter next to the word that best completes the sentence.

1. a. trade-off  
   are generally compounds between metallic and nonmetallic elements and include such compounds as oxides, nitrides, and carbides. Typically they are insulating and resistant to high temperatures and harsh environments.

2. b. Metals  
   - materials that are normally combinations of metallic elements.

3. c. Semiconductors  
   properties are: tensile strength, fracture toughness, fatigue strength, creep strength, hardness, etc.

4. d. Electrical  
   or polymers are generally organic compounds based upon carbon and hydrogen. They are very large molecular structures. Usually they are low density and are not stable at high temperatures.

5. e. properties  
   technologies produce quality goods at low prices, and apply the properties of materials to ensure the desired function of a product.

6. f. Plastics  
   properties are: magnetic susceptibility, Curie temperature, Neel temperature, saturation magnetization, etc.

7. g. Materials  
   have electrical properties intermediate between metallic conductors and ceramic insulators. Also, the electrical properties are strongly dependent upon small amounts of impurities.

8. h. Composites  
   Often a compromise/ among the needed properties must be made to be consistent with the processing selected and the structural state desired or possible.

9. i. Magnetic  
   consist of more than one material type. Fiberglass, a combination of glass and a polymer, is an example. Concrete and plywood are other examples.

10. j. Ceramics  
    Properties of materials can be as: mechanical, electrical, magnetic, optical and dielectric and thermal.

11. k. Mechanical  
    properties are: conductivity or resistivity, ionic conductivity, semiconductor conductivity, etc.

12. l. Thermal  
    properties are: coefficient of thermal expansion, heat capacity, thermal conductivity, etc.
13. _________ and Dielectric properties are: polarization, capacitance, refractive index, absorption, etc.

14. The physical _________ of the material are a basic reason for selecting the material for the needed product performance.

15. Metals usually are good _________ of heat and electricity.

16. _________ can be categorized as the following: metals, ceramics, plastics, semiconductors and composites.
Fill in the blanks in these sentences with the word that fits.

1. ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ technologies produce quality goods at low prices, and apply the properties of materials to ensure the desired function of a product.

2. The physical ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ of the material are a basic reason for selecting the material for the needed product performance.

3. Often a compromise/ ___ ___ ___ ___ ___ ___ ___ ___ ___ among the needed properties must be made to be consistent with the processing selected and the structural state desired or possible.

4. ___ ___ ___ ___ ___ ___ ___ ___ ___ can be categorized as the following: metals, ceramics, plastics, semiconductors and composites.

5. ___ ___ ___ ___ ___ ___ ___ - materials that are normally combinations of metallic elements.

6. Metals usually are good ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ of heat and electricity.

7. ___ ___ ___ ___ ___ ___ ___ ___ ___ are generally compounds between metallic and nonmetallic elements and include such compounds as oxides, nitrides, and carbides. Typically they are insulating and resistant to high temperatures and harsh environments.

8. ___ ___ ___ ___ ___ ___ ___ ___ ___ or polymers are generally organic compounds based upon carbon and hydrogen. They are very large molecular structures. Usually they are low density and are not stable at high temperatures.

9. ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ have electrical properties intermediate between metallic conductors and ceramic insulators. Also, the electrical properties are strongly dependent upon small amounts of impurities.

10. ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ consist of more than one material type. Fiberglass, a combination of glass and a polymer, is an example. Concrete and plywood are other examples.

11. Properties of materials can be ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ as: mechanical, electrica, magnetic, optical and dielectric and thermal.

12. ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ properties are: tensile strength, fracture toughness, fatigue strength, creep strength, hardness, etc.

13. ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ properties are: conductivity or resistivity, ionic conductivity, semiconductor conductivity, etc.

14. ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ properties are: magnetic susceptibility, Curie temperature, Neel temperature, saturation magnetization, etc.
15. ___ ___ ___ ___ ___ ___ ___ and Dielectric properties are: polarization, capacitance, refractive index, absorption, etc.

16. ___ ___ ___ ___ ___ ___ ___ properties are: coefficient of thermal expansion, heat capacity, thermal conductivity, etc.

Select your answers from the following words:

<table>
<thead>
<tr>
<th>Materials</th>
<th>Electrical</th>
<th>Ceramics</th>
<th>properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>Semiconductors</td>
<td>Mechanical</td>
<td>Thermal</td>
</tr>
<tr>
<td>categorized</td>
<td>Plastics</td>
<td>Optical</td>
<td>Magnetic</td>
</tr>
<tr>
<td>Metals</td>
<td>conductors</td>
<td>Composites</td>
<td>trade-off</td>
</tr>
</tbody>
</table>
Fill in the crossword puzzle by using the clues.

Across

1. ____________________ properties are: tensile strength, fracture toughness, fatigue strength, creep strength, hardness, etc.

Across
2. Materials have electrical properties intermediate between metallic conductors and ceramic insulators. Also, the electrical properties are strongly dependent upon small amounts of impurities.

3. Technologies produce quality goods at low prices, and apply the properties of materials to ensure the desired function of a product.

4. Compounds are generally compounds between metallic and nonmetallic elements and include such compounds as oxides, nitrides, and carbides. Typically they are insulating and resistant to high temperatures and harsh environments.

5. Materials can be categorized as the following: metals, ceramics, plastics, semiconductors and composites.

6. and Dielectric properties are: polarization, capacitance, refractive index, absorption, etc.

7. - materials that are normally combinations of metallic elements.

8. consist of more than one material type. Fiberglass, a combination of glass and a polymer, is an example. Concrete and plywood are other examples.

9. The physical of the material are a basic reason for selecting the material for the needed product performance.

10. properties are: magnetic susceptibility, Curie temperature, Neel temperature, saturation magnetization, etc.

**Down**

1. properties are: conductivity or resistivity, ionic conductivity, semiconductor conductivity, etc.

2. or polymers are generally organic compounds based upon carbon and hydrogen. They are very large molecular structures. Usually they are low density and are not stable at high temperatures.

3. Metals usually are good of heat and electricity.

4. Often a compromise/ among the needed properties must be made to be consistent with the processing selected and the structural state desired or possible.

5. Properties of materials can be as: mechanical, electrica, magnetic, optical and dielectric and thermal.

6. properties are: coefficient of thermal expansion, heat capacity, thermal conductivity, etc.
Select your answers from the following words:

<table>
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<tr>
<th>Mechanical</th>
<th>Thermal</th>
<th>trade-off</th>
<th>conductors</th>
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<tr>
<td>Optical</td>
<td>Materials</td>
<td>Manufacturing</td>
<td>Magnetic</td>
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<td>Electrical properties</td>
<td>Metals</td>
<td>Composites</td>
<td>Ceramics</td>
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<tr>
<td></td>
<td>categorized</td>
<td>Semiconductors</td>
<td>Plastics</td>
</tr>
</tbody>
</table>
Word Search - 5.2.1A Manufacturing

Name: ___________________________ Class: ___________ Date: ___________

Try to find the hidden words.

I P A L C M N Z N F A V O S V N I N I V
Q L X U Q O G W R U B U W H J M K Z D C
Y A T M X S N M L T M A T E R I A L S A
M S J D A D H D J R R M R H U C V R D F
E T N U Z N F K U U M A GNETIC W T
C I B C H U U Q M C K I D J Z R Z Y P N
H C C U O S L F E S T I E E U C M K Z U
A S A J P M E T A L S O O L O K B A N D
N I T T T P P M Z C E X R K L F C Z L J
I K E C I R H O I F T C K S G S F W A R
C J G Z C O P N S C N U T U B K Q Q P G
A E O F A P P I D I O B R R J N A J T E
L E R Q L E O V X T T N E I I Q C P U V
K J I A Q R J X Z B C E D L N C W C I V
I H Z I M T Y C A T L C S U B G A D T T
W T E S V I K B Z M H N O E C S Q L K Z
G U D T U E C D A X A C F Z L T R N E O
X N B M V S T S R M T O I Z N R O J I J
R R X W J X R R Y Q E X F S X C Q R Z L
C F I W T Y N S E W X F Z Y B I S F S S

Select from the following words:

Plastics Optical Semiconductors Electrical
conductors trade-off Ceramics categorized
Mechanical Manufacturing Thermal Magnetic
Metals Composites properties Materials